PLANNING COMMISSION
Regular Meeting

Agenda

Thursday, October 11, 2018 at 7:00 PM
City Hall Council Chamber – 14177 Frederick Street

CALL TO ORDER

ROLL CALL

PLEDGE OF ALLEGIANCE

APPROVAL OF AGENDA

APPROVAL OF AGENDA

CONSENT CALENDAR

All matters listed under Consent Calendar are considered to be routine and all will be enacted by one roll call vote. There will be no discussion of these items unless Members of the Planning Commission request specific items be removed from the Consent Calendar for separate action.

1. APPROVAL OF MINUTES

Planning Commission – Regular Meeting – August 23, 2018 7:00 PM

PUBLIC COMMENTS PROCEDURE

Any person wishing to address the Commission on any matter, either under the Public Comments section of the Agenda or scheduled items or public hearings, must fill out a "Request to Speak" form available at the door. The completed form must be submitted to the Secretary prior to the Agenda item being called by the Chairperson. In speaking to the Commission, member of the public may be limited to three minutes per person, except for the applicant for entitlement. The Commission may establish an overall time limit for comments on a particular Agenda item. Members of the public must direct their questions to the Chairperson of the Commission and not to other members of the Commission, the applicant, the Staff, or the audience.

Upon request, this agenda will be made available in appropriate alternative formats to persons with disabilities, in compliance with the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to Guy Pegan, ADA Coordinator, at 951.413.3120 at least 72 hours before the meeting. The 72-hour notification will enable the City to make reasonable arrangements to ensure accessibility to this meeting.

NON-PUBLIC HEARING ITEMS

PUBLIC HEARING ITEMS

1.	Case:	PEN18-0023 Plot Plan PEN18-0024 General Plan Amendment PEN18-0025 Change of Zone
	Applicant:	Newcastle Partners, Inc.
	Representative:	Jackson Smith
	Location:	Northeast corner of Brodiaea Avenue and Frederick Street
	Case Planner:	Seda Yaghoubian
	Council District:	1

OTHER COMMISSION BUSINESS

STAFF COMMENTS

PLANNING COMMISSIONER COMMENTS

ADJOURNMENT

Planning Commission Regular Meeting, October 25, 2018 at 7:00 P.M., City of Moreno Valley, City Hall Council Chamber, 14177 Frederick Street, Moreno Valley, CA 92553.

OFFICIAL MINUTES OF THE
PLANNING COMMISSION
OF THE CITY OF MORENO VALLEY

REGULAR MEETING – 7:00 PM
August 23, 2018

CALL TO ORDER

This Regular Meeting of the Planning Commission of the City of Moreno Valley was called to order at 7:10 p.m. by Vice Chair Korzec in the Council Chamber located at 14177 Frederick Street.

ROLL CALL

Planning Commission:	Patricia Korzec	Vice Chair	Present
	Jeffrey Barnes	Chair	Excused Absence
	Jeffrey Sims	Commissioner	Present
	Ray L. Baker	Commissioner	Present
	Alvin Dejohnette	Commissioner	Present
	Robert Harris	Commissioner	Present
	JoAnn Stephan	Chairman	Present

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Commissioner Jeffrey Sims.

APPROVAL OF AGENDA

APPROVAL OF AGENDA

Motion made by Commissioner Ray Baker and seconded by Commissioner Jeffrey Sims.

Vote:	6-0-0-1
Ayes:	Commissioners Joann Stephan, Alvin Dejohnette, Ray Baker, Robert Harris and Vice Chair Korzec
Noes:	
Abstain:	
Action:	Approved
Excused:	Chair Jeffrey Barnes

STAFF PRESENT

Paul Early	City Attorney
Albert Armijo	Interim Planning Manager
Chris Ormsby	Senior Planner
Julia Descoteaux	Associate Planner
Vince Giron	Associate Engineer
Michael Lloyd	Assistant City Engineer

Eric Lewis	City Traffic Engineer
Doug Bloom	Assistant Fire Marshal
Ashley Aparicio	Planning Commission Secretary

CONSENT CALENDAR

APPROVAL OF MINUTES

Minutes - Planning Commission Regular Meeting - Jul 26, 2018 7:00 PM

Motion made by Commissioner Robert Harris and seconded by Commissioner Joann Stephan.

Vote:	4-0-2-1
Ayes:	Commissioners Joann Stephan, Alvin Dejohnette, Robert Harris and Vice Chair Korzec
Noes:	
Abstain:	Commissioners Jeffrey Sims and Ray Baker
Action:	Approved
Excused:	Chair Jeffrey Barnes

PUBLIC COMMENTS PROCEDURE

No Public Comments.

NON-PUBLIC HEARING ITEMS

No items for Discussion.

PUBLIC HEARING ITEMS

1. Proposed Change of Zone and Plot Plan to allow for development of a 262,000 square foot warehouse building, while preserving development opportunity on the residual BPX property fronting Alessandro (Report of: Planning Commission)

A. Staff recommends that Planning Commission APPROVE Resolution Numbers 2018-40, 2018-41 and 2018-42, and thereby RECOMMEND that the City Council:

Resolution 2018-40

1. CERTIFY that the Final Environmental Impact Report PEN17-0145 for the Brodiaea Commerce Center project on file with the Community Development Department, incorporated herein by this reference, has been completed in compliance with the California Environmental Quality Act, that the Planning Commission reviewed and considered the information contained in the Final EIR and that the Final EIR reflects the City's independent judgment and analysis; and

2. ADOPT the Findings and Statement of Overriding Considerations regarding the Final EIR for the Brodiaea Commerce Center, attached hereto as Exhibit A; and

3. ADOPT the Mitigation Monitoring and Reporting Program for the Final EIR for the proposed project, attached hereto as Exhibit B; and

   Resolution 2018-41

4. APPROVE PEN17-0144, the Change of Zone as shown on the attachment included as Exhibit A; and

   Resolution 2018-42

5. APPROVE PEN17-0143 Plot Plan subject to the attached Conditions of Approval included as Exhibit A

Public Hearing Opened: 7:50 p.m.

Public Comments:

Tom Thornsley Opposes the item.

Thomas Ruiz Supports the item.

John Light Supports the item.

Michael Sotomeyor, Representing the Carpenter Union Area 951, Supports the item.

Juan Munoz Supports the item.

Rafael Brugueras Supports the item.

Public Hearing Closed: 8:02 p.m.

Motion made by Commissioner Jeffrey Sims and seconded by Ray Baker with the Conditions of Approval as amended.

Vote:	6-0-0-1
Ayes:	Commissioners Joann Stephan, Alvin Dejohnette, Ray Baker, Robert Harris and Vice Chair Korzec
Noes:	
Abstain:	
Action:	Approved
Excused:	Chair Jeffrey Barnes

OTHER COMMISSION BUSINESS

No items for Discussion.

STAFF COMMENTS

Staff will be taking the Brodiaea Commerce Center item to the next available City Council meeting.

PLANNING COMMISSIONER COMMENTS

Vice Chair Patricia Korzec thanked staff for the comprehensive report that was delivered in a timely manner and stated they did a wonderful job.

ADJOURNMENT

There being no further business to come before the Planning Commission, Vice Chair Korzec adjourned the meeting at 8:09 PM.

Submitted by:

_____
Ashley Aparicio
Planning Commission Secretary

Approved by:

_____
Patricia Korzec
Vice Chair

PLANNING COMMISSION

STAFF REPORT

Meeting Date: October 11, 2018

GENERAL PLAN AMENDMENT, CHANGE OF ZONE, AND PLOT PLAN FOR A 204,022 SQUARE FOOT WAREHOUSE BUILDING ON AN 8.8 ACRE SITE

Case:	PEN18-0023 Plot Plan PEN18-0024 General Plan Amendment PEN18-0025 Change of Zone
Applicant:	Newcastle Partners, Inc.
Representative:	Jackson Smith
Location:	Northeast corner of Brodiaea Avenue and Frederick Street
Case Planner:	Seda Yaghoubian
Council District:	1

SUMMARY

The applicant, Newcastle Partners, Inc., is requesting approval of the Centerpointe Commerce Center. The project includes a General Plan Amendment and Change of Zone to modify the project site's land use and zoning designations, and a Plot Plan for a 204,022 square foot warehouse/light industrial building including office/mezzanine space and associated site development components. Associated improvements to the property include points of ingress and egress, loading docks, surface parking areas (automobile parking and truck trailer parking) and utility infrastructure.

PROJECT DESCRIPTION

Project

The project, Centerpointe Commerce Center, includes a General Plan Amendment (PEN18-0024), a Change of Zone (PEN18-0025) and a Plot Plan (PEN18-0023) to develop an 8.8-acre property located at the northeast corner of Brodiaea Avenue and Frederick Street intersection with a light industrial/warehouse building containing 194,022 square feet of warehouse/light industrial building and 10,000 square feet of associated office and mezzanine space. A General Plan Amendment is required for the proposed project because the land use designation of the property is currently "Office" which does not allow warehouse/light industrial uses. Similarly, a Change of Zone is required because the property is currently zoned "Office" which is not intended for the proposed uses. The applicant, Newcastle Partners Inc., is requesting the General Plan Amendment and Change of Zone as their interest is to develop a single warehouse/light industrial commerce center in light of current market demand for these types of facilities.

PEN18-0024 General Plan Amendment

The proposed General Plan Amendment will change the General Plan land use designation for the entire 8.8-acre property from Office to Business Park. The proposed General Plan land use designation of Business Park will provide development opportunity for manufacturing, research and development, warehousing and distribution, as well as office and support commercial activities. This land use designation would be consistent with General Plan Objective 2.5, which aims to promote a mix of industrial uses that provides a sound and diversified economic base and employment opportunities for the citizens of Moreno Valley in locations that have good access to the regional transportation system, accommodate the personal needs of workers and business visitors, and which meets the service needs of local businesses.

The project site is surrounded by other development areas designated as either "Business Park" or "Commercial" in the General Plan. Existing warehouse buildings are located to the east and southeast of the project site. The Riverside County Waste Management offices, located to the immediate south, are on land with a land use designation of Business Park. The vacant parcel to the immediate north of the project site is designated as Commercial in the General Plan. The City Hall complex and adjacent City owned vacant land (approximately 30 acres) on the west side of Frederick Street, and the proposed project site are currently designated as Office. The surrounding Commercial and Business Park General Plan designations do allow for office land use.

PEN18-0025 Change of Zone

The proposed Change of Zone will change the zoning designation of the 8.8-acre site from Office (O) to Light Industrial (LI). The existing zoning, Office (O) allows for the establishment of park-like, office-based working environments for general business, corporate, professional and administrative offices.

The proposed Change of Zone to the Light Industrial (LI) zoning district provides for light manufacturing, light industrial, research and development, warehousing and distribution and multi-tenant industrial uses, as well as certain supporting administrative and professional offices, and commercial uses on a limited basis. This district is intended as an area for light industrial uses (including buildings over 50,000 square feet) that can

meet high performance standards. The proposed LI zoning will allow for the development of the proposed warehouse/light industrial commerce center desired by the applicant.

The project site is surrounded by developed Light Industrial zoned properties to the east and south, vacant properties zoned commercial to the immediate north, and City Hall offices on property zoned for Office to the west, as well as properties southwest of the project site developed and zoned with Business Park uses. Although the requested Change of Zone would replace the 8.8 acres of "Office" zoned property with "Light Industrial" zoning, opportunity for office land uses would remain available on the project site as well as the surrounding properties zoned for Business Park, Light Industrial, and Community Commercial.

PEN18-0023 Plot Plan

The proposed Plot Plan is for a 204,022 square foot warehouse building including 10,000 square feet of office and mezzanine space. Shipping and receiving areas will be located on the east side of the building with 23 loading docks and 27 truck trailer parking spaces. The office, including the mezzanine space, will be located on the northwest corner at the main entrance facing Frederick Street. Employee and visitor parking will be provided along the Frederick Street frontage on the western side of the building.

Site

The project site is located on the northeast corner of Brodiaea Avenue and Frederick Street on a relatively flat, rectangular-shaped site. The proposed grading will not create any manufactured slopes. The site is vacant, undeveloped and has no notable topographic features.

Access/Parking

Vehicular access to the project site is provided by three driveways – two driveways on Frederick Street and one driveway on Brodiaea Avenue. The northernmost driveway on Frederick Street would be used for truck and passenger vehicle traffic access and would be restricted to right turn movements when entering/exiting the site. The southernmost driveway onto Frederick Street would be the de facto eastern leg of the Frederick Street/Calle San Juan intersection and would be used by passenger vehicles accessing the site. This driveway would be controlled by an existing traffic signal and would have no restrictions for vehicle turning movements. The proposed driveway onto Brodiaea Avenue would be used for truck and passenger vehicle traffic access and would have no restrictions for vehicle turning movements. All project driveways that would be utilized by trucks would feature a sign directing exiting truck drivers to City of Moreno Valley truck routes. The City of Moreno Valley designates Frederick Street as a truck route.

The auto parking areas will be designed consistent with City parking standards including landscape planters and lighting. The project provides 109 automobile parking spaces

and 27 truck trailer parking spaces. Designated spaces for low emitting fuel efficient vehicles and van pool spaces will be provided per the California Building Standards. Bicycle parking will also be provided per the City's Municipal Code requirements.

Design/Landscaping

The architectural design of the building consists of painted concrete tilt-up panels constructed to a maximum of approximately 45 feet with low-reflective, blue-glaze glass façade treatment. It is noted that the project has been reviewed by the Riverside County Airport Land Use Commission (ALUC) due to the proximity of the project site to the March Air Reserve Base. ALUC has conditionally approved the project. One of the specific conditions will limit the building to 41 feet. This issue will be further discussed with ALUC prior to the City Council consideration of the project. Therefore, with your consideration of this project we are requesting the Planning Commission to consider both the option for a 45-foot and 41-foot building as you make your recommendations on this project to the City Council. In addition to height considerations, the project has been reviewed with regard to its articulated and decorative building elements, including parapets, wall recesses, mullions, aluminum canopies and stone veneer. The exterior color palette for the proposed building is comprised of various neutral colors, including shades of white, tan, gray and blue. The proposed building elements and colors have been found to be of high quality and would be compatible with and complementary to the surrounding architecture.

Screen walls and fences include 6 to 14-foot high decorative concrete tilt-up panels matching the building along the northern and eastern property line, a 6-foot tall black steel fence to enclose the portions of the truck court/loading area that are not visible from a public street, and a 3.5-foot tall open-rail fence with black metal posts installed along the perimeter of the bio-retention basin along Brodiaea Avenue.

REVIEW PROCESS

The applicant submitted the project application on February 6, 2018. The Project Review Staff Committee reviewed the project on February 28, 2018. Staff further reviewed the project, which was revised by the applicant between March 2018 and August 2018 to address various site design, access, drainage and circulation design issues.

The applicant has addressed all of staff's comments, and other than the 45 versus 41-foot building height discussed above there are no outstanding site planning or design items.

ENVIRONMENTAL

An Initial Study was prepared for the project after all discretionary applications were deemed complete. The Initial Study indicated a Mitigated Negative Declaration (MND) would be the appropriate environmental document for the project. The MND incorporates mitigation measures for Biological Resources, Cultural Resources and

Tribal Cultural Resources which result in a less than significant impact on these subject areas. A Notice of Availability for the IS/MND was prepared with the public comment period beginning on September 18, 2018 and ending on October 8, 2018.

T&B Planning prepared the draft environmental documents, and submitted the documents to the City for review to ensure that the documents reflect the independent judgment and analysis of the City as the California Environmental Quality Act (CEQA) Lead Agency.

NOTIFICATION

Staff sent public hearing notices to all property owners of record within 300' of the project site. In addition, the public hearing notice for the project was posted on the project site and published in the local newspaper.

REVIEW AGENCY COMMENTS

Staff received the following responses to the Project Review Committee transmittal which was sent to all potentially affected reviewing agencies.

Agency	Response Date	Comments
Riverside County Flood Control and Water Conservation District	February 27, 2018	Project within the limits of District's Sunnymead Area – Fees apply prior to grading permits

ALTERNATIVES

1. Conduct a public hearing for the Centerpointe Commerce Center, recommending that the City Council approve the Mitigated Negative Declaration, adopt the Mitigation Monitoring and Reporting Program, approve the General Plan Amendment, approve the Change of Zone, and approve the Plot Plan with Conditions of Approval. *Staff recommends this alternative.*

2. Conduct a public hearing for the Centerpointe Commerce Center and do not recommend that the City Council approve the Mitigated Negative Declaration, do not adopt the Mitigation Monitoring and Reporting Program, do not approve the General Plan Amendment, do not approve the Change of Zone or approve the Plot Plan. *Staff does not recommend this alternative.*

STAFF RECOMMENDATION

Staff recommends that the Planning Commission **APPROVE** Resolution Numbers 2018-43, 2018-44, 2018-45 and 2018-46, and thereby **RECOMMEND** that the City Council:

Resolution 2018-43

1. **CERTIFY** that the Initial Study/Mitigation Negative Declaration PEN18-0026 for the Centerpointe Commerce Center project, inclusive of all related applications on file with the Community Development Department, incorporated herein by this reference, has been completed in compliance with the California Environmental Quality Act, and the information and findings contained in the Mitigated Negative Declaration, attached hereto as Exhibit A, reflects the City's independent judgment and analysis; and

2. **ADOPT** the Mitigation Monitoring and Reporting Program for the Initial Study/Mitigated Negative Declaration for the proposed project, attached hereto as Exhibit B; and

Resolution 2018-44

3. **APPROVE** PEN18-0024, the General Plan Amendment as shown on the attachment included as Exhibit A; and

Resolution 2018-45

4. **APPROVE** PEN18-0025, the Change of Zone as shown on the attachment included as Exhibit A; and

Resolution 2018-46

5. **APPROVE** PEN18-0023, Plot Plan subject to the attached Conditions of Approval included as Exhibit A.

Prepared by:
Chris Ormsby
Senior Planner

Approved by:
Albert Armijo
Interim Planning Manager

ATTACHMENTS

1. 300-ft Mailing Notice
2. Resolution No 2018-43 Mitigated Negative Declaration
3. Exhibit A Centerpointe IS-MND (2018-09-18)
4. Exhibit B Centerpointe MMRP
5. Resolution No 2018-44 General Plan Amendment
6. Exhibit A to Resolution No 2018-44

7. Resolution No 2018-45 Change of Zone
8. Exhibit A to PC Reso 2018-45
9. Resolution No 2018-46 Plot Plan
10. Exhibit A Conditions of Approval
11. Air Quality Impact Analysis
12. Mobile Source Health Risk Assessment 2
13. General Biological Assessment
14. Focused Burrowing Owl Survey Report
15. Cultural Resources Report
16. Paleontological Resources Assessment
17. Geotechnical Investigation
18. Greenhouse Gas Emissions Report
19. Phase I Environmental Site Assessment
20. Phase II Environmental Site Assessment
21. Hydrology Report
22. Water Quality Management Plan
23. Noise Impact Analysis
24. Traffic Impact Analysis
25. TIA Appendices
26. Site Plan
27. Color Elevations
28. Preliminary Grading Plan
29. Preliminary Landscape Plan

This may affect your property

Notice of PUBLIC HEARING

Notice is hereby given that a Public Hearing will be held by the Planning Commission of the City of Moreno Valley on the following item(s):

PROJECT: Centerpointe Commerce Center

PEN18-0023 Plot Plan
PEN18-0024 General Plan Amendment
PEN18-0025 Change of Zone

APPLICANT: Newcastle Partners, Inc.
OWNER: Moreno Valley Centerpointe
REPRESENTATIVE: Jackson Smith
A.P. No: 297-170-029
LOCATION: Northeast corner of Brodiaea Avenue and Frederick Street
PROPOSAL: The Project includes a Plot Plan (PEN18-0023) for the construction of a 204,022 square-foot warehouse building including 10,000 square feet of office and mezzanine space on an 8.8-acre site located east of Frederick Street and north of Brodiaea Avenue. A General Plan Amendment (PEN18-0024) and a Change of Zone (PEN18-0025) are required to change the General Plan Land Use Designation from Office to Business Park, and the Zoning Designation of the property from Office (O) to Light Industrial (LI). Approval of this Project will require adoption of a Mitigated Negative Declaration (MND).

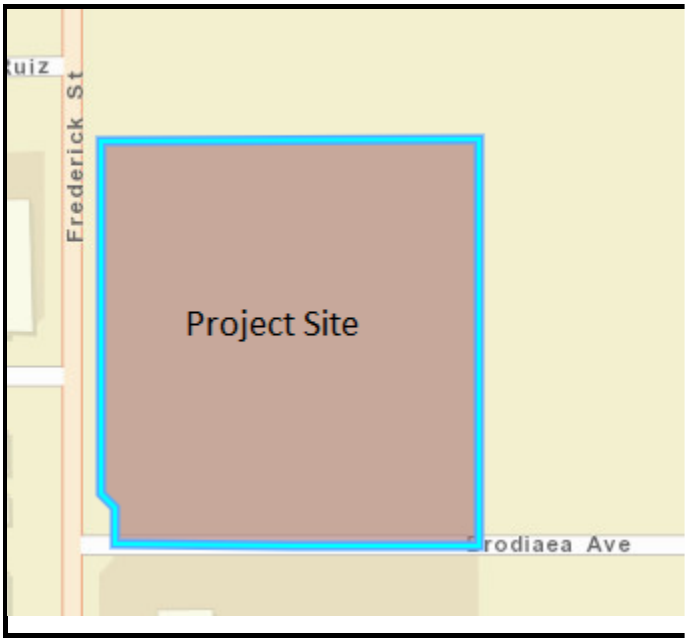
ENVIRONMENTAL DETERMINATION: Mitigated Negative Declaration (Circulated September 18, 2018 through October 8, 2018)

COUNCIL DISTRICT: 1

STAFF RECOMMENDATION: Approval

Any person interested in any listed proposal can contact the Community Development Department, Planning Division, at 14177 Frederick St., Moreno Valley, California, during normal business hours (7:30 a.m. to 5:30 p.m., Monday through Thursday and Fridays from 7:30 a.m. to 4:30 p.m.), or may telephone (951) 413-3206 for further information. The associated documents will be available for public inspection at the above address. In the case of Public Hearing items, any person may also appear and be heard in support of or opposition to the project or recommendation of adoption of the Environmental Determination at the time of the Hearing. The Planning Commission, at the Hearing or during deliberations, could approve changes or alternatives to the proposal.

The Planning Commission, at the Hearing or during deliberations, could approve changes or alternatives to the proposal. If you challenge any of these items in court, you may be limited to raising only those items you or someone else raised at the Public Hearing described in this notice, or in written correspondence delivered to the Planning Commission at, or prior to, the Public Hearing.



LOCATION N

PLANNING COMMISSION HEARING

City Council Chamber, City Hall
14177 Frederick Street
Moreno Valley, Calif. 92553

DATE AND TIME: October 11, 2018 at 7 PM
CONTACT PLANNER: Chris Ormsby
PHONE: (951) 413-3229

Upon request and in compliance with the Americans with Disabilities Act of 1990, any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to Guy Pegan, ADA Coordinator, at 951.413.3120 at least 48 hours before the meeting. The 48-hour notification will enable the City to make reasonable arrangements to ensure accessibility to this meeting.

Attachment: 300-ft Mailing Notice (3273 : Centerpointe Commerce Center)

RESOLUTION NO. 2018-43

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY RECOMMENDING THAT THE CITY COUNCIL ADOPT THE FINAL INITIAL STUDY AND MITIGATED NEGATIVE DECLARATION AND MITIGATION MONITORING AND REPORTING PROGRAM FOR THE CENTERPOINTE COMMERCE CENTER PROJECT

WHEREAS, the applicant, Newcastle Partners,Inc. submitted applications for the Centerpointe Commerce Center project including Plot Plan PEN18-0023, General Plan Amendment PEN18-0024, and Change of Zone PEN18-0025 ("Project"), and an Initial Study/Mitigated Negative Declaration PEN18-0026, for the development of a 204,022 square foot warehouse building. The above applications shall not be approved unless the Initial Study/Mitigated Negative Declaration (IS/MND) is adopted and approved; and

WHEREAS, with respect to concurrently filed applications, Section 9.02.030D of the City Municipal Code establishes that applications which are dependent on approval of other enabling application(s), of which the General Plan Amendment and Change of Zone serve, the final approval authority for such dependent application(s) shall be vested with the body authorized to approve the enabling application(s), which in this case is the City Council; and

WHEREAS, the applications for the Project have been evaluated in accordance with established City of Moreno Valley (City) procedures, and with consideration of the General Plan and other applicable regulations; and

WHEREAS, an Initial Study, supporting studies, and Mitigated Negative Declaration for the Project were prepared, consistent with the California Environmental Quality Act (CEQA); and

WHEREAS, the City of Moreno Valley (City) worked with the environmental consultant T&B Planning, in the preparation of an Initial Study checklist; and

WHEREAS, a 20-day public review period of the Initial Study and Mitigated Negative Declaration commenced on September 18, 2018 and concluded on October 8, 2018. The public notice of Intent to adopt the Mitigated Negative Declaration was mailed to interested parties, public agencies, as well as published in the local newspaper on September 18, 2018 and filed with the Riverside County Clerk; and

WHEREAS, the City, in conducting its own independent analysis of the Final Mitigated Negative Declaration, determined that a Mitigated Negative Declaration is an appropriate environmental determination for the Project as there is substantial evidence that demonstrates the Project with mitigation would not result in any significant environmental impacts; and

WHEREAS, a Mitigated Monitoring and Reporting Program (MMRP) has been prepared in accordance with CEQA Guidelines, and is designed to ensure compliance with the identified mitigation measures outlined in the Final Mitigated Negative Declaration through Project implementation; and

WHEREAS, the City of Moreno Valley, Community Development Department, located at 14177 Frederick Street, Moreno Valley, California 92552 is the custodian of documents and other materials that constitute the record of proceedings upon which the decision to adopt the Mitigated Negative Declaration is based; and

WHEREAS, the Planning Commission of the City Moreno Valley considered the Project, including all environmental documentation, at a public hearing held on October 11, 2018; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred; and

WHEREAS, the Planning Commission considered the Initial Study prepared for the Project for the purpose of compliance with the California Environmental Quality Act (CEQA), and based on the Initial Study including all supporting technical evidence, it was determined that the project impacts are expected to be less than significant with mitigation, and approval of a Mitigated Negative Declaration is an appropriate environmental determination for the Project.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

A. This Planning Commission specifically finds that all of the facts set forth above in the Resolution are true and correct.

B. Based upon substantial evidence presented to this Planning Commission during the above-referenced meeting on October 11, 2018, including written and oral staff reports, and the record from the public hearing, this Planning Commission finds as follows:

1. Independent Judgment and Analysis – City staff coordinated the preparation of the Initial Study/Mitigated Negative Declaration and related technical studies with T&B Planning for the Centerpointe Commerce Center. The documents were properly circulated for public review in accordance with the California Environmental Quality Act Guidelines. The Initial Study/Mitigated Negative Declaration has been completed along with the Mitigation Monitoring and Reporting Program (MMRP) to ensure compliance with all mitigation through project implementation. All environmental documents that comprise the

Mitigated Negative Declaration, including all technical studies, were independently reviewed by the City. On the basis of the whole record, there is no substantial evidence that the Project as designed, conditioned and mitigated, will have a significant effect on the environment. The Mitigated Negative Declaration prepared and completed, in accordance with the CEQA Guidelines reflects the independent judgment and analysis of the City.

BE IT FURTHER RESOLVED that the Planning Commission HEREBY APPROVES Resolution No. 2018-43, and RECOMMENDS that the City Council:

1. **CERTIFY** that the Mitigated Negative Declaration prepared for General Plan Amendment PEN18-0024, Change of Zone PEN18-0025 and Plot Plan PEN18-0023 on file with the Community Development Department, incorporated herein by this reference, has been completed in compliance with the California Environmental Quality Act, that the Planning Commission reviewed and considered the information contained in the Mitigated Negative Declaration and that the Document reflects the City's independent judgment and analysis. Attached hereto as Exhibit A; and

2. **APPROVE** the Mitigation Monitoring and Reporting Program for Plot Plan PEN18-0023, attached hereto as Exhibit B.

APPROVED AND ADOPTED this 11th day of October, 2018.

AYES:
NOES:
ABSTAIN:

_____
Jeffrey Barnes
Chair, Planning Commission

ATTEST:

_____
Albert Armijo, Interim Planning Manager
Secretary to the Planning Commission

APPROVED AS TO FORM:

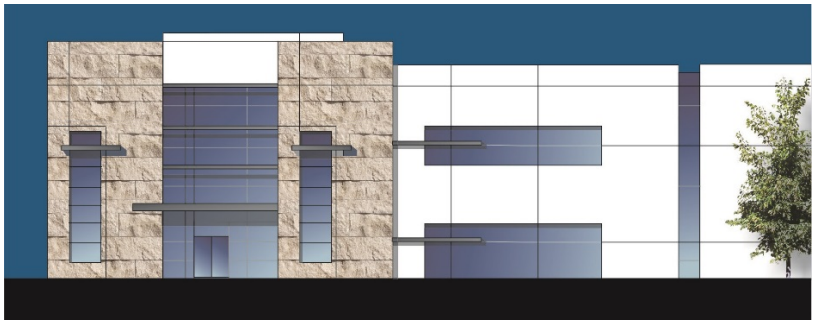
_____
City Attorney

Exhibit A and Exhibit B

Mitigated Negative Declaration

Centerpointe Commerce Center

Moreno Valley, California



Lead Agency
City of Moreno Valley
14177 Frederick Street
Moreno Valley, CA 92552

September 18, 2018

Mitigated Negative Declaration

Centerpointe Commerce Center
Moreno Valley, California

Lead Agency
City of Moreno Valley
14177 Frederick Street
Moreno Valley, CA 92552

Applicant
Newcastle Partners
4740 Green River Road, Suite 118
Corona, CA 92880

CEQA Consultant
T&B Planning, Inc.
17542 East 17th Street, Suite 100
Tustin, CA 92780

Lead Agency Discretionary Permits
Plot Plan (PEN18-0023)
General Plan Amendment (PEN18-0024)
Change of Zone (PEN18-0025)

September 18, 2018

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B	Mobile Source Health Risk Assessment
C1	General Biological Assessment
C2	Focused Burrowing Owl Survey Report
D1	Cultural Resources Report
D2	Paleontological Resources Report
E	Geotechnical Investigation
F	Greenhouse Gas Emissions Report
G1	Phase I Environmental Site Assessment
G2	Phase II Environmental Site Assessment
H	Hydrology Report
I	Water Quality Management Program
J	Noise Impact Analysis
K	Traffic Impact Analysis

ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASURE

§	Section
AM	Ante Meridiem (between the hours of midnight and noon)
AB	Assembly Bill
AB 32	Assembly Bill 32
AB 341	Mandatory Commercial Recycling Program
AB 939	Assembly Bill 939
AB 2185	Assembly Bill 2185
ACMs	Asbestos Containing Materials
ADT	Average Daily Traffic
ALUC	Airport Land Use Commission
ALUCP	Airport Land Use Compatibility Plan
amsl	Above Mean Sea Level
APN	Assessor Parcel Number
AQMP	Air Quality Management Plan
BFSA	Brian F. Smith and Associates
BMPs	Best Management Practices
BP	Business Park / Light Industrial (City of Moreno Valley General Plan designation)
C	Commercial (City of Moreno Valley General Plan designation)
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CalTrans	California Department of Transportation
CARB	California Air Resources Board
CAPCOA	California Air Pollution Controls Officers Association
CASSA	Criteria Area Species Survey Area
CBSC	California Building Standards Code
CCR	California Code of Regulations
CDTSC	California Department of Toxic Substances Control
CEQA	California Environmental Quality Act
CFS	Cubic Feet per Second
CIWMP	Countywide Integrated Waste Management Plan
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CO	Carbon Monoxide
CWA	Clean Water Act
c.y.	Cubic Yards
dBA	A-weighted Decibels
dBA Leq	equivalent decibels
DBESP	Determination of Biologically Superior Preservation
DIF	Development Impact Fee

DOC	Department of Conservation
DPM	Diesel Particulate Matter
DTSC	Department of Toxic Substances Control
E+A+P+C	Existing plus Ambient Growth plus Project plus Cumulative Development
E+P	Existing plus Project Conditions
e.g.	exempli gratia, meaning "for example"
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
EnA	Exeter sandy loam (soil type)
EpA	Exeter sandy loam, deep (soil type)
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
ESFR	Early Suppression Fast Response
et seq.	et sequentes, meaning "and the following"
FAR	Floor Area Ratio
FEMA	Federal Emergency Management Agency
FEIR	Final Environmental Impact Report
FICON	Federal Interagency Committee Noise
FIRM	Flood Insurance Rate Map
GCC	Global Climate Change
GHG	Greenhouse Gas
GPD	Gallons per Day
Greene	California Senate Bill 50
HCP	Habitat Conservation Plan
HMBEP	Hazardous Materials Business Emergency Plan
I-#	Interstate #
i.e.	that is
ISA	Industrial Support Area (City of Moreno Valley Zoning overlay)
ITE	Institute of Transportation Engineers
JPA	Joint Powers Authority
kWh	kilowatt-hour
kBTU	thousand British thermal units
Leq	Equivalent Continuous Sound Level
LOS	Level of Service
MARB	March Air Reserve Base

MARB/IPA	March Air Reserve Base / Inland Port Airport
MATES IV	Multiple Air Toxics Exposure Study
MBTA	Migratory Bird Treaty Act
MDP	Master Drainage Plan
MEIR	Maximally Exposed Individual Receptor
MEISC	Maximally Exposed Individual School Child
MEIW	Maximally Exposed Individual Worker
MGPD	Million Gallons per Day
MM	Mitigation Measure
MMRP	Mitigation Monitoring and Reporting Program
MND	Mitigated Negative Declaration
MPO	Metropolitan Planning Organization
MSHCP	Multiple Species Habitat Conservation Plan
MS4	Municipal Separate Storm Sewer System
$MTCO_2e$	Metric Tons of Carbon Dioxide Equivalent
MVFD	Moreno Valley Fire Department
MVIAP	Moreno Valley Industrial Area Plan
MWD	Metropolitan Water District
n.d.	No Date
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEPSSA	Narrow Endemic Plant Species Survey Area
No.	Number
NOD	Notice of Determination
NOI	Notice of Intent
NOP	Notice of Preparation
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
O_3	Ozone
OWOW	One Water One Watershed
PaA	Pachappa fine sandy loam
PCBs	polychlorinated biphenyls
PCE	Passenger Car Equivalent
PEN#-#	City of Moreno Valley Project Case Number
PM	Post Meridiem (afternoon)
$PM_{2.5}$	Fine Particulate Matter (2.5 microns or smaller)
PM_{10}	Fine Particulate Matter (10 microns or smaller)
PPM	Parts per Million
RCALUC	Riverside County Airport Land Use Commission
RCB	Reinforced Concrete Box (drainage term)
RCIT	Riverside County Information Technologies

RECs	Recognized Environmental Conditions
RTA	Riverside Transit Authority
RTP/SCS	Regional Transportation Plan / Sustainable Communities Strategy
RWQCB	Regional Water Quality Control Board
SCAB	South Coast Air Basin
SCAG	Southern California Association of Government
SCAQMD	South Coast Air Quality Management District
SF/s.f.	Square Foot or Square Feet
SLF	Sacred Lands File
SO_x	Sulfur Oxides
SR-#	State Route #
SWPPP	Storm Water Pollution Prevention Plan
US EPA	United States Environmental Protection Agency
VdB	Vibration Decibels
VOCs	Volatile Organic Compounds
WQMP	Water Quality Management Plan

1.0 INTRODUCTION

1.0 INTRODUCTION

1.1 DOCUMENT PURPOSE

This document is a Mitigated Negative Declaration (MND) prepared in accordance with the California Environmental Quality Act (CEQA), including all criteria, standards, and procedures of CEQA (California Public Resource Code §§ 21000 *et seq.*) and the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, §§ 15000 *et seq.*). This MND is an informational document intended for use by the City of Moreno Valley, Trustee, and Responsible agencies, and members of the general public in evaluating the physical environmental effects of the proposed Centerpointe Commerce Center project (hereafter referred to as "Project" and as described in further detail in Section 3.0 of this MND).

This MND was compiled by the City of Moreno Valley, serving as the Lead Agency for the proposed Project pursuant to CEQA Section 21067 and CEQA Guidelines Article 4 and Section 15367. "Lead Agency" refers to the public agency that has the principal responsibility for carrying out or approving a project.

This *Introduction* provides general information regarding: 1) a summary of the location and history of the Project site; 2) a summary of Initial Study findings supporting the City of Moreno Valley's decision to prepare an MND for the proposed Project; 3) the standards of adequacy for a MND under CEQA; 4) a description of the format and content of this MND; and 5) the governmental processing requirements to consider the proposed Project for approval.

1.2 PROJECT SUMMARY

The Project consists of applications for a General Plan Amendment (PEN18-0024), Change of Zone (PEN18-0025), and Plot Plan (PEN18-0023) to develop an approximately 8.8-acre property located at the northeast corner of the Brodiaea Avenue and Frederick Street intersection with a light industrial/warehouse building containing up to 204,022 square feet (s.f.) of floor area and associated improvements including, but not limited to, surface parking lots, drive aisles, utility infrastructure, landscaping, exterior lighting, and walls/fencing. Refer to Section 3.0, *Project Description*, for a comprehensive description of the proposed Project.

1.3 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

1.3.1 CEQA Objectives

CEQA requires that before a public agency makes a decision to approve a project that could have one or more adverse effects on the physical environment, the agency must inform itself about the project's potential environmental impacts, give the public an opportunity to comment on the environmental issues, and take feasible measures to avoid or reduce potential harm to the physical environment. The principal objectives of CEQA are to: 1) inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities; 2) identify the ways that environmental damage can be avoided or significantly reduced; 3) prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and 4) disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

1.3.2 CEQA Requirements for Environmental Setting and Baseline Conditions

CEQA Guidelines Section 15125 establishes requirements for defining the environmental setting to which the environmental effects of a proposed project must be compared. The environmental setting is defined as "…the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time the environmental analysis is commenced..." (CEQA Guidelines § 15125(a)). In the case of the proposed Project, the Initial Study determined that an MND is the appropriate form of CEQA compliance document, which does not require publication of a Notice of Preparation (NOP) (refer to Subsection 1.3.4, *Initial Study Findings*). Thus, the environmental setting for the proposed Project is the approximate date that the Project's environmental analysis commenced.

The Project's applications were filed with the City of Moreno Valley in February 2018, at which time the City determined the applications were complete and the environmental analysis commenced. Therefore, the environmental setting for the proposed Project is defined as the physical environmental conditions on the Project site and in the vicinity of the Project site as they existed in February 2018.

1.3.3 CEQA Requirements for a Mitigated Negative Declaration (MND)

An MND is a written statement by the Lead Agency that briefly describes the reasons why a project that is not exempt from the requirements of CEQA will not have a significant effect on the environment and, therefore, does not require preparation of an Environmental Impact Report (EIR, CEQA Guidelines § 15371). The CEQA Guidelines require the preparation of an MND if the Initial Study prepared for a project identifies potentially significant effects, but: 1) revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed MND and Initial Study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and 2) there is no substantial evidence, in light of the whole record before the Lead Agency, that the project may have a significant effect on the environment. If the potentially significant effects associated with a project cannot be mitigated to a level below significance, then an EIR must be prepared. (CEQA Guidelines § 15070(b))

1.3.4 Initial Study Findings

Section 4.0 of this document contains the Initial Study that was prepared for the proposed Project pursuant to CEQA and City of Moreno Valley requirements. The Initial Study determined that implementation of the proposed Project would not result in significant environmental effects under the impact areas of: Aesthetics, Agriculture and Forestry, Air Quality, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation/Circulation, and Utilities and Service Systems. The Initial Study determined that the proposed Project would result in potentially significant effects to the issue areas of Biological Resources, Cultural Resources, and Tribal Cultural Resources, but the Project Applicant has agreed to incorporate mitigation measures that would avoid or reduce the effects to a point where clearly no significant effects would occur. The Initial Study determined that, with the incorporation of mitigation measures, there is no substantial evidence in light of the whole record before the Lead Agency (City of Moreno Valley) that the Project may have a significant effect on the environment. Based on the Initial Study's findings, the City of Moreno Valley determined that a MND is appropriate for the proposed Project pursuant to CEQA Guidelines § 15070(b).

1.3.5 Format and Content of Mitigated Negative Declaration

The following components comprise the MND in its entirety:

1) This document, including all sections. Section 4.0 comprises the completed Initial Study Checklist ("Initial Study") and its associated analyses which document the reasons to support the findings and conclusions of the Initial Study. Section 5.0 comprises the Mitigation Monitoring and Reporting Program (MMRP), which includes all mitigation measures imposed on the proposed Project to ensure that effects to the environment are reduced to less-than-significant levels. The MMRP also indicates the required timing for the implementation of each mitigation measure and identifies the parties responsible for implementing and monitoring each mitigation measure.

2) Thirteen technical reports that evaluate the environmental effects of the proposed Project are attached as Technical Appendices A-K. Each of the appendices listed below are available for review at the City of Moreno Valley Community Development Department, Planning Division, located at 14177 Frederick Street, Moreno Valley, CA, 92552, and are hereby incorporated by reference pursuant to CEQA Guidelines § 15150.

Appendix A	"Centerpointe Air Quality Impact Analysis, City of Moreno Valley" prepared by Urban Crossroads and dated June 4, 2018.
Appendix B	"Centerpointe Mobile Source Diesel Health Risk Assessment, City of Moreno Valley" prepared by Urban Crossroads and dated June 4, 2018.
Appendix C1	"General Habitat Assessment, 8.78-acre Centerpointe Industrial Center Site" prepared by Ecological Sciences, Inc., and dated May 17, 2018.
Appendix C2	"Focused Burrowing Owl Surveys, 8.78-acre Centerpointe Industrial Center Site" prepared by Ecological Sciences, Inc., and dated May 21, 2018.
Appendix D1	"Phase I Cultural Resources Survey for the Centerpointe Project" prepared by Brian F. Smith and Associates and dated February 12, 2018.
Appendix D2	"Paleontological Resource and Monitoring Assessment, Centerpointe Warehouse Project" prepared by Brian F. Smith and Associates and dated January 30, 2018.
Appendix E	"Updated Geotechnical Engineering Investigation, Proposed Industrial Warehouse, NWC of Frederick Street and Brodiaea Avenue, Moreno Valley, California" prepared by NorCal Engineering and dated December 19, 2017.
Appendix F	"Centerpointe Greenhouse Gas Analysis, City of Moreno Valley" prepared by Urban Crossroads and dated June 4, 2018.
Appendix G1	"Phase I Environmental Site Assessment Report, Centerpointe" prepared by Arcadis and dated January 15, 2018.
Appendix G2	"Limited Phase II Investigation Report for Undeveloped Land located at the NEC of the Intersection of Brodiaea Avenue and Frederick Street, Moreno Valley, California" prepared by Arcadis and dated February 12, 2018.

Appendix H "Drainage Study for Centerpointe industrial, NWC of Frederick Street and Brodiaea Avenue" prepared by REC Consultants, Inc., and dated April 5, 2018.

Appendix I "Project Specific Preliminary Water Quality Management Plan" prepared by REC Consultants, Inc., and dated January 31, 2018.

Appendix J "Centerpointe Noise Impact Analysis, City of Moreno Valley" prepared by Urban Crossroads and dated May 25, 2018.

Appendix K "Centerpointe Traffic Impact Analysis, City of Moreno Valley" prepared by Urban Crossroads and dated September 12, 2018.

3) All plans, policies, regulatory requirements, and other documentation that is incorporated by reference in this document pursuant to CEQA Guidelines § 15150.

1.3.6 Mitigated Negative Declaration Processing

The City of Moreno Valley Community Development Department, Planning Division directed and supervised the preparation of this MND. Although prepared with the assistance of the consulting firm T&B Planning, Inc., the content contained within and the conclusions drawn by this MND reflect the sole independent judgment of the City of Moreno Valley.

A Notice of Intent (NOI) to adopt the MND will be distributed to the following entities for a 20-day public review period: 1) organizations and individuals who have previously requested such notice in writing to the City of Moreno Valley; 2) owners of contiguous property shown on the latest equalized assessment roll; 3) responsible and trustee agencies (public agencies that have a level of discretionary approval over some component of the proposed Project); and 4) the Riverside County Clerk. The NOI identifies the location(s) where the MND, Initial Study, MMRP, and associated Technical Appendices are available for public review.

Following the public review period, the City of Moreno Valley will review any comment letters received and determine whether any substantive comments were provided that may warrant revisions to the MND document. If substantial revisions are not necessary (as defined by CEQA Guidelines § 15073.5(b)), then the MND will be finalized and forwarded to City of Moreno Valley decision-makers for review as part of their deliberations concerning the proposed Project. If the Project is approved, the City of Moreno Valley will adopt findings relative to the Project's environmental effects, as disclosed in this MND, and a Notice of Determination (NOD) will be filed with the Riverside County Clerk.

2.0 ENVIRONMENTAL SETTING

2.0 ENVIRONMENTAL SETTING

2.1 PROJECT SETTING

2.1.1 Project Location

Figure 2-1, *Regional Map*, and Figure 2-2, *Vicinity Map*, depict the location of the Project site. The Project site is located in Western Riverside County, within the City of Moreno Valley, immediately north of Brodiaea Avenue and east of Frederick Street. The Project site encompasses Riverside County Assessor Parcel Number (APN) 297-170-029.

2.1.2 Surrounding Land Uses and Development

The land uses surrounding the Project site are described below and illustrated on Figure 2-3, *Surrounding Land Uses and Development*.

North:
The Project site is bounded on the north by a vacant/undeveloped property that contains minimal vegetation and appears to be routinely disced for weed abatement and fire fuel management. Further north of the vacant property is Alessandro Boulevard, a major east-west oriented thoroughfare.

South:
The Project site is bounded on the south by Brodiaea Avenue. Directly south of the site is an office park with two buildings and a small recycling/waste collection facility operated by the Riverside County Department of Waste Resources. The facility includes exterior lighting, ornamental landscaping, and fencing along its frontage to Brodiaea Avenue and parkway landscaping and passenger vehicle parking along its frontage to Frederick Street. Southeast of the Project site is a large warehouse facility (Harbor Freight Distribution Center) that includes automobile parking, truck parking, a screen wall, exterior lighting, and ornamental landscaping along its frontage with Brodiaea Avenue.

West:
The Project site is bounded on the west by Frederick Street. Southwest of the Project site is a business park containing four buildings. The business park includes automobile parking, exterior lighting, and ornamental landscaping along its frontage with Frederick Street. Northwest of the Project site is the Moreno Valley Civic Center complex, which includes City Hall, the Moreno Valley Police Department, and the Moreno Valley Conference Center.

East:
The Project site is bounded on the east by a large, recently constructed warehouse facility. The facility includes automobile parking, truck parking, exterior lighting, and ornamental landscaping. Farther to the east (east of Graham Street) is a concentration of large distribution warehouses.

2.2 EXISTING SITE CHARACTERISTICS

Pursuant to CEQA Guidelines § 15125, the physical environmental condition for purposes of establishing the setting of an MND is the environment as it existed at the time the Lead Agency commenced the environmental analysis for the project. The Project's applications were filed with the City of Moreno Valley

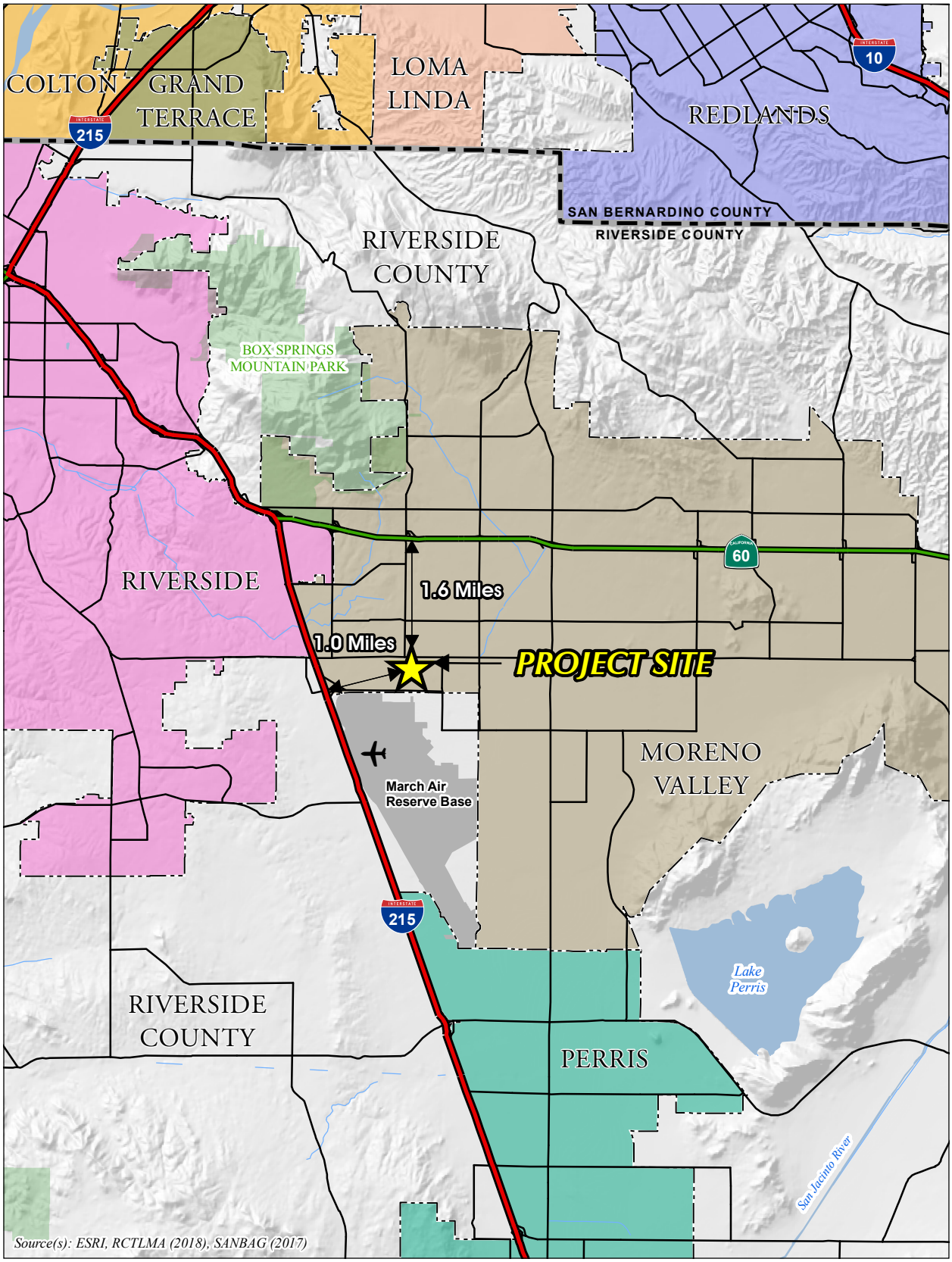


Figure 2-1

REGIONAL MAP

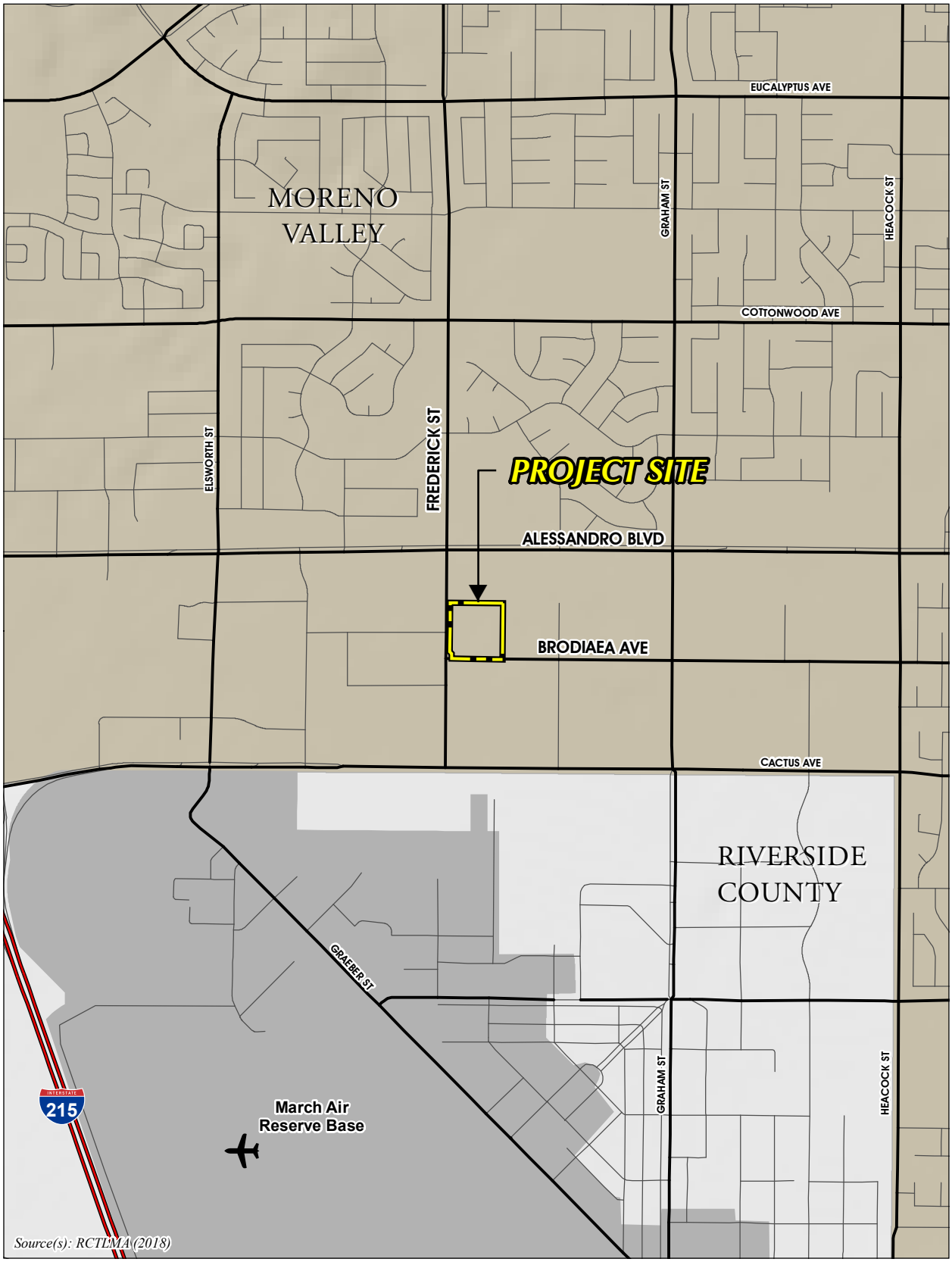


Figure 2-2

VICINITY MAP

Figure 2-3

SURROUNDING LAND USES AND DEVELOPMENT

in February 2018 and the environmental review commenced at that time. As such, the environmental baseline for the Project is established as of February 2018 and the following subsections provide a description of the Project site's physical environmental condition as of that approximate date. Topics are presented on the following pages in no particular order of importance.

2.2.2 Land Use

Based on historical aerial photography, the Project site has remained vacant/undeveloped (and routinely disced) up to the present day. An informal, unpaved trail existed along the Project's western boundary between 1989 and 1994. Between 1994 and 2005, landscaping was installed along the Project site's landscaped frontage with Frederick Street. The Project site's conditions have remained unchanged since 2005. (Arcadis, 2018, Appendix B) Figure 2-4, *Aerial Photograph*, depicts the existing conditions at the Project site.

2.2.3 Aesthetic and Topographic Features

The Project site is virtually flat, with a topographic high point of approximately 1,562 feet above mean sea level (amsl) in the northern portion of the site and a topographic low point of approximately 1,553 feet amsl in the southwest corner of the site. The overall topographic relief of the Project site is approximately 9 feet. Figure 2-5, *USGS Topographic Map*, illustrates the topographic character of the Project site.

The aesthetic character of the Project site is defined by disturbed/undeveloped land. All portions of the Project site are routinely maintained (i.e., disced) for weed abatement and fire fuel management. The Project site's western boundary abuts a landscaped parkway, signalized intersection, and sidewalk along Frederick Street and the Project site's southern boundary abuts a sidewalk and two street lights along Brodiaea Avenue. The existing aesthetic conditions of the Project site are illustrated on Figure 2-6, *Site Photograph Key Map*, Figure 2-7, *Site Photographs* 1-3, and Figure 2-8, *Site Photographs 4-6*.

2.2.4 Site Access and Circulation

The Project site abuts Brodiaea Avenue (an east-west oriented roadway) to the south and Frederick Street (a north-south oriented roadway) to the west. Under existing conditions, there are no driveways or other points of access that connect the Project site to either Brodiaea Avenue or Frederick Street.

The Project site is located approximately 1.2 miles northeast of Interstate 215 (I-215), a north-south oriented freeway facility, and approximately 1.8 miles south of California State Route 60 (SR-60), an east-west oriented freeway facility. Both I-215 and SR-60 are part of the state highway system operated by the California Department of Transportation (CalTrans).

One Riverside Transit Agency (RTA) bus stop, for RTA Routes 11 and 20, is located along the Project site's western frontage with Frederick Street, north of Brodiaea Avenue and south of Calle San Juan.

2.2.5 Air Quality and Climate

The Project site is located in the 6,745-square-mile South Coast Air Basin (SCAB), which includes portions of Los Angeles, Riverside, and San Bernardino Counties, and all of Orange County. The SCAB is bound by the Pacific Ocean to the west, the San Gabriel, San Bernardino, and San Jacinto Mountains to the north

Figure 2-4

AERIAL PHOTOGRAPH

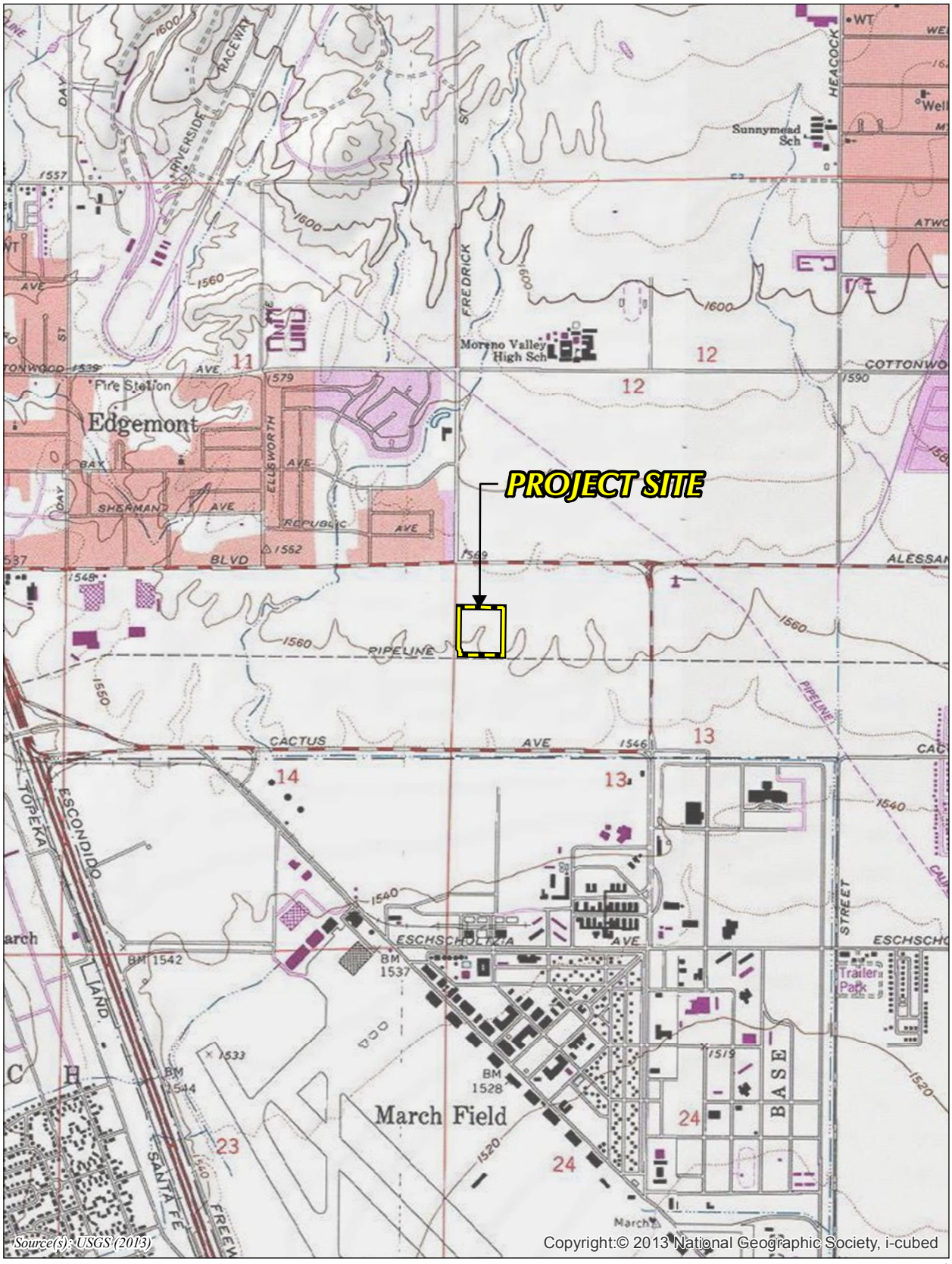


Figure 2-5

USGS TOPOGRAPHIC MAP

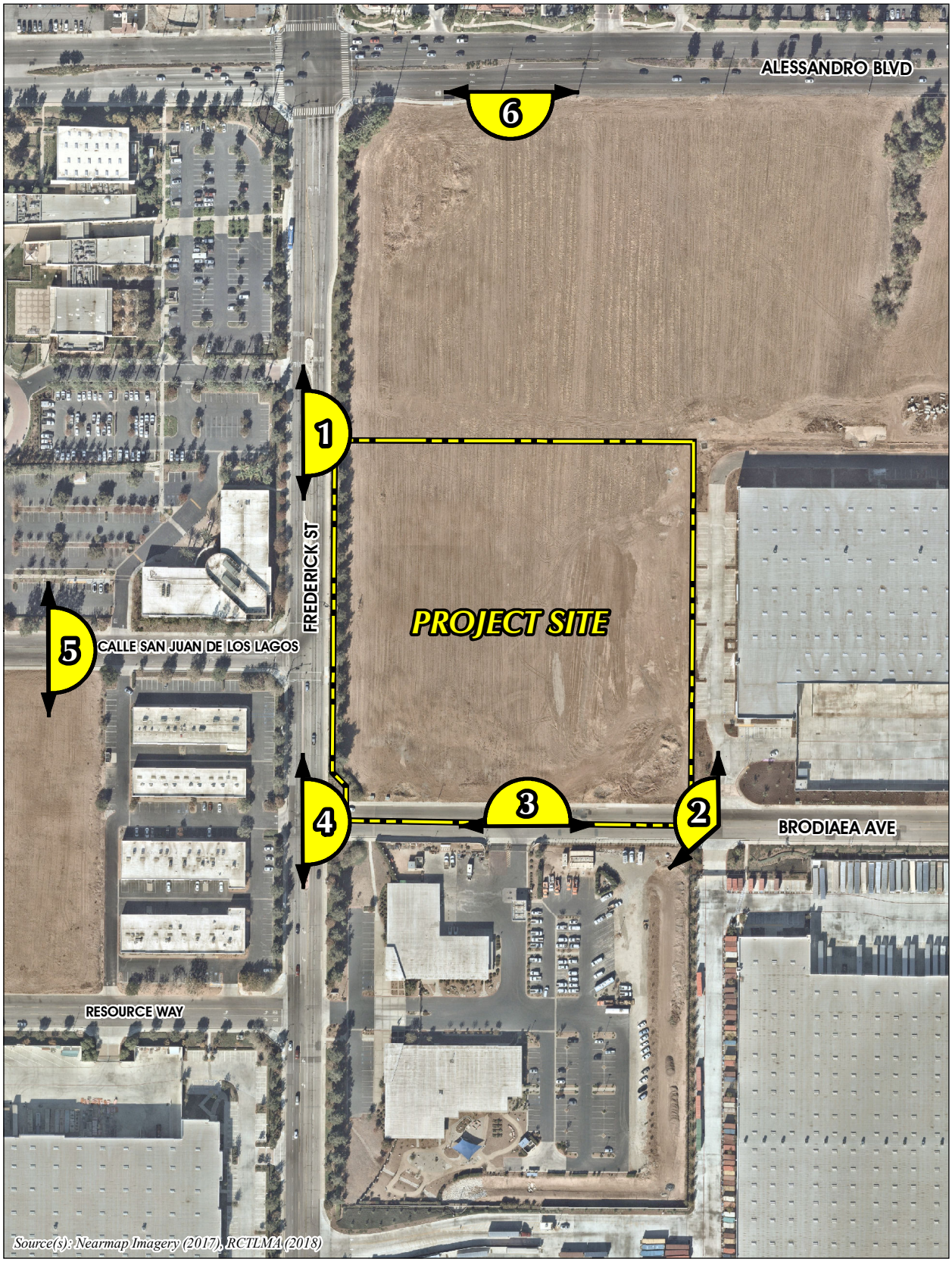


Figure 2-6

SITE PHOTOGRAPH KEY MAP

North

South

Site Photograph 1: From northwest corner of Project Site along Frederick Street looking north to south.

Southwest

North

Site Photograph 2: From southeast corner of Project Site along Brodiaea Avenue looking southwest to north.

West

Northeast

Site Photograph 3: From southern edge of Project Site along Brodiaea Avenue looking west to northeast.

NOT TO SCALE

Figure 2-7

SITE PHOTOGRAPHS 1-3

Site Photograph 4: From southwest corner of Project Site at the intersection of Frederick Street and Brodiaea Avenue looking north to south.

Site Photograph 5: From west of Project Site along Calle San Juan De Los Lagos looking north to south.

Site Photograph 6: From north of Project Site along Alessandro Boulevard looking east to west.

NOT TO SCALE

Figure 2-8

SITE PHOTOGRAPHS 4-6

and east, and the San Diego County Line to the south. The SCAB is within the jurisdiction of South Coast Air Quality Management District (SCAQMD), the agency charged with bringing air quality in the SCAB into conformity with federal and state air quality standards. The climate of the SCAB is characterized as semi-arid and more than 90% of the SCAB's rainfall occurs from November through April. During the dry season, which also coincides with the months of maximum photochemical smog concentrations, the wind flow is bimodal, characterized by a daytime onshore sea breeze and a nighttime offshore drainage wind.

In the Project region, the SCAB does not attain State and/or federal standards established for one-hour and eight-hour Ozone (O_3) concentrations and particulate matter (PM_{10} and $PM_{2.5}$) concentrations. Local air quality in the vicinity of the Project site has exceeded air quality standards for one-hour and eight-hour ozone concentrations and particulate matter concentrations within the last three years, as recorded at the nearest air monitoring station to the Project site (Perris Valley monitoring station SRA 24). (Urban Crossroads, 2018a, p. 13) Refer to Table 2-3 in the Project's air quality report (refer to *Technical Appendix A*) for a summary of air quality conditions in the vicinity of the Project site within the last three years.

Air pollution contribute to human health concerns. The SCAQMD conducted an in-depth analysis of the toxic air contaminants and their resulting health risks for all of Southern California. This study, titled "Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES IV)," shows that the Project area has an ambient carcinogenic risk of 587.29 in one million persons (SCAQMD, n.d.). Information about specific air pollutants and their specific effects on human health are contained in the Air Quality Impact Analysis and Mobile Source Health Risk Assessment provided as *Technical Appendix A* and *Technical Appendix B*, respectively, to this MND.

2.2.6 Geology

There are no known active or potentially active earthquake faults on the Project site or in the immediate area, and the Project site is not located within an "Alquist-Priolo" Special Studies Zone (NorCal, 2017, p. 6). The closest active fault to the Project site, the San Jacinto fault, is located approximately 7.1 miles northeast of the Project site (Moreno Valley, 2006b). Similar to other properties throughout Southern California, the Project site is located within a seismically active region and is subject to ground shaking during seismic events.

During subsurface investigations conducted on the Project site in 2017, groundwater was encountered at 30 feet below existing ground surface in one of the boring samples (NorCal, 2017, Appendix A). Accordingly, the static groundwater table at the Project site is considered to exist at a depth of approximately 30 feet below existing ground surface.

2.2.7 Soils

The Project site features artificial fill soils to a depth of 1 to 2½ feet. These soils were classified as loose, damp, clayey sand and possess a disturbed appearance, resulting in their classification as artificial fill (NorCal, 2017, p. 2). In addition, the Project site contains native alluvial soils, beneath the artificial fill soils, extending to a depth of at least 30 feet below existing ground surface. The alluvial soils closer to the surface generally consist of dense to very dense clayey sands and the deeper alluvial soils consist of very dense silty sands and sandy silts. (NorCal, 2017, p. 3)

2.2.8 Hydrology

The Project site is located in the Santa Ana River watershed, which drains an approximately 2,650 square-mile area and is the principal surface flow water body within the region. The Santa Ana River starts in the San Bernardino Mountains, approximately 16.5 miles northeast of the Project site, and flows southwesterly for approximately 96 miles across San Bernardino, Riverside, Los Angeles, and Orange counties before spilling into the Pacific Ocean.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 06065C0745G, the Project site is located within "Flood Zone X (unshaded)" which corresponds with areas of minimal flood hazard (i.e., less than 0.2-percent annual chance of flood). (FEMA, 2008)

Under existing conditions, stormwater on the Project site sheet flows in a southerly direction across the Project site into two (2) existing storm drain inlets located along the Project site's frontage with Brodiaea Avenue. The existing inlets convey flows into an existing 36-inch-diamter storm drain line (Line P) located beneath Brodiaea Avenue.

2.2.9 Noise

The primary source of noise in the Project site vicinity includes vehicle noise along Frederick Street and Brodiaea Avenue and noise associated with flight operations at the March Air Reserve Base, whose nearest runway is located approximately 1.2 miles southwest of the Project site. Based on 24-hour noise measurements collected by the consulting firm Urban Crossroads on January 3, 2018, hourly noise levels in the Project area range between 62.2 equivalent decibels (dBA Leq) and 70.2 dBA Leq (Urban Crossroads, 2018b, p. 31).

2.2.10 Utilities and Service Systems

The Project site is located in the service area of the Eastern Municipal Water District (EMWD) for domestic water and sewer service. EMWD manages the domestic water supply and delivery service within its 555-square mile service area, including the City of Moreno Valley, all or portions of six other cities, and a portion of unincorporated Riverside County. EMWD's water supply is obtained from four sources: 1) imported water from the Metropolitan Water District (MWD); 2) recycled water; 3) local groundwater production; and 4) desalted groundwater. (EMWD, 2016b, pp. 3-1, 3-3) EMWD has an adopted Water Shortage Contingency Plan (EMWD Ordinance 117.2) that applies regulations and restrictions on the delivery of and consumption of water during water shortages.

Wastewater flows generated within the Project area are conveyed to the Moreno Valley Regional Water Reclamation Facility (RWRF). The Moreno Valley RWRF generally receives wastewater flows produced within the northwestern portion of the EMWD service area. (EMWD, 2016b, p. 6-18)

Solid waste collection and disposal in the Project area is conducted by Waste Management of the Inland Empire, a division of Waste Management, Inc. The El Sobrante Landfill, Badlands Sanitary Landfill, and/or Lamb Canyon Sanitary Landfill would receive solid waste produced within the City of Moreno Valley. (Moreno Valley, 2006b, p. 5.13-35)

2.2.11 Vegetation

Under existing conditions, the entirety of the site has been disturbed by past and on-going routine maintenance activities (i.e., discing for weed abatement and fire fuel management). Based on a field survey conducted by Ecological Sciences on January 10, 2018, the following plant species were found on-site: Short-podded mustard (*Hirschfeldia incana*), Russian thistle (*Salsola tragus*), Pigweed (*Amaranthus sp.*), Mediterranean grass (*Schismus barbatus*), and Slender oat (*Avena barbata*) (Ecological Sciences, 2018a, p. 6). No native plant species were observed on the Project site during field surveys (Ibid., p. 10). Due to historic and on-going human disturbances, the Project site no longer supports native vegetation or native plant communities. For more information pertaining to on-site vegetation refer to *Technical Appendix C1*.

2.2.12 Wildlife

Ecological Sciences did not observe any sensitive wildlife species on-site and no State or Federally listed species are expected to occur on-site due to the absence of suitable habitat (Ecological Sciences, 2018a, p. 10). For more information pertaining to observed on-site wildlife refer to *Technical Appendix C1*.

2.3 PLANNING CONTEXT

2.3.1 General Plan Land Use & Zoning Designations

The prevailing planning documents for the Project site and its surrounding area is the City of Moreno Valley General Plan. The City of Moreno Valley General Plan designates the Project site for "Office (O)" land uses as shown in Figure 2-9, *Existing General Plan Designations*. The Office land use designation provides for general office uses, including, administrative, professional, legal, medical and financial offices, with a building intensity up to a floor area ratio (FAR) of 2.0.

As shown on Figure 2-10, *Existing Zoning Designations*, the City of Moreno Valley Zoning Map applies the "Office (O)" zoning designation to the Project site. According to the City of Moreno Valley Municipal Code, the primary purpose of the Office district is to provide areas for the establishment of park-like, office-based working environments for general business, corporate, professional, and administrative offices (Moreno Valley, 2017, § 9.04.020).

2.3.2 Western Riverside County Multiple Species Habitat Conservation Plan

The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) is a comprehensive, multi-jurisdictional Habitat Conservation Plan (HCP) focusing on conservation of species and their habitats in Western Riverside County. The Project site is not located within a Cell Group or Criteria Cell and is not targeted for conservation. Pursuant to the MSHCP, the Project site located in the Burrowing Owl Survey Area and the Narrow Endemic Plant Species Survey Area (NEPSSA). (Ecological Sciences, 2018a, p. 1)

2.3.3 Riverside County Airport Land Use Compatibility Plan

The March Air Reserve Base (MARB) Airport Land Use Compatibility Plan (ALUCP) identifies land use standards and design criteria for new development located in the proximity of the MARB to ensure compatibility between the airport and surrounding land uses and to maximize public safety. The Project site is located within "Compatibility Zone D" of the MARB influence area of MARB and is subject to the MARB ALUCP. Within Compatibility Zone D, there are no land use or design restrictions, with the exception of hazards to flight (e.g., very tall objects, visual and electronic forms of interference). (RCALUC, 2014, Table MA-1)

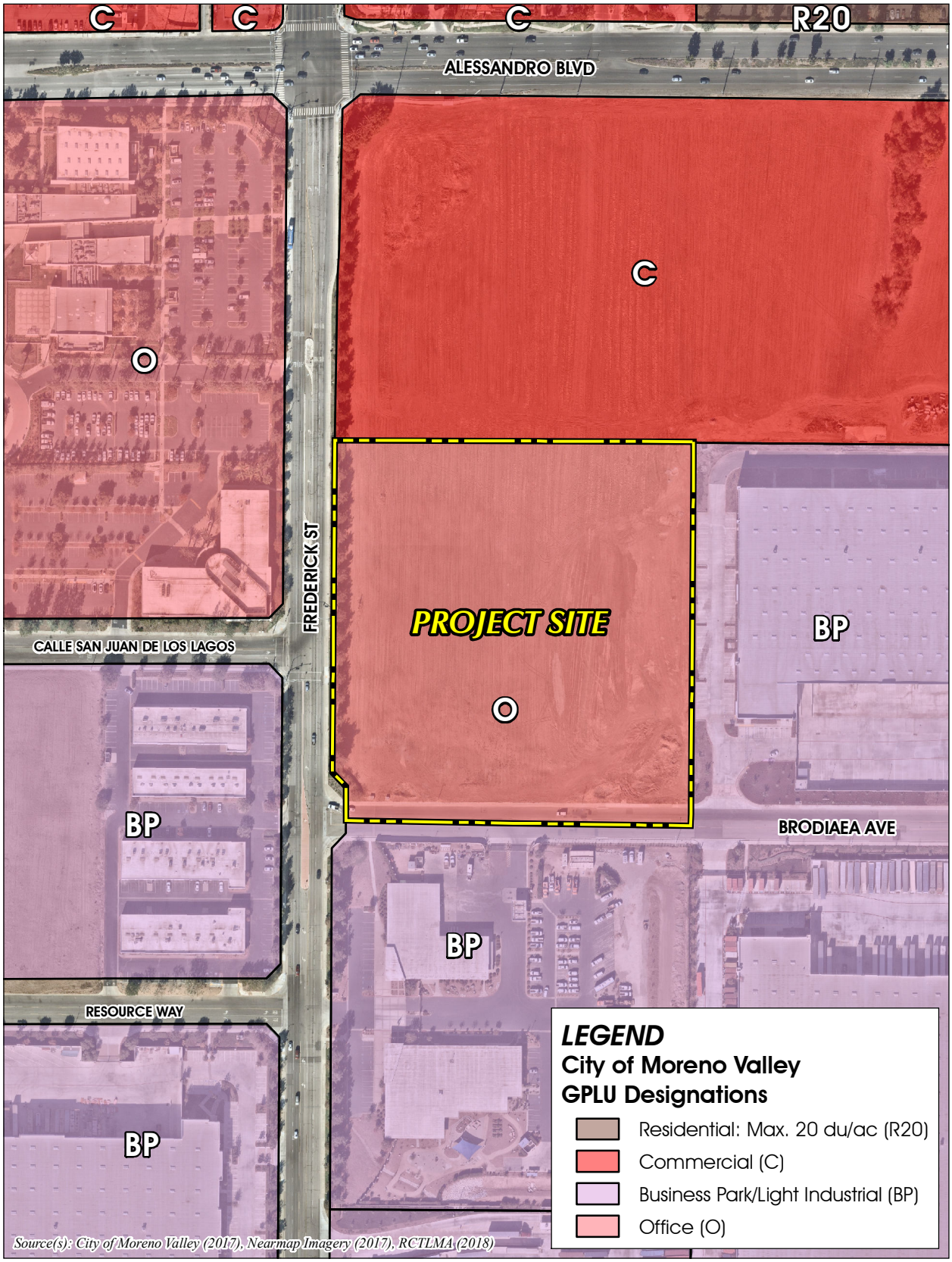


Figure 2-9

EXISTING GENERAL PLAN DESIGNATIONS

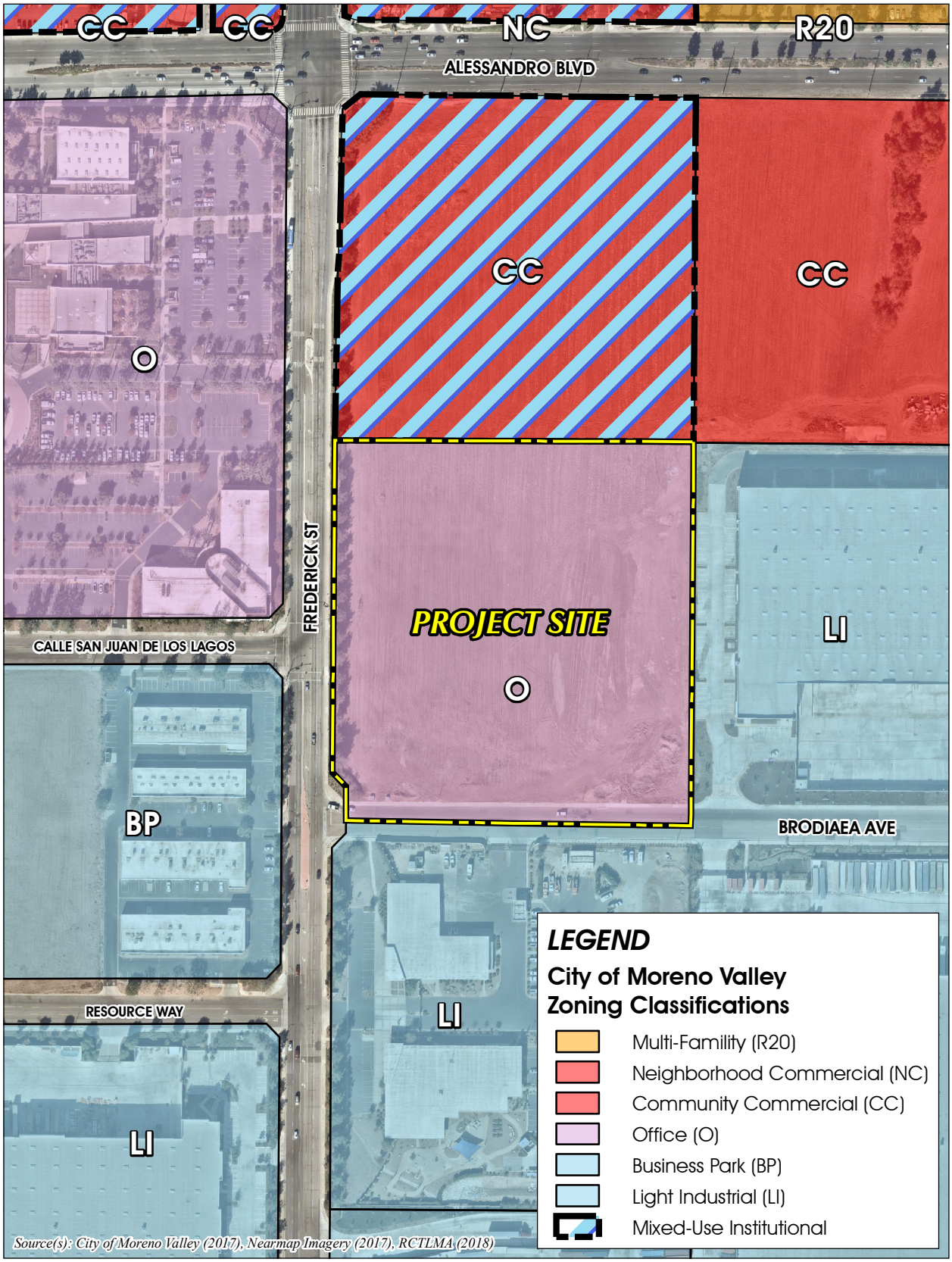


Figure 2-10

EXISTING ZONING DESIGNATIONS

2.3.4 Southern California Association of Governments Regional Transportation Plan

The Southern California Association of Governments (SCAG) is a Joint Powers Authority (JPA) under California state law, established as an association of local governments and agencies that voluntarily convene as a forum to address regional issues. Under federal law, SCAG is designated as a Metropolitan Planning Organization (MPO) and under state law as a Regional Transportation Planning Agency and a Council of Governments. The SCAG region encompasses six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) and 191 cities in an area covering more than 38,000 square miles. SCAG develops long-range regional transportation plans including sustainable communities strategy and growth forecast components, regional transportation improvement programs, regional housing needs allocations and other plans for the region (SCAG, n.d.).

As an MPO and public agency, SCAG develops transportation and housing plans that transcend jurisdictional boundaries that affect the quality of life for Southern California as a whole. SCAG's *2016-2040 Regional Transportation Plan/Sustainable Communities Strategy* (*RTP/SCS*) includes a chapter titled "Goods Movement" that is applicable to the Project because the Project proposes an industrial building in the SCAG region that would provide for a variety of light industrial, distribution warehousing, and logistics tenants. The Goods Movement chapter states that the SCAG region hosts one of the largest clusters of logistics activity in North America. Logistics activities, and the jobs that go with them, depend on a network of warehousing and distribution facilities, highway and rail connections, and intermodal rail yards. To that end, the *Goods Movement Appendix* of the *RTP/SCS* sets forth regional strategies to achieve an efficient movement of goods which states the following:

> *"The goods movement system in the SCAG region is comprised interconnected infrastructure components designed to serve commercial activities spurred by regional, national, and global demand. The goods movement system provides the backbone for the flow of goods between businesses and consumers. Numerous demand factors (e.g., types of products, destinations, urgency, costs, etc.) create unique markets that must be accommodated by varying types of goods movement activities. Markets in the SCAG region range from origins like local manufacturing companies and the San Pedro Bay Ports to business and customers across the U.S. These markets depend on an extensive regional transportation network that provides the mobility and speed necessary to support economic growth. These mobility needs, coupled with air quality, environmental and community challenges posed by regional goods movement activities, serve as the rationale for developing a comprehensive plan to enhance the regional freight system."* (SCAG, 2016, p. 1)

According to SCAG's *Comprehensive Regional Goods Movement Plan and Implementation Strategy*, the SCAG region has a large demand for warehouse space and the demand will continue into the foreseeable future, resulting in a large unmet demand by the year 2035 (SCAG, 2013, pp. 4-39 and 4-40). SCAG reports that a substantial amount of available industrial land for this type of development is located in the vicinity of the SR-60 corridor, particularly in Moreno Valley, Perris, and near March Air Reserve Base (i.e., the vicinity of the Project site).

3.0 PROJECT DESCRIPTION

3.0 PROJECT DESCRIPTION

The Project evaluated by this MND is located within the City of Moreno Valley, Riverside County, California. The proposed Project consists of applications for a Plot Plan (PEN18-0023), General Plan Amendment (PEN18-0024), and Change of Zone (PEN18-0025). Copies of the entitlement applications for the proposed Project are herein incorporated by reference pursuant to CEQA Guidelines § 15150 and are available for review at the City of Moreno Valley Community Development Department, Planning Division, located at 14177 Frederick Street, Moreno Valley, CA 92552. A detailed description of the proposed Project is provided in the following subsections. Additional discretionary and administrative actions that would be necessary to implement the proposed Project are listed in Table 3-1, *Matrix of Project Approvals/Permits*, at the end of this section.

3.1 PROPOSED DISCRETIONARY APPROVALS

3.1.1 General Plan Amendment (PEN18-0024)

General Plan Amendment (PEN18-0024) would amend the City of Moreno Valley General Plan Land Use Map to change the land use designation for the entire Project site from "Office" to "Business Park / Light Industrial" (refer to Figure 3-1, *General Plan Amendment (PEN18-0024)*). According to the City of Moreno Valley General Plan, the "Business Park / Light Industrial" land use designation is intended for "manufacturing, research and development, warehousing and distribution, as well as office and support commercial activities" (Moreno Valley, 2006a, p. 9-7).

3.1.2 Change of Zone (PEN18-0025)

Change of Zone (PEN18-0025) would amend the City of Moreno Valley Zoning Map to change the zoning designation for the entire Project site from "Office" to "Light Industrial" (refer to Figure 3-2, *Change of Zone (PEN18-0025)*. According to the City of Moreno Valley Municipal Code, the "Light Industrial" zoning designation is intended "to provide for light manufacturing, light industrial, research and development, warehousing and distribution and multi-tenant industrial uses, as well as certain supporting administrative and professional offices and commercial uses on a limited basis" (Moreno Valley, 2017, § 9.05.020).

3.1.3 Plot Plan (PEN18-0023)

As shown on Figure 3-3, *Plot Plan (PEN18-0023)*, the Project Applicant proposes to construct a 204,022-square foot (s.f.) warehouse facility on the subject property. The proposed facility would consist of 194,022 s.f. of warehouse floor area, 5,000 s.f. of office space on the first floor, and 5,000 s.f. of mezzanine office space.

Vehicular access to the Project site would be provided by three driveways – two driveways onto Frederick Street and one driveway onto Brodiaea Avenue. The northernmost driveway onto Frederick Street would be used for truck and passenger vehicle traffic access and would be restricted to right turn movements when entering/exiting the site. The southernmost driveway onto Frederick Street would be the de facto eastern leg of the Frederick Street / Calle San Juan intersection and would only be used by passenger vehicles accessing the site; this driveway would be controlled by an existing traffic signal and would have no restrictions for vehicle turning movements. The proposed driveway onto Brodiaea Avenue would be used

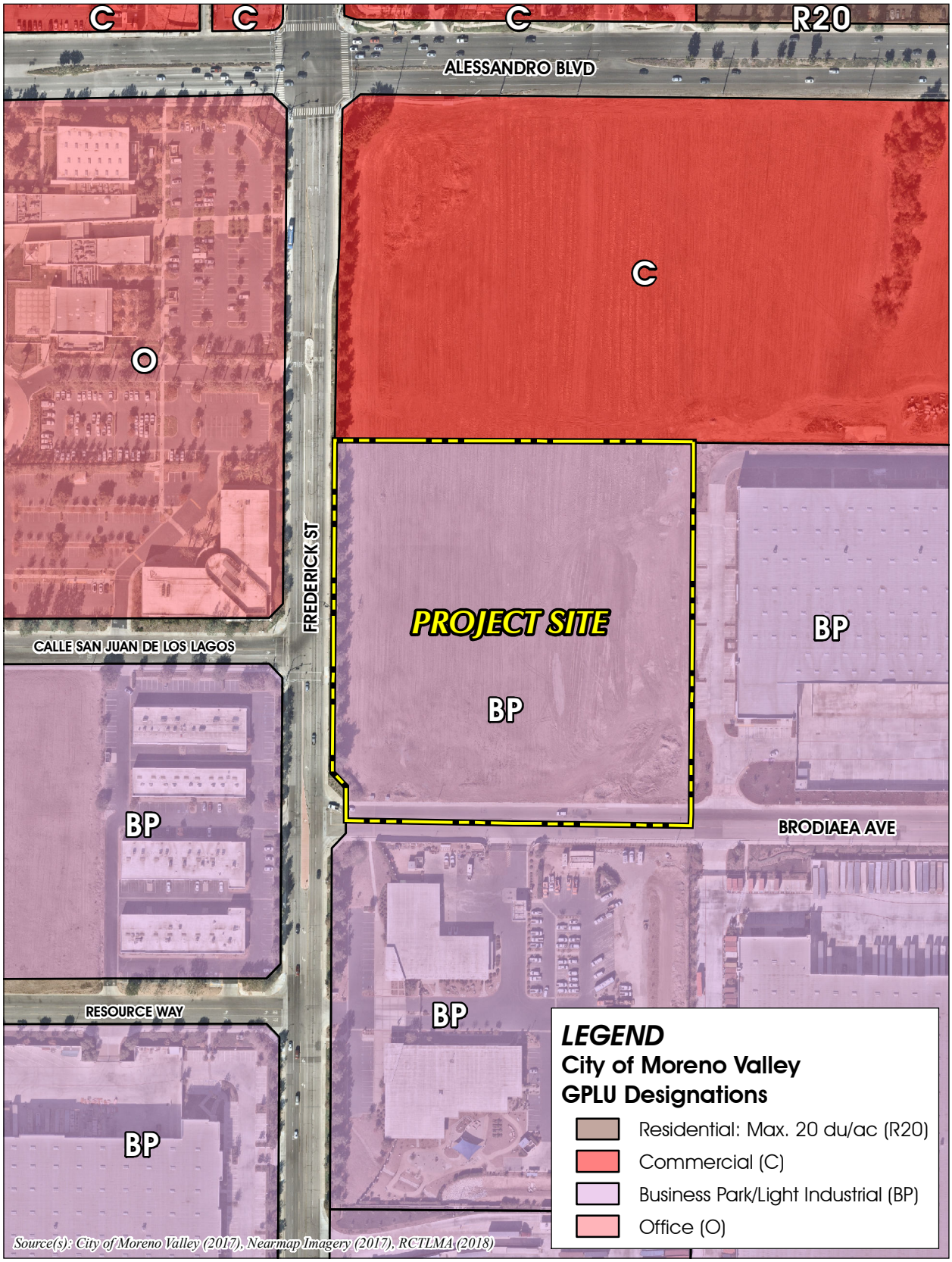


Figure 3-1

GENERAL PLAN AMENDMENT (PEN18-0024)

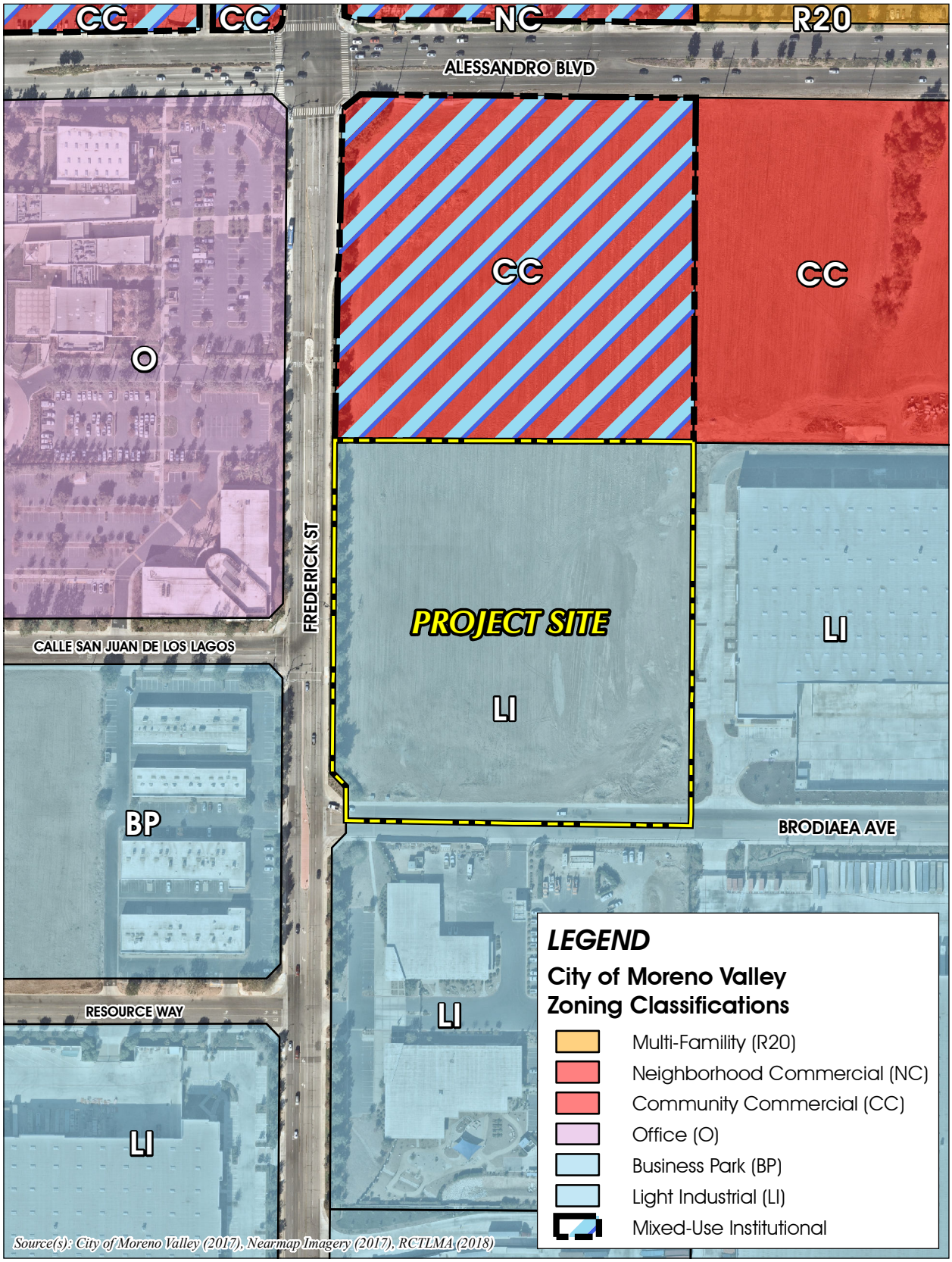
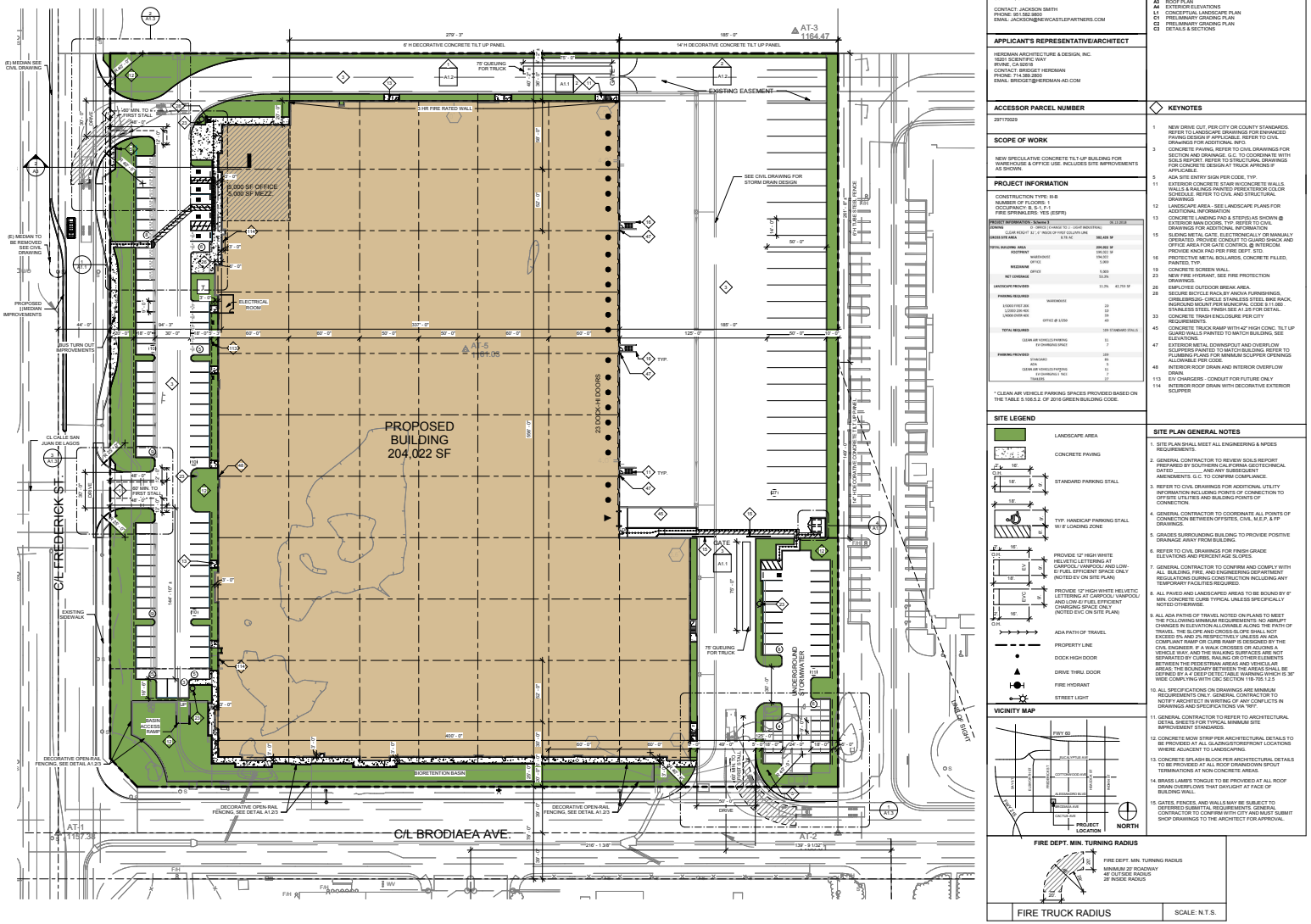


Figure 3-2

CHANGE OF ZONE (PEN18-0025)



Source(s): Herdman (08-06-2018)

NOT TO SCALE

Figure 3-3

PLOT PLAN (PEN18-0023)

for truck and passenger vehicle traffic access and would have no restrictions for vehicle turning movements. All Project driveways that would be utilized by trucks would feature a sign directing exiting truck drivers to City of Moreno Valley truck routes. The City of Moreno Valley designates Frederick Street as a truck route.

B. Parking and Loading

Figure 3-3 depicts the number and location of parking spaces and loading bays for the Project. The Project would include 109 total automobile parking spaces, including 86 standard spaces, five (5) handicap-accessible stalls, 11 clean air vehicle stalls, and 7 (seven) electrical vehicle charging stalls. The total number of parking spaces proposed by the Project meets the number of parking spaces – 109 – required by the City of Moreno Valley. In addition, the Project includes 23 loading docks on the east side of the building and 27 truck trailer parking spaces. All on-site parking spaces, drive aisles, and loading areas would be paved with concrete.

The Project provides six (6) bicycle parking spaces (two (2) bicycle racks, each with three (3) bicycle spaces) in compliance with the Moreno Valley Municipal Code Section 9.11.060(B)(1), which requires bicycle parking to be provided at a minimum rate equal to 5 percent of the required automobile parking spaces (6 bicycle spaces ÷ 109 total required parking spaces = 5.45%).

C. Architecture, Walls, and Fences

Figure 3-4, *Conceptual Architectural Elevations*, depicts the Project's conceptual architectural design. The proposed warehouse building would be constructed to a maximum height of approximately 45 feet (measured from finished grade to the top of the parapets). The building would be constructed with painted concrete tilt-up panels and low-reflective, blue-glazed glass. Articulated building elements, including parapets, wall recesses, mullions, aluminum canopies, and stone veneer, are proposed as decorative elements. The exterior color palette for the proposed building is comprised of various neutral colors, including shades of white, tan, gray, and blue.

A 14-foot tall, painted concrete screen wall would be installed along portions of the site's eastern and northern boundaries to screen views of the truck court/loading area from public streets. A six (6)-foot tall, black, tube steel fence would enclose the portions of the truck court/loading area that are not visible from public streets. In addition, a six (6)-foot tall painted concrete screen wall would be installed along a portion of the site's northern boundary to provide a transition between on-site uses and future commercial uses on the undeveloped property to the north of the Project site. Lastly, a 3.5-foot tall open-rail fence with black metal posts would be installed along the outside perimeter of the bioretention basin which is located along the southern and southeastern boundaries of the Project site.

D. Conceptual Landscape Plan

The Project's conceptual landscape plan is depicted on Figure 3-5, *Conceptual Landscape Plan*. Proposed landscaping would be ornamental in nature, with the exception of the plantings in the proposed bioretention basin – where species would be selected for their water quality benefits. Landscaping would feature drought-tolerant trees, shrubs, accent succulents and ornamental grasses, and groundcovers. Plant materials would be concentrated along the Project site's frontages with Brodiaea Avenue and Frederick Street, at building entries, along the eastern boundary of the Project site, and within the passenger vehicle parking

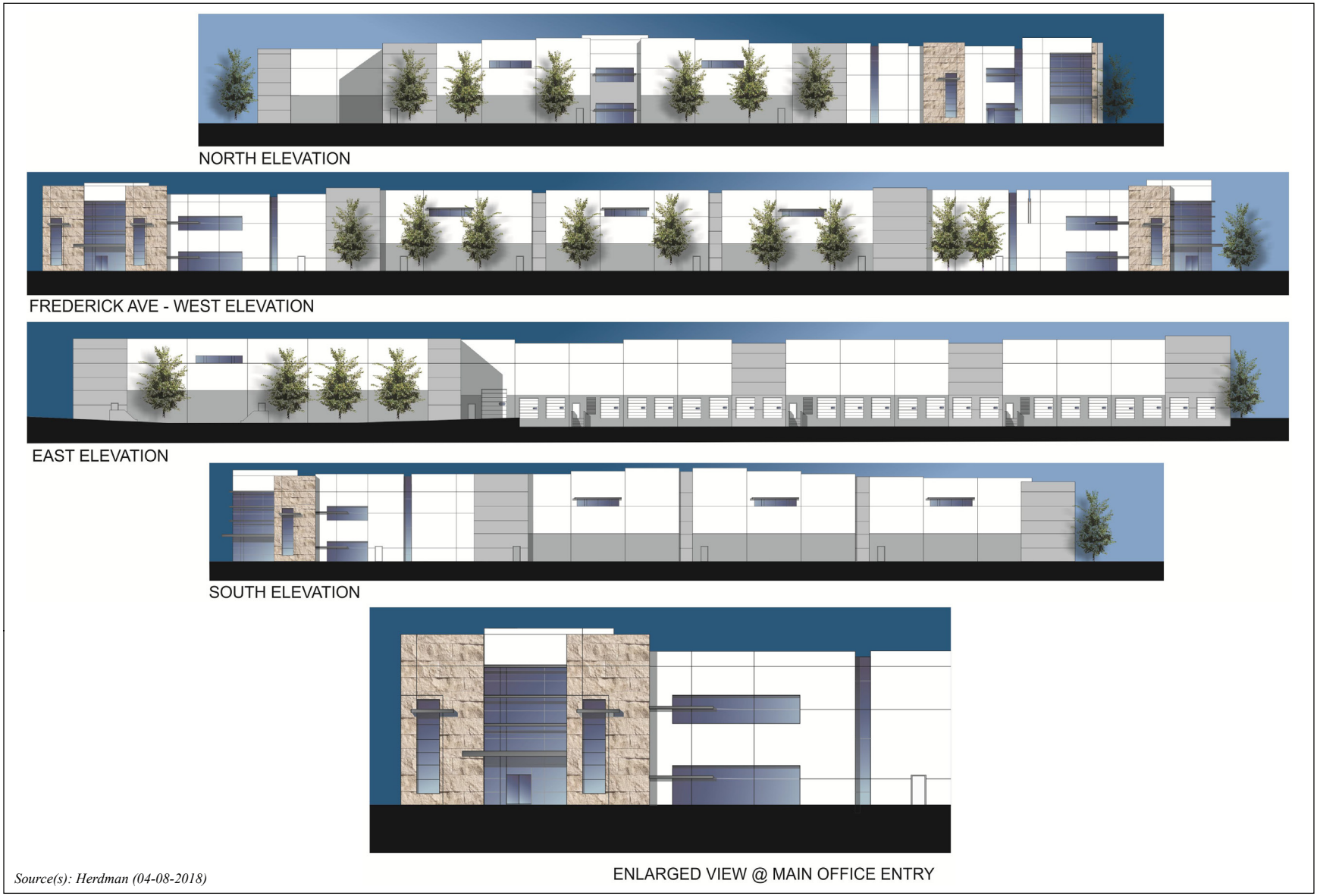
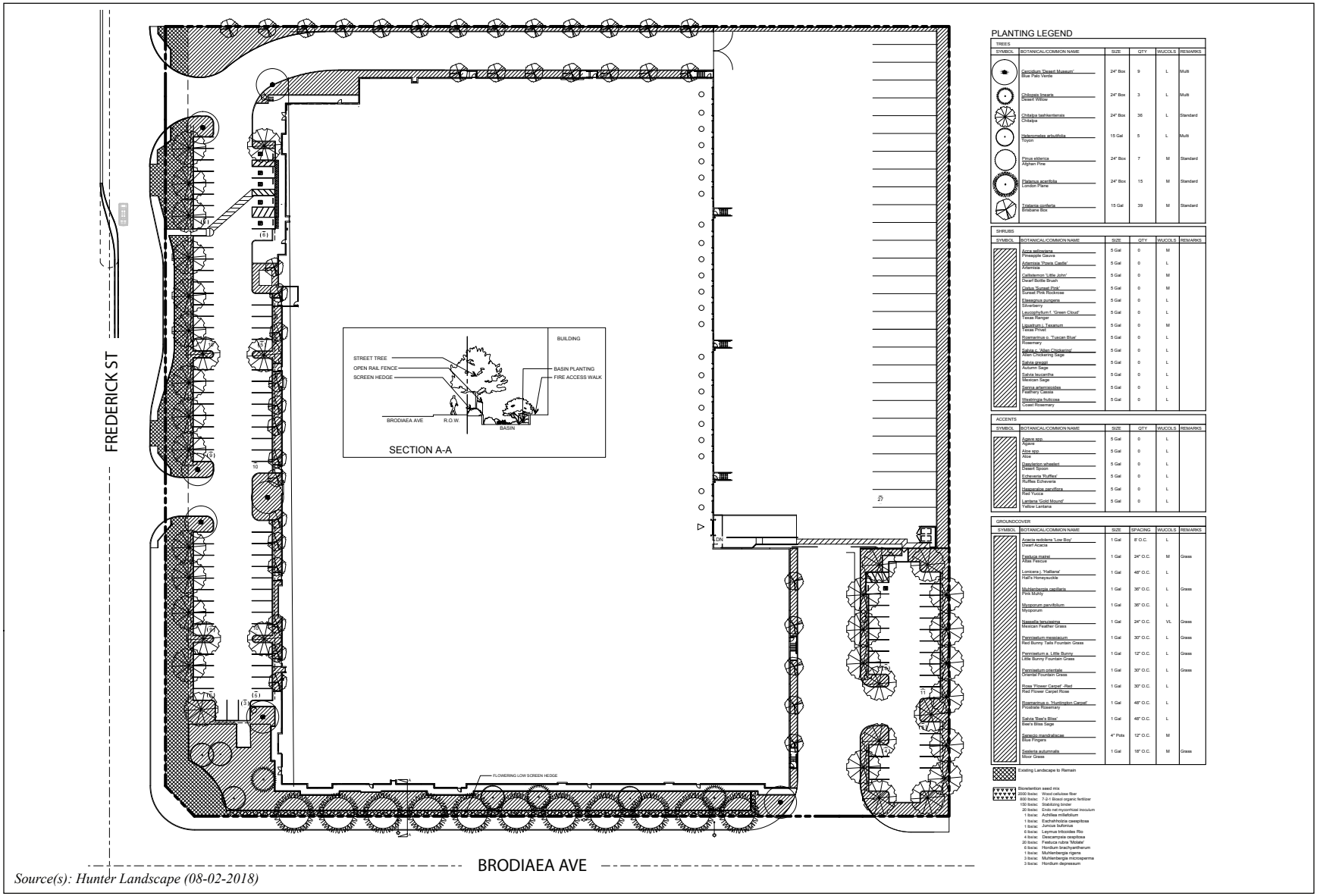


Figure 3-4

CONCEPTUAL ARCHITECTURAL ELEVATIONS



Source(s): Hunter Landscape (08-02-2018)

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Figure 3-5

CONCEPTUAL LANDSCAPE PLAN

lots. The Project would retain existing landscaping abutting Frederick Street, with the exception of landscaping that would need to be removed to accommodate proposed driveways. The Project's planting and irrigation plans are required to comply with Chapter 9.17 of the Moreno Valley Municipal Code, which establishes requirements for landscape design, automatic irrigation system design, and water-use efficiency.

3.2 PROJECT TECHNICAL CHARACTERISTICS

3.2.1 Project Improvements

A. Public Roadway Improvements

The existing public street network servicing and abutting the Project site consists of Frederick Street to the west and Brodiaea Avenue to the south.

Under existing conditions, Frederick Street is developed to its full width with two vehicular travel lanes in each direction, a raised median, and sidewalk with parkway along both sides of the street. The Project would not alter the primary vehicular travel way of Frederick Street, but would construct a bus turn out for the existing RTA bus stop located approximately 120 feet north of the intersection of Frederick Street and Brodiaea Avenue.

Under existing conditions, Brodiaea Avenue is developed to its full width with one vehicular travel lane in each direction, a painted median, and sidewalks on both sides of the street. The Project would install a landscaped parkway along the site's frontage and would retain the existing curb-adjacent sidewalk.

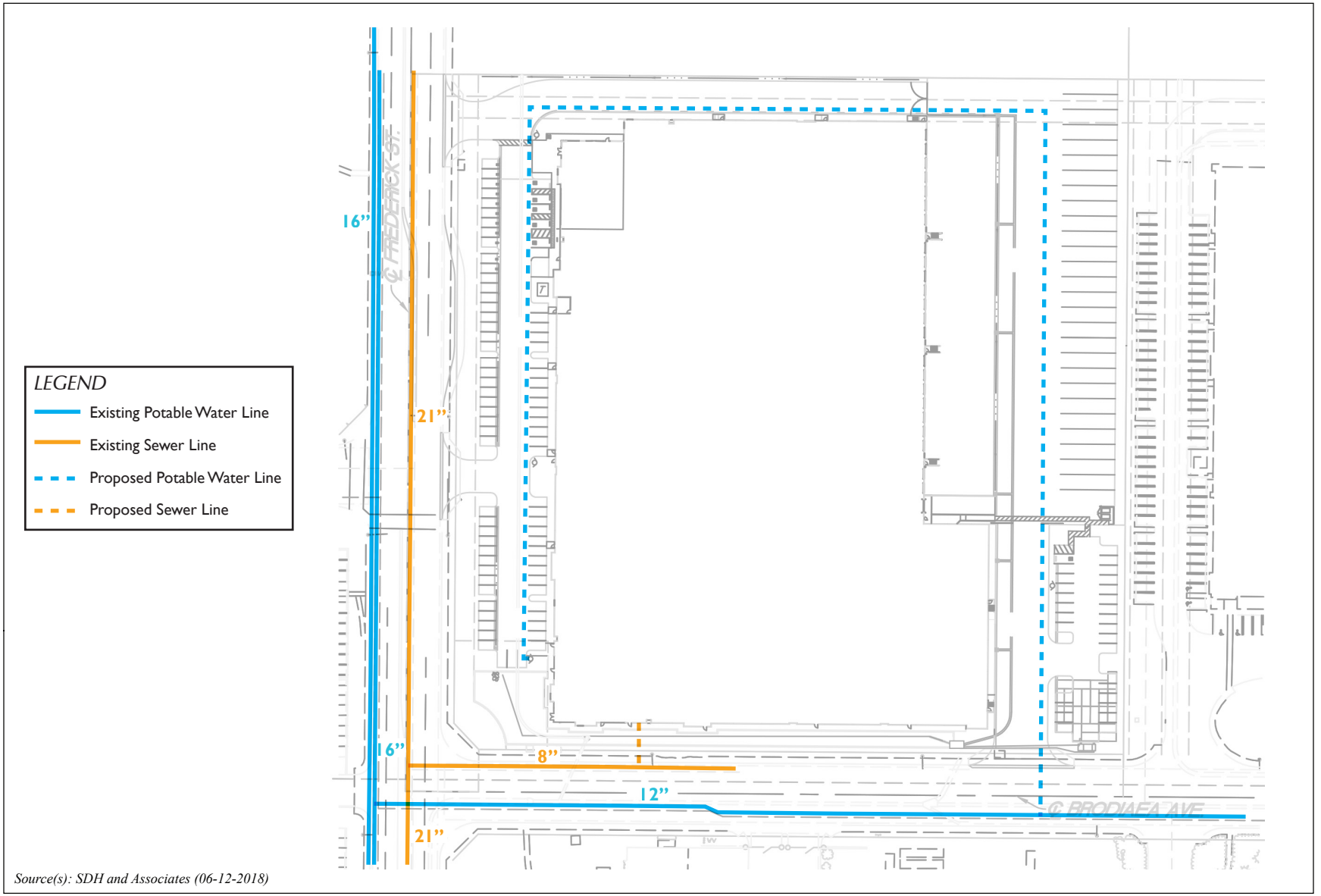
B. Water and Wastewater Infrastructure

Water and wastewater service would be provided to the Project site by the EMWD. As shown on Figure 3-6, *Existing Water and Sewer Network*, under pre-development conditions, potable water service is provided to the Project area via a 12-inch-diameter water main beneath Brodiaea Avenue and two 16-inch-diameter water mains beneath Frederick Street. Additionally, wastewater service is provided to the Project area via one 21-inch-diameter sewer line in Frederick Street and one eight (8)-inch-diameter sewer line in Brodiaea Avenue. The Project would construct new connections to the existing water and wastewater mains beneath Brodiaea Avenue and Frederick Street. All proposed water and wastewater facilities would be designed and constructed in accordance with EMWD standards.

C. Drainage Plan

The Project's stormwater drainage system is depicted on Figure 3-7, *Conceptual Drainage Plan*. The Project's on-site stormwater drainage system would consist of catch basins, underground storm drain pipes, a bioretention basin, and an underground stormwater storage vault/modular wetland. The system is designed to collect, treat, and/or temporarily detain stormwater runoff before discharging treated flows off-site.

The Project's proposed drainage plan generally bisects the Project site into two (2) distinct drainage areas: the Western Area and the Eastern Area. The Western Area comprises the passenger parking lot west of the proposed warehouse, the western portion of the proposed warehouse, and the landscaped area in the southwestern corner and southern boundary of the Project site. The Eastern Area compromises the truck lot and passenger parking lot east of the proposed warehouse, the eastern portion of the proposed warehouse, and the drive aisles along the northern and eastern portions of the proposed warehouse.



Source(s): SDH and Associates (06-12-2018)

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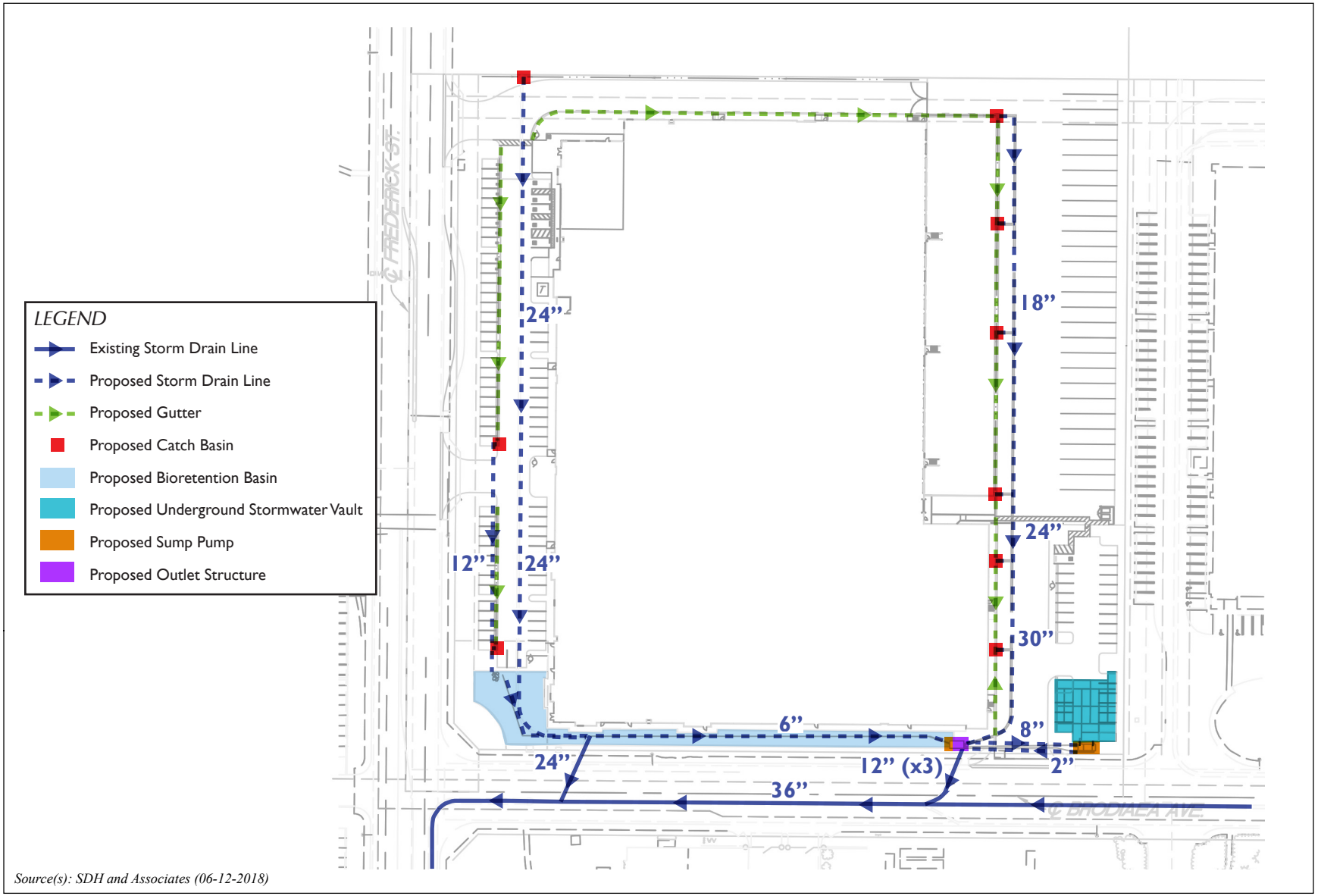
Figure 3-6

EXISTING WATER AND SEWER NETWORK



Source(s): SDH and Associates (06-12-2018)

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Figure 3-7

CONCEPTUAL DRAINAGE PLAN

Stormwater flows within the Western Area would be conveyed to a landscaped bioretention basin located at southwestern corner of the Project site and along the southern boundary of the Project site. The bioretention basin would capture and treat low flows (i.e., generally the first 3/4-inch of rainfall) by facilitating percolation into the landscaped coverage and into a perforated pipe located beneath the bioretention basin. From there, low flows would be conveyed easterly through the perforated pipe toward a drainage inlet (herein, "Inlet A") located adjacent to the southeast corner of the proposed warehouse building. Stormwater from the Western Area would then convey from Inlet A into the existing storm drain line located beneath Brodiaea Avenue. When the bioretention basin reaches capacity, high flows (i.e., the higher volumes flows which follow low flows) from the Western Area would pond within the bioretention area and surface flow directly into Inlet A and proceed toward the existing storm drain line beneath Brodiaea Avenue.

Stormwater flows within the Eastern Area would be conveyed into an underground storm drain line (located east of the proposed warehouse building) and would travel southerly into Inlet A. From there, low flows would be directed easterly toward an underground stormwater vault (located beneath the passenger vehicle parking lot) and would be treated by a closed modular wetland system or approved equal LID BMP as determined in the final water quality management plan. Once treated, low flows would be pumped out of the stormwater vault and would convey westerly, back to Inlet A. Low flows from the Eastern Area would then convey from Inlet A into the existing storm drain line beneath Brodiaea Avenue. When the underground vault reaches capacity, high flows from the Eastern Area would bypass the underground vault altogether and would instead convey directly into Inlet A and proceed toward the existing storm drain line beneath Brodiaea Avenue.

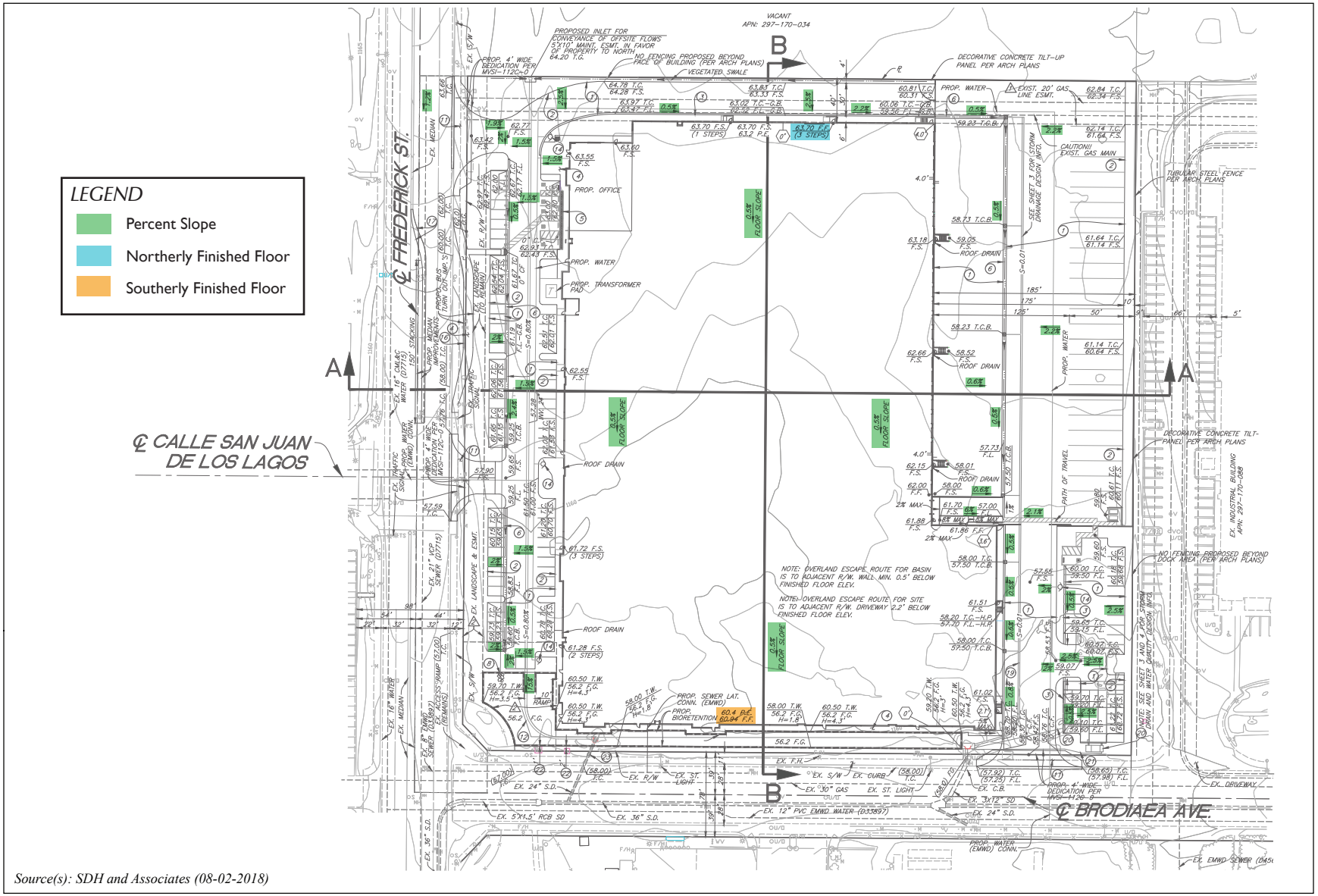
Off-site runoff, which sheet flows southerly toward the Project site from properties to the north, would be conveyed into a catch basin located along the Project's northern boundary (northwest of the proposed warehouse building). Off-site stormwater would then convey southerly via an underground storm drain line (located beneath the western passenger vehicle parking lot) and would terminate at an existing drainage inlet (herein, "Inlet B") located beneath the bioretention basin in the southwestern portion of the Project site. The off-site stormwater flows would then convey into the existing storm drain line beneath Brodiaea Avenue.

D. Earthwork and Grading

As shown on Figure 3-8, *Conceptual Grading Plan*, earthwork and grading would occur over the entire Project site. No area of the site would be left undisturbed. Proposed earthwork and grading activities would occur in one phase and would result in approximately 15,000 cubic yards (c.y.) of cut and 15,000 c.y. of fill. No import or export of soil materials would be required. Proposed grading would not create manufactured slopes.

3.2.2 Construction Characteristics

The proposed Project is expected to be constructed over the course of approximately 9 months, commencing in December 2018 and completing in September 2019. Construction activities would commence with site preparation, during which the property would be graded and underground infrastructure would be installed. Next, surface materials would be poured and the building would be erected, connected to the underground utility system, and painted. Lastly, landscaping, fencing/walls, and other site improvements would be installed, and fine grading would occur.



Source(s): SDH and Associates (08-02-2018)

NOT TO SCALE

Figure 3-8

CONCEPTUAL GRADING PLAN

Construction equipment is expected to operate on the Project site eight hours per day, five days per week during the construction phase. The types and numbers of heavy equipment expected to be used during construction activities are summarized in Table 3-3 of *Technical Appendix A.*

3.2.3 Operational Characteristics

At the time this MND was prepared, the future Project occupant(s) were unknown. The Project Applicant expects that the building primarily would be occupied by warehouse distribution operators. The proposed building is not designed to include any cold storage or refrigerated uses. For purposes of evaluation in this MND, it is anticipated that the Project would be operational in the year 2020. The Project could be operational 24 hours per day, seven days per week, with exterior loading and parking areas illuminated at night. Lighting would be subject to compliance with Moreno Valley Municipal Code Section 9.08.100, which states that exterior lighting shall be energy-efficient, shielded, or recessed, and directed downward, and away from adjoining properties. The building is designed such that business operations would be conducted within the enclosed building, with the exception of traffic movement, parking, and the loading, and unloading of tractor trailers at designated loading bays. The outdoor cargo handling equipment used during loading, and unloading of trailers (e.g., yard trucks, hostlers, yard goats, pallet jacks, forklifts) are expected to be powered by non-combustion engines (e.g. electric or non-diesel). During long-term operating conditions, the Project is calculated to generate approximately 486 actual vehicle trips[1] on a daily basis, including 386 daily passenger vehicle trips and 100 daily truck trips (Urban Crossroads, 2018c, Table 4-2).

Based on standard EMWD demand rates for industrial warehouse/distribution land uses, the Project is estimated to result in a demand for approximately 4,840 gallons of water per day and 14,960 gallons of wastewater treatment capacity per day (EMWD's standard demand rates for industrial warehouse/distribution land uses are 550 gallons of water per acre per day and 1,700 gallons of wastewater per acre per day, respectively). Based on calculations from the Project's Greenhouse Gas Analysis (*Technical Appendix F*), the Project's operational energy use is estimated at approximately 822,315 kilowatt hours (kWh) per year, and natural gas usage is estimated at approximately 1,657,053 kilo-British thermal units per year (kBTU/yr) (Urban Crossroads, 2018c, Appendix 3.2).

3.3 STANDARD REQUIREMENTS AND CONDITIONS OF APPROVAL

The proposed Project and its technical aspects have been reviewed in detail by the City of Moreno Valley. Various City departments and divisions are responsible for reviewing land use applications for compliance with City codes and regulations. These departments and divisions also were responsible for reviewing this MND for technical accuracy and compliance with CEQA. The City of Moreno Valley departments and divisions responsible for technical review include:

- Community Development Department, Building and Safety Division
- Community Development Department, Planning Division
- Public Works Department, Land Development Division
- Public Works Department, Transportation Engineering Division

[1]Although the Project proposes warehouse land uses, the number of traffic trips identified here and evaluated in this MND is based off a mix of warehouse and general light industrial land uses as such a mix would generate more traffic than solely warehouse land uses. This was done as a conservative measure to overstate the Project's potential environmental effects. Refer to Subsection 15, *Transportation/Traffic*, of the Initial Study / Environmental Checklist Form for additional details regarding the methodology for the Project's traffic generation calculations.

- Public Works Department, Special Districts Division
- Fire Prevention Bureau
- Moreno Valley Utility

Review of the proposed Project will result in the production of a comprehensive set of draft Conditions of Approval that will be available for public review prior to consideration of the Project for approval by the City of Moreno Valley. If approved, the Project would be required to comply with all imposed Conditions of Approval.

Conditions of Approval and other applicable regulations, codes, and requirements that the Project is required to comply with and that result in the reduction or avoidance of an environmental impact are specified throughout the analysis presented in this MND.

3.4 SUMMARY OF REQUESTED ACTIONS

The City of Moreno Valley has primary approval responsibility for the proposed Project. As such, the City is the Lead Agency for this MND pursuant to CEQA Guidelines Section 15050. The City will consider the information contained in this MND and this MND's Administrative Record in its decision-making processes.

In the event of approval of the Project and this MND, the City would conduct administrative reviews and issue ministerial permits to implement the Project. A list of the primary actions under City jurisdiction and the jurisdiction of other agencies is provided in Table 3-1, *Matrix of Project Approvals/Permits*. This MND covers all federal, state, local government and quasi-government approvals which may be needed to construct or implement the Project, whether or not they are explicitly listed in Table 3-1, or elsewhere in this MND (CEQA Guidelines § 15124(d)).

Table 3-1 Matrix of Project Approvals/Permits

Public Agency	Approvals and Decisions
City of Moreno Valley	
Proposed Project – City of Moreno Valley Discretionary Approvals	
City of Moreno Valley City Council	• Approve or deny General Plan Amendment (PEN18-0024) and Change of Zone (PEN18-0025). • Approve, conditionally approve, or deny Plot Plan (PEN18-0023). • Reject or adopt this MND along with the appropriate CEQA Findings.
Subsequent City of Moreno Valley Discretionary and Ministerial Approvals	
City of Moreno Valley Implementing Approvals	• Approve Final Maps. • Approve Conditional or Temporary Use Permits, if required. • Issue Grading Permits. • Issue Building Permits. • Approve Road Improvement Plans. • Issue Encroachment Permits. • Accept public-right-of way dedications. • Approvals by Moreno Valley Utility associated with installing electrical infrastructure.
Other Agencies – Subsequent Approvals and Permits	
Riverside County Flood Control and Water Conservation District	• Administrative approvals for the design of drainage infrastructure.
Eastern Municipal Water District	• Administrative approvals for the design of on and off-site water and sewer infrastructure.
Santa Ana Regional Water Quality Control Board	• Issuance of a Construction Activity General Construction Permit. • Issuance of a National Pollutant Discharge Elimination System (NPDES) Permit.
Riverside County Airport Land Use Commission	• Determination of consistency with the ALUCP.

4.0 INITIAL STUDY CHECKLIST

INITIAL STUDY/
ENVIRONMENTAL CHECKLIST FORM
CITY OF MORENO VALLEY

1. **Project Title:** Centerpointe Commerce Center

2. **Lead Agency Name and Address:** City of Moreno Valley Community Development Department, Planning Division, 14177 Frederick Street, Moreno Valley, CA 92552

3. **Contact Person and Phone Number:** Seda Yaghoubian, Planning Consultant, (714) 401-9514

4. **Project Location:** Northwest corner of the Brodiaea Avenue/Frederick Street intersection.

5. **Project Sponsor's Name and Address:** Newcastle Partners, 4740 Green River Road, Suite 118, Corona, CA 92880

6. **General Plan Designation:** Office

7. **Zoning:** Office

8. **Description of the Project:** Refer to Section 2.0 of this Initial Study/Mitigated Negative Declaration

9. **Surrounding Land Uses and Setting:** The Project site is bounded on the west by Frederick Street. West of Frederick Street is the City of Moreno Valley Civic Center complex and office/business park land uses. The Project site is bounded on the east by a large warehouse facility. The Project site is bounded on the north by vacant, undeveloped property and bounded on the south by Brodiaea Avenue. South of Brodiaea Avenue are office and warehouse land uses.

10. **Other public agencies whose approval is required:** Riverside County Airport Land Use Commission (Airport Land Use Plan Consistency Determination); Santa Ana Regional Water Quality Control Board (NPDES Permit), Riverside County Flood Control and Water Conservation District (drainage infrastructure design); and Eastern Municipal Water District (domestic water and sewer system design).

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below (✓) would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

	Aesthetics		Hazards & Hazardous Materials		Recreation
	Agriculture and Forestry Resources		Hydrology/Water Quality		Transportation/Traffic
	Air Quality		Land Use/Planning		Tribal Cultural Resources
	Biological Resources		Mineral Resources		Utilities/Service Systems
	Cultural Resources		Noise		Mandatory Findings of Significance
	Geology/Soils		Population/Housing		
	Greenhouse Gas Emissions		Public Services		

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	
I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	✓
I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	
I find that the proposed project MAY have a "potential significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	
I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.	

Signature 9/13/2018 Date

SEDA YAGHOUBIAN, City of Moreno Valley Case Planner
Printed Name

EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Potentially Significant Unless Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section 17, "Earlier Analysis," may be cross-referenced).

5) Earlier analysis may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c) (3) (d). In this case, a brief discussion should identify the following:

   (a) Earlier Analysis Used. Identify and state where they are available for review.

   (b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   (c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g. general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The analysis of each issue should identify: (a) the significance criteria or threshold used to evaluate each question; and (b) the mitigation measure identified, if any, to reduce the impact to less than significance.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

1. AESTHETICS. Would the project:

A) Have a substantial adverse effect on a scenic vista?			✓	

Source: (City of Moreno Valley, 2006; Google Earth, 2018)

The Project site is located in a relatively flat valley floor, approximately 2.6 miles southeast of the Box Springs Mountains and Rec Canyon foothills, respectively, approximately 9.5 miles west of the Badlands, and approximately 4.1 miles northwest of Mount Russe According to General Plan EIR Figure 5.11-1, *Major Scenic Resources*, the Project site is not located within a view corridor for the B Springs Mountains, Reche Canyon, the Badlands, or Mount Russell. Notwithstanding, Box Springs Mountains is visible from Brodia Avenue along the Project site frontage; however, views of this feature are not prominent in the Project area and the views that are provid are relatively common in Moreno Valley and not unique to the site. Views of Reche Canyon foothills and the Badlands are mos obscured from Frederick Street by existing landscaping along the Project site frontage that will be retained and supplemented. Views Mount Russell also are obscured along Frederick Street by existing landscaping and intervening development. No prominent views Reche Canyon foothills, the Badlands, and Mount Russell are provided from Brodiaea Avenue and the Project would not alter the vie of these resources offered from Brodiaea Avenue. (City of Moreno Valley, 2006, Figure 5.11-1; Google Earth, 2018) Accordingly, t proposed Project would not have a substantial effect on a scenic vista. Impacts would be less than significant.

B) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?				✓

Source: (City of Moreno Valley, 2006; Google Earth, 2018; Caltrans, 2017)

The Project site is not located within or adjacent to a scenic highway corridor and does not contain scenic resources, such as trees of scer value, rock outcroppings, or historic buildings. There are no State-designated or eligible scenic highways within the City of More Valley or within the vicinity of the Project site (Caltrans, 2017). The Project site also is located approximately 1.8 miles south of SR-6 which the City of Moreno Valley General Plan Figure 7-2 identifies as a "Scenic Route." (Google Earth, 2018; City of Moreno Valle 2006, p. 5.11-1) The Project's proposed physical features – one warehouse building with screen walls, gates, parking lots, truck yar landscaping, etc. – would not be visible from SR-60 due to intervening development and distance. Accordingly, the Project site is r located within a State scenic highway corridor and implementation of the proposed Project would not have a substantial effect on scer resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway corridor. Thus, impact would occur.

C) Substantially degrade the existing visual character or quality of the site and its surroundings?			✓	

Source: (Project Application Materials, 2018; City of Moreno Valley, 2016)

Under existing conditions, the Project site and the surrounding area consist entirely of developed or disturbed land. Immediately ea south, and west of the Project site are fully built-out light industrial and business/office park land uses. Land to the north of the Proj site is vacant and undeveloped. Implementation of the Project would convert vacant, undeveloped land to a warehouse facility with loading/unloading area, parking lot, drive aisles, landscaping, exterior lighting, and signage.

All Project-related construction activities would be temporary in nature and all construction equipment and materials would be remov from the Project site following completion of the Project's construction activities. Project-related changes to local visual character wou be less than significant during near-term construction activities because construction activity is common in the City, would be tempora in nature, and would not substantially degrade the visual character of the area, which currently contains vacant, undeveloped land, n warehouse construction, and established office and warehouse uses.

The Project site is located in a portion of the City of Moreno Valley that has developed with a mix of land uses, with, generally, offi and business park land uses west of Frederick Street and warehouse and light industrial land uses east of Frederick Street. The Projec architecture incorporates design elements on its western façade, including but not limited to decorative glass, stone veneer, and decorati canopies at office entries, that emulate the quality and character of existing office and business park uses located west of Frederick Stre The Project also incorporates other architectural features on its western façade, such as offsets, a varied roofline, glass, and a varied co palette – all complemented with landscaping – to minimize the scale of the proposed building and provide a gradual visual transition fr the existing office and business park uses west of the Project site to the larger scale warehousing and light industrial land uses located e of the site. Therefore, although the Project would alter the visual character of the site, due to its similarity to the character of other existi buildings in the surrounding area, such an alteration would not result in a substantial degradation to the existing visual character. T Project's impacts to visual character would be less than significant.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Although the Project would change the aesthetic conditions on the Project site relative to existing conditions, the Project incorporates number of features to enhance the aesthetic quality of the Project. The Project's architecture incorporates a color palette that would n be visually offensive and also incorporates accent elements, such as colored glass and decorative building elements, for visual intere The Project's landscape plan incorporates attractive plant species that can maintain vibrancy during drought conditions. Additionally, t Project places loading docks and truck parking areas on the east side of the building, which is the furthest point on the property fro public roadways and viewpoints, and would install solid screen walls to shield views of the loading and truck parking area from pub views. The Project's visual features would complement surrounding development and would be consistent with the design standards f industrial development provided by the Moreno Valley General Plan. Based on the foregoing, the Project's impacts to visual qual would be less than significant.

D) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			✓	

Source: (City of Moreno Valley, 2017c; Project Application Materials, 2018)

Under existing conditions, the Project site is vacant and undeveloped and generates no day or nighttime light or glare, although there a existing street lights along the Project's frontages with Frederick Street and Brodiaea Avenue. The proposed Project would inclu exterior lighting; however, the installation of exterior lighting would be ancillary to the proposed industrial building. The proposed Proj would be required to adhere to the lighting requirements as set forth in the Moreno Valley Municipal Code. The Moreno Valley Municip Code Chapter 9.08.100 requires that all outdoor lighting associated with nonresidential uses shall be fully shielded and directed away fro surrounding residential uses to reduce glare and light trespass and shall not exceed one-quarter-foot-candle measured from within five (feet of any property line. The Moreno Valley Municipal Code also specifies that exterior lighting associated with nonresidential uses sh not blink, flash, oscillate, or be of unusually high intensity or brightness. (City of Moreno Valley, 2017c) The Project would be requir to demonstrate compliance with the aforementioned requirements prior to issuance of building permits. The Project's mandato compliance with the City of Moreno Valley Municipal Code would ensure that the Project would not produce a new source of substant light or glare from artificial lighting sources that would adversely affect day or nighttime views in the area.

The Project would involve the construction of one (1) warehouse building with exterior building surfaces that consist of concrete tilt- panels and blue glass. While window glazing has a potential to result in minor glare effects, such effects would not adversely affe daytime views of any surrounding properties, including motorists on adjacent roadways, because the glass used by the Project would low-reflective. Areas proposed for window glazing would be limited, as shown on the Project's application materials. Additionally, t Project does not propose to install rooftop solar panels; however, the roof of the proposed warehouse building could accommodate t potential future installation of solar panels. Because solar panels absorb light – and do not reflect it – they are not expected to result substantial adverse glare effects in the event they are installed on the site in the future. In addition, any solar panels installed on the s in the future would need to be designed to minimize glare in accordance with Riverside County ALUC requirements (refer to analy under Response 7(E)). Accordingly, a less-than-significant daytime glare impact would occur.

In conclusion, the proposed Project would not create a new source of substantial light or glare and would not adversely affect daytime nighttime views of the area. Impacts would be less than significant.

2. AGRICULTURE AND FORESTRY RESOURCES: In determining whether impacts to agricultural resources are significa environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepar by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determini whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to informati compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the For and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in For Protocols adopted by the California Air Resources Board. Would the project:

A) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency to non-agricultural use?				✓

Source: (CDC, n.d.)

According to Farmland Mapping and Monitoring Program mapping information available from the California Department Conservation, the Project site does not contain any soils mapped by the Department of Conservation as "Prime Farmland," "Uniq Farmland," or "Farmland of Statewide Importance." (CDC, n.d.) As such, the Project would not convert Prime Farmland, Uniq Farmland, or Farmland of Statewide Importance to a non-agricultural use. No impact would occur.

B) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				✓

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Source: (City of Moreno Valley, 2017b; DOC, 2016; City of Moreno Valley, 2006)

The Project site is zoned for "Office" land uses under existing conditions. There are no properties zoned for agricultural land uses in t Project vicinity. (City of Moreno Valley, 2017b) Therefore, implementation of the Project has no potential to conflict with existi zoning for an agricultural use.

As disclosed in the City of Moreno Valley General Plan FEIR and supported mapping information from the California Department Conservation, no land within the City is under a Williamson Act Contract (DOC, 2016; City of Moreno Valley, 2006, p. 5.8-9). As suc the Project would not conflict with a Williamson Act contract.

C) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				✓

Source: (City of Moreno Valley, 2006)

The Project site is not zoned as forest land, timberland, or Timberland Production, nor is it surrounded by forest land, timberland, Timberland Production land. There are no lands located within the City of Moreno Valley that are zoned for forest land, timberland, timberland zoned Timberland Production. (City of Moreno Valley, 2006, Figure 5.8-1) Therefore, the Project has no potential to confl with any areas currently zoned as forest, timberland, or Timberland Production and would not result in the rezoning of any such lands. such, no impact would occur.

D) Result in the loss of forest land or conversion of forest land to non-forest use?				✓

Source: (City of Moreno Valley, 2006)

The Project site does not contain a forest and is not designated as forest land; thus, the proposed Project would not result in the loss forest land or the conversion of forest land to non-forest use (City of Moreno Valley, 2006, Figure 5.8-1). As such, no impact wou occur.

E) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				✓

Source: (City of Moreno Valley, 2017b; CDC, n.d.)

"Farmland" is defined in Section II(a) of Appendix G of the CEQA Guidelines to mean "Prime Farmland," "Unique Farmland" "Farmland of Statewide Importance." As described above in Response 2(A), the Project site does not contain any soils mapped by t Department of Conservation as "Farmland." Additionally, as described above in Responses 2(C) and 2(D), the Project site and surroundi areas do not contain forest lands and are not designated for forest land uses. Thus, implementation of the Project would not result in t conversion of Farmland to non-agricultural use or the conversion of forest land to non-forest use.

3. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

A) Conflict with or obstruct implementation of the applicable air quality plan?			✓	

Source: (Urban Crossroads, 2018a)

The Project site is located within the South Coast Air Basin (SCAB or "Basin"). The SCAB encompasses approximately 6,745 squa miles and includes Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The SCAB bound by the Pacific Ocean to the west; the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, respective and the San Diego County line to the south. In these areas, the SCAQMD is principally responsible for air pollution control, and wor directly with the Southern California Association of Governments (SCAG), county transportation commissions, local governments, well as State and federal agencies to reduce emissions from stationary, mobile, and indirect sources to meet State and federal ambient quality standards.

Currently, State and federal air quality standards are exceeded in most parts of the Basin. In response, the SCAQMD has adopted a ser of Air Quality Management Plans (AQMPs) to meet the State and federal ambient air quality standards. AQMPs are updated regularly order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

the economy. The current AQMP, the *2016 AQMP*, was adopted by SCAQMD in March 2017. Criteria for determining consistency w the *AQMP* are defined in Chapter 12, Section 12.2 and Section 12.3 of the SCAQMD's *CEQA Air Quality Handbook (1993)*. The Projec consistency with these criteria is discussed below.

Consistency Criterion No. 1: The Project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

Consistency Criterion No. 1 refers to violations of the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). As evaluated under Responses 3(B), (C), and (D), below, the Project would not exceed regional or localized significance thresholds for any criteria pollutant during construction or during long-term operation with the application of mandatory regulatory requirements. Therefore, the Project would not violate either the CAAQS or NAAQS. Accordingly, the Project's regional and localized emissions would not contribute substantially to an existing or potential future air quality violation or delay the attainment of air quality standards.

Consistency Criterion No. 2: The Project will not exceed the assumptions in the AQMP based on the years of Project build-out phase.

The growth forecasts used in the *AQMP* to calculate future emissions levels are based in part on land use planning data provided by lead agencies via their general plan documentation. Projects that increase the intensity of use on a subject property may result in increased stationary area source emissions and/or vehicle source emissions when compared to the *AQMP* assumptions. However, if a project does not exceed the growth projections in the applicable local general plan, then the project is considered to be consistent with the growth assumptions in the *AQMP*. The prevailing planning document for the Project site is the City of Moreno Valley General Plan. The City of Moreno Valley General Plan Land Use Map designates the Project site for Office (O) land use. The Project proposes to change the General Plan land use designation to Business Park/Light Industrial (BP/LI). However, daily emissions are largely independent of land use assignments, but rather a function of the specific scope and intensity of development. Irrespective of the site's land use designation, development of the site to its maximum potential would likely occur and was assumed by the *AQMP* accordingly. As evaluated under Responses 3(B), (C), and (D), below, the Project would not exceed regional or localized significance thresholds for any criteria pollutant during construction or during long-term operation with the application of mandatory regulatory requirements; therefore, the Project would not cause any new air quality impacts that were not previously anticipated by the *AQMP*. Accordingly, although the Project would alter the planned land uses for the Project site, the proposed alteration would not result in a significant adverse effect to air quality in the SCAB and would not exceed the emissions assumptions in the *AQMP*.

For the reasons stated above, the Project would not result in an increase in the frequency or severity of existing air quality violations cause or contribute to new violations, delay the timely attainment of air quality standards or the interim emissions reductions specified the *AQMP*. Furthermore, the Project would not exceed the emissions assumptions in the *AQMP*. As such, the Project would be consiste with the *AQMP* and impacts would be less-than-significant.

B) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.			✓	

Source: (Urban Crossroads, 2018a)

The proposed Project has the potential to generate substantial pollutant concentrations during both construction activities and long-te operation. The following analysis is based on the applicable significance thresholds established by the SCAQMD (which are based federal and State air quality standards). This analysis assumes that the proposed Project would comply with applicable, mandatory regio air quality standards, including: SCAQMD Rule 403, "Fugitive Dust;" SCAQMD Rule 431.2, "Sulfur Content of Liquid Fuel SCAQMD Rule 1113, "Architectural Coatings;" SCAQMD Rule 1186, "PM_{10} Emissions from Paved and Unpaved Roads, and Livesto Operations;" SCAQMD Rule 1186.1, "Less-Polluting Street Sweepers," and Title 13, Chapter 10, Section 2485, Division 3 of t California Code of Regulations "Airborne Toxic Control Measure." For a detailed description of the health effects of air pollutants re to Section 2.6 of the Project's Air Quality Report *(Technical Appendix A)*. In general, air pollutants have adverse effects to human hea including, but not limited to, respiratory illness and carcinogenic effects.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Impact Analysis for Construction Emissions

For purposes of this analysis, construction is conservatively expected to begin in December 2018 and end in September 2019. T California Emissions Estimator Model (CalEEMod) accounts for the implementation and enforcement of California's progressively mo restrictive regulatory requirements for construction equipment and the ongoing replacement of older construction fleet equipment w newer, less-polluting equipment. Thus, according to the CalEEMod, construction activities that occur in the near future are expected generate more air pollutant emissions than the same activities that may occur farther into the future. Accordingly, in the unexpected eve that the Project's construction occurs at a later date than expected by this analysis, the Project's construction emissions would not exce the values presented herein. (Urban Crossroads, 2018a, p. 31) The Project's construction characteristics and construction equipment fle assumptions used in the analysis were previously described in Section 3.0, *Project Description*. The calculated maximum daily emissio associated with Project construction are presented in Table 1, *Summary of Construction-Related Emissions*.

Table 1 Summary of Construction-Related Emissions

Year	Emissions (pounds per day)					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
2018	3.21	38.45	14.72	0.04	4.66	2.82
2019	23.79	35.94	32.11	0.07	4.56	2.72
Maximum Daily Emissions	**23.79**	**38.45**	**32.11**	**0.07**	**4.66**	**2.82**
SCAQMD Regional Threshold	75	100	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Source: (Urban Crossroads, 2018a, Table 3-4)

As shown in Table 1, the Project's daily construction emissions of volatile organic compounds (VOCs), nitrogen oxides (NO_X) carb monoxide (CO), sulfur oxides (SO_X), and particulate matter (PM_{10} and $PM_{2.5}$) would not exceed SCAQMD regional criteria threshol Accordingly, the Project would not emit substantial concentrations of these pollutants during construction and would not contribute to existing or projected air quality violation, on a direct or cumulatively-considerable basis. Impacts associated with construction-relat emissions of VOCs, NO_X, CO, SO_X, PM_{10} and $PM_{2.5}$ would be less than significant and mitigation is not required.

Impact Analysis for Operational Emissions

Operational activities associated with the Project are expected to generate air pollutant emissions from the operation of motor vehicl (including trucks), landscape maintenance activities, application of architectural coatings, and the use of electricity and natural gas. Lo term operational emissions associated with the Project are presented in Table 2, *Summary of Peak Operational Emissions.*

As summarized in Table 2, Project-related operational emissions of VOCs, NO_X, CO, SO_X, PM_{10} and $PM_{2.5}$ would not exceed SCAQM regional criteria thresholds. Accordingly, the Project would not emit substantial concentrations of these pollutants during long-te operation and would not contribute to an existing or projected air quality violation. The Project's long-term emissions of VOCs, NO CO, SO_X, PM_{10} and $PM_{2.5}$ would be less than significant.

Table 2 Summary of Peak Operational Emissions

Summer Scenario	Emissions (pounds per day)					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Area Source	4.59	3.50E-04	0.04	0.00	1.40E-04	1.40E-04
Energy Source	0.05	0.45	0.37	2.67E-03	0.03	0.03
Mobile (Trucks)	1.61	43.54	13.09	0.16	5.62	1.78
Mobile (Passenger Cars)	1.12	2.78	41.13	0.15	17.72	4.77
Total Maximum Daily Emissions	**7.37**	**46.77**	**54.64**	**0.32**	**23.37**	**6.58**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Table 2 (cont.) Summary of Peak Operational Emissions

Winter Scenario	Emissions (pounds per day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area Source	4.59	3.50E-04	0.04	0.00	1.40E-04	1.40E-04
Energy Source	0.05	0.45	0.37	2.67E-03	0.03	0.03
Mobile (Trucks)	1.62	44.95	13.66	0.17	5.62	1.78
Mobile (Passenger Cars)	1.03	3.02	35.72	0.14	17.72	4.77
Total Maximum Daily Emissions	**7.29**	**48.42**	**49.79**	**0.31**	**23.37**	**6.58**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Source: (Urban Crossroads, 2018a, Table 3-5)

C) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			✓	

Source: (Urban Crossroads, 2018a)

SCAQMD considers air pollutant emissions that exceed the SCAQMD's project-level thresholds to also be cumulatively-considerab Conversely, if a project does not exceed the SCAQMD project-level thresholds, then SCAQMD considers that project's air polluta emissions to be less than cumulatively-considerable. The evaluation of Project-specific air pollutant emissions presented under Respor 3(B) demonstrates that the Project would not exceed any applicable thresholds that are designed to assist the region in attaining t applicable national air quality standards. Therefore, the Project's air pollutant emissions would be less than cumulatively considerab and would not contribute to the non-attainment of applicable State and federal standards.

D) Expose sensitive receptors to substantial pollutant concentrations?			✓	

Source: (Urban Crossroads, 2018a)

The following provides an analysis of the Project's potential to expose sensitive receptors in the immediate vicinity of the Project site substantial pollutant concentrations during Project construction and long-term operation. For a detailed description of the health effe of air pollutants refer to Section 2.6 of the Project's Air Quality Report *(Technical Appendix A)*. In general, air pollutants have adver effects to human health including, but not limited to, respiratory illness and carcinogenic effects. The following analysis is based on t applicable significance thresholds established by the SCAQMD.

Sensitive receptors are people who are especially sensitive to air pollution. Sensitive receptors could include children, the elderly, perso with preexisting respiratory or cardiovascular illness, and those who engage in frequent exercise. The four sensitive receptor locatio used in this analysis include:

- **R1:** Located approximately 794 feet north of the Project site, R1 represents existing residential homes north of Alessand Boulevard.
- **R2:** Location R2 represents existing Riverside County Department of Waste Resources facilities and offices at roughly 146 f south of the Project site.
- **R3:** Location R3 represents the existing offices located west of the Project site at approximately 146 feet on Frederick Street.
- **R4:** Located approximately 109 feet west of the Project site, R4 represents the existing Moreno Valley City Hall. (Urb Crossroads, 2018a, p. 40)

Impact Analysis for Construction Localized Emissions

As summarized in Table 3, *Summary of Construction Localized Emissions*, the Project would not exceed the SCAQMD's localiz significant threshold for any criteria pollutants during construction. Impacts would be less than significant.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Table 3 Summary of Construction Localized Emissions

On-Site Site Preparation Emissions	Emissions (pounds per day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	**2.63**	**2.34**	**0.19**	**0.17**
SCAQMD Localized Threshold	335	4,359	67	20
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**
On-Site Grading Emissions	**Emissions (pounds per day)**			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	**38.39**	**14.13**	**4.51**	**2.78**
SCAQMD Localized Threshold	422	7,070	91	33
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

Source: (Urban Crossroads, 2018a, Table 3-7)

Impact Analysis for Operational Localized Emissions

The Project's estimated operational localized emissions are presented in Table 4, *Summary of Operational Localized Emissions*. shown, the Project's calculated long-term operational emissions would not exceed the localized thresholds established by the SCAMQ Accordingly, long-term operation of the Project would not result in the exposure of any sensitive receptors to substantial pollut concentrations. Impacts would be less than significant.

Table 4 Summary of Operational Localized Emissions

Peak Operational Emissions	Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	**2.76**	**3.12**	**1.20**	**0.36**
SCAQMD Localized Threshold	488	6,860	23	8
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

Source: (Urban Crossroads, 2018a, Table 3-8)

Impact Analysis for CO "Hot Spots"

Localized areas where ambient CO concentrations exceed the CAAQS and/or NAAQS are termed CO "hot spots." Emissions of CO a produced in greatest quantities from motor vehicle combustion and are usually concentrated at or near ground level because they do r readily disperse into the atmosphere, particularly under cool, stable (i.e., low or no wind) atmospheric conditions. Consequently, t highest CO concentrations are generally found within close proximity to congested intersection locations.

For purposes of providing a conservative, worst-case impact analysis, the Project's potential to cause or contribute to CO hotspots w evaluated by comparing the study area intersections that would receive Project traffic (both intersection geometry and traffic volume with prior studies conducted by the SCAQMD in support of their AQMPs. In the *2003 AQMP*, the SCAQMD evaluated CO concentratio at four (4) busy intersections in the City of Los Angeles that were determined to be the most congested intersections in the SCAB. Ea of the evaluated intersections were primary thoroughfares, some of which were located near major freeway on/off ramps, and experienc traffic volumes of approximately 100,000 vehicles per day. The SCAQMD's analysis at these busy intersections did not identify any C hotspots. Based on an analysis of the intersections in the Project's study area, Urban Crossroads determined that none of the intersectio in the Project's study area would be subject to the extreme traffic volumes and vehicle congestion of the intersections modeled by t SCAQMD in the *2003 AQMP*. (Urban Crossroads, 2018a, pp. 44-45) Therefore, Project-related vehicular emissions would not creat CO hot spot and would not substantially contribute to an existing or projected CO hot spot. Impacts would be less than significant.

Impact Analysis for Diesel Particulate Emissions

Diesel-fueled trucks would travel to/from the Project site during operation of the Project. Diesel trucks produce diesel particulate mat (DPM), which is known to be associated with health hazards, including cancer. To evaluate the Project's potential to expose sensiti receptors within ¼-mile of the Project site and the Project's primary travel routes to substantial amounts of DPM during long-te operation, a Mobile Source Health Risk Assessment was prepared for the proposed Project (*Technical Appendix B*). Project-related DP

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

health risks were evaluated under the residential and worker receptor scenarios, which are summarized below. Potential DPM health ris were not calculated for the school child receptor scenario because there are no schools within ¼-mile of the Project site or the Projec primary travel routes. Detailed air dispersion model outputs and risk calculations are presented in Appendices 2.1 and 2.2, respective of *Technical Appendix B*.

At the maximally exposed individual receptor (MEIR) – the existing residential apartment building located along Frederick Street a approximately 150 feet north of Alessandro Boulevard – the maximum cancer risk attributable to the Project's DPM emissions is calculat to be 0.24 in one million. The cancer risk attributable to the Project at the MEIR (i.e., 0.24 in one million) would not exceed the SCAQM cancer risk threshold of 10 in one million. At this same receptor location, the non-cancer health risk index attributable to the Project wou be 0.00009, which would not exceed the SCAQMD non-cancer health risk index of 1.0. (Urban Crossroads, 2018b, p. 1) According long-term operations at the Project site would not directly cause or contribute in a cumulatively-considerable manner to the exposure residential receptors to substantial DPM emissions. Therefore, the Project would result in a less-than-significant impact.

At the maximally exposed individual worker (MEIW), identified as the existing warehouse building immediately to the east of the Proj site, the maximum cancer risk attributable to the Project's DPM emissions is calculated to be 0.23. The cancer risk attributable to t Project at the MEIW (i.e., 0.23 in one million) would not exceed the SCAQMD cancer risk threshold of 10 in one million. At this sa receptor location, the non-cancer health risk index attributable to the proposed Project would be 0.0007, which would not exceed t SCAQMD non-cancer health risk index of 1.0. (Urban Crossroads, 2018b, p. 1) Accordingly, long-term operations at the Project s would not directly cause or contribute in a cumulatively considerable manner to the exposure of nearby workers to substantial DP emissions. Therefore, the Project would result in a less-than-significant impact.

E) Create objectionable odors affecting a substantial number of people?			✓	

Source: (Urban Crossroads, 2018a)

The Project could produce odors during proposed construction activities resulting from construction equipment exhaust, application asphalt, and/or the application of architectural coatings; however, standard construction practices would minimize the odor emissions a their associated impacts. Furthermore, any odors emitted during construction would be temporary, short-term, and intermittent in natu and would cease upon the completion of the respective phase of construction. In addition, construction activities on the Project site wou be required to comply with SCAQMD Rule 402, which prohibits the discharge of odorous emissions that would create a public nuisan (Urban Crossroads, 2018a, p. 1) Accordingly, the proposed Project would not create objectionable odors affecting a substantial numb of people during construction, and short-term impacts would be less than significant.

During long-term operation, the Project would include warehouse distribution land use, which is not typically associated w objectionable odors. The temporary storage of refuse associated with the proposed Project's long-term operational use could be a potent source of odor; however, Project-generated refuse is required to be stored in covered containers and removed at regular intervals compliance with the City's solid waste regulations, thereby precluding any significant odor impact. Furthermore, the proposed Proj would be required to comply with SCAQMD Rule 402, which prohibits the discharge of odorous emissions that would create a pub nuisance, during long-term operation. (Urban Crossroads, 2018a, p. 1) As such, long-term operation of the proposed Project would n create objectionable odors affecting a substantial number of people.

4. BIOLOGICAL RESOURCES. Would the project:

A) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U. S. Fish and Wildlife Service?		✓		

Source: (Ecological Sciences, 2018a)

As documented by the Project's biologist (Ecological Sciences, Inc., hereafter "Ecological Sciences"), no special-status plants we detected or have the potential to occur within the Project site (Ecological Sciences, 2018a, p. 10). Accordingly, there is no potential f the Project to directly impact special-status plant species. No impact would occur.

According to Ecological Sciences, the Project site contains suitable habitat for the Burrowing Owl, which is a California Species of Spec Concern. There were no other special-status wildlife species detected within the Project site. (Ecological Sciences, 2018a, p. 9) With t exception of the Burrowing Owl, all special-status wildlife species with the potential to occur on the Project site are covered by the Weste Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and the Stephens' Kangaroo Rat Habitat Conservation Pl (HCP). For properties, such as the Project site, that are located outside of the Western Riverside County MSHCP Criteria Area o

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Stephens' Kangaroo Rat Reserve area, impacts to covered wildlife species are authorized by the City's incidental take permits associat with the respective conservation plans. Pursuant to the Moreno Valley Municipal Code, the Project Applicant will be required to pay t Western Riverside County MSHCP Mitigation Fee as well as the Stephens' Kangaroo Rat HCP Mitigation Fee, which pays for n development's share of the financing, acquisition, and long-term management of lands supporting species covered by the Weste Riverside County MSHCP and the Stephens' Kangaroo Rat HCP (City of Moreno Valley, 2017c, Title 3, Chapter 3.48, 8.60). I additional mitigation is required for species covered by the Western Riverside County MSHCP and/or Stephens' Kangaroo Rat HCP.

The burrowing owl is classified as a Covered Species not adequately conserved by the MSHCP. Although the Project site supports suitab habitat, no burrowing owl individuals or signs of burrowing owl use were observed on the Project improvement area during focus surveys conducted by Ecological Services (Ecological Sciences, 2018b, p. 9). However, the burrowing owl is a nomadic species and the is the potential that the species could migrate onto the Project site prior to construction. If burrowing owls are present on the Project s during grading activities, the Project's impact to the species would be significant and mitigation would be required.

The Project would result in removal of vegetation across the Project site that has the potential to support nesting migratory birds that a protected by the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code. The Project's potential to impact nesting bir and migratory birds is a significant direct impact for which mitigation is required.

MM BR-1 and MM BR-2 would reduce potential impacts to the burrowing owl and nesting migratory birds to less-than-significant leve by ensuring that pre-construction surveys are conducted to determine the presence or absence on the Project site of the burrowing o and/or protected nesting bird species prior to the commencement of construction activities. If the burrowing owl or protected nesting bi species are present, the mitigation measures provide performance criteria that require avoidance and/or relocation of the species accordance with accepted protocols.

Mitigation

MM BR-1: Within 30 days prior to grading, a qualified biologist shall conduct a survey of suitable habitat on site and make determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a rep and shall be submitted, reviewed, and accepted by the City of Moreno Valley prior to the issuance of a grading permit a subject to the following provisions:

a) In the event that the pre-construction survey identifies no burrowing owls on the property, a grading permit may issued without restriction.

b) In the event that the pre-construction survey identifies the presence of at least one individual but less than three (mating pairs of burrowing owl, then prior to the issuance of a grading permit and prior to the commencement of groun disturbing activities on the property, the qualified biologist shall passively or actively relocate any burrowing ow Passive relocation, including the required use of one-way doors to exclude owls from the site and the collapsing burrows, will occur if the biologist determines that the proximity and availability of alternate habitat is suitable f successful passive relocation. Passive relocation shall follow California Department of Fish and Wildlife (CDFW relocation protocol and shall only occur between September 15 and February 1. If proximate alternate habitat is n present as determined by the biologist, active relocation shall follow CDFW relocation protocol. The biologist sh confirm in writing that the species has fledged the site or been relocated prior to the issuance of a grading permit.

c) In the event that the pre-construction survey identifies the presence of three (3) or more mating pairs of burrowing ov the requirements of MSHCP Species-Specific Conservation Objectives 5 for the burrowing owl shall be followe Objective 5 states that if the site (including adjacent areas) supports three (3) or more pairs of burrowing owls a supports greater than 35 acres of suitable habitat, at least 90 percent of the area with long-term conservation value a burrowing owl pairs will be conserved onsite until it is demonstrated that Objectives 1-4 have been met. A gradi permit shall be issued, either:

i. Upon approval and implementation of a property-specific Determination of Biologically Superior Preservati (DBESP) report for the burrowing owl by the CDFW; or

ii. A determination by the biologist that the site is part of an area supporting less than 35 acres of suitable Habitat, a upon passive or active relocation of the species following accepted CDFW protocols. Passive relocation, includi the required use of one-way doors to exclude owls from the site and the collapsing of burrows, will occur if t

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

biologist determines that the proximity and availability of alternate habitat is suitable for successful passi relocation. Passive relocation shall follow CDFW relocation protocol and shall only occur between September and February 1. If proximate alternate habitat is not present as determined by the biologist, active relocation sh follow CDFW relocation protocol. The biologist shall confirm in writing that the species has fledged the site been relocated prior to the issuance of a grading permit.

MM BR-2 Vegetation clearing and ground disturbance shall be prohibited during the migratory bird nesting season (February 1 throu September 15), unless a migratory bird nesting survey is completed in accordance with the following requirements:

a) A migratory bird nesting survey of the Project's impact footprint, including suitable habitat within a 500-foot radi shall be conducted by a qualified biologist within three (3) days prior to initiating vegetation clearing or grou disturbance.

b) A copy of the migratory nesting bird survey results report shall be provided to the City of Moreno Valley. If the surv identifies the presence of active nests, then the qualified biologist shall provide the City with a copy of maps showi the location of all nests and an appropriate buffer zone around each nest sufficient to protect the nest from direct a indirect impact. The size and location of all buffer zones, if required, shall be subject to review and approval by t City and shall be no less than a 100-foot radius around the nest for non-raptors and no more than a 500-foot radi around the nest for raptors. The nests and buffer zones shall be field checked weekly by a qualified biological monit The approved buffer zone shall be marked in the field with construction fencing, within which no vegetation clearing ground disturbance shall commence until the qualified biologist and the City verify that the nests are no longer occupi and juvenile birds can survive independently from the nests.

B) Have a substantially adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U. S. Wildlife Service?				✓

Source: (Ecological Sciences, 2018a)

According to the field survey conducted by Ecological Sciences, no riparian habitats or other sensitive natural biological communit were found on or adjacent to the Project site (Ecological Sciences, 2018a, p. 10). Accordingly, there is no potential for the Project to ha a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, polici regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. No impact would occur.

C) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				✓

Source: (Ecological Sciences, 2018a)

According to the field survey conducted by Ecological Sciences, the Project site does not contain any protected wetland or aqua resources, including but not limited to, natural drainages or water courses, wetland habitat, marsh, vernal pool, or coastal resourc (Ecological Sciences, 2018a, p. 10). Therefore, the Project would not result in a substantial adverse effect on federally protected wetlan as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means. No impa would occur and mitigation is not required.

D) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?		✓		

Source: (Ecological Sciences, 2018b; City of Moreno Valley, 2006; RCA, 2018; Ecological Sciences, 2018a; Google Earth, 2018)

According to the field survey conducted by Ecological Sciences, the Project site does not support a diversity of native vegetation wildlife. In addition, there are no natural water bodies on the Project site; therefore, there is no potential for the Project to interfere w the movement of fish. There are also no native wildlife nurseries on-site; therefore, there is no potential for the Project to impede the u of a native wildlife nursery site. (Ecological Sciences, 2018a, p. 6, Attachment E-4; Google Earth, 2018) No impact would occur.

Wildlife movement corridors in Western Riverside County and the City of Moreno Valley are addressed by the conservation requireme specified in the Western Riverside County MSHCP, and the Project site is not identified for conservation or designated as a wildl

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

movement corridor as part of the MSHCP. (City of Moreno Valley, 2006, Figure 5.9-2; RCA, 2018) Accordingly, the site is not consider to be a wildlife movement corridor.

Ecological Sciences did not observe active or inactive bird nests on the Project site during field surveys (Ecological Sciences, 2018b, 9). Regardless, the Project would result in removal of vegetation across the Project site that has the potential to support nesting migrato birds that are protected by the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code and, out of an abundance caution, this MND concludes the Project's potential to impact nesting birds and migratory birds is a significant direct impact for whi mitigation is required.

MM BR-2 would reduce potential impacts to nesting migratory birds to less-than-significant levels by ensuring that pre-constructi surveys are conducted to determine the presence or absence of protected nesting bird species on the Project site prior to the commenceme of construction activities. If protected nesting bird species are present, this mitigation measure provides performance criteria that requ avoidance and/or relocation of the species in accordance with accepted protocols.

Mitigation

MM BR-2 shall apply; refer to Response 4(A).

E) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			✓	

Source: (Moreno Valley, 2017c)

The Moreno Valley Municipal Code contains provisions for the collection of mitigation fees to further the implementation of the Weste Riverside County MSHCP (refer to Title 3, Chapter 3.48 of the Municipal Code). The Project Applicant is required to contribute a loc mitigation fee, which requires a fee payment to assist the City in implementing the Western Riverside County MSHCP reserve syste (including the acquisition, management, and long-term maintenance of sensitive habitat areas). With mandatory compliance with standa regulatory requirements (i.e., mitigation fee payment), the proposed Project would not conflict with any City policies or ordinances relat to the mitigation fee program associated with Western Riverside County MSHCP.

The Moreno Valley Municipal Code also contains provisions for the protection of the Stephens' Kangaroo Rat pursuant to the Stephen Kangaroo Rat HCP (refer to Title 8, Chapter 8.60 of the Municipal Code). The Project site is not located within an identified reserve ar for the Stephens' Kangaroo Rat and the species has a low potential to occur on the Project site. Accordingly, the Project is exempt fro the focused survey requirements for the Stephens' Kangaroo Rat established by the Moreno Valley Municipal Code. The Project Applica is required to contribute a local development impact and mitigation fee, which requires a fee payment to assist the City in implementi the habitat conservation plan for the Stephens' Kangaroo Rat. With mandatory compliance with standard regulatory requirements (i. development impact and mitigation fee payment), the proposed Project would not conflict with any City policies or ordinances related the protection of the Stephens' Kangaroo Rat.

The City of Moreno Valley does not have any additional policies or ordinances in place to protect biological resources that are applicab to the Project.

F) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?		✓		

Source: (Ecological Sciences, 2018a; RCA, 2018; Ecological Sciences, 2018b)

The Project site is located within the Reche Canyon/Badlands Area Plan portion of the Western Riverside County MSHCP; but is n located in a Criteria Cell or Conservation Area. The MSHCP's intent is to preserve native vegetation and meet the regional habitat nee of multiple species, rather than focusing preservation efforts on one species at a time. The MSHCP provides coverage (including ta authorization for listed species) for special-status plant and animal species, as well as mitigation for impacts to special-status species a associated native habitats.

The following analysis evaluates the Project's compliance with the Western Riverside County MSHCP's Reserve Assembly Requiremer as well as other applicable MSHCP requirements pursuant to the following sections of the MSHCP. Section 6.1.2, *Protection of Spec Associated with Riparian/Riverine areas and Vernal Pools*; Section 6.1.3, *Protection of Narrow Endemic Plant Species*; Section 6.1 *Guidelines Pertaining to the Urban/Wildland Interface*; and Section 6.3.2, *Additional Survey Needs and Procedures*.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Project Relation to Reserve Assembly

The Project site is located within the MSHCP Reche Canyon/Badlands Area Plan, but is not located within an MSHCP Criteria Cell, included within the MSHCP Reserve Assembly (RCA, 2018). By being located outside of a Criteria Cell and MSHCP Reserve Assemb the Project is not required to conserve land. Therefore, the proposed Project would not conflict with the Western Riverside Cour MSHCP Reserve Assembly requirements.

Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools

The Project site does not contain wetland/riparian features, or vernal pools on or adjacent to the site regulated by the MSHCP; therefo the Project would not conflict with Section 6.1.2, *Protection of Species Associated with Riparian/Riverine areas and Vernal Poo* (Ecological Sciences, 2018a, p. 10)

Protection of Narrow Endemic Plants

The Project is located within the Narrow Endemic Plant Species Survey Area (NEPSSA); however, the entire site is highly disturbed (i discing) and does not support suitable habitat for any NEPSSA sensitive species. The site does not support alkaline marshes, wet meadov vernal pools, wetlands, or chaparral/coastal sage scrub habitats; therefore, no suitable habitat is present for all of the species identified potentially occurring by the MSHCP. (Ecological Sciences, 2018a, p. 10) Based on the foregoing information, the Project would r impact any sensitive plant species and the Project would be consistent with Section 6.1.3, *Protection of Narrow Endemic Plant Species*

Guidelines Pertaining to Urban/Wildland Interface

According to Section 6.1.4 of the MSHCP, the Urban/Wildlands Interface Guidelines are intended to address indirect effects associat with locating development in proximity to MSHCP conservation areas. The Project site is not adjacent to any MSHCP conservation area therefore, there is no potential for the project to directly or indirectly affect MSHCP open space areas (RCA, 2018). Thus, the propos Project would be consistent with Section 6.1.4 of the Western Riverside County MSHCP.

Additional Needs Survey and Procedures

Western Riverside County MSHCP Section 6.3.2 identifies that in addition to the Narrow Endemic Plant Species addressed in Secti 6.1.3, additional surveys may be needed for other certain plant and wildlife species in conjunction with MSHCP implementation in orc to achieve full coverage for these species. Within areas of suitable habitat, focused surveys are required for additional plant species i project site occurs within a designated Criteria Area Species Survey Area (CASSA), or special wildlife species survey area (i.e., burrowi owl, amphibians, and mammals).

The Project site is not located within the CASSA but is located within the Burrowing Owl Survey Area (RCA, 2018). Ecological Scienc conducted a focused survey for the burrowing owl in 2018 in accordance with the Western Riverside County MSHCP Burrowing O Survey Requirements. As discussed above under Response 4(A), Ecological Sciences did not observe any burrowing owls or signs of t species use of the property (i.e., scat, tracks, pellets, or feathers) (Ecological Sciences, 2018b, p. 9). However, the species is migratc and could use/occupy the property prior to ground-disturbing construction activities. Therefore, mitigation is required to ensure that t Project does not result in a substantial adverse effect to the burrowing owl in the event the species occupies the Project site at the time construction.

Mitigation

MM-BR-1 shall apply; refer to Response 4(A).

5. CULTURAL RESOURCES. Would the project:				
A) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?				✓

Source: (BFSA, 2018a; City of Moreno Valley, 2006)

A cultural resources survey conducted by Brian F. Smith and Associates (BFSA), which included a comprehensive site survey and archiv records search, identified no historic resources on the Project site (BFSA, 2018a, p. 1.0-1). Additionally, the Project site is not identifi as containing a historic resource by the City of Moreno Valley General Plan FEIR, Exhibit 5.10-1, *Locations of Listed Historic Resour*

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Inventory Structures. Accordingly, the Project has no potential to impact a historical resource as defined by California Code of Regulatio Section 15064.5.

B) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?			✓	

Source: (BFSA, 2018a)

No prehistoric archaeological resources were observed on the Project site during a comprehensive field survey conducted by BFSA a no prehistoric archaeological resources are known to exist within a one-mile radius of the Project site based on an archival records sear conducted by BFSA at the Eastern Information Center at the University of California, Riverside (BFSA, 2018a, p. 1.0-1). The Project s historically been used for agriculture and does not contain bedrock outcrops, natural sources of water, or other landforms that are typica associated with prehistoric use areas. Based on the findings of the field survey and archival research and due to historic agricultu activities on the Project site – which resulted in pervasive physical disturbances across the subject property – BFSA concluded the Proj site has a low potential for buried or masked prehistoric archaeological resources (BFSA, 2018a, p. 5.0-3). Based on the foregoing, t Project would result in a less-than-significant impact to prehistoric archaeological resources defined by California Code of Regulatio Section 15064.5.

C) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		✓		

Source: (BFSA, 2018b)

The Project site is underlain by lower Pleistocene very old alluvial fan deposits, which have a high potential to contain signific nonrenewable paleontological resources according to the San Bernardino County Museum (SBCM). Furthermore, the County of Riversi designates the entire Project site as having a "Medium" sensitivity for paleontological resources, which is based on the presence of geolog formations or mappable rock units where fossilized body elements, and trace fossils such as tracks, nests, and eggs have been discover elsewhere in Southern California. The category "Medium" indicates that fossils are likely to be encountered at or below four feet of dep and may be impacted during excavation by construction activities. (BFSA, 2018b, p. 2) The Project's potential to directly or indirec destroy unknown, unique paleontological resources that may be buried beneath the ground surface is a significant impact and mitigati is required.

Implementation of MM CR-1 through MM CR-4 would ensure the proper identification and subsequent treatment of any paleontologi resources that may be encountered during ground-disturbing activities associated with implementation of the proposed Project. Therefo with implementation of MM CR-1 through MM CR-4, the Project's potential impacts related to paleontological resources would reduced to less-than-significant levels.

Mitigation

MM CR-1 Prior to the issuance of a grading permit, the Project Applicant shall provide evidence to the City of Moreno Valley tha qualified paleontologist has been retained by the Project Applicant to conduct monitoring of excavation activities and h the authority to halt and redirect earthmoving activities in the event that suspected paleontological resources are unearthe

MM CR-2 The paleontological monitor shall conduct full-time monitoring during grading and excavation operations in undisturbe very old alluvial fan sediments at or below four (4) feet below ground surface and shall be equipped to salvage fossils they are unearthed to avoid construction delays and to remove samples of sediments that are likely to contain the remai of small fossil invertebrates and vertebrates. The paleontological monitor shall be empowered to temporarily halt or div equipment to allow of removal of abundant and large specimens in a timely manner. Monitoring may be reduced if t potentially fossiliferous units are not present in the subsurface, or if present, are determined upon exposure a examination by qualified paleontological personnel to have a low potential to contain or yield fossil resources.

MM CR-3 Recovered specimens shall be properly prepared to a point of identification and permanent preservation, including scre washing sediments to recover small invertebrates and vertebrates, if necessary. Identification and curation of specime into a professional, accredited public museum repository with a commitment to archival conservation and permane retrievable storage, such as the Western Science Museum in Hemet, California, is required for significant discoveries.

MM CR-4 A final monitoring and mitigation report of findings and significance shall be prepared, including lists of all foss recovered and written repository agreements, if any, and necessary maps and graphics to accurately record the origi location of the specimens. The report shall be submitted to the City of Moreno Valley prior to building final.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
D) Disturb any human remains, including those interred outside of formal cemeteries?			✓	

Source: (City of Moreno Valley, 2006; BFSA, 2018a)

The Project site does not contain a cemetery, and no known formal cemeteries are located within the immediate site vicinity (City Moreno Valley, 2006, p. 5.10-10; BFSA, 2018a, p. 5.0-2). Nevertheless, the remote potential exists that human remains may be unearth during grading and excavation activities associated with Project construction. If human remains are unearthed during Project constructio the construction contractor would be required by law to comply with Health and Safety Code, Section 7050.5 "Disturbance of Hum Remains." According to Section 7050.5(b) and (c), if human remains are discovered, the County Coroner must be contacted and if t Coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native Americ the Coroner is required to contact, by telephone within 24 hours, the Native American Heritage Commission (NAHC). Pursuant to Pub Resources Code Section 5097.98, whenever the NAHC receives notification of a discovery of Native American human remains from county coroner, the NAHC is required to immediately notify those persons it believes to be most likely descended from the deceas Native American. The descendants may, with the permission of the owner of the land, or his or her authorized representative, inspect t site of the discovery of the Native American human remains and may recommend to the owner or the person responsible for the excavati work means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. The descenda shall complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to t site. According to Public Resources Code Section 5097.94(k), the NAHC is authorized to mediate disputes arising between landowne and known descendants relating to the treatment and disposition of Native American human burials, skeletal remains, and items associat with Native American burials.

With mandatory compliance with Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98, any potent impacts to human remains, including human remains of Native American ancestry, would be less than significant.

6. GEOLOGY AND SOILS. Would the project:				
A) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:				
(I) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				✓

Source: (NorCal Engineering, 2017)

The Project site is not located within an Alquist-Priolo Earthquake Fault Zone, and no known faults traverse or underlie the site (NorC Engineering, 2017, p. 6). Because there are no known faults located on the Project site, there is no potential for the Project to expo people or structures to substantial adverse effects related to ground rupture. Thus, no impact would occur.

(II) Strong seismic ground shaking?			✓	

Source: (City of Moreno Valley, 2017c; CBSC, 2016)

The Project site is located in a seismically active area of Southern California and is expected to experience moderate-to-severe grou shaking during the lifetime of the Project. This risk is not considered substantially different than that of other similar properties in t Southern California area. As a mandatory condition of Project approval, the Project would be required to construct the proposed warehou building in accordance with the California Building Standards Code (CBSC), also known as California Code of Regulations (CCR), Ti 24 (Part 2), and the Moreno Valley Building Code (Moreno Valley Municipal Code, Chapter 8.20), which is based on the CBSC w local amendments. The CBSC and City of Moreno Valley Building Code have been tailored specifically for California earthqua conditions and provide standards that must be met to safeguard life or limb, health, property, and public welfare by regulating a controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings and structures. addition, the CBSC (Chapter 18) and the Moreno Valley Building Code require development projects to prepare geologic engineeri reports to identify site-specific geologic and seismic conditions and implement the design and construction recommendations contain therein, including, but not limited to, recommendations related to ground stabilization, selection of appropriate foundation type and dept selection of appropriate structural systems, to preclude adverse effects related to strong seismic ground-shaking. (CBSC, 2016) Such report has been prepared for the Project site and is included as *Technical Appendix E* to this Initial Study. The City will condition t Project to comply with the site-specific ground preparation and construction recommendations contained in this report. (City of More Valley, 2017c) With mandatory compliance with required building codes and site-specific design and construction measures, potent impacts related to seismic ground shaking would be less than significant. As such, the Project would not expose people or structures substantial adverse effects, including loss, injury, or death, involving seismic ground shaking. Impacts would be less than significant.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
(III) Seismic-related ground failure, including liquefaction?			✓	

Source: (City of Moreno Valley, 2006; NorCal Engineering, 2017; City of Moreno Valley, 2017c; CBSC, 2016)

According to General Plan FEIR Figure 5.6-2, *Seismic Hazards*, the Project site is not located in an area with the potential for liquefactio Furthermore, the geotechnical investigation prepared for the Project site concludes that the potential for liquefaction at the site is very lo due to the presence of stiff and dense subsurface soils on-site and a relatively deep groundwater table (NorCal Engineering, 2017, p. The City of Moreno Valley will require that the property be developed in accordance with the latest applicable seismic safety guidelin including the standard requirements of the CBSC and Moreno Valley Municipal Code Section 9.08.160 (City of Moreno Valley, 201 CBSC, 2016). Furthermore, the Project would be required to comply with the site-specific grading and construction recommendatio contained within the Project site's geotechnical report *(Technical Appendix E)*, which the City would impose as a standard condition Project approval (Moreno Valley Municipal Code Section 8.21.050), to further reduce the risk of seismic-related ground failure due liquefaction (City of Moreno Valley, 2017c). Thus, less-than-significant effects involving seismic-related ground failure, includi liquefaction, would occur.

(IV) Landslides?			✓	

Source: (Project Application Materials, 2018; Google Earth, 2018)

The Project site is virtually flat and contains no substantial natural or man-made slopes under existing conditions and proposed gradi would not create manufactured slopes on the site. There are no substantial natural or man-made slopes in the Project site vicinity, eith Accordingly, the Project site is located in an area with a low potential for landslides. Accordingly, development on the subject prope would not be exposed to landslide risks, and the Project would not pose a landslide risk to surrounding properties and a less-than-significa impact would occur.

(B) Result in substantial soil erosion or the loss of topsoil?			✓	

Source: (SCAQMD, 2005; REC, 2018b)

The analysis below summarizes the likelihood of the Project to result in substantial soil erosion during temporary construction activiti and/or long-term operation.

Impact Analysis for Temporary Construction-Related Activities

Construction of the Project would involve grading, paving, utility installation, building construction, and landscaping installation, whi has the potential to temporarily expose on-site soils that would be subject to erosion during rainfall events or high winds. Pursuant State Water Resources Control Board requirements, the Project Applicant is required to obtain a National Pollutant Discharge Eliminati System (NPDES) permit for construction activities, including proposed grading. The NPDES permit is required for all projects th include construction activities, such as clearing, grading, and/or excavation that disturb at least one (1) acre of total land area. The City Municipal Separate Storm Sewer System (MS4) NPDES Permit requires the Project Applicant to prepare and submit to the City f approval a Project-specific Storm Water Pollution Prevention Plan (SWPPP) (City of Moreno Valley, 2017c, Section 8.21.170). T SWPPP would identify a combination of erosion control and sediment control measures (i.e., Best Management Practices) to reduce eliminate sediment discharge to surface water from storm water and non-storm water discharges during construction. In addition, t Project would be required to comply with SCAQMD Rule 403, which would reduce the amount of particulate matter in the air a minimize the potential for wind erosion (SCAQMD, 2005). With mandatory compliance to the requirements noted in the Projec SWPPP, as well as applicable regulatory requirements, the potential for water and/or wind erosion impacts during Project constructi would be less than significant.

Long-Term Operational Activities

Following construction, wind and water erosion on the Project site would be less than existing conditions because the Project site wou be landscaped or covered with impervious surfaces and surface runoff would be captured and treated by an on-site storm drain syste Implementation of the Project would result in less long-term erosion and loss of topsoil than under the site's existing conditions.

The City's MS4 NPDES Permit requires the Project Applicant to prepare and submit to the City for approval a Water Quality Manageme Plan (WQMP) (City of Moreno Valley, 2017c, Section 8.21.170). The WQMP identifies an effective combination of erosion control a sediment control measures (i.e., Best Management Practices) to reduce or eliminate sediment discharge to surface water from storm wa and non-storm water discharges. The Preliminary WQMP for the Project, prepared by REC Consultants, Inc. (REC) (attached hereto *Technical Appendix I*), incorporates catch basin/inlet filters, one (1) underground storage vault, and one (1) bioretention basin (RE 2018b, WQMP Site Plan). The catch basin/inlet filters and bioretention basin would remove waterborne pollutants from storm wa

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

flows, including silt and sediment. The underground infiltration basin would facilitate percolation to maximize on-site infiltration a minimize the amount of stormwater – which could, potentially, carry sediment – discharged from the site. These design features wou be effective at removing silt and sediment from storm water runoff, and the Preliminary WQMP requires post-construction maintenan and operational measures to ensure ongoing erosion protection. Compliance with the Preliminary WQMP would be required as a conditi of Project approval and long-term maintenance of on-site water quality features is required. Therefore, the proposed Project would r result in substantial erosion or loss of top soil during long-term operation. The Project's impact would be less than significant.

(C) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			✓	

Source: (NorCal Engineering, 2017; City of Moreno Valley, 2017c)

The Project site's geotechnical report (*Technical Appendix E*) indicates that the site's settlement potential would be attenuated through t proposed removal of near surface soils down to competent materials and replacement with properly compacted fill (NorCal Engineeri 2017, pp. 7-9). Through standard conditions of approval, the proposed Project would be required by the City to incorporate t recommendations contained within the Project site's geotechnical report into the grading plan for the Project (City of Moreno Valle 2017c, Section 9.08.080). As such, implementation of the Project would result in less-than-significant impacts associated with s shrinkage/subsidence and collapse.

As discussed in Responses 6(A)(III) and (IV), development of the Project would result in a less-than-significant impact involving grou failure, including liquefaction and landslide, and a less-than-significant impact involving landslides.

(D) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			✓	

Source: (NorCal Engineering, 2017; City of Moreno Valley, 2017c)

As determined by NorCal Engineering, the near surface on-site soils possess a very low expansion potential (Expansion Index rangi from 0-20) (NorCal Engineering, 2017, Table II). The minimal expansive characteristics of on-site soils would be further attenuated implementation of the foundation and floor slab design recommendations included in the Project's geotechnical report, which the C will require as a condition of approval pursuant to Section 9.08.080 of the Moreno Valley Municipal Code (NorCal Engineering, 2017, 13). According to the above, implementation of the Project would result in less-than-significant impacts associated with expansive so and would not create substantial risks to life or property.

(E) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				✓

Source: (Project Application Materials, 2018)

The Project does not propose the use of septic tanks or alternative waste water disposal systems. Accordingly, no impact would occur.

7. GREENHOUSE GAS EMISSIONS. Would the project?

A) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			✓	

Source: (CAPCOA, 2008; SCAQMD, 2008; Urban Crossroads, 2018c)

While estimated Project-related GHG emissions can be calculated, the direct impacts of such emissions on global climate change (GC and global warming cannot be determined on the basis of available science because GCC is a global phenomenon and not limited to specific locale such as the Project site and its immediate vicinity. Furthermore, there is no evidence that would indicate that the emissio from a project the size of the proposed Project could directly or indirectly affect the global climate. Because global climate change is t result of GHG emissions, and GHGs are emitted by innumerable sources worldwide, the proposed Project would not result in a dire impact to global climate change; rather, Project-related impacts to global climate change only could be potentially significant on cumulative basis. Therefore, the analysis below focuses on the Project's potential to contribute to global climate change in a cumulativel considerable way.

The City of Moreno Valley has not adopted a numerical threshold for determining the significance of GHG emissions; however, the C has discretion to select an appropriate significance criterion used by other agencies, based on substantial evidence (Urban Crossroa

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

2018c, p. 39). The SCAQMD adopted a numerical GHG emissions threshold for industrial projects for which SCAQMD is the le agency. The threshold adopted by SCAQMD, 10,000 metric tons of carbon dioxide equivalent ($MTCO_2e$) per year, is a widely accept threshold used by numerous lead agencies in the South Coast Air Basin (SCAB) and was established based on the recommendations the California Air Pollution Controls Officers Association (CAPCOA) in a report titled "CEQA and Climate Change" (dated Janua 2008), which serves as a resource for public agencies as they establish agency procedures for reviewing GHG emissions from proje under CEQA. The CAPCOA report provides three recommendations for evaluating a development project's GHG emissions. Wh establishing their significance threshold, SCAQMD selected the CAPCOA non-zero approach which establishes a numerical thresh based on capture of approximately 90 percent of emissions from future development (Approach 2, Threshold 2.5). A 90 percent emissi capture rate means that 90 percent of total emissions from all new or modified projects would be subject to evaluation under CEQ Based on SCAQMD's research of 1,297 major, industrial source point (i.e., stationary) emission sources in the SCAB, SCAQMD fou that source point industrial facilities that generate at least 10,000 $MTCO_2e$ per year produce approximately 90 percent of the carb dioxide equivalent emissions in the SCAB per year. As such, SCAQMD established their significance criterion at 10,000 $MTCO_2e$ as t threshold that would capture 90 percent of total emissions from future industrial development in accordance with CAPCC recommendations. (CAPCOA, 2008, pp. 46-47; SCAQMD, 2008, pp. 3-5)

Based on the foregoing, the City of Moreno Valley selects SCAQMD's industrial threshold of 10,000 $MTCO_2e$ as the threshold significance against which to evaluate the Project's GHG emissions. If the Project would emit less than 10,000 $MTCO_2e$ of GHGs p year, the project would not be considered a substantial GHG emitter. On the other hand, if the Project's GHG emissions would exce 10,000 $MTCO_2e$ per year, the project would be considered a substantial source of GHG emissions. The SCAQMD's industrial thresh was selected by the City because the proposed Project's operating characteristics, which include a large building with loading bays a truck courts that are expected to house businesses that serve mid-stream functions in the goods movement chain, are characteristic of industrial land use more so than any other land use type, including commercial and/or residential uses. Furthermore, evaluating t Project's GHG emissions against SCAQMD's industrial threshold will provide a conservative analysis, as SCAQMD only intended th threshold be used to evaluate stationary source GHG emissions, while the analysis presented below applies the threshold to all of the GH emissions related to the Project (stationary source, mobile source, area source, or other). (Urban Crossroads, 2018c, p. 39)

The Project's annual GHG emissions are summarized in Table 5, *Total Annual Project Greenhouse Gas Emissions.* The methodolo used to calculate the Project's GHG emissions is described in detail in *Technical Appendix F*.

Table 5 Total Annual Project Greenhouse Gas Emissions

Emission Source	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2e
Annual construction-related emissions amortized over 30 years	16.96	0.00	0.00	17.01
Area	9.13E-03	2.00E-05	0.00	9.75E-03
Energy	350.433	0.01	3.86E-03	351.90
Mobile Sources (Passenger Cars)	1,895.67	0.04	0.00	1,896.64
Mobile Sources (Trucks)	2,883.01	0.13	0.00	2,886.30
Waste	41.41	2.45	0.00	102.60
Water Usage	210.71	1.55	0.04	260.66
Total CO_2e (All Sources)	**5,515.11**			
Screening Threshold (CO_2e)	**10,000**			
Threshold Exceeded?	**NO**			

Source: (Urban Crossroads, 2018c, Table 3-1)

As shown in Table 5, the Project is estimated to generate approximately 5,515.11 $MTCO_2e$ annually, which is less than the significan threshold of 10,000 $MTCO_2e$. Because the Project's total annual GHG emissions would not exceed 10,000 $MTCO_2e$, the Project wou not generate substantial GHG emissions – either directly or indirectly – that would have a significant impact on the environment. Impa would be less than significant.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
B) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			✓	

Source: (Urban Crossroads, 2018c)

The Project would comply with a number of regulations, policies, plans, and policy goals that would further reduce GHG emissio including the City of Moreno Valley Energy Efficiency and Climate Action Strategy, Title 24 California Building Standards Code (CBS Assembly Bill 32 (AB 32), and Senate Bill 32 (SB 32), which are regulations particularly applicable to the Project. For more informati on these regulations as well as other state-wide plans, policies, and regulations associated with GHG emissions that are not applicable the Project, refer to *Technical Appendix F*.

On October 9, 2012, the Moreno Valley City Council approved an Energy Efficiency and Climate Action Strategy and related GH analysis. The Energy Efficiency and Climate Action Strategy document identifies potential programs and policies to reduce overall C energy consumption and increase the use of renewable energy. The majority of the policies are directed at municipal operations of t City, but the document also contains recommended policies for the community at large (including private development projects). The recommended policies include but are not limited to: energy efficiency, water use reduction, trip reduction, solid waste diversion, a educational policies. The overall goal of the Energy Efficiency and Climate Action Strategy is to ensure that the City is consistent w and would not otherwise conflict with the provisions of AB 32. As demonstrated by the analysis below, the Project would not confl with the provisions of AB 32 and, therefore, would not obstruct implementation of the components of the City's Energy Efficiency a Climate Action Strategy that are applicable to the Project.

The Project would include the construction and operation of a warehouse building, which would include contemporary, energ efficient/energy-conserving design features and operational procedures. Warehouse land uses are not inherently energy-intensive and t total Project energy demands would be comparable to, or less than, other warehouse projects of similar scale and configuration due to t Project's modern construction and requirement to be constructed in accordance with the most recent CBSC. The CBSC includes t California Energy Code, or Title 24, Part 6 of the California Code of Regulations, also titled The Energy Efficiency Standards f Residential and Nonresidential Buildings. The California Energy Code was established in 1978 in response to a legislative mandate reduce California's energy consumption. The standards are updated approximately every three years to allow consideration and possib incorporation of new energy efficiency technologies and methods. The Project would be required to comply with all applicable provisio of the CBSC. As such, the Project's energy demands would be minimized through design features and operational programs that, aggregate, would ensure that Project energy efficiencies would comply with – or exceed – incumbent CBSC energy efficien requirements, thereby minimizing GHG emissions produced during from energy consumption. The Project has no potential to inconsistent with the mandatory regulations of the CBSC. (Urban Crossroads, 2018c, pp. 18-20)

The Global Warming Solutions Act of 2006 (AB 32) is the State of California's primary GHG emissions regulation. AB 32 requires th by year 2020 the State's GHG emissions must be reduced to year 1990 levels. The California Air Resources Board (CARB) identifi measures in its Scoping Plan that would reduce statewide GHG emissions and achieve the emissions reductions goals of AB 32. Thu projects that are consistent with the CARB Scoping Plan would not conflict with AB 32's mandate to reduce statewide GHG emissio A detailed description of the Project's consistency with the CARB Scoping Plan is presented in Section 2.7 of *Technical Appendix F* this Initial Study. As presented in *Technical Appendix F*, the Project would not conflict with any applicable measures of the CAR Scoping Plan. (Urban Crossroads, 2018c, pp. 22-25)

In April 2015, Governor Edmund Brown Jr. signed Executive Order (EO) B-30-15, which advocated for a statewide GHG-reduction targ of 40 percent below year 1990 levels by 2030 and 80 percent below 1990 levels by 2050. In September 2016, Governor Brown sign the Senate Bill (SB) 32. SB 32 formally established a statewide goal to reduce GHG emissions to 40 percent below year 1990 levels 2030. To date, no statutes or regulations have been adopted to translate the year 2050 GHG reduction goal into comparable, scientificall based statewide emission reduction targets.

According to research conducted by the Lawrence Berkeley National Laboratory and supported by the CARB, California, under its existi GHG reduction policies, is on track to meet the years 2020 and 2030 reduction targets established by AB 32 and SB 32, respective (Urban Crossroads, 2018c, p. 25). As described above, the Project would not conflict with or obstruct implementation of the CAR Scoping Plan; therefore, the Project would not interfere with the State's ability to achieve the year 2030 GHG-reduction target establish by SB 32.

Rendering a significance determination for year 2050 GHG emissions relative to EO B-30-15 would be speculative because EO B-30- establishes a goal 32 years into the future; no agency with GHG subject matter expertise has adopted regulations to achieve the statewi goal at the project-level; and, available analytical models cannot presently quantify all project-related emissions in those future yea

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Further, due to the technological shifts anticipated and the unknown parameters of the regulatory framework in 2050, available GH models and the corresponding technical analyses are subject to limitations for purposes of quantitatively estimating the Project's emissio in 2050. (Urban Crossroads, 2018c, p. 25)

As described on the preceding pages, the Project would not conflict with the State's ability to achieve the State-wide GHG reducti targets defined in AB 32 and would be consistent with applicable policies and plans related to GHG emissions reductions. Therefore, t Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs a would result in a less-than-significant impact.

7. HAZARDS AND HAZARDOUS MATERIALS. Would the project?				
A) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			✓	

Source: (Arcadis, 2018a; Arcadis, 2018b)

Impact Analysis for Existing Site Conditions

A Phase I Environmental Site Assessment (ESA) and Phase II ESA was prepared for the Project site by Arcadis U.S., Inc. (Arcad (included as *Technical Appendix G1* and *Appendix G2* to this Initial Study). As part of the Phase I and Phase II ESA efforts, Arca conducted a property and adjacent site reconnaissance; interviews with key personnel; a review of historical sources; a review of regulatc agency records; and performed limited soil sampling/testing. Refer to *Technical Appendices G1* and *G2* for a detailed discussion of t analysis methodologies followed and reference sources consulted during preparation of the Phase I and Phase II ESAs.

A Recognized Environmental Condition (REC) is defined as "the presence or likely presence of any hazardous substances or petroleu products in, on, or at a property: 1) due to release to the environment; 2) under conditions indicative of a release to the environment; or under conditions that pose a material threat of a future release to the environment (Arcadis, 2018a, p. 1)." Based on a review of histo regulatory agency hazardous materials databases, historic site aerial photographs, interviews with current property owners, reconnaissance of the Project site, and limited soil sampling/testing, Arcadis determined that the Project site does not contain any RE (Arcadis, 2018a, p. 19; Arcadis, 2018b, p. 4).

Based on a review of historical topographic maps and aerial photographs, which date back to 1901, the Project site was never develope there is no evidence of agriculture, structures or other uses on the subject property (Arcadis, 2018a, p. ES-1). The Project site was locat adjacent to a former firing range associated with MARB; however, soil sampling/testing performed by Arcadis determined that on-s soils did not contain any compounds above the applicable soil screening criteria (Arcadis, 2018b, p. 4). Additionally, there were petroleum products, underground storage tanks (USTs), above-ground storage tanks (ASTs), polychlorinated biphenyls (PCBs) drun sumps, ponds, pits, lagoons, stained soil or pavement, stressed vegetation, wells, septic systems, or cesspools found on the Project si Two pad-mounted transformers located in the southwest corner of the Project site appear to be in good condition and no evidence seepage or releases were observed. A stormwater drainage feature is located on the southeastern corner of the Project site; however, concerns were noted. (Arcadis, 2018a, pp. 15-17)

According to the National Pipeline Mapping System, a gas transmission line runs in an east/west direction beneath Brodiaea Avenu however, this pipeline would not pose or present a substantial hazard to the Project. (Arcadis, 2018a, p. ES-2)

The Project site is located approximately ¼-mile north of the March Air Reserve Base (MARB), where numerous releases of hazardo materials have occurred over time and resulted in localized groundwater contamination. A plume of groundwater containing VOCs h been documented to extend east and southeast of the Base (i.e., flowing away from the Project site). Based on a review of historical vap migration data and the flow direction of the groundwater plume, it is unlikely that there is the risk of vapor migration at the Project si (Arcadis, 2018a, p. ES-2)

Based on the foregoing information, the Project would not create significant hazard to the public or the environment through routi transport, use, or disposal of hazardous materials. A less-than-significant impact would occur.

Impact Analysis for Temporary Construction-Related Activities

Heavy equipment (e.g., dozers, excavators) would operate on the Project site during construction. Heavy equipment is typically fuel and maintained by petroleum-based substances such as diesel fuel, gasoline, oil, and hydraulic fluid, which is considered hazardous improperly stored or handled. In addition, materials such as paints, adhesives, solvents, and other substances typically used in buildi construction would be located on the Project site during construction. Improper use, storage, or transportation of hazardous materials c

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

result in accidental releases or spills, potentially posing health risks to workers, the public, and the environment. This is a standard ri on all construction sites, and there would be no greater risk for improper handling, transportation, or spills associated with the propos Project than would occur on any other similar construction site. Construction contractors would be required to comply with all applicat federal, state, and local laws and regulations regarding the transport, use, and storage of hazardous construction-related materials, includi but not limited requirements imposed by the EPA, California Department of Toxic Substances Control (DTSC), SCAQMD, and San Ana Regional Water Quality Control Board (RWQCB). With mandatory compliance to applicable hazardous materials regulations, t Project would not create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardo materials during the construction phase. Impacts would be less than significant.

Impact Analysis for Long-Term Operational Activities

The future building occupant(s) for the Project site are not yet identified. However, the Project is designed to house warehouse distributi and light industrial occupants and it is possible that hazardous materials could be used during the course of a future building user's da operations. State and federal Community-Right-to-Know laws allow the public access to information about the amounts and types chemicals in use at local businesses. Laws also are in place that requires businesses to plan and prepare for possible chemical emergenci Any business that occupies a building on the Project site and that handles hazardous materials (as defined in Section 25500 of Health a Safety Code, Division 20, Chapter 6.95) will require a permit from the Moreno Valley City Fire Department Hazardous Materials Divisi in order to register the business as a hazardous materials handler. Such businesses also are required to comply with California's Hazardo Materials Release Response Plans and Inventory Law, which requires immediate reporting to the County of Riverside Fire Departme and the State Office of Emergency Services regarding any release or threatened release of a hazardous material, regardless of the amou handled by the business. In addition, any business handling at any one time, greater than 500 pounds of solid, 55 gallons of liquid, or 2 cubic feet of gaseous hazardous material, is required, under Assembly Bill 2185 (AB 2185), to file a Hazardous Materials Busine Emergency Plan (HMBEP). A HMBEP is a written set of procedures and information created to help minimize the effects and extent a release or threatened release of a hazardous material. The HMBEP satisfies federal and State Community Right-To-Know laws a provides detailed information for use by emergency responders.

If businesses that use or store hazardous materials occupy the Project, the business owners and operators would be required to comp with all applicable federal, State, and local regulations to ensure proper use, storage, use, emission, and disposal of hazardous substanc (as described above). With mandatory regulatory compliance, the Project is not expected to pose a significant hazard to the public or t environment through the routine transport, use, storage, emission, or disposal of hazardous materials, nor would the Project increase t potential for accident conditions which could result in the release of hazardous materials into the environment. In addition, the Proje would be required to comply with Moreno Valley Municipal Code Section 9.20.12, which establishes development and performan standards, as well as reporting and permitting requirements for the use, handling, storage, and transportation of hazardous materials.

With mandatory regulatory compliance, along with mandatory compliance with the Moreno Valley Municipal Code, potential hazardo materials impacts associated with long-term operation of the Project are determined to be less than significant.

B) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			✓	

Source: (Project Application Materials, 2018)

Accidents involving hazardous materials that could pose a significant hazard to the public or the environment would be highly unlike during the construction and long-term operation of the Project and are not reasonably foreseeable. As discussed above under Respor 7(A), the transport, use, and handling of hazardous materials on the Project site during construction is a standard risk on all constructi sites, and there would be no greater risk for upset and accidents than would occur on any other similar construction site. Upon buildo the Project would operate as a warehouse distribution/light industrial center. Based on the operational characteristics of warehou distribution and light industrial centers, it is possible that hazardous materials could be used during the course of a future occupan routine, daily operations; however, as discussed above under Response 7(A), the Project would be required to comply with all applicat local, State, and federal regulations related to the transport, handling, and usage of hazardous material. Accordingly, impacts associat with the accidental release of hazardous materials would be less than significant during both construction and long-term operation of t Project.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
C) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				✓

Source: (Google Earth, 2018)

There are no schools located within ¼-mile of the Project site. The nearest school to the Project site is the Moreno Valley High Scho located approximately 0.7-mile northeast of the Project site. (Google Earth, 2018) Thus, the Project would not have a significant effe in emitting hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of existing or proposed school. No impact would occur.

D) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result would it create a significant hazard to the public or the environment?				✓

Source: (CDTSC, n.d.)

The Project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (CDTS n.d.). Accordingly, no impact would occur.

E) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			✓	

Source: (RCALUC, 2014; City of Moreno Valley, 2017b)

The Project site is located approximately 0.9-mile north of MARB. According to the MARB Compatible Use Zone Study commission by the United States Air Force and as depicted on Figure 6-5, *Air Crash Hazards*, of the Moreno Valley General Plan, the Project site not located within a zone subject to hazards related to air crashes. Furthermore, according to the MARB/Inland Port Airport Land U Compatibility Plan (ALUCP), the Project site is located in Compatibility Zone D. Properties located in Zone D are subject to safety ris associated with aircraft operations, but the impacts are sufficiently minimal that land use restrictions are unnecessary and the lig industrial land uses proposed by the Project are permitted. (RCALUC, 2014, Table MA-1). The building proposed by the Project wou not exceed 45 feet in height and does not include an air travel component (e.g., runway, helipad); therefore, the Project would not interfe with flight operations at MARB. Based on the foregoing analysis, the Project would not result in safety hazards for people residing working in the Project area. Impacts would be less than significant.

The Project was reviewed by the Riverside County Airport Land Use Commission (ALUC), which determined the Project would n conflict with the MARB / Inland Port ALUCP. Nonetheless, the ALUC recommended conditions for the Project that would ensure th no hazards are created during the Project's construction or long-term operation that would be detrimental to safe operations at MAR (The ALUC's conditions reflect standard regulations and design requirements imposed by the Riverside County ALUC for projects locat within the AIA of any public airport.) The City of Moreno Valley will enforce the ALUC's recommendations as conditions of approv for the Project. Mandatory compliance with these conditions of approval would ensure that the Project does not result in a safety haza for people residing or working in the Project area.

F) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				✓

Source: (Google Earth, 2018)

There are no private airfields, or airstrips in the vicinity of the Project site (Google Earth, 2018). Because no private airports are locat nearby, there is no potential for the Project to result in a safety hazard for people residing or working the Project area. No impact wou occur.

G) Impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan?				✓

Source: (Project Application Materials, 2018; City of Moreno Valley, 2006)

The Project site does not contain any emergency facilities under existing conditions nor does it serve as an emergency evacuation rou so there is no potential for the Project to adversely affect an existing emergency response or evacuation plan. During construction and Project buildout, the proposed Project would be required to maintain adequate emergency access for emergency vehicles. As part of t City's discretionary review process, the City of Moreno Valley confirmed the Project would provide adequate emergency ingress a

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

egress and determined that the Project would not substantially impede emergency response times in the local area. According implementation of the proposed Project would not impair implementation of or physically interfere with an adopted emergency respor plan or an emergency evacuation plan, and no impact would occur.

H) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			✓	

Source: (City of Moreno Valley, 2006; Google Earth, 2018)

According to City of Moreno Valley General Plan FEIR Figure 5.5-2, *Floodplains and High Fire Hazard Areas*, the Project site is r located in an area with a high fire risk. The Project site is located in an area of the City that has been largely developed. No wildlan are located on or adjacent to the Project site and the Project site is largely disturbed and devoid of vegetation and is surrounded on all sic by developed or maintained properties and paved roads (Google Earth, 2018). Thus, implementation of the proposed Project would r expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjace to urbanized areas or where residences are intermixed with wildlands. Impacts would be less than significant.

8. HYDROLOGY AND WATER QUALITY. Would the project:

A) Violate any water quality standards or waste discharge requirements?			✓	

Source: (SARWQCB, 2011; SAWPA, 2014; City of Moreno Valley, 2017c; REC, 2018b)

The California Porter-Cologne Water Quality Control Act (Section 13000 *et seq*., of the California Water Code), and the Federal Wa Pollution Control Act Amendment of 1972 (also referred to as the Clean Water Act (CWA)) require that comprehensive water qual control plans be developed for all waters within the State of California. The Project site is located within the jurisdiction of the Santa A RWQCB. Water quality information for the Santa Ana River is contained in the Santa Ana RWQCB's *Santa Ana River Basin Wa Quality Control Plan* (updated June 2011) and the *One Water, One Watershed Plan 2.0 (OWOW) for the Santa Ana River Watershed* (al referred to as "Integrated Regional Water Management Plan," dated February 4, 2014), prepared by the Santa Ana Watershed Proj Authority. These documents are herein incorporated by reference and are available for public review at the Santa Ana RWQCB offi located at 3737 Main Street, Suite 500, Riverside, CA 92501. (SARWQCB, 2011; SAWPA, 2014)

The CWA requires all states to conduct water quality assessments of their water resources to identify water bodies that do not meet wa quality standards. Water bodies that do not meet water quality standards are placed on a list of impaired waters pursuant to t requirements of Section 303(d) of the CWA. The Project site is located within the Santa Ana River Watershed. Receiving waters for t site's stormwater runoff include: the City of Moreno Valley Public Storm Drain, Perris Valley Storm Drain, San Jacinto River Reach Canyon Lake, San Jacinto River Reach 1, Lake Elsinore Temescal Creek and the Santa Ana River, which ultimately discharge into t Pacific Ocean. Canyon Lake is impaired by nutrients and pathogens; and Lake Elsinore is impaired by PCBs, nutrients, orga enrichment/low dissolved oxygen, and sediment toxicity. (REC, 2018b, Table A.1)

A specific provision of the CWA applicable to the proposed Project is CWA Section 402, which authorizes the NPDES permit progra that covers point sources of pollution discharging to a water body. The NPDES program also requires operators of construction sites o acre or larger to prepare a SWPPP and obtain authorization to discharge stormwater under an NPDES construction stormwater permit.

Temporary Construction-Related Activities

Construction of the proposed Project would involve clearing, grading, paving, utility installation, building construction, and landscapi activities. Construction activities would result in the generation of potential water quality pollutants such as silt, debris, chemicals, pain and solvents, and other chemicals with the potential to adversely affect water quality. As such, short-term water quality impacts have t potential to occur during construction of the Project in the absence of any protective or avoidance measures.

Pursuant to the requirements of the Santa Ana RWQCB and the Moreno Valley Municipal Code Chapter 8.10 and Section 8.21.170, t Project would be required to obtain a NPDES Municipal Stormwater Permit for construction activities. The NPDES permit is requir for all projects that include construction activities, such as clearing, soil stockpiling, grading, and/or excavation that disturb at least o (1) acre of total land area. In addition, the Project would be required to comply with the Santa Ana RWQCB's *Santa Ana River Bas Water Quality Control Program*. Compliance with the NPDES permit and the *Santa Ana River Basin Water Quality Control Progra* involves the preparation and implementation of a SWPPP for construction-related activities, including grading. The SWPPP will speci the Best Management Practices (BMPs) that the Project would be required to implement during construction activities to ensure that potential pollutants of concern are prevented, minimized, and/or otherwise appropriately treated prior to being discharged from the subj

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

property. Mandatory compliance with the SWPPP would ensure that the proposed Project does violate any water quality standards waste discharge requirements during construction activities. Therefore, water quality impacts associated with construction activities wou be less than significant and no mitigation measures would be required.

Post-Development Water Quality Impacts

Stormwater pollutants commonly associated with the warehouse and light industrial land uses proposed by the Project include bacter indicators, metals, nutrients, pesticides, toxic organic compounds, sediments, trash and debris, and oil and grease. Based on curre receiving water impairments (pursuant to the CWA's Section 303(d) list), the Project's pollutants of concern are nutrients, pesticid toxic organic compounds, and sediments. (REC, 2018b, Table E.1)

Pursuant to the Moreno Valley Municipal Code Chapter 8.10 and Section 8.21.170, the Project would be required to implement a WQM to demonstrate compliance with the City's NPDES permit, and to minimize the release of potential waterborne pollutants, includi pollutants of concern for downstream receiving waters. The WQMP is a site-specific post-construction water quality management progra designed to address the pollutants of concern of a development project via BMPs, implementation of which ensures the on-going protecti of the watershed basin. The Project's Preliminary WQMP, prepared by REC, is appended as *Technical Appendix I* to this MND. identified in *Technical Appendix I*, the proposed Project is designed to include on-site, structural source control BMPs (including bioretention basin, an underground storage vault, and on-site storm drain catch basins/inlets with filters) as well as operational sour controls (including but not limited to: drainage system maintenance, proper waste disposal, landscape maintenance, and implementati of minimal pesticide use) to minimize, prevent, and/or otherwise appropriately treat stormwater runoff flows before they are discharg from the site. Compliance with the Preliminary WQMP would be required as a condition of Project approval pursuant to Moreno Vall Municipal Code Chapter 8.10 and Section 8.21.170, and long-term maintenance of on-site BMPs would be required to ensure their lor term effectiveness. Therefore, water quality impacts associated with long-term operational activities would be less than significant.

In addition to the WQMP, the NDPES program also requires certain land uses, including industrial land uses as proposed by the Proje to prepare a SWPPP for operational activities and to implement a long-term water quality sampling and monitoring program, unless exemption has been granted. On April 1, 2014, the California State Water Resources Control Board adopted an updated new NPDI permit for storm water discharge associated with industrial activities (referred to as the "Industrial General Permit"). Under the new effective NPDES Industrial General Permit, the Project is required to prepare a SWPPP for operational activities and implement a lor term water quality sampling and monitoring program or receive an exemption. Because the permit is dependent upon the operatio activities of the buildings, and the Project's future building occupants and their operations are not known at this time, details of the SWP (including BMPs) or potential exemption to the SWPPP operational activities requirement cannot be determined at this time. Howev based on the requirements of the NPDES Industrial General Permit, it is assured that the Project's mandatory compliance with applicable regulations would further reduce potential water quality impacts during long-term operation.

Based on the foregoing analysis, the Project would not violate any water quality standards or waste discharge requirements during lor term operation. Impacts would be less than significant.

B) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			✓	

Source: (City of Moreno Valley, 2006)

No potable groundwater wells are proposed by the Project. The Project would receive potable water service from EMWD. The EMW relies on local potable groundwater as a source of its water supply (in addition to imported water from the Metropolitan Water District Southern California, desalted ground water, and recycled water). The EMWD has indicated it has sufficient available water resourc including groundwater resources, to adequately serve the Project in addition to past, present, and future commitments to supply wa (refer to Response 17(D)). Accordingly, the proposed Project would not directly or indirectly extract groundwater that would substantia deplete groundwater supplies in the Project area. Impacts would be less than significant.

The Project would increase impervious surface coverage on the Project site, which would incrementally reduce the amount of wa percolating down into the underground aquifer that underlies the Project site (and a majority of the City). However, and as noted in t City's General Plan EIR, the impact to groundwater resources due to an increase in impervious surface coverage throughout the C would "not be significant as domestic water supplies are not reliant on groundwater as a primary source." (City of Moreno Valley, 20(

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

pp. 5.7-12) Additionally, water captured by the proposed Project's bioretention BMP basin, underground infiltration chamber, a landscaped areas would have the opportunity to percolate into the ground. Thus, buildout of the Project would not interfere substantia with groundwater recharge.

For the reasons stated above, the Project would neither substantially deplete groundwater supplies nor interfere substantially w groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. Impa would be less than significant.

C) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?			✓	

Source: (REC, 2018a)

Under existing conditions, stormwater on the Project site sheet flows in a southwesterly direction into two (2) existing storm drain inl that merge into an existing storm drain (Line P) located beneath Brodiaea Avenue. Stormwater runoff originating off-site – from t undeveloped parcel north of the site – generally sheet flows in a southerly direction onto the Project site.

The Project would grade the entire property and construct one warehouse/light industrial building and associated improvements, whi would change the site's existing ground contours and alter the site's existing drainage patterns. Although the Project would alter t subject property's internal drainage patterns, such changes would not result in substantial erosion or siltation on- or off-site. Under po development conditions, a majority of the site would be covered with impervious surfaces and, therefore, the amount of exposed soils the Project site that would potentially be subject to erosion or sedimentation would be minimal. Also, as discussed under Response 8(A the Project would construct an integrated storm drain system on-site with BMPs to minimize the amount of water-borne pollutants carri from the Project site. The BMPs provided by the Project via its Preliminary Water Quality Management Plan, including a bioretenti basin, catch basins/inlets with filters, and an underground bioretention basin are highly effective at removing sediment from stormwa runoff flows. Therefore, stormwater runoff flows leaving the Project site would not carry substantial amounts of sediment. Once sto water runoff leaves the Project site, it would be discharged into a storm drain pipe beneath Brodiaea Avenue. Because there are no expos soils at the Project's discharge point, there is no potential for the Project's stormwater runoff to result in erosion as it leaves the Proj site. Accordingly, the Project would not result in substantial erosion or siltation on- site or off-site, and a less-than-significant impa would occur.

D) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or surface runoff in a manner which would result in flooding on- or off site?			✓	

Source: (REC, 2018a; Project Application Materials, 2018)

As described above under Response 8(C), proposed grading and earthwork activities on the Project site would alter the site's existi internal drainage patterns but would not substantially alter the general drainage pattern of the local area. According to the Projec Hydrology Report, under long-term development conditions, the peak storm water runoff flows discharged from the Project site wou not exceed the available capacity of the existing storm drain line (Line P) beneath Brodiaea Avenue (REC, 2018a, p. 1). The storm dra line beneath Brodiaea Avenue is a master-planned facility that is designed to accept peak stormwater runoff flows from the Project ar and safely convey these flows downstream to preclude flooding. Because the proposed Project is consistent with the applicable mas drainage plan, Project implementation would not result in flooding on- or off-site due to the introduction of substantial, unanticipat storm water flows. Impacts associated with flooding would be less than significant.

E) Create or contribute runoff which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			✓	

Source: (REC, 2018a; REC, 2018b)

As discussed above under Response 8(D), existing storm drain facilities have sufficient capacity to convey storm water runoff generat by the Project. Accordingly, the Project would not create or contribute runoff which would exceed the capacity of any planned sto water drainage system, and impacts would be less than significant.

As discussed under Response 8(A), the proposed Project would be required to comply with a future SWPPP and the Project's Prelimina WQMP (*Technical Appendix I*), which identify required BMPs to be incorporated into the Project to ensure that near-term constructi

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

activities and long-term post-development activities of the proposed Project would not result in substantial amounts of polluted runo Therefore, with mandatory compliance with the Project's SWPPP and Preliminary WQMP, the proposed Project would not create contribute substantial additional sources of polluted runoff, and impacts would be less than significant.

F) Otherwise substantially degrade water quality?				✓

Source: (REC, 2018a)

Refer to Responses 8(A), (C), and (D) above. The Project does not contain any other features that would have the potential to substantia degrade water quality. Thus, no impact would occur.

G) Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				✓

Source: (FEMA, 2008)

The proposed Project does not include housing. In addition, according to the Federal Emergency Management Agency (FEMA) Flo Insurance Rate Map (FIRM) No. 06065C0745G (dated August 28, 2008), the Project site is not located within a 100-year flood haza area. Accordingly, the Project would not place structures or housing within a 100-year flood hazard area. No impact would occur.

H) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				✓

Source: (FEMA, 2008)

See Response 8(G).

I) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			✓	

Source: (City of Moreno Valley, 2006)

The nearest dam to the Project site is Lake Perris, located approximately 5.6 miles southeast of the Project site. According to City Moreno Valley General Plan FEIR Figure 5.5-2, *Floodplains, and High Fire Hazard Areas*, the Project site is not located in an identifi dam inundation area. There are no levees in the vicinity of the Project site. Accordingly, and also based on the information provid under Responses 8(D), (G), and (H), the Project would not expose people or structures to a significant risk of loss, injury, or death involvi flooding. Impacts would be less than significant.

J) Inundation by seiche, tsunami, or mudflow?				✓

Source: (Google Earth, 2018)

The Pacific Ocean is located more than 40 miles from the Project site; consequently, there is no potential for tsunamis to impact the Proj site. In addition, the Project site and immediate surrounding area do not contain steep hillsides that may be susceptible to mudflow. T nearest large body of surface water to the site is Lake Perris, located approximately 5.6 miles southeast of the Project site. (Google Ear 2018) Due to the distance of Lake Perris from the Project site, a seiche in Lake Perris would have no impact on the Project site. Therefo the Project site would not be subject to seiches, mudflows, and/or tsunamis. Thus, no impact would occur.

9. LAND USE AND PLANNING. Would the project:

A) Physically divide an established community?				✓

Source: (Google Earth, 2018)

Development of the Project site with a warehouse/light industrial building and associated improvements would not physically disrupt divide the arrangement of an established community. The property to the north of the Project site is undeveloped and the properties to t west and south are physically separated from the site by Frederick Street and Brodiaea Avenue, respectively. The property to the east the Project site is developed as a warehouse; therefore, the Project would serve as an extension of the existing development patterns in t area.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
B) Conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?		✓		

Source: (City of Moreno Valley, 2017a; City of Moreno Valley, 2017b)

Under existing conditions, the Project site is designated for "Office" land uses by the City's General Plan Land Use Plan and the Zoni Map (City of Moreno Valley, 2017a; City of Moreno Valley, 2017b). Although the proposed Project would be inconsistent with t subject property's existing General Plan land use and Zoning designations, such inconsistency would only be significant if it were to res in significant, adverse physical effects to the environment that would not otherwise occur with implementation of the "Office" designatic As disclosed in this MND, implementation of the Project would result in the development of a warehouse/light industrial facility, whi would result in several adverse effects to the environment. This MND provides mitigation to reduce all of the Project's effects on t environment to less-than-significant levels. Accordingly, after mitigation, the Project's conflict with the site's existing General Plan la use and Zoning designations would be less than significant. The Project otherwise would not conflict with any goals, objectives, polici or regulations of land use and planning documents applicable to the Project area, including the SCAQMD *AQMP*, SCAG *RTP/SCS*, a *SCAG Regional Comprehensive Plan*.

C) Conflict with any applicable habitat conservation plan or natural community conservation plan?		✓		

Source: (City of Moreno Valley, 2006; Ecological Sciences, 2018a)

Please refer to the analysis provided for Response 4(F). The Project would not conflict with any applicable habitat conservation plan natural community conservation plan.

10. MINERAL RESOURCES. Would the project:

A) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				✓

Source: (City of Moreno Valley, 2006)

The Project site is not located within an area known to be underlain by regionally- or locally-important mineral resources or within area that has the potential to be underlain by regionally- or locally-important mineral resources. Implementation of the proposed Proj would not result in the loss of availability of a known mineral resource that would be of value to the region or the residents of the State California. In addition, the City's General Plan EIR does not identify any locally-important mineral resource recovery sites on-site within proximity to the Project site. (City of Moreno Valley, 2006, p. 5.14-2)

B) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				✓

Source: (City of Moreno Valley, 2006)

Please refer to Response 10(A), above.

11. **NOISE.** Would the project result in:

A) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			✓	

Source: (Urban Crossroads, 2018d; City of Moreno Valley, 2017c)

Noise generated at the Project site under existing conditions is limited to vehicles traveling to and from the Project site and routi maintenance activities on the Project site (i.e., discing), which both occur sporadically. No known unusual or loud noises occur on t Project site on a regular basis. Primary noise sources near the site include vehicular noise from Frederick Street and Brodiaea Aven For more information about the existing noise environment surrounding the Project site, refer to *Technical Appendix J*.

Near-term (i.e., temporary) and long-term (i.e., permanent) noise level increases that would be associated with the Project are describ below.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Impact Analysis for Near-Term Construction Noise

The Moreno Valley Municipal Code Chapter 11.80 "Noise Regulation" (Noise Ordinance) establishes noise limits for maximu continuous sound, maximum impulsive sound, and maximum non-impulsive sound. For purposes of analysis, the Project's constructi noise is evaluated against the City's standards for non-impulsive sound (i.e., ambient noise) from non-residential sources (65 A-weight decibels, dBA, during daytime hours and 60 dBA during nighttime hours, measured 200 feet from the property line) and continuous noi (90 dBA Leq over eight hours) because these standards are the best metrics against which to evaluate the scope and intensity of t Project's proposed construction activities (Urban Crossroads, 2018d, pp. 19, 26).

Based on noise samples collected from construction sites across Southern California and logarithmic noise modeling performed by Urb Crossroads, none of the Project's construction activities would exceed 90 dBA Leq; refer to Tables 10-2 through 10-6 from *Technic Appendix J* (Urban Crossroads, 2018d, pp. 58-62). As also shown on Tables 10-2 through 10-6 from *Technical Appendix J*, the Proje would not exceed the City's 65 dBA standard during daytime hours or 60 dBA standard during nighttime hours, as measured 200 fe from the property line, during any stage of construction. (When calculated at a receptor distance 182 feet from the site, the Projec construction noise falls below the applicable 65 dBA daytime and 60 dBA nighttime noise standards; the Project's construction noi would be even lower if calculated at 200 feet). (Urban Crossroads, 2018d, pp. 58-63) Refer to *Technical Appendix J* for a detail description of the methodology used to calculate the Project's operational noise levels. Accordingly, the Project would not expose perso to or generate noise levels in excess of applicable City of Moreno Valley standards during construction. Impacts would be less th significant and mitigation is not required.

Impact Analysis for Long-Term Operational Noise

The City of Moreno Valley's non-impulsive noise standard, which allows non-residential land uses to produce up to 65 dBA duri daytime hours and 60 dBA during nighttime hours, as measured 200 feet from the property line of the noise source, is the most appropri standard against which to evaluate the Project's operational noise because the Project's land uses will not produce substantial impulsi noise (short bursts of loud noise) and does not include exterior mechanical equipment or uses that would produce substantial continuo noise (Urban Crossroads, 2018d, p. 18). Using the reference noise levels collected from other warehouse facilities in the Inland Emp area – which include noise associated with idling trucks, delivery truck activities, parking, backup alarms, and HVAC equipment – represent the proposed warehouse operations on the Project site, Urban Crossroads calculated the operational source noise levels that a expected to be generated at the Project site. The Project's calculated operational noise levels are presented in Table 6, *Project Operation Noise Levels At 200 Feet*. Refer to *Technical Appendix J* for a detailed description of the methodology used to calculate the Projec operational noise levels.

Table 6 Project Operational Noise Levels At 200 Feet

Noise Source	Ref. Noise Level (dBA Leq)	Distance Atten. @ 200 ft. (dBA Leq)	Hourly Activity (Mins.)	Hourly Activity Adjustment (dBA Leq)	Noise Level @ 200 ft. (dBA Leq)
Truck Unloading/Docking Activity	67.2	-16.5	60	0.0	50.7
Roof-Top Air Conditioning Units	77.2	-32.0	39	-1.9	43.3
Parking Lot Vehicle Movements	52.2	-19.5	60	0.0	32.7
				Combined Total:	51.5

Source: (Urban Crossroads, 2018d, Table 9-2)

As shown in Table 6, the Project's operational noise levels are calculated to be 51.5 dBA Leq at a distance of 200 feet from the Proje site, which would fall below both the City's applicable daytime (65 dBA) and nighttime (60 dBA) standards. (Urban Crossroads, 2018 p. 52). Accordingly, the Project site would be consistent with the City of Moreno Valley standard for daytime and nighttime exterior noi levels, respectively. Accordingly, the Project would not expose persons to or generate noise levels in excess of applicable City of More Valley standards during operation. Impacts would be less than significant and mitigation is not required.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
B) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			✓	

Source: (Urban Crossroads, 2018d)

Impact Analysis for Near-Term Construction Vibration

Construction activities on the Project site would utilize heavy equipment that has the potential to generate low levels of intermitte localized ground-borne vibration. Refer to *Technical Appendix J* for a detailed description of the methodology used to calcula construction vibration levels.

Vibration levels from Project-related construction activities were calculated at four (4) receiver locations near the Project site. (See Figu 1, *Noise Receiver Locations*, for locations of the modeled receptors and refer to *Technical Appendix J* for a detailed description of t receptors). The results of the vibration analysis for Project-related construction activities are summarized in Table 7, *Constructi Vibration Levels.*

Table 7 Construction Vibration Levels

Receiver Location[1]	Distance to Construction Activity (Feet)	Receiver Vibration Levels (VdB)[2]					Threshold Exceeded ?[3]
		Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level	
R1	824	12.5	33.5	40.5	41.5	41.5	No
R2	182	32.1	53.1	60.1	61.1	61.1	No
R3	174	32.7	53.7	60.7	61.7	61.7	No
R4	134	36.1	57.1	64.1	65.1	65.1	No

[1]Noise receiver locations are shown on Exhibit 10-A of *Technical Appendix J.*
[2]Based on the Vibration Source Levels of Construction Equipment included on Table 6-7 of *Technical Appendix J.*
[3]Does the peak vibration exceed the FTA maximum acceptable vibration standard of 80 VdB?
Source: (Urban Crossroads, 2018d, Table 10-9)

As shown in Table 7, Project construction activities would generate a maximum vibration level of 65.1 vibration decibels (VdB), whi is less than the City's significance threshold of 80 VdB (Urban Crossroads, 2018d, p. 66). Accordingly, the Project's construction activiti would not expose persons to or generate excessive groundborne vibration or groundborne noise levels. The Project would result in les than-significant impacts associated with construction vibration and groundborne noise.

Impact Analysis for Long-Term Operational Vibration

Under long-term conditions, the proposed Project would not include nor require equipment, facilities, or activities that would result substantial or perceptible groundborne vibration. Trucks would travel to-and-from the Project site during long-term operation; howev according to the Federal Transit Administration, vibration levels for heavy trucks operating at low-to-normal speeds on smooth, pav surfaces – as is expected on the Project site and along surrounding roadways – typically do not exceed 65 VdB, which is less than t City's significance threshold of 80 VdB (Urban Crossroads, 2018d, p. 54). Accordingly, long-term operation of the Project would r expose persons to or generate excessive groundborne vibration or groundborne noise levels, and a less-than-significant impact wou occur.

Source(s): Urban Crossroads (05-25-2018)

NOT TO SCALE

Figure

NOISE RECEIVER LOCATIONS

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
C) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			✓	

Source: (Urban Crossroads, 2018d)

The Federal Interagency Committee on Noise (FICON) developed guidance to be used for the assessment of project-generated increas in noise levels that take into account the ambient noise environment. Although the FICON recommendations were specifically develop to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use cumulative exposure metrics, such as the average-daily noise level (i.e., CNEL). The CNEL is the weighted average of the intensity o sound, with corrections for time of day, and averaged over 24 hours. For example, if the ambient noise environment is very quiet and new noise source substantially increases localized noise levels, a perceived impact may occur even though the numerical noise thresho might not be exceeded. Therefore, for the purpose of this analysis, when the ambient noise environment is less than 60 dBA CNEL, a dBA or more increase (i.e., "readily perceptible") resulting from Project-related noise is considered cumulatively considerable when noi sensitive receptors are affected. Where the ambient noise levels range from 60 to 65 dBA CNEL, a 3 dBA or more increase (i.e., "bare perceptible") resulting from Project-related noise is considered cumulatively considerable when noise sensitive receptors are affected. areas where the ambient noise levels exceed 65 dBA CNEL, a 1.5 dBA or more increase resulting from Project-related noise is consider cumulatively considerable when noise sensitive receptors are affected. (Urban Crossroads, 2018d, p. 24)

Impact Analysis for Stationary Noise

As summarized in Table 8, *Project Noise Level Contributions*, the Project would not contribute substantial noise at nearby sensiti receptors during daytime or nighttime hours. Accordingly, the Project would not contribute to a substantial permanent increase in ambie noise levels in the project vicinity above levels existing without the Project. Impacts would be less than significant.

Table 8 Project Noise Level Contributions

Daytime Noise Levels (8:00 a.m. – 10:00 p.m.)

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]	Threshold Exceeded?[7]
R1	39.0	L1	57.4	57.5	0.1	No
R2	35.7	L2	58.9	58.9	0.0	No
R3	38.2	L3	66.5	66.5	0.0	No
R4	42.7	L4	59.0	59.1	0.1	No

Table 8 (cont.) Project Noise Level Contributions

Nighttime Noise Levels (10:01 p.m. – 7:59 a.m.)

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]	Threshold Exceeded?[7]
R1	39.0	L1	55.5	55.6	0.1	No
R2	35.7	L2	57.9	57.9	0.0	No
R3	38.2	L3	62.9	62.9	0.0	No
R4	42.7	L4	55.5	55.7	0.2	No

[1]Noise receiver locations are shown on Figure 1.
[2]Estimated Project stationary source noise levels based on data presented in Table 6.
[3]Reference noise level measurements as shown on Exhibit 5-A of *Technical Appendix J*.
[4]Observed daytime ambient noise levels as shown on Table 5-1 of *Technical Appendix J*.
[5]Represents the combined reference ambient noise levels plus Project operational noise level.
[6]The noise level increase expected with the addition of the Project.
[7]As defined under Response 11(C) of this Initial Study.
Source: (Urban Crossroads, 2018d, Table 9-4 and Table 9-5)

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Impact Analysis for Traffic-Related Noise

To evaluate permanent, off-site noise increases that could result from Project-related traffic, noise levels were modeled for the followi traffic scenarios:

- Existing: This scenario refers to the existing traffic noise conditions without and with the proposed Project.
- Project Opening Year (2023): This scenario refers to the background noise conditions in the year 2023 without and with t Project, including reasonably foreseeable cumulative development projects.
- Project Buildout (2040): This scenario refers to the General Plan Buildout noise conditions in the year 2040 without and with t Project, including reasonably foreseeable cumulative development projects.

Traffic noise contours and noise levels were established based on existing and projected future traffic conditions on off-site roadw segments within the Project's study area, and do not take into account the effect of any existing noise barriers or topography that m affect ambient noise levels. Refer to *Technical Appendix J* for a detailed description of the methodology used to evaluate the Projec traffic-related noise effects.

Table 9, *Existing plus Project Traffic Noise Impacts*, presents a comparison of the existing noise conditions along Project study ar roadway segments and the noise levels that would result with addition of Project-related traffic. Noise levels along roadway segmer within the Project study area would increase between 0.0 to 2.4 dBA CNEL with development of the Project; however, the Project's noi contributions would not exceed the threshold of significance due to the existing noise environment and the lack of noise sensitive receiv in the vicinity of the Project site. Accordingly, the Project would not result in a substantial permanent increase in noise levels abo ambient conditions. Therefore, the Project's off-site, traffic-related noise impacts would be less than significant under Existing pl Project conditions.

Table 10, *Year 2023 Traffic Noise Impacts*, presents a comparison of the expected Year 2023 noise conditions along Project study ar roadway segments, including reasonably foreseeable cumulative development projects, and the noise levels that would result with additi of Project-related traffic. Noise levels along roadway segments within the Project study area would increase between 0.0 to 2.2 dE CNEL with development of the Project; however, the Project's noise contributions would not exceed the threshold of significance due the projected noise environment and the lack of noise sensitive receivers in the vicinity of the Project site. Accordingly, the Project wou not result in a substantial permanent increase in noise levels above ambient conditions. Therefore, the Project's off-site traffic-relat noise impacts would be less than significant under Year 2023 plus cumulative development conditions.

Table 9 Existing plus Project Traffic Noise Impacts

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Threshold Exceeded?[3]
			No Project	With Project	Project Addition		
1	Frederick St.	s/o Alessandro Bl.	70.1	70.5	0.4	No	No
2	Frederick St.	n/o Brodiaea Av.	69.0	69.3	0.3	No	No
3	Frederick St.	n/o Cactus Av.	69.3	69.8	0.5	No	No
4	Graham St.	s/o Brodiaea Av.	68.2	68.5	0.3	No	No
5	Alessandro Bl.	w/o Frederick St.	73.4	73.5	0.1	Yes	No
6	Calle San Juan De Los Lagos	w/o Frederick St.	64.2	64.3	0.1	No	No
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	61.8	61.9	0.1	No	No
8	Brodiaea Av.	w/o Graham St.	58.7	61.1	2.4	No	No
9	Cactus Av.	w/o Frederick St.	75.2	75.3	0.1	No	No

[1]The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2]"Yes" = Existing, noise-sensitive land uses adjacent to the study area roadway segment.
[3] As defined under Response 11(C) of this Initial Study.
Source: (Urban Crossroads, 2018d, Table 7-7)

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Table 10 Year 2023 Traffic Noise Impacts

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Threshold Exceeded?[3]
			No Project	With Project	Project Addition		
1	Frederick St.	s/o Alessandro Bl.	72.0	72.3	0.3	No	No
2	Frederick St.	n/o Brodiaea Av.	71.4	71.6	0.2	No	No
3	Frederick St.	n/o Cactus Av.	71.6	71.9	0.3	No	No
4	Graham St.	s/o Brodiaea Av.	70.0	70.2	0.2	No	No
5	Alessandro Bl.	w/o Frederick St.	74.2	74.3	0.1	Yes	No
6	Calle San Juan De Los Lagos	w/o Frederick St.	65.1	65.2	0.1	No	No
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	62.2	62.3	0.1	No	No
8	Brodiaea Av.	w/o Graham St.	59.2	61.4	2.2	No	No
9	Cactus Av.	w/o Frederick St.	77.5	77.6	0.1	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2]"Yes" = Existing, noise-sensitive land uses adjacent to the study area roadway segment.
[3] As defined under Response 11(C) of this Initial Study.
Source: (Urban Crossroads, 2018d, Table 7-8)

Table 11, *General Plan Buildout Year 2040 Traffic Noise Impacts*, presents a comparison of the expected 2040 noise conditions alo Project study area roadway segments plus reasonably foreseeable cumulative development projects and the noise levels that would res with addition of Project-related traffic. Noise levels along roadway segments within the Project study area would increase between 0.0 1.7 dBA CNEL with development of the Project. As shown in Table 11, the Project's noise contributions would not exceed the significan thresholds based on existing ambient noise levels and the lack of nearby noise-sensitive land uses. Accordingly, the Project would neith substantially contribute to noise levels in excess of applicable noise standards nor result in a substantial permanent increase in noise lev above ambient conditions. Therefore, the Project's off-site traffic-related noise impacts would be less than significant under Year 20 plus cumulative development conditions.

Table 11 General Plan Buildout Year 2040 Traffic Noise Impacts

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Threshold Exceeded?[3]
			No Project	With Project	Project Addition		
1	Frederick St.	s/o Alessandro Bl.	72.4	72.6	0.2	No	No
2	Frederick St.	n/o Brodiaea Av.	71.8	72.0	0.2	No	No
3	Frederick St.	n/o Cactus Av.	72.0	72.3	0.3	No	No
4	Graham St.	s/o Brodiaea Av.	70.4	70.6	0.2	No	No
5	Alessandro Bl.	w/o Frederick St.	75.3	75.4	0.1	Yes	No
6	Calle San Juan De Los Lagos	w/o Frederick St.	66.1	66.1	0.0	No	No
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	63.7	63.8	0.1	No	No
8	Brodiaea Av.	w/o Graham St.	60.6	62.3	1.7	No	No
9	Cactus Av.	w/o Frederick St.	77.1	77.2	0.1	No	No

[1]The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2]"Yes" = Existing, noise-sensitive land uses adjacent to the study area roadway segment.
[3] As defined under Response 11(C) of this Initial Study.
Source: (Urban Crossroads, 2018d, Table 7-9)

In summary, long-term operation of the proposed Project would not result in a substantial permanent increase in off-site, traffic-related noise levels under any analysis scenario. The Project's traffic-related noise impacts would be less than significant.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
D) A substantially temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			✓	

Source: (Urban Crossroads, 2018d)

The Project would only have the potential to cause a substantial temporary or periodic increase in ambient noise levels during construction phase. Construction activities on the Project site, especially those activities involving the use of heavy equipment, wou create intermittent, temporary increases in ambient noise levels in the vicinity of the Project site. Noise generated by heavy constructi equipment, including trucks, graders, bulldozers, concrete mixers, and portable generators, can reach high levels. However, constructio related noise increases: 1) would be transitory (i.e., varying from day-to-day and throughout the day), 2) would completely cease up completion of Project construction, and 3) would not represent a recurring, periodic source of noise (although periodic and tempora construction noise has the potential to be substantial compared to existing ambient noise levels).

As discussed above under Response 11(A), the construction noise generated by the Project would be consistent with the City's Noi Ordinance, which requires noise levels to be quantified at a distance of 200 feet from the noise source, regardless of the distance betwe the noise source and potential sensitive (i.e., residential) receptors. Notwithstanding the Project's consistency with the City's Noi Ordinance, construction activities on the Project site, especially those activities involving heavy equipment, would create intermitte temporary increases in ambient noise levels that have the potential to adversely affect receptors in the vicinity of the Project site. T Project's construction-related noise levels, as calculated at nearby receptor locations, are presented in Table 12, *Project Constructi Noise Level Summary*. (Receptor locations were previously depicted on Figure 1). To present a conservative analysis, all receptors in t Project site vicinity – including the existing office/worker receptor locations (i.e., R2 through R4) – are evaluated as sensitive recepto The noise levels summarized in Table 12 are based on reference noise levels collected from construction sites throughout Southe California (refer to *Technical Appendix J* for a detailed description of reference construction noise levels).

As shown on Table 12, Project-related construction activities are calculated to reach maximum noise levels between 49.1 and 6 equivalent-level decibels (dBA Leq) when measured at nearby receptors. The City does not consider noise levels less than 65 dBA L to be excessive for sensitive receptors; therefore, the Project's temporary or periodic noise impacts would be less-than-significant a mitigation would not be required. (Urban Crossroads, 2018d, p. 62)

Table 12 Project Construction Noise Level Summary

Receiver Location	Distance to Receiver (Feet)	Daytime Construction Noise Levels (dBA L_{eq})						Nighttime Concrete Pour Noise Levels (dBA L_{eq})	Threshold Exceeded?	
		Site Prep.	Grading	Building Const.	Paving	Architectural Coating	Highest Outdoor Const. Noise Levels		Daytime (65 dBA L_{eq})	Nighttime (60 dBA L_{eq})
R1	824	39.8	49.1	43.8	47.3	43.1	49.1	47.3	No	No
R2	182	47.9	57.2	51.9	55.4	51.2	57.2	55.4	No	n/a
R3	174	53.3	62.6	57.3	60.8	56.6	62.6	60.8	No	n/a
R4	134	55.6	64.9	59.6	63.0	58.9	64.9	63.0	No	n/a

Source: (Urban Crossroads, 2018d, Table 10-8)

E) For a project located within an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?			✓	

Source: (Google Earth, 2018; RCALUC, 2014; Urban Crossroads, 2018d)

The Project site is located approximately 1.2 miles northeast of the nearest runway for MARB. Based on the *Airport Land U Compatibility Plan* (ALUCP) for MARB, the Project is located outside of the Airport's 60 dBA CNEL noise level contours, and therefo is a "*clearly acceptable*" use for the subject property based on the ALUCP's land use compatibility criteria. A *clearly acceptable* la use indicates that "the activities associated with the specified land use can be carried out with essentially no interference from the noi exposure" (RCALUC, 2014, Table 2B; Urban Crossroads, 2018d, p. 21). Accordingly, the proposed Project would not expose peop residing or working in the Project area to excessive noise levels from a public airport; therefore, impacts would be less-than-significan

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
F) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				✓

Source: (Google Earth, 2018)

There are no private airfields or airstrips in the vicinity of the Project site (Google Earth, 2018). Therefore, the Project would not expc people to excessive noise levels associated with operations at a private airstrip. No impact would occur.

12. POPULATION AND HOUSING. Would the project:

A) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			✓	

Source: (City of Moreno Valley, 2006; City of Moreno Valley, 2016)

The Project would develop the Project site with employment land uses. The Project site is located in an area of Moreno Valley that already developing with employment land uses – and on a site that is planned for employment land uses by the Moreno Valley Gene Plan. Accordingly, development of the Project would sustain the ongoing trend of the development of employment land uses in the C of Moreno Valley and would not generate job growth that substantially exceeds what was already anticipated by the City in their Gene Plan and evaluated in the General Plan FEIR. Additionally, the Project site is located in an area of Moreno Valley that is served by existi roadways and public utility infrastructure and the Project would not require the extension or expansion of any infrastructure. According the Project would not induce direct or indirect substantial growth in the area and impacts would be less than significant.

B) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				✓

Source: (Project Application Materials, 2018; Google Earth, 2018)

The Project site does not contain any residential structures and no people live on the site under existing conditions. According implementation of the Project would not displace substantial numbers of existing housing or people and would not necessitate t construction of replacement housing elsewhere. No impact would occur.

C) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				✓

Source: (Project Application Materials, 2018; Google Earth, 2018)

Refer to Response 12(B).

13. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new physically altered government facilities, need for new or physically altered government facilities, the construction of which could cau significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for a of the public services:

A) Fire protection?			✓	

Source: (Google Earth, 2018; City of Moreno Valley, 2017c)

Fire protection services to the Project site are provided by the Moreno Valley Fire Department (MVFD). The Project site is served by t Towngate Fire Station (Station No. 6) located at 22280 Eucalyptus Avenue, approximately 2.1 roadway miles to the northwest of t Project site, and the Kennedy Park Fire Station (Station No. 65) located at 15111 Indian Avenue, approximately 3.6 roadway miles to t southeast of the Project site (Google Earth, 2018). Based on the Project site's proximity to the two (2) existing fire stations, the Proje would be adequately served by fire protection services, and no new or expanded unplanned facilities would be required. The Project required to comply with the provisions of the City of Moreno Valley's Development Impact Fee (DIF) Ordinance (Ordinance No. 69 which requires a fee payment that the City applies to the funding of public facilities, including fire protection facilities (City of More Valley, 2017c). Mandatory compliance with the DIF Ordinance would be required prior to the issuance of a building permit.

The Project would feature fire safety and fire suppression activities, including type of building construction, fire sprinklers, a fire hydra system, and paved access. The proposed building would be of concrete tilt-up construction that contains a low fire hazard risk rating. addition, a fire alarm system is proposed to be installed, as well as an ESFR (Early Suppression, Fast Response) ceiling mounted f sprinklers. ESFR provides protection that exceeds that of in-rack systems. ESFR high output, high volume systems are located in ceili spaces and incorporate large, high-volume, high-pressure heads designed to suppress a fire and to provide the necessary fire protection

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

warehouse/light industrial buildings that may contain high-piled storage. (To suppress a fire does not necessarily mean it will extingui the fire but rather it is meant to "knock" the fire back down to its source and control its spread until emergency personnel arrive.)

Based on the foregoing, the proposed Project would receive adequate fire protection service and would not result in the need for new physically altered fire protection facilities. Impacts to fire protection facilities would be less than significant.

B) Police protection?			✓	

Source: (City of Moreno Valley, 2017c)

The Project would introduce a new building structure and employees to the Project site, which would result in an incremental increase demand for police protection services, but is not anticipated to require or result in the construction of new or physically altered poli facilities. Furthermore, prior to the issuance of building permits, the Project Applicant would be required to comply with the provisio of Moreno Valley's DIF Ordinance (Ordinance No. 695), which requires a fee payment that the City applies to the funding of pub facilities, including police protection facilities (City of Moreno Valley, 2017c). Mandatory compliance with the DIF Ordinance would required prior to the issuance of a building permit. Based on the foregoing, the proposed Project would receive adequate police protecti service, and would not result in the need for new or physically altered police protection facilit would therefore be less than significant.

C) Schools?			✓	

Source: (Project Application Materials, 2018; City of Moreno Valley, 2006; City of Moreno Valley, 2017c)

The Project would not create a direct demand for public school services, as the subject property would contain non-residential uses th would not generate any school-aged children requiring public education. The proposed Project is not expected to draw a substant number of new residents to the region and would, therefore, not indirectly generate school-aged students requiring public educatio Because the proposed Project would not directly generate students and is not expected to indirectly draw students to the area, the propos Project would not cause or contribute to a need to construct new or physically altered public school facilities. Although the Project wou not create a direct demand for additional public-school services, the Project Applicant would be required to contribute development impa fees to the Moreno Valley Unified School District (MVUSD) in compliance with California Senate Bill 50 (Greene), which allows scho districts to collect fees from new developments to offset the costs associated with increasing school capacity needs (City of Moreno Valle 2017c). Mandatory payment of school fees would be required prior to the issuance of building permits. Impacts to public schools wou be less than significant.

D) Parks?				✓

Source: (Project Application Materials, 2018)

As discussed under Responses 14(A) and (B) below, the Project would not create a demand for public park facilities and would not res in the need to modify existing or construct new park facilities. Accordingly, implementation of the Project would not adversely affect a park facility. Thus, no impact would occur.

e) Other public facilities?				✓

Source: (Project Application Materials, 2018)

The Project is not expected to result in a demand for other public facilities/services, including libraries, community recreation cente post offices, and/or animal shelters. As such, implementation of the Project would not adversely affect other public facilities or requ the construction of new or modified public facilities and no impact would occur.

14. RECREATION

A) Would the project increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				✓

Source: (Project Application Materials, 2018)

The Project would develop the subject property with an employment land use (i.e., warehousing/light industrial). The Project does r propose any type of residential use or other land use that may generate a population that would increase the use of existing neighborho and regional parks or other recreational facilities. Accordingly, implementation of the proposed Project would not result in the increas use or substantial physical deterioration of an existing neighborhood or regional park, thus, no impact would occur.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
B) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				✓

Source: (Project Application Materials, 2018)

The Project does not propose to construct any new on- or off-site recreation facilities. Additionally, the Project would not expand a existing off-site recreational facilities. Therefore, environmental effects related to the construction or expansion of recreational facilit would not occur.

15. TRANSPORTATION/TRAFFIC. Would the project:				
A) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			✓	

Source: (Urban Crossroads, 2018e)

A Traffic Impact Analysis was prepared for the Project by Urban Crossroads to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project and to recommend improvements to achieve acceptable circulation syste operational conditions. This report is included as *Technical Appendix K* to this Initial Study and its findings are incorporated into the analysis presented herein.

Project Study Area

For purposes of analyzing the Project's potential impacts to the local circulation system, the traffic impact study area (hereafter "Proj study area" or "study area") was based on the City of Moreno Valley's Traffic Study Guidelines and in consultation with City of More Valley staff, and includes the intersections listed in Table 13, *Intersection Analysis Locations* (Urban Crossroads, 2018e, p. 4) .

Table 13 Intersection Analysis Locations

ID	Intersection Location	Jurisdiction	CMP?
1	Veterans Wy. & Calle San Juan de Los Lagos	Moreno Valley	No
2	Frederick St. & Alessandro Bl.	Moreno Valley, March JPA	No
3	Frederick St. & Driveway 1 – Future Intersection	Moreno Valley	No
4	Frederick St. & Calle San Juan de Los Lagos/Driveway 2	Moreno Valley	No
5	Frederick St. & Brodiaea Av.	Moreno Valley	No
6	Frederick St. & Cactus Av.	Moreno Valley	No
7	Driveway 3 & Brodiaea Av. – Future Intersection	Moreno Valley	No
8	Graham St. & Brodiaea Av.	Moreno Valley	No

Source: (Urban Crossroads, 2018e, Table 1-1)

Existing traffic counts were collected in the study area in April 2018 during representative, typical weekday peak hour traffic conditio No observations were made in the field during the traffic count collection period that would indicate atypical traffic conditions. Based the collected traffic counts, all intersections in the Project study area operate at a level of service (LOS) of "B" or better during the A and PM peak hours (7:00-9:00am and 4:00-6:00pm, respectively). (Urban Crossroads, 2018e, p. 29, Table 3-1) Refer to *Techni Appendix K* for more information about existing traffic conditions in the Project's study area.

Thresholds of Significance

The Project would result in a significant direct impact to the City of Moreno Valley's circulation system if the Project would contribu substantial traffic (i.e., 50 or more peak hour trips) that would cause any study area intersection to degrade from an acceptable level service (LOS D or better) to an unacceptable level of service (LOS E or F). If the Project would contribute less than 50 peak hour trips a particular intersection but that intersection would degrade from an acceptable LOS to an unacceptable LOS with the addition of Proj

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

traffic, the Project's direct impact would be considered significant if the Project increased the delay at the affected intersection by 1.0 more seconds relative to conditions without the Project. (Urban Crossroads, 2018e, pp. 19-20)

If the Project contributes substantial traffic (i.e., 50 or more peak hour trips) to an intersection that already operates at an unacceptal level of service (i.e., LOS E or LOS F) without the Project, a cumulatively-considerable impact would occur. If the Project wou contribute less than 50 peak hour trips to a particular intersection that already operates at unacceptable LOS, the Project's cumulati impact would be considered significant if the Project increased the delay at the affected intersection by 1.0 or more seconds relative conditions without the Project. (Urban Crossroads, 2018e, pp. 19-20)

Project Trip Generation and Distribution

Trip generation represents the amount of traffic that is attracted to and produced by a development project. Although the Project propos warehouse land uses, the Project's traffic analysis evaluated the Project as a mix of "Warehouse" (80 percent) and "General Lig Industrial" (20 percent) uses. According to vehicle trip generation rates published by the Institute of Transportation Engineers (IT General Light Industrial Land Uses are expected to generate substantially more traffic than Warehouse land uses; therefore, the Projec traffic analysis intentionally selected a land use mix that would overstate the amount of traffic generated by the Project in order to provi a conservative, "worst-case" analysis of the Project's potential impacts. Based on land use-specific vehicle trip generation rates publish by the ITE and vehicle fleet mixes published in the City of Fontana Truck Trip Generation Study, the Project is estimated to genera approximately 486 daily vehicle trips, including 56 trips during the AM peak hour (7:00-9:00am) and 57 trips during the PM peak ho (4:00-6:00pm). (Urban Crossroads, 2018e, pp. 41-42, Table 4-2)

Of the Project's estimated 486 daily vehicle trips, 43 trips would be from trucks with two or more axles. In conformance with standa traffic engineering practices in Southern California, the Project's daily vehicle trips were converted to a passenger car equivalent (PC PCE factors allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit (i.e., the passenger ca for purposes of capacity and LOS analyses. A PCE factor of 1.5 was applied to two-axle truck trips, a factor of 2.0 was applied to thre axle truck trips, and a factor of 3.0 was applied to four plus-axle truck trips. After converting Project trips to PCE, the Project is estimat to produce an estimated 629 daily PCE trips, including 72 PCE trips during the AM peak hour and 74 PCE trips during the PM peak ho (Urban Crossroads, 2018e, Table 4-1) The Project's PCE vehicle trips were used for purposes of evaluating the Project's potential effe on the circulation system. For more information about the Project's trip generation, refer to *Technical Appendix K.*

Trip distribution is the process of identifying the probable destinations, directions, or traffic routes that would be utilized by Project traff The potential interaction between the planned land uses and surrounding regional access routes are considered, to identify the routes whe Project traffic would distribute. The trip distribution for the proposed Project was developed based on anticipated passenger car and tru travel patterns to-and-from the Project site. The total volume on each roadway was divided by the Project's total traffic generation indicate the percentage of Project traffic that would use each component of the roadway system in each relevant direction. The Projec trip distribution patterns are graphically depicted on Figure 2, *Project Truck Trip Distribution*, and Figure 3, *Project Car Trip Distributio*

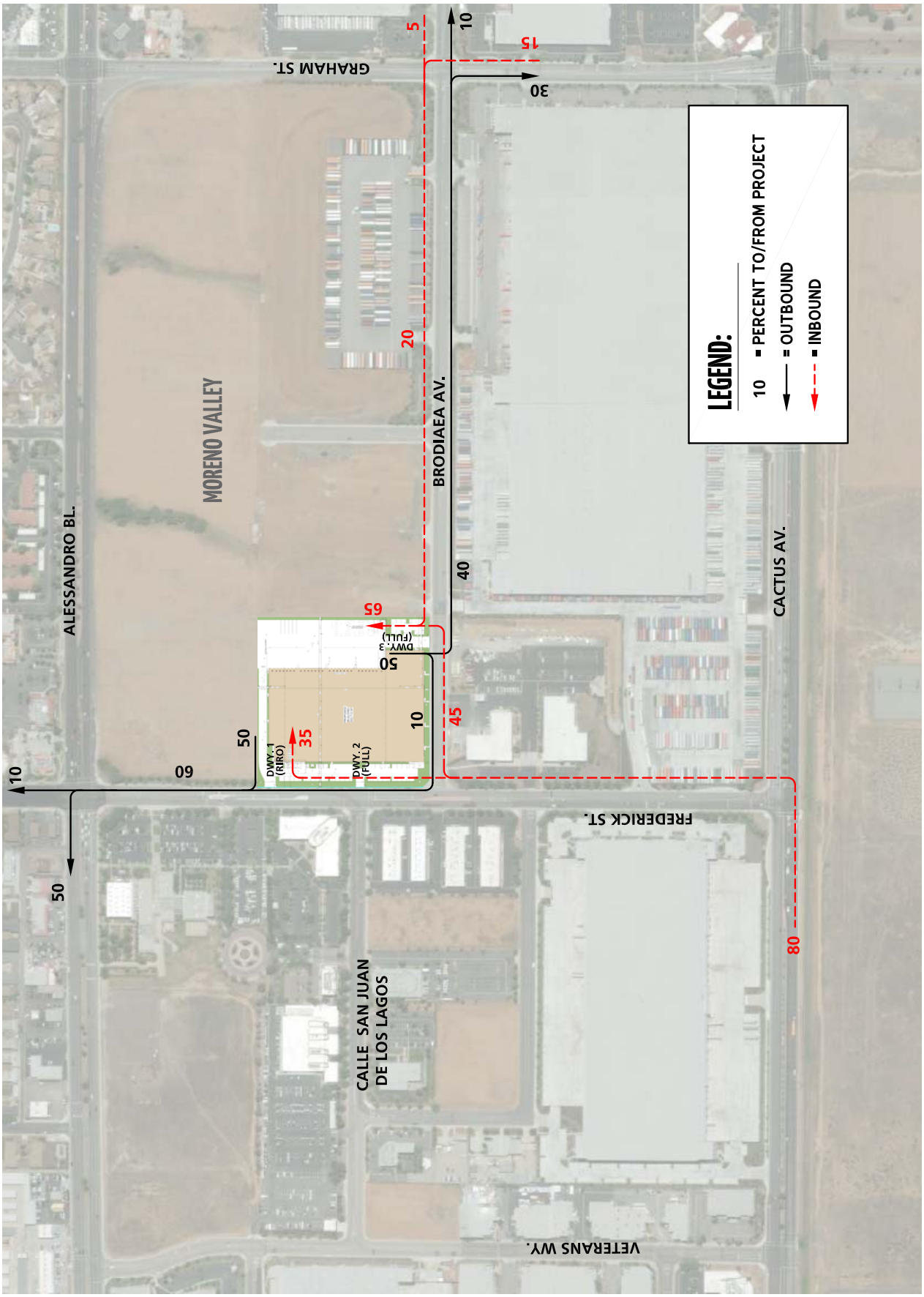
The assignment of traffic from the Project area to the adjoining roadway system is based on the Project trip generation, trip distributio and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Bas on the identified Project traffic generation and trip distribution patterns, PCE factored Project average daily traffic (ADT) volumes for t weekday are shown on Figure 4, *Project Average Daily Traffic*.

Analysis Scenarios

The Project's potential impacts to traffic and circulation have been assessed for each of the following conditions:

- Near-Term Construction
- Existing (2018) plus Project;
- Opening Year (2023) and cumulative development projects with and without Project; and
- General Plan Buildout (Post-2040) and cumulative development projects with and without Project.

The Near-Term Construction conditions analysis determines the potential for the Project's construction-related traffic to result in adverse effect to the local roadway system. Types of traffic anticipated during construction include construction workers traveling to/fr the Project site as well as deliveries of construction materials to the Project site.

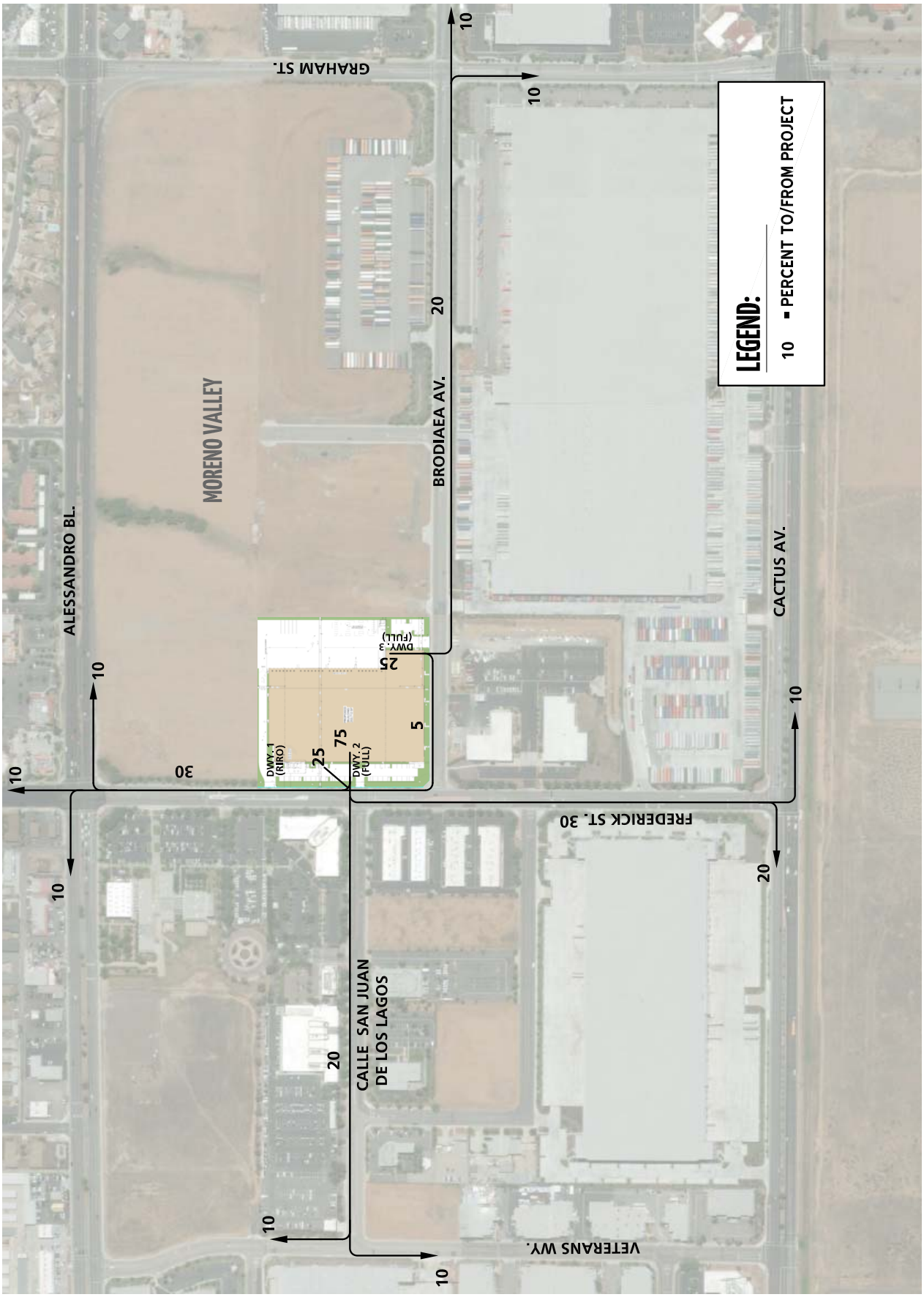


Source(s): Urban Crossroads (05-24-2018)

NOT TO SCALE

Figure 2

PROJECT TRUCK TRIP DISTRIBUTION

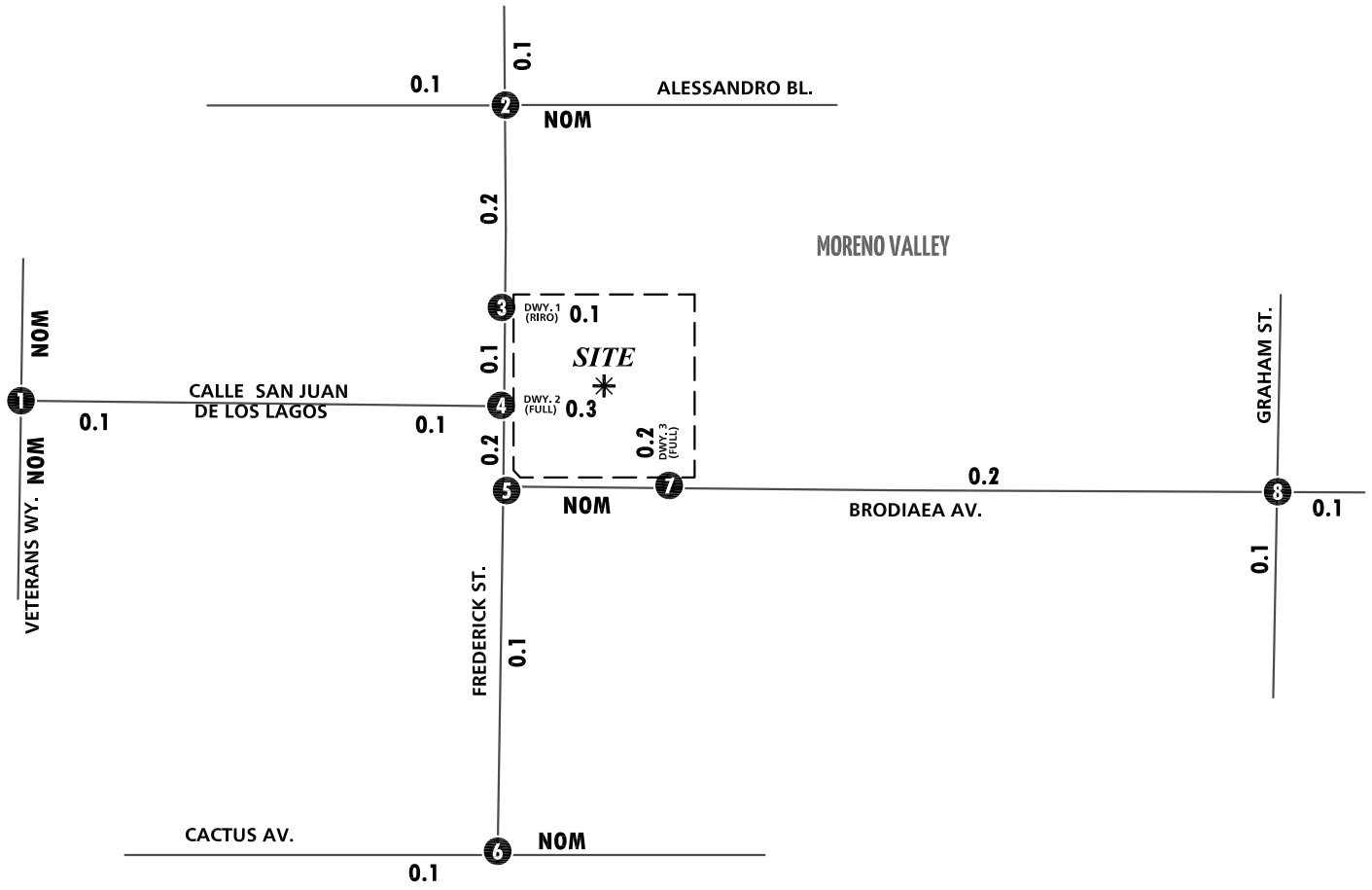


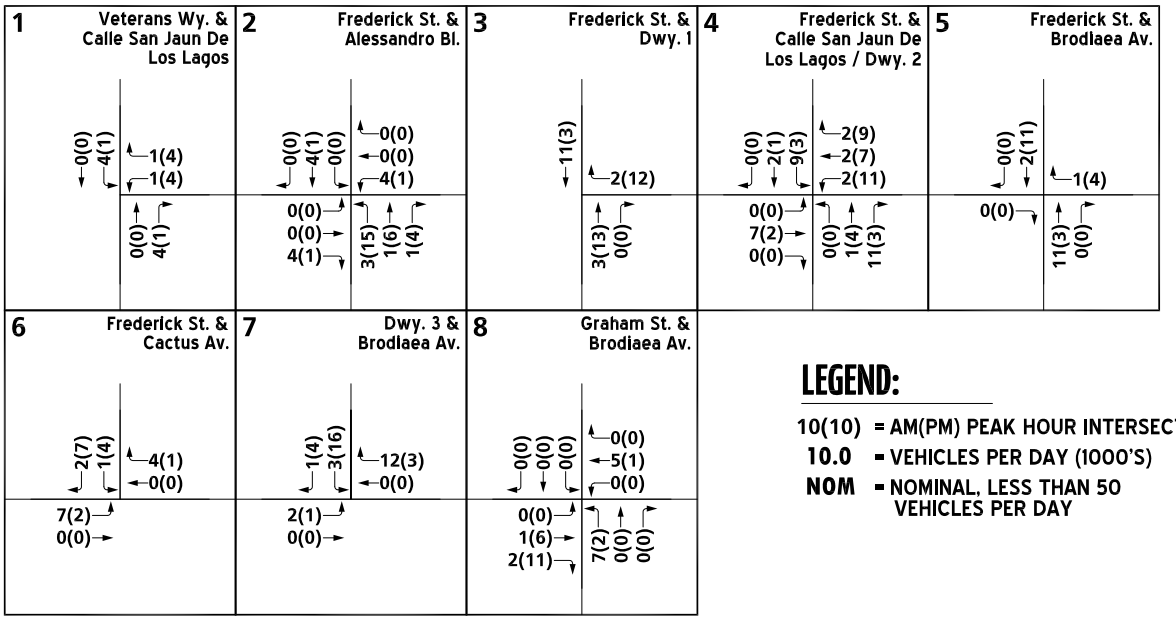
Source(s): Urban Crossroads (05-24-2018)

NOT TO SCALE

Figure 1

PROJECT CAR TRIP DISTRIBUTION





LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

Source(s): Urban Crossroads (05-24-2018)

NOT TO SCALE

Figure 4

PROJECT AVERAGE DAILY TRAFFIC

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

The Existing (2018) plus Project (E+P) analysis determines direct Project-related traffic impacts that would occur on the roadway syste under the theoretical scenario where the Project is added to existing conditions. The E+P scenario is presented to disclose direct impa as required by CEQA. In the case of the proposed Project, the estimated time period between the commencement of the Projec environmental review (2018) and estimated Project occupancy (2020) is two (2) years. During this time period, traffic conditions are r static – other projects are being constructed, the transportation network is evolving, and traffic patterns are changing. Therefore, the E scenario is very unlikely to materialize in real world conditions and thus does not accurately describe the environment that will exist wh the proposed Project is constructed and becomes operational. Regardless, the E+P scenario is evaluated to satisfy CEQA requirements identify the Project's impacts to the existing environment.

The Opening Year (2023) analysis includes an evaluation of traffic conditions at the Project's "opening year." Pursuant to the methodolo established by the City of Moreno Valley Transportation Engineering Division, a project's "opening year" is defined as existing conditio plus five (5) years. In the case of the Project, 2018 represents the existing condition; therefore, the Opening Year is defined as 2023. T Opening Year (2023) analysis is utilized to determine the Project's contribution to potential cumulative traffic impacts within the stu area with consideration of existing traffic + ambient growth + Project-related traffic + traffic from cumulative development projects.

The General Plan Buildout (Post-2040) conditions analysis determines the potential for long-term cumulative circulation syste deficiencies when the Moreno Valley General Plan reaches full buildout in the year 2040. The General Plan Buildout (2040) traf forecasts were derived from the SCAG transportation model. In addition, traffic associated with reasonably foreseeable cumulati projects in the area was also added in addition to Project traffic for General Plan Buildout (2040) conditions.

Refer to Technical *Appendix K* for a detailed discussion of the methodologies and assumptions for each analysis scenario, and a list cumulative development projects considered in the analysis.

Impact Analysis for Near-term Construction Traffic Conditions

During the Project's construction phase, traffic to-and-from the subject property would be generated by activities such as constructi employee trips, delivery of construction materials, and use of heavy equipment. Vehicular traffic associated with construction employe would be substantially less than daily and peak hour traffic volumes generated during Project operational activities, especially becau construction activities typically begin/end outside of the peak hour; therefore, a majority of the construction employees would not driving to/from the Project site during hours of peak congestion. Traffic from construction workers is not expected to result in a substant adverse effect to the local roadway system because most trips would occur during non-peak hours and the total volumes of trips would less than the Project's operational trips, which are shown below to have a less-than-significant impact (see "Impact Analysis for Existi plus Project Traffic Conditions," below). Deliveries of construction materials to the Project site would also have a nominal effect to t local roadway network because most trips would occur during non-peak hours and the total volumes of trips would be less than t Project's operational trips, which are shown below to have a less-than-significant impact. Construction materials would be delivered the site throughout the construction phase based on need and would not occur on an everyday basis. Heavy equipment would be utiliz on the Project site during the construction phase. As most heavy equipment is not authorized to be driven on public roadways, mo equipment would be delivered and removed from the site via flatbed trucks. As with the delivery of construction materials, the delive of heavy equipment to the Project site would not occur on a daily basis, but would occur periodically throughout the construction pha based on need. Accordingly, traffic generated by the Project's construction phase would not result in a conflict with an applicable pla ordinance, or policy establishing measures of effectiveness for the performance of the circulation system. Impacts during the Projec construction phase would be less than significant.

Impact Analysis for Existing plus Project (E+P) Traffic Conditions

Study area intersection levels of service for E+P conditions are summarized in Table 14, *Existing plus Project Conditions Intersectio Analysis*. As shown in Table 14, Project-related traffic would not exceed applicable significance thresholds under E+P traffic condition Under E+P conditions, the Frederick Street and Alessandro Boulevard intersection (Intersection #2) is calculated to have insufficie stacking length for the southbound left turn movement; however, because this intersection is calculated to operate at acceptable LOS w the addition of Project traffic and because the Project would contribute less than 50 PCE peak hour trips at this intersection, queui impacts would be less than significant (Urban Crossroads, 2018e, p. 59). Accordingly, the Project would result in a less-than-significa impact to the local roadway network under E+P traffic conditions.

Table 14 Existing plus Project Conditions Intersections Analysis

#	Intersection	Traffic Control[2]	Existing (2018) Delay[1] (secs.) AM	Existing (2018) Delay[1] (secs.) PM	Existing (2018) Level of Service AM	Existing (2018) Level of Service PM	E+P Delay[1] (secs.) AM	E+P Delay[1] (secs.) PM	E+P Level of Service AM	E+P Level of Service PM
1	Veterans Wy. & Calle San Juan de Los Lagos	CSS	9.7	9.7	A	A	9.8	9.7	A	A
2	Frederick St. & Alessandro Bl.	TS	38.8	48.6	D	D	39.5	49.0	D	D
3	Frederick St. & Driveway 1	**CSS**	Future Intersection				9.3	9.8	A	A
4	Frederick St. & Calle San Juan de Los Lagos/Driveway 2	TS	6.4	11.7	A	B	9.1	12.5	B	B
5	Frederick St. & Brodiaea Av.	CSS	9.6	10.0	A	B	9.6	10.0	A	B
6	Frederick St. & Cactus Av.	TS	14.1	12.1	B	B	14.2	12.5	B	B
7	Driveway 3 & Brodiaea Av.	**CSS**	Future Intersection				9.1	9.1	A	A
8	Graham St. & Brodiaea Av.	TS	13.2	13.3	B	B	13.5	14.2	B	B

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).
[1]Per the 2010 Highway Capacity Manual (HCM), overall average intersection delay and level of service are shown for intersections with a traffic signal. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. LOS calculated using Synchro (Version 9.1).
[2]TS = Traffic Signal; CSS = Cross-street Stop
Source: (Urban Crossroads, 2018e, Table 5-1)

Impact Analysis for Opening Year (2023) Traffic Conditions

As shown in Table 15, *Opening Year Intersections Analysis*, all intersections in the Project study area would operate at acceptable LO under Opening Year traffic conditions, with the exception of Intersection #2, which would operate at LOS E during the PM peak ho with or without the Project. Additionally, Intersection #2 is calculated to have insufficient stacking length for the southbound left tu and westbound left turn movements. The Project would contribute less than 50 PCE peak hour trips at Intersection #2 and would increa the delay by less than 1.0 second; therefore, the Project's contribution to the deficiencies at this intersection would not be cumulative considerable (Urban Crossroads, 2018e, p. 66). Accordingly, the Project would result in a less-than-significant impact to the local roadw network under Opening Year traffic conditions.

Table 15 Opening Year Intersections Analysis

#	Intersection	Traffic Control[2]	2023 Without Project Delay[1] (secs.) AM	2023 Without Project Delay[1] (secs.) PM	2023 Without Project Level of Service AM	2023 Without Project Level of Service PM	2023 With Project Delay[1] (secs.) AM	2023 With Project Delay[1] (secs.) PM	2023 With Project Level of Service AM	2023 With Project Level of Service PM
1	Veterans Wy. & Calle San Juan de Los Lagos	CSS	10.1	10.2	B	B	10.2	10.3	B	B
2	Frederick St. & Alessandro Bl.	TS	48.7	**72.1**	D	**E**	49.6	**72.9**	D	**E**
3	Frederick St. & Driveway 1	**CSS**	Future Intersection				9.7	10.4	A	B
4	Frederick St. & Calle San Juan de Los Lagos/Driveway 2	TS	7.5	11.8	A	B	10.3	12.7	B	B
5	Frederick St. & Brodiaea Av.	CSS	10.3	11.3	B	B	10.4	11.3	B	B
6	Frederick St. & Cactus Av.	TS	19.3	19.6	B	B	20.7	21.5	C	C
7	Driveway 3 & Brodiaea Av.	**CSS**	Future Intersection				9.1	9.1	A	A
8	Graham St. & Brodiaea Av.	TS	14.0	14.2	B	B	14.3	15.1	B	B

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).
[1]Per the 2010 Highway Capacity Manual (HCM), overall average intersection delay and level of service are shown for intersections with a traffic signal. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. LOS calculated using Synchro (Version 9.1).
[2]TS = Traffic Signal; CSS = Cross-street Stop
Source: (Urban Crossroads, 2018e, Table 6-1)

Impact Analysis for General Plan Buildout (Post-2040) Traffic Conditions

As shown in Table 16, *General Plan Buildout Intersections Analysis*, all intersections in the Project study area would operate at acceptal LOS under General Plan Buildout (Post-2040) traffic conditions, with the exception of Intersection #2, which would operate at LOS

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

during the PM peak hour with or without the Project. Additionally, Intersection #2 is calculated to have insufficient stacking length f the southbound left turn, eastbound left turn, eastbound right turn, and westbound left turn movements. The Frederick Street / Calle S Juan intersection (Intersection #4) also would experience insufficient stacking at the eastbound left turn movement as would the Frederi Street / Cactus Avenue intersection (Intersection #6) at the eastbound left turn and westbound right turn movements. The Project wou contribute less than 50 PCE peak hour trips at Intersections #2, #4, and #6 and would increase the delay at each intersection by less th 1.0 second; therefore, the Project's contribution to the deficiencies at these intersections would not be cumulatively considerable (Urb Crossroads, 2018e, p. 78). Accordingly, the Project would result in a less-than-significant impact to the local roadway network unc General Plan Buildout traffic conditions.

Table 16 General Plan Buildout Intersections Analysis

#	Intersection	Traffic Control[2]	Post-2040 Without Project Delay[1] (secs.) AM	Post-2040 Without Project Delay[1] (secs.) PM	Post-2040 Without Project Level of Service AM	Post-2040 Without Project Level of Service PM	Post-2040 With Project Delay[1] (secs.) AM	Post-2040 With Project Delay[1] (secs.) PM	Post-2040 With Project Level of Service AM	Post-2040 With Project Level of Service PM
1	Veterans Wy. & Calle San Juan de Los Lagos	CSS	10.5	10.7	B	B	10.6	10.8	B	B
2	Frederick St. & Alessandro Bl.	TS	**112.1**	**>200.0**	**F**	**F**	**112.5**	**>200.0**	**F**	**F**
3	Frederick St. & Driveway 1	CSS	Future Intersection				10.0	10.9	B	B
4	Frederick St. & Calle San Juan de Los Lagos/Driveway 2	TS	7.9	13.7	A	B	11.2	15.1	B	B
5	Frederick St. & Brodiaea Av.	CSS	10.8	11.8	B	B	10.8	11.8	B	B
6	Frederick St. & Cactus Av.	TS	39.6	24.9	D	C	40.0	29.5	D	C
7	Driveway 3 & Brodiaea Av.	CSS	Future Intersection				9.3	9.2	A	A
8	Graham St. & Brodiaea Av.	TS	14.6	15.6	B	B	14.8	15.8	B	B

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).
[1]Per the 2010 Highway Capacity Manual (HCM), overall average intersection delay and level of service are shown for intersections with a traffic signal. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. LOS calculated using Synchro (Version 9.1).
[2]TS = Traffic Signal; CSS = Cross-street Stop
Source: (Urban Crossroads, 2018e, Table 7-1)

Conclusion

Based on the foregoing analysis, the Project would not conflict with an applicable plan, ordinance or policy establishing measures effectiveness for the performance of the circulation system during projected near- or long-term development conditions. The Proje would result in a less-than-significant impact to the local circulation system and no mitigation would be required.

B) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				✓

Source: (Urban Crossroads, 2018e; Caltrans, 2014)

No Riverside County Congestion Management Program (CMP) arterial roadways are located within the Project study area; therefore, the is no potential for the Project to cause or contribute to adverse effects to CMP arterial roadways (Urban Crossroads, 2018e, p. 6).

The Project would contribute fewer than 50 two-way peak hour trips to the two nearest freeways to the Project site, SR-60 and I-21 which are part of the CMP roadway network. Projects that contribute fewer than 50 two-way peak hour trips to a freeway do not exce Caltrans' typical screening threshold for requiring an analysis of potential impacts to freeway mainline segments because when a projec peak hour trips are less than 50 they become unrecognizable from other traffic on the State highway system (Caltrans, 2014). According the Project would not contribute substantial traffic to SR-60 and I-215 mainline segments and impacts to these freeway facilities wou be less than significant.

Although the Project would not contribute substantial traffic to SR-60 or I-215, Project-related traffic would continue to travel throughc the Southern California region along the State highway system, dissipating as distance from the Project site increases. As such, Proje related traffic has the potential to travel along freeway mainline segments that experience unacceptable levels of service, including but r limited to Riverside County CMP segments of SR-71, SR-91, and I-15, as well as freeway segments located outside of Riverside Coun

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

such as I-5, I-15, I-110, I-405, and I-710, among others. All State highway system facilities that operate at an unacceptable LOS a considered to be cumulatively impacted; however, because the Project would contribute fewer than 50 peak hour trips to these congest freeway segments, the Project's effect on Riverside County CMP freeway mainline facilities and other freeway mainline facilities locat outside of Riverside County would be less than cumulatively considerable under all traffic scenarios.

Based on the foregoing analysis, the Project would not conflict with the applicable CMP and impacts would be less-than-significant.

C) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?			✓	

Source: (Project Application Materials, 2018)

The proposed Project would not include an air travel component (e.g., runways, helipads) and products directly transported to and fro the Project site would not be transported via air travel. In addition, the Riverside County ALUC reviewed the Project for consistency w the MARB ALUCP and determined that the Project would not conflict with airport operations at the MARB. Accordingly, the Proj would not substantially affect air traffic patterns, including an increase in traffic levels or a change in flight path location that results substantial safety risks. A less-than-significant impact would occur.

D) Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?			✓	

Source: (Project Application Materials, 2018)

City staff reviewed the Project's application materials and determined that no unsafe design features are proposed as part of the Proje All improvements planned as part of the Project would be in conformance with applicable City of Moreno Valley standards and wou not result in any hazards due to a design feature. Additionally, the proposed Project would be compatible with existing and plann industrial land uses in the surrounding area and would not substantially increase safety hazards due to incompatible uses. Thus, impa would be less than significant.

E) Result in inadequate emergency access?			✓	

Source: (Project Application Materials, 2018)

The Project would construct one warehouse/light industrial building on the Project site, which would require the need for emergen access to-and-from the site. During the course of the City of Moreno Valley's review of the proposed Project, the City confirmed that t Project would provide adequate access to-and-from the Project site for emergency vehicles. The City also confirmed the layout of t Project's proposed warehouse building, drive aisles, parking lots, and truck courts was sufficient to provide adequate on-site circulati for emergency vehicles. The Project's proposed driveways would connect directly to Brodiaea Avenue and Frederick Street, and t Project does not propose any changes to public roads other than frontage improvements along Brodiaea Avenue and Frederick Street th are designed to improve local traffic circulation. Furthermore, the City of Moreno Valley will review all future Project constructi drawings to ensure that adequate emergency access is maintained along abutting public streets during temporary construction activiti Impacts would be less than significant.

F) Conflict with adopted policies or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?			✓	

Source: (Urban Crossroads, 2018e; Google Earth, 2018; City of Moreno Valley, 2016; City of Moreno Valley, 2014)

The proposed Project would contain a light industrial warehouse building, which is a land use that is not likely to attract large volumes pedestrian, bicycle, or transit traffic. Regardless, the Project is designed to comply with all applicable City of Moreno Valley transportati policies.

According to City of Moreno Valley General Plan Figure 9-4, *Bikeway Plan*, the Project site is not located near any City-designat bikeways (City of Moreno Valley, 2016, p. 9-29). In 2015, the City of Moreno Valley adopted a Bicycle Master Plan, which updates a supersedes the recommendations of the General Plan. The Bicycle Master Plan identifies a planned Class 2 bike lane along Frederi Street and a Class 3 bike lane on Brodiaea Avenue (City of Moreno Valley, 2014, Figure 14). The Project would be required to comp with the City's Bicycle Master Plan; therefore, the Project has no potential to conflict with any City-designated bikeways. Sight distan at each Project driveway would be reviewed by the City of Moreno Valley at the time future improvement plans are considered to ensu that sight distance meets applicable City standards and provides for safe bicycle and pedestrian circulation. Furthermore, bicycle parki would be provided on the Project site in accordance with Moreno Valley Municipal Code requirements for bicycle parking facilities.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

The Project area is served by the Riverside Transit Authority (RTA), which provides bus service along Frederick Street and Cactus Aven via RTA Bus Route 11 and along Alessandro Boulevard via RTA Bus Route 20. The Project proposes a bus turnout along the frontage Frederick Street, which would be designed in accordance with the City's adopted policies, plans, and programs. (Urban Crossroa 2018e, p. 23) Accordingly, the Project would not conflict with RTA bus transit operations nor with local public transit service.

As demonstrated by the foregoing analysis, the Project would not conflict with adopted policies, plans or programs related to alternati transportation, or otherwise substantially decrease the performance or safety of such facilities, and a less-than-significant impact wou occur.

16. TRIBAL CULTURAL RESOURCES. Would the project cause a substantial adverse change in the significance of a tribal cultu resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defin in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and tl is:

A) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or B) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		✓		

Source: (BFSA, 2018a)

BFSA conducted a pedestrian field survey, an archival records search, a Sacred Lands File records search, and sent information reque to the Native American tribes with potential knowledge of the Project area (refer to *Technical Appendix D1* for additional details). As the date of the cultural resources report (*Technical Appendix D1*), a response has not been received from NAHC. (BFSA, 2018a, p. 1 1) Additionally, no prehistoric archaeological resources were observed on the surface of the Project site or have been previously record within the Project site's immediate vicinity.

Notwithstanding, the Project is subject to compliance with California Senate Bill (SB) 18, which requires that lead agencies consult w California Native American tribes during the local planning process for the purposes of protecting Traditional Tribal Cultural Plac whenever a project proposes to amend or adopt any general plan or specific plan, or designate land as open space. Because the propos Project includes a General Plan Amendment, the City of Moreno Valley is subject to all requirements associated with the SB 18 proce for Native American consultation. Additionally, the Project is subject to compliance with Assembly Bill 52 (AB 52), which applies projects that have a notice of preparation or a notice of negative declaration or mitigated negative declaration filed on or after July 1, 201 The primary intent of AB 52 is to establish a consultation process between potentially affected Native American tribes and CEQA le agencies that aims to identify tribal cultural resources that would potentially be impacted by a proposed project.

During the AB 52 and SB 18 consultation process, the City of Moreno Valley was notified by Native American tribes with a traditio use areas that encompasses the Project site that tribal cultural resources had the potential to be uncovered on the Project site duri construction. Accordingly, although not anticipated, implementation of the Project could cause a substantial adverse change in t significance of a tribal cultural resource as defined in Public Resources Code Section 21074. Mitigation would be required.

Implementation of MM TR-1 through MM TR-6 would ensure the proper identification and subsequent treatment of any tribal cultu resources that may be encountered during ground-disturbing activities associated with the Project's implementation. Therefore, w implementation of MM TR-1 through MM TR-6, the Project's potential impacts related to tribal cultural resources would be reduced less-than-significant levels.

Mitigation

MM TR-1 Prior to the issuance of a grading permit, the Developer shall retain a professional archaeologist to conduct monitoring all mass grading and trenching activities. The Project Archaeologist shall have the authority to temporarily redir earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. T Project Archaeologist, in consultation with the Consulting Tribe(s), the contractor, and the City, shall develop a Cultu Resources Management Plan (CRMP) in consultation pursuant to the definition in AB52 to address the details, timing a

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

responsibility of all archaeological and cultural activities that will occur on the project site. A consulting tribe is defin as a tribe that initiated the AB 52 tribal consultation process for the Project, has not opted out of the AB52 consultati process, and has completed AB 52 consultation with the City as provided for in Cal Pub Res Code Section 21080.3.2(b)(of AB52. Details in the Plan shall include:

a) Project grading and development scheduling;

b) The Project archeologist and the Consulting Tribes(s) as defined in CR-1 shall attend the pre-grading meeting witl the City, the construction manager and any contractors and will conduct a mandatory Cultural Resources Worker Sensitivity Training to those in attendance. The Training will include a brief review of the cultural sensitivity of tl Project and the surrounding area; what resources could potentially be identified during earthmoving activities; the requirements of the monitoring program; the protocols that apply in the event inadvertent discoveries of cultural resources are identified, including who to contact and appropriate avoidance measures until the find(s) can be properly evaluated; and any other appropriate protocols. All new construction personnel that will conduct earthwork or grading activities that begin work on the Project following the initial Training must take the Cultural Sensitivity Training prior to beginning work and the Project archaeologist and Consulting Tribe(s) shall make themselves available to provide the training on an as-needed basis;

c) The protocols and stipulations that the contractor, City, Consulting Tribe(s) and Project archaeologist will follow the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits tl shall be subject to a cultural resources evaluation.

MM TR-2 Prior to the issuance of a grading permit, the Developer shall secure agreements with the Pechanga Band of Luise Indians and Soboba Band of Luiseño Indians for tribal monitoring. The Developer is also required to provide a minimu of 30 days advance notice to the tribes of all mass grading and trenching activities. The Native American Trib Representatives shall have the authority to temporarily halt and redirect earth moving activities in the affected area in t event that suspected archaeological resources are unearthed. If the Native American Tribal Representatives suspect tl an archaeological resource may have been unearthed, the Project Archaeologist or the Tribal Representatives sh immediately redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of t suspected resource. In consultation with the Native American Tribal Representatives, the Project Archaeologist sh evaluate the suspected resource and make a determination of significance pursuant to California Public Resources Co Section 21083.2.

MM TR-3 In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoverie the following procedures shall be carried out for final disposition of the discoveries:

a) One or more of the following treatments, in order of preference, shall be employed with the tribes. Evidence of su shall be provided to the City of Moreno Valley Planning Department:

i. Preservation-In-Place of the cultural resources, if feasible. Preservation in place means avoiding the resourc leaving them in the place they were found with no development affecting the integrity of the resources.

ii. Onsite reburial of the discovered items as detailed in the treatment plan required pursuant to Mitigation Measu CR-1. This shall include measures and provisions to protect the future reburial area from any future impacts perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been complete No recordation of sacred items is permitted without the written consent of all Consulting Native American Trib Governments as defined in CR-1.

MM TR-4 The City shall verify that the following note is included on the Grading Plan: “If any suspected archaeological resourc are discovered during ground-disturbing activities and the Project Archaeologist or Native American Trib Representatives are not present, the construction supervisor is obligated to halt work in a 100-foot radius around the fi and call the Project Archaeologist and the Tribal Representatives to the site to assess the significance of the find."

MM TR-5 If potential historic or cultural resources are uncovered during excavation or construction activities at the project site, wo in the affected area must cease immediately and a qualified person meeting the Secretary of the Interior's standards (CFR 61), Tribal Representatives, and all site monitors per the Mitigation Measures, shall be consulted by the City

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

evaluate the find, and as appropriate recommend alternative measures to avoid, minimize or mitigate negative effects the historic, or prehistoric resource. Determinations and recommendations by the consultant shall be immediate submitted to the Planning Division for consideration, and implemented as deemed appropriate by the Commun Development Director, in consultation with the State Historic Preservation Officer (SHPO) and any and all Consulti Native American Tribes as defined in CR-1 before any further work commences in the affected area.

MM TR-6 If human remains are discovered, no further disturbance shall occur in the affected area until the County Coroner has ma necessary findings as to origin. If the County Coroner determines that the remains are potentially Native American, t California Native American Heritage Commission shall be notified within 24 hours of the published finding to be given reasonable opportunity to identify the "most likely descendant". The "most likely descendant" shall then ma recommendations, and engage in consultations concerning the treatment of the remains (California Public Resources Co 5097.98). (GP Objective 23.3, CEQA).

17. UTILITIES AND SERVICE SYSTEMS. Would the project:

A) Exceed wastewater treatment requirements of the Santa Ana Regional Water Quality Control Board?			✓	

Source: (SARWQCB, 2011)

Wastewater treatment services would be provided to the Project site by EMWD. EMWD is required to operate their wastewater treatme facilities in compliance with the waste treatment and discharge standards/requirements established by the Santa Ana RWQCB. Therefo the Project's contribution of wastewater to the EMWD wastewater treatment facilities would not have any potential to exceed wastewa treatment requirements of the Santa Ana RWQCB. Additionally, the Project would not install or utilize septic systems or alterna wastewater treatment systems; therefore, the Project would have no potential to exceed the applicable wastewater treatment requiremer established by the Santa Ana RWQCB. Accordingly, a less-than-significant impact would occur.

B) Require or result in construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			✓	

Source: (Project Application Materials, 2018)

Refer to Response 17(E), below, for an analysis of the Project's potential effects to wastewater treatment facilities.

The Project would construct an on-site network of water and sewer pipes that would connect to existing water and sewer lines benea Brodiaea Avenue. The installation of water and sewer line connections as proposed by the Project would result in physical impac however, these impacts are considered to be part of the Project's construction phase and are evaluated throughout this Initial Stu accordingly. In instances where significant impacts have been identified for the Project's construction phase, mitigation measures a recommended in each applicable subsection of this Initial Study to reduce impacts to less-than-significant levels. The construction water and sewer lines necessary to serve the proposed Project would not result in any significant physical effects on the environment tl are not already identified and disclosed as part of this Initial Study. Accordingly, additional mitigation measures beyond those identifi throughout this Initial Study would not be required.

C) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			✓	

Source: (Project Application Materials, 2018)

The Project would involve the construction of stormwater drainage facilities, including an underground stormwater storage (infiltratic vault, a bioretention BMP basin, storm drain pipes, and catch basins. The construction of stormwater drainage facilities proposed by t Project would result in physical impacts to the surface and subsurface of the Project site, as well as physical impacts within Brodia Avenue. These impacts are considered to be part of the Project's construction phase and are evaluated throughout the Initial Stu accordingly. In instances where potentially significant impacts may occur during the Project's construction phase, such potential impa have been identified under the appropriate issue area in this Initial Study. The construction of storm drain infrastructure as necessary serve the proposed Project would not result in any potentially-significant physical effects on the environment that are not already identifi and disclosed as part of this Initial Study.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
D) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			✓	

Source: (EMWD, 2016b; City of Moreno Valley, 2006; EMWD, 2007)

EMWD is responsible for supplying potable water to the Project site and its region. The Project proposes to change the land use a zoning designation from commercial development ("Office") to industrial development ("Light Industrial"). According to EMWI *Water System Planning & Design*, commercial and industrial development have the same average day water demand rate (2,000 gpd p acre) (EMWD, 2007, p. 4) As discussed in the *2015 EMWD Urban Water Management Plan*, herein incorporated by reference as t "UWMP," which applies to and was adopted by the EMWD, adequate water supplies are projected to be available to meet EMWI estimated water demand through 2040 under normal, historic single-dry and historic multiple-dry year conditions (EMWD, 2016b, p. XV EMWD forecasts for projected water demand are based on the population projections of SCAG, which rely on the adopted land u designations contained within the general plans that cover the geographic area within EMWD's service. Because the Project's wa demand would be identical to the projection for the site's existing land use designation (as mentioned above), EMWD would ha sufficient water supplies available to serve the Project from existing entitlements/resources and no new or expanded entitlements a needed. The Project's impact would be less than significant.

E) Result in a determination by the wastewater treatment provider which services or may serve the project determined that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			✓	

Source: (EMWD, 2016a; Project Application Materials, 2018; EMWD, 2006)

Wastewater generated by the Project would be treated by the EMWD, which operates the Moreno Valley Regional Water Reclamati Facility. Based upon EMWD's wastewater generation rate of 1,700 gallons per day (gpd) per acre for industrial light land uses, t proposed Project would generate approximately 14,960 gallons (0.015 million gallons) of wastewater per day (1,700 gpd per acre × 8 Project acres = 14,960 gpd) (EMWD, 2006, Table 1). Under existing conditions, the Moreno Valley Regional Water Reclamation Facil has an excess treatment capacity of approximately 4.8 million gallons per day (mgpd). Implementation of the Project would utili approximately 0.3 percent of the Moreno Valley Regional Water Reclamation Facility daily excess treatment capacity (0.015 mgd ÷ 4 mgpd = 0.3 percent). (EMWD, 2016a; Project Application Materials, 2018). Accordingly, the Moreno Valley Regional Wa Reclamation Facility has sufficient capacity to treat wastewater generated by the Project in addition to existing commitments. The Proj would not create the need for any new or expanded wastewater facility (such as conveyance lines, treatment facilities, or lift station Because there is adequate capacity at existing treatment facilities to serve the Project's projected sewer demand, impacts would be le than significant.

F) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			✓	

Source: (EPA, 2009; CA Legislative Information, 2015; CalRecycle, Multi-year County Destination, n.d.; CalRecycle, El Sobra Landfill, 2017; CalRecycle, Badlands Sanitary Landfill, 2017; CalRecycle, Lamb Canyon Sanitary Landfill, 2016; CalRecycle, n.d.)

Implementation of the proposed Project would generate an incremental increase in solid waste volumes requiring off-site disposal duri short-term construction and long-term operational activities. The Project would be required to comply with City of Moreno Vall Ordinance No. 706, which requires a minimum of 50 percent of all construction waste and debris to be recycled. Additionally, the Proj would be required to comply with mandatory waste reduction requirements as described below in Response 17(G). Solid waste generat by the Project would be disposed at the El Sobrante Landfill, the Badlands Sanitary Landfill, and/or the Lamb Canyon Sanitary Landf Existing capacities at each of these landfills is discussed below.

The El Sobrante Landfill is permitted to accept a maximum of 16,054 tons of solid waste per day. In August 2017, the most recent ti period for which disposal data was publicly available, the El Sobrante Landfill was receiving an average of 10,684 tons of waste per da which is approximately 66.5 percent of the facility's maximum permitted daily intake. The El Sobrante Landfill has available capac until at least the year 2045; however, future landfill expansion opportunities exist at this site. (CalRecycle, El Sobrante Landfill, 2017)

The Badlands Sanitary landfill is permitted to accept a maximum of 4,800 tons of solid waste per day. In August 2017, the most rece time period for which disposal data was publicly available, the Badlands Sanitary Landfill was receiving an average of 2,668 tons of was per day, which is approximately 55.6 percent of the facility's maximum permitted daily intake. The Badlands Sanitary Landfill h available capacity until at least the year 2021; however, future landfill expansion opportunities may exist at this site. (CalRecycle, Badlan Sanitary Landfill, 2017)

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The Lamb Canyon Sanitary Landfill is permitted to accept a maximum of 5,500 tons of solid waste per day. In July 2016, the most rece time period for which disposal data was publicly available, the Lamb Canyon Sanitary Landfill was receiving an average of 1,548 tons waste per day, which is approximately 28.1 percent of the facility's maximum permitted daily intake. The Lamb Canyon Landfill h available capacity until at least the year 2029; however, future landfill expansion opportunities may exist at this site. (CalRecycle, Lar Canyon Sanitary Landfill, 2016)

Construction Impact Analysis

Solid waste requiring disposal would be generated by the construction process, primarily consisting of discarded materials and packagi Based on the size of the Project (i.e., 203,712 s,f, building) and the United States Environmental Protection Agency's (U.S. EP construction waste generation factor of 4.34 pounds per s.f. for non-residential uses, approximately 442.1 tons of waste is expected to generated during the Project's construction phase ([203,712 s.f. × 4.34 pounds per s.f.] ÷ 2,000 pounds per ton = 442.1 tons) (EPA, 20(p. 10). California Assembly Bill 939 (AB 939) requires that a minimum of 50% of all solid waste be diverted from landfills (by recycli reusing, and other waste reduction strategies); therefore, the Project is estimated to generate approximately 221.1 tons during construction phase. The Project's construction phase is estimated to last for up to 304 days; therefore, the Project is estimated to genera approximately 0.73 tons of solid waste per day (221.1 tons ÷ 304 days = 0.73 tons per day) requiring landfill during construction.

Non-recyclable construction waste generated by the Project would be disposed at the El Sobrante Landfill, the Badlands Sanitary Landf and/or the Lamb Canyon Sanitary Landfill. As described above, these landfills receive well below their maximum permitted daily dispo volume; thus, the relatively minimal construction waste generated by the Project is not anticipated to cause the landfill to exceed maximum permitted daily disposal volume. Furthermore, the El Sobrante Landfill, the Badlands Sanitary Landfill, and the Lamb Cany Sanitary Landfill are not expected to reach its total maximum permitted disposal capacities during the Project's construction period. T El Sobrante Landfill, the Badlands Sanitary Landfill, and the Lamb Canyon Sanitary Landfill have sufficient daily capacity to accept so waste generated by the Project's construction phase; therefore, impacts to landfill capacity associated with the Project's near-te construction activities would be less than significant.

Operational Impact Analysis

Based on a daily waste generation factor of 1.42 pounds of waste per 100 square feet of industrial building area obtained from CalRecyc long-term, on-going operation of the Project would generate approximately 1.45 tons of solid waste per day ([[1.42 pounds / 100 s.f.] 203,712 s.f.] ÷ 2,000 pounds = 1.45 tons per day) (CalRecycle, n.d.). Pursuant to AB 939, at least 50 percent of the Project's solid wa is required to be diverted from landfills; therefore, the Project would generate a maximum of 0.73 tons of solid waste per day requiri landfilling (1.45 tons per day × 50% = 0.73 tons per day). (CA Legislative Information, 2015)

Non-recyclable solid waste generated during long-term operation of the Project would be disposed at the El Sobrante Landfill, the Badlan Sanitary Landfill, and/or the Lamb Canyon Sanitary Landfill. As described above, these landfills receive well below their maximu permitted daily disposal volume; thus, waste generated by the Project's operation is not anticipated to cause the landfill to exceed maximum permitted daily disposal volume. Because the Project would generate a relatively small amount of solid waste per day compared to the permitted daily capacities at receiving landfills, impacts to regional landfill facilities during the Project's long-te operational activities would be less than significant.

F) Comply with federal, state, and local statues and regulations related to solid waste?			✓	

Source: (CA Legislative Information, 2015; CA Legislative Information, 2011; CA Legislative Information, 2005)

The California Integrated Waste Management Act (AB 939), signed into law in 1989, established an integrated waste management syste that focused on source reduction, recycling, composting, and land disposal of waste. In addition, the bill established a 50 percent wa reduction requirement for cities and counties by the year 2000, along with a process to ensure environmentally safe disposal of waste t could not be diverted. Per the requirements of the Integrated Waste Management Act, t Riverside County Board of Supervisors adopted the County of Riverside Countywide Integrated Waste Management Plan (CIWM which outlines the goals, policies, and programs the County and its cities implement to create an integrated and cost-effective wa management system that complies with the provisions of AB 939 and its diversion mandates. (CA Legislative Information, 2015)

In order to assist the City of Moreno Valley and the County of Riverside in achieving the mandated goals of the Integrated Wa Management Act, the Project's building tenant(s) would be required to work with future refuse haulers to develop and implement feasi waste reduction programs, including source reduction, recycling, and composting. Additionally, in accordance with the California So Waste Reuse and Recycling Act of 1991 (Public Resources Code § 42911), the Project is required to provide adequate areas for collecti and loading recyclable materials where solid waste is collected. The collection areas are required to be shown on construction drawin

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

and be in place before occupancy permits are issued. (CA Legislative Information, 2005) Additionally, in compliance with AB 3 (Mandatory Commercial Recycling Program), the future occupant(s) of the proposed Project would be required to arrange for recycli services, if the occupant generates four (4) or more cubic yards of solid waste per week (CA Legislative Information, 2011). T implementation of these mandatory requirements would reduce the amount of solid waste generated by the Project and diverted to landfil which in turn will aid in the extension of the life of affected disposal sites. The Project would be required to comply with all applicat solid waste statutes and regulations; as such, impacts related to solid waste statutes and regulations would be less than significant.

18. MANDATORY FINDINGS OF SIGNIFICANCE.

A) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?		✓		

All impacts to the environment, including impacts to habitat for fish and wildlife species, fish and wildlife populations, plant and anin communities, rare and endangered plants and animals, and historical and pre-historical resources were evaluated as part of this Init Study. Throughout this Initial Study, where impacts were determined to be potentially significant, mitigation measures have been impos to reduce those impacts to less-than-significant levels. Accordingly, with incorporation of the mitigation measures imposed throughc this Initial Study, the Project would not substantially degrade the quality of the environment and impacts would be less than significan

B) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of the past projects, the effects of other current projects, and the effects of probable future projects)?		✓		

As discussed throughout this Initial Study, implementation of the proposed Project has the potential to result in effects to the environme that are individually limited, but cumulatively considerable. In all instances where the Project has the potential to contribute tc cumulatively-considerable impact to the environment, mitigation measures have been imposed to reduce potential effects to less-tha significant levels.

Aesthetics

New development on the Project site and in the surrounding area would change the existing character of the Project's viewshed; howev all development in the immediate vicinity of the Project would be required to comply with the development regulations and desi standards contained in the City's Development Code, which would ensure that minimum standards related to visual character and qual are met to preclude adverse aesthetic effects (e.g., size, scale, building materials, lighting). Accordingly, the Project's aesthetic impa would not be cumulatively-considerable.

Agriculture Resources

The Project would have no impact on agricultural resources. Therefore, there is no potential for the Project to contribute to a cumulativel considerable impact under this topic.

Air Quality

Based on SCAQMD guidance, any direct exceedance of a regional or localized threshold also is considered to be a cumulative considerable effect, while air pollutant emissions below applicable regional and/or localized thresholds are not considered cumulative considerable. As discussed in Responses 3(A) through (E), Project-related construction and operation emissions would not exceed t applicable SCAQMD thresholds and, therefore, the Project's air quality impacts would not be cumulatively considerable.

Biological Resources

The Project site does not support any sensitive plant or wildlife species, riparian, or sensitive natural habitat, or federally-protect wetlands; therefore, there is no potential for the Project to contribute to a cumulatively-considerable impact under these resourc Although the Project site is highly disturbed and fragmented from other open space areas under existing conditions, the site does conta quality habitat for the burrowing owl and nesting birds. Therefore, there is the potential that the burrowing owl and/or nesting birds cou

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

be present on the Project site prior to construction and there also is the potential that other development projects in the Riverside ar could support the burrowing owl and/or bird nests. The Project's potential impact to the burrowing owl and nesting birds would cumulatively-considerable. MM BR-1 and MM BR-2 would reduce the Project's cumulative effects to less-than-significant levels ensuring that no direct take of burrowing owls or nesting birds occurs during construction.

Cultural Resources

The Project site does not contain historic or prehistoric archaeological resources and mandatory compliance with State law would preclu impacts to human remains; therefore, there is no potential for the Project to contribute to a cumulatively-considerably impact to the resources. Although development activities on the Project site would not impact any known paleontological resources, there is the remo potential that such resources are buried beneath the surface of the Project site and could be impacted during construction. Other proje within region would similarly have the potential to impact unknown, subsurface paleontological resources during ground-disturbi activities. Therefore, the potential for development on the Project site to impact subsurface paleontological resource deposits is cumulatively-considerable impact. Application of MMs CR-1 through CR-4 would reduce the Project's cumulative impacts to less-tha significant levels.

Geology and Soils

Potential effects related to geology and soils are inherently site-specific; therefore, there is no potential for the Project to contribute to cumulatively-considerable impact under this topic. Furthermore, all development proposals would be required to comply with applicabl federal, State, and local regulations that are in place to preclude adverse geology and soils effects, including effects related to stro seismic ground shaking, fault rupture, soil erosion, and hazardous soil conditions (e.g., liquefaction, expansive soils, landslides).

Greenhouse Gas Emissions

As described in the preceding analysis, global climate change (GCC) occurs as the result of global emissions of GHGs. An individu development project does not have the potential to result in direct and significant GCC-related effects in the absence of cumulative sourc of GHGs. The CEQA Guidelines also emphasize that the effects of GHG emissions are cumulative and should be analyzed in the conte of CEQA's requirements for cumulative impacts analysis (See CEQA Guidelines § 15130(f)). Accordingly, the preceding analysis reflec a cumulative impact analysis of the GHG emissions related to the Project. As concluded under Responses 7(A) and (B), the Project wou not result in a cumulatively considerable impact related to GHG emissions.

Hazards and Hazardous Materials

Potential effects related to hazards and hazardous materials are inherently site-specific; therefore, there is no potential for the Project contribute to a cumulatively-considerable impact under this topic.

Hydrology and Water Quality

Construction and operation of the Project and other projects in the Santa Ana River watershed would have the potential to result in cumulative water quality impact, including erosion and sedimentation. However, in accordance with applicable federal, State, and loc regulations, all development projects would be required to implement plans during construction and operation (e.g., SWPPP and WQM to minimize adverse effects to water quality, which would avoid a cumulatively-considerable impact.

The Project and other projects in the Santa Ana River Basin would be required to comply with federal, State, and local regulations in orc to preclude flood hazards both on- and off-site. Compliance with federal, State, and local regulations would require on-site areas to protected, at a minimum, from flooding during peak storm events (i.e., 100-year storm) and that proposed development would not expo downstream properties to increased flooding risks during peak storm events. Accordingly, a cumulatively-considerable effect related flooding would not occur.

Land Use and Planning

The Project would not physically divide an established community, or conflict with applicable land use/planning documents; therefo there is no potential for the Project to contribute to a cumulatively-considerable impact related to land use and planning.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

Mineral Resources

The Project would have no impact on mineral resources. Therefore, there is no potential for the Project to contribute to a cumulativel considerable impact under this topic.

Noise

Noise levels diminish rapidly with distance; therefore, for a development project to contribute to a noise-related cumulative impact it mu be located in close proximity to another development project or source of substantial noise. There are no construction projects in t immediate vicinity of the Project site that would overlap with Project-related construction activities. Accordingly, cumulative considerable impacts related to periodic noise and construction-related vibration would not occur. Under long-term operating conditio the Project would comply with the City of Moreno Valley Noise Ordinance and would not produce noticeable levels of vibration; therefo cumulatively considerable impacts related to these issue areas would not occur. The analysis provided under Response 12(A) demonstrat that the Project would not result in a cumulatively considerable impact related to transportation noise under long-term conditions.

Population and Housing

The Project would not implement land uses that generate new residents and would not require the construction of replacement housir Accordingly, the City has anticipated – and planned for – the growth that would occur on the Project site and there is no potential for t Project to result in an adverse, cumulatively-considerable environmental effect related to population and housing.

Public Services

All development projects in the City of Moreno Valley, including the Project, would be required to pay development impact fees, a porti of which would be used by the City for the provision of public services, to offset the incremental increase in demand for fire protecti and police protection services. Furthermore, future development would generate an on-going stream of property tax revenue and sales t revenue, which would provide funds that could be used by the City of Moreno Valley for the provision of fire and police protecti services. The Project would not directly result in the introduction of new residents to the City and, therefore, would have no potential result in cumulatively-considerable impacts to resident-serving public facilities such as schools, parks, libraries, and other public facilit or services.

Recreation

The Project would have no impact to recreation facilities. Therefore, there is no potential for the Project to contribute to a cumulativel considerable impact under this topic.

Transportation/Traffic

The Project's potential to result in cumulatively considerable effects to the circulation network were evaluated in the preceding analy under Responses 15 (A) and (B) – see the analysis for the Opening Year (2023) and General Plan Buildout (Post-2040) traffic conditio As demonstrated in the analysis, the Project would not contribute to any cumulatively considerable adverse effects to the circulati network.

Tribal Cultural Resources

Development activities on the Project site would not impact any known tribal cultural resources; however, there is the remote potent that such resources are buried beneath the surface of the Project site and could be impacted during construction. Other projects with region would similarly have the potential to impact unknown, subsurface tribal cultural resources during ground-disturbing activiti Therefore, the potential for development on the Project site to impact subsurface tribal cultural resource deposits is a cumulativel considerable impact. Application of MMs TR-1 though TR-6 would reduce the Project's cumulative impacts to less-than-significa levels.

Utilities and Service Systems

The Project would require water and wastewater infrastructure, as well as solid waste disposal for building operation. Development public utility infrastructure is part of an extensive planning process involving utility providers and jurisdictions with discretionary revie

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact

authority. The coordination process associated with the preparation of infrastructure plans is intended to ensure that adequate public util services and resources are available to serve both individual development projects and cumulative growth in the region. Each individu development project is subject to review for utility capacity to avoid unanticipated interruptions in service or inadequate suppli Coordination with the utility providers would allow for the provision of utility services to the Project and other developments. The Proj and other planned projects are subject to connection and service fees to offset increased demand and assist in facility expansion and servi improvements (at the time of need). Because of the utility planning and coordination activities described above, cumulatively-considerab impacts to utilities and service systems would not occur.

C) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		✓		

The Project's potential to result in environmental effects that could adversely affect human beings, either directly or indirectly, has be discussed throughout this Initial Study. In instances where the Project has potential to result in direct or indirect adverse effects to hum beings (air quality and associated effects on human health from air pollutants, and construction-related noise and potential effects hearing impairment), project design feature best practices and mitigation measures have been applied to ensure impacts to not rise abo a level of significance. With required implementation of project design features and the mitigation measures identified in this Init Study, construction and operation of the proposed Project would not involve any activities that would result in environmental effe which would cause substantial adverse effects on human beings, either directly or indirectly.

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Urban Crossroads, 2018b	Urban Crossroads, 2018b. *Centerpointe Mobile Source Diesel Health Risk Assessment, City of Moreno Valley.* June 4, 2018. (Technical Appendix B)
Urban Crossroads, 2018c	Urban Crossroads, 2018c. *Centerpointe Greenhouse Gas Analysis, City of Moreno Valley.* June 4, 2018. (Technical Appendix F)
Urban Crossroads, 2018d	Urban Crossroads, 2018d. *Centerpointe Noise Impact Analysis, City of Moreno Valley.* May 25, 2018. (Technical Appendix J)
Urban Crossroads, 2018e	Urban Crossroads, 2017e. *Centerpointe Traffic Impact Analysis, City of Moreno Valley.* September 12, 2018. (Technical Appendix K)

5.0 Mitigation Monitoring and Reporting Program

5.0 Mitigation Monitoring and Reporting Program (MMRP)

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
Biological Resources					
Threshold a & f: There is potential for the project to impact the burrowing owl species and/or protected nesting bird species.	**MM BR-1:** Within 30 days prior to grading, a qualified biologist shall conduct a survey of suitable habitat on site and make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report and shall be submitted, reviewed, and accepted by the County of Riverside prior to the issuance of a grading permit and subject to the following provisions: a) In the event that the pre-construction survey identifies no burrowing owls on the property a grading permit may be issued without restriction. b) In the event that the pre-construction survey identifies the presence of at least one individual but less than three (3) mating pairs of burrowing owl, then prior to the issuance of a grading permit and prior to the commencement of ground-disturbing activities on the property, the qualified biologist shall passively or actively relocate any burrowing owls. Passive relocation, including the required use of one-way doors to exclude owls from the site and the collapsing of burrows, will occur if the biologist determines that the proximity and availability of alternate habitat is suitable for successful passive relocation. Passive relocation shall follow California Department of Fish and Wildlife (CDFW) relocation protocol and shall only occur between September 15 and February 1. If proximate alternate habitat is not present as determined by the biologist, active relocation shall follow	Project Applicant, Project Biologist	City of Moreno Valley Planning Division & Land Development Division	Within 30 days prior to grading	Less than significant with mitigation incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	CDFW relocation protocol. The biologist shall confirm in writing that the species has fledged the site or been relocated prior to the issuance of a grading permit. c) In the event that the pre-construction survey identifies the presence of three (3) or more mating pairs of burrowing owl, the requirements of MSHCP Species-Specific Conservation Objectives 5 for the burrowing owl shall be followed. Objective 5 states that if the site (including adjacent areas) supports three (3) or more pairs of burrowing owls and supports greater than 35 acres of suitable habitat, at least 90 percent of the area with long-term conservation value and burrowing owl pairs will be conserved onsite until it is demonstrated that Objectives 1-4 have been met. A grading permit shall be issued, either: i. Upon approval and implementation of a property-specific Determination of Biologically Superior Preservation (DBESP) report for the burrowing owl by the CDFW; or ii. A determination by the biologist that the site is part of an area supporting less than 35 acres of suitable Habitat, and upon passive or active relocation of the species following accepted CDFW protocols. Passive relocation, including the required use of one-way doors to exclude owls from the site and the collapsing of burrows, will occur if the biologist determines that the proximity and availability of alternate habitat is suitable for successful passive relocation. Passive relocation shall follow CDFW relocation protocol and shall only occur between September 15 and February 1. If proximate alternate habitat is not				

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	present as determined by the biologist, active relocation shall follow CDFW relocation protocol. The biologist shall confirm in writing that the species has fledged the site or been relocated prior to the issuance of a grading permit.				
	MM BR-2: Vegetation clearing and ground disturbance shall be prohibited during the migratory bird nesting season (February 1 through September 15), unless a migratory bird nesting survey is completed in accordance with the following requirements: a) A migratory bird nesting survey of the Project's impact footprint, including suitable habitat within a 500-foot radius, shall be conducted by a qualified biologist within three (3) days prior to initiating vegetation clearing or ground disturbance. b) A copy of the migratory nesting bird survey results report shall be provided to the City of Moreno Valley. If the survey identifies the presence of active nests, then the qualified biologist shall provide the City with a copy of maps showing the location of all nests and an appropriate buffer zone around each nest sufficient to protect the nest from direct and indirect impact. The size and location of all buffer zones, if required, shall be subject to review and approval by the City and shall be no less than a 100-foot radius around the nest for non-raptors and no more than a 500-foot radius around the nest for raptors. The nests and buffer zones shall be field checked weekly by a qualified biological monitor. The approved buffer zone shall be marked in the field with construction fencing, within which no vegetation clearing or ground disturbance shall commence until the	Project Biologist, Project Construction Contractor	City of Moreno Valley Planning Division	Within 3 days prior to initiating vegetation clearing or ground disturbance	Less than significant with mitigation incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	qualified biologist and the City verify that the nests are no longer occupied and juvenile birds can survive independently from the nests.				
Threshold d: The Project would be removing trees and low-lying vegetation across the Project site that has the potential to support nesting migratory birds that are protected by the Migratory Bird Treaty Act and California Fish and Game Code, including the burrowing owl.	**MM BR-1** and **MM BR-2** shall apply.	Refer to MM BR-1 and MM BR-2	Refer to MM BR-1 and MM BR-2	Refer to MM BR-1 and MM BR-2	Refer to MM BR-1 and MM BR-2
Cultural Resources					
Threshold c: The Project site has "High Potential/Sensitivity (High B)," which indicates that fossils are likely to be encountered at or below four feet of depth, and may be impacted during excavation by construction activities.	**MM CR-1:** Prior to the issuance of a grading permit, the Project Applicant shall provide evidence to the City of Moreno Valley that a qualified paleontologist has been retained by the Project Applicant to conduct monitoring of excavation activities and has the authority to halt and redirect earthmoving activities in the event that suspected paleontological resources are unearthed.	Project Applicant/ Project Construction Contractor, Project Paleontologist	City of Moreno Valley Planning Division	Prior to the issuance of a grading permit	Less than significant with mitigation incorporated
	MM CR-2: The paleontological monitor shall conduct full-time monitoring during grading and excavation operations in undisturbed, very old alluvial fan sediments at or below four (4) feet below ground surface and shall be equipped to salvage fossils if they are unearthed to avoid construction delays and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. The paleontological monitor shall be empowered to temporarily halt or divert equipment to allow of removal of abundant and large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the	Project Applicant/ Project Construction Contractor, Project Paleontologist	City of Moreno Valley Planning Division	Concurrent with grading activities	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	subsurface, or if present, are determined upon exposure and examination by qualified paleontological personnel to have a low potential to contain or yield fossil resources.				
	MM CR-3: Recovered specimens shall be properly prepared to a point of identification and permanent preservation, including screen washing sediments to recover small invertebrates and vertebrates, if necessary. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage, such as the Western Science Museum in Hemet, California, is required for significant discoveries. The paleontological program should include a written repository agreement prior to the initiation of mitigation activities.	Project Applicant/ Project Construction Contractor, Project Paleontologist	City of Moreno Valley Planning Division	Prior to grading permit final inspection	
	MM CR-4: A final monitoring and mitigation report of findings and significance shall be prepared, including lists of all fossils recovered, if any, and necessary maps and graphics to accurately record the original location of the specimens. The report shall be submitted to the City of Moreno Valley prior to building final.	Project Applicant/ Project Construction Contractor, Project Paleontologist	City of Moreno Valley Planning Division	Prior to building final	
Land Use and Planning					
Threshold b: The Project would be inconsistent with the City's General Plan Land Use Plan and Zoning Ordinance, which would result in significant, adverse physical effects to the environment.	MM BR-1 and MM BR-2, MM CR-1 through MM CR-4, and TR-1 through TR-4 shall apply.	Project Applicant	City of Moreno Valley Planning Division	Prior to the issuance of a building permits	Less than significant with Mitigation Incorporated
Tribal Cultural Resources					
Thresholds a & b: Project construction has the potential to uncover tribal cultural resources	**MM TR-1:** Prior to the issuance of a grading permit, the Developer shall retain a professional archaeologist to conduct monitoring of all mass	Project Archaeologist, Project Applicant, Construction	City of Moreno Valley Planning Division	Prior to the issuance of a grading permit	Less than significant with Mitigation Incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
and is subject to compliance with Assembly Bill 52.	grading and trenching activities. The Project Archaeologist shall have the authority to temporarily redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. The Project Archaeologist, in consultation with the Consulting Tribe(s), the contractor, and the City, shall develop a Cultural Resources Management Plan (CRMP) in consultation pursuant to the definition in AB52 to address the details, timing and responsibility of all archaeological and cultural activities that will occur on the project site. A consulting tribe is defined as a tribe that initiated the AB 52 tribal consultation process for the Project, has not opted out of the AB52 consultation process, and has completed AB 52 consultation with the City as provided for in Cal Pub Res Code Section 21080.3.2(b)(1) of AB52. Details in the Plan shall include: a.) Project grading and development scheduling; b) The Project archeologist and the Consulting Tribes(s) as defined in CR-1 shall attend the pre-grading meeting with the City, the construction manager and any contractors and will conduct a mandatory Cultural Resources Worker Sensitivity Training to those in attendance. The Training will include a brief review of the cultural sensitivity of the Project and the surrounding area; what resources could potentially be identified during earthmoving activities; the requirements of the monitoring program; the protocols that apply in the event inadvertent discoveries of cultural resources are identified, including who to contact and appropriate avoidance measures until the find(s) can be properly evaluated; and any	Contractor, Consulting Native American Tribe(s)			

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	other appropriate protocols. All new construction personnel that will conduct earthwork or grading activities that begin work on the Project following the initial Training must take the Cultural Sensitivity Training prior to beginning work and the Project archaeologist and Consulting Tribe(s) shall make themselves available to provide the training on an as-needed basis; c) The protocols and stipulations that the contractor, City, Consulting Tribe(s) and Project archaeologist will follow in the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits that shall be subject to a cultural resources evaluation. **MM TR-2:** Prior to the issuance of a grading permit, the Developer shall secure agreements with the Pechanga Band of Luiseño Indians and Soboba Band of Luiseño Indians for tribal monitoring. The Developer is also required to provide a minimum of 30 days advance notice to the tribes of all mass grading and trenching activities. The Native American Tribal Representatives shall have the authority to temporarily halt and redirect earth moving activities in the affected area in the event that suspected archaeological resources are unearthed. If the Native American Tribal Representatives suspect that an archaeological resource may have been unearthed, the Project Archaeologist or the Tribal Representatives shall immediately redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of the suspected resource. In consultation with the Native American Tribal Representatives, the Project Archaeologist shall evaluate the suspected resource and make a determination of	Project Applicant, Native American Monitor	City of Moreno Valley Planning Division	Prior to the issuance of a grading permit	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	significance pursuant to California Public Resources Code Section 21083.2. **MM TR-3:** In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries: a) One or more of the following treatments, in order of preference, shall be employed with the tribes. Evidence of such shall be provided to the City of Moreno Valley Planning Department: i. Preservation-In-Place of the cultural resources, if feasible. Preservation in place means avoiding the resources, leaving them in the place they were found with no development affecting the integrity of the resources. ii. Onsite reburial of the discovered items as detailed in the treatment plan required pursuant to Mitigation Measure CR-1. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments as defined in CR-1. **MM TR-4:** The City shall verify that the following note is included on the Grading Plan: "If any suspected archaeological resources are	Construction Contractor, Project Archaeologist, Native American Monitor Project Applicant, City of Moreno	City of Moreno Valley Planning Division and Building & Safety Division City of Moreno Valley Planning	Concurrent with grading activities Concurrent with grading activities	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	discovered during ground-disturbing activities and the Project Archaeologist or Native American Tribal Representatives are not present, the construction supervisor is obligated to halt work in a 100-foot radius around the find and call the Project Archaeologist and the Tribal Representatives to the site to assess the significance of the find."	Valley Planning Division	Division and Building & Safety Division		
	MM TR-5: If potential historic or cultural resources are uncovered during excavation or construction activities at the project site, work in the affected area must cease immediately and a qualified person meeting the Secretary of the Interior's standards (36 CFR 61), Tribal Representatives, and all site monitors per the Mitigation Measures, shall be consulted by the City to evaluate the find, and as appropriate recommend alternative measures to avoid, minimize or mitigate negative effects on the historic, or prehistoric resource. Determinations and recommendations by the consultant shall be immediately submitted to the Planning Division for consideration, and implemented as deemed appropriate by the Community Development Director, in consultation with the State Historic Preservation Officer (SHPO) and any and all Consulting Native American Tribes as defined in CR-1 before any further work commences in the affected area.	Construction Contractor, Native American Monitor	City of Moreno Valley Planning Division, Consulting Native American Tribes, State Historic Preservation Officer	Concurrent with grading activities	
	MM TR-6: If human remains are discovered, no further disturbance shall occur in the affected area until the County Coroner has made necessary findings as to origin. If the County Coroner determines that the remains are potentially Native American, the California Native American Heritage Commission shall be notified within 24 hours of the published finding to be given a reasonable opportunity to identify	Construction Contractor	County Coroner, California Native American Heritage Commission	Concurrent with grading activities	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	the "most likely descendant". The "most likely descendant" shall then make recommendations, and engage in consultations concerning the treatment of the remains (California Public Resources Code 5097.98). (GP Objective 23.3, CEQA).				

Mitigation Monitoring and Report Program (MMRP)

Centerpointe Commerce Center

Moreno Valley, California

Lead Agency
City of Moreno Valley
14177 Frederick Street
Moreno Valley, CA 92552

Applicant
Newcastle Partners
4740 Green River Road, Suite 118
Corona, CA 92880

CEQA Consultant
T&B Planning, Inc.
17542 East 17th Street, Suite 100
Tustin, CA 92780

Lead Agency Discretionary Permits
Plot Plan (PEN18-0023)
General Plan Amendment (PEN18-0024)
Change of Zone (PEN18-0025)

October 2018

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
Biological Resources					
Threshold a & f: There is potential for the project to impact the burrowing owl species and/or protected nesting bird species.	**MM BR-1:** Within 30 days prior to grading, a qualified biologist shall conduct a survey of suitable habitat on site and make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report and shall be submitted, reviewed, and accepted by the County of Riverside prior to the issuance of a grading permit and subject to the following provisions: a) In the event that the pre-construction survey identifies no burrowing owls on the property a grading permit may be issued without restriction. b) In the event that the pre-construction survey identifies the presence of at least one individual but less than three (3) mating pairs of burrowing owl, then prior to the issuance of a grading permit and prior to the commencement of ground-disturbing activities on the property, the qualified biologist shall passively or actively relocate any burrowing owls. Passive relocation, including the required use of one-way doors to exclude owls from the site and the collapsing of burrows, will occur if the biologist determines that the proximity and availability of alternate habitat is suitable for successful passive relocation. Passive relocation shall follow California Department of Fish and Wildlife (CDFW) relocation protocol and shall only occur between September 15 and February 1. If proximate alternate habitat is not present as determined by the biologist, active relocation shall follow CDFW relocation protocol. The biologist shall confirm in writing that the species has fledged the site	Project Applicant, Project Biologist	City of Moreno Valley Planning Division & Land Development Division	Within 30 days prior to grading	Less than significant with mitigation incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	or been relocated prior to the issuance of a grading permit. c) In the event that the pre-construction survey identifies the presence of three (3) or more mating pairs of burrowing owl, the requirements of MSHCP Species-Specific Conservation Objectives 5 for the burrowing owl shall be followed. Objective 5 states that if the site (including adjacent areas) supports three (3) or more pairs of burrowing owls and supports greater than 35 acres of suitable habitat, at least 90 percent of the area with long-term conservation value and burrowing owl pairs will be conserved onsite until it is demonstrated that Objectives 1-4 have been met. A grading permit shall be issued, either: i. Upon approval and implementation of a property-specific Determination of Biologically Superior Preservation (DBESP) report for the burrowing owl by the CDFW; or ii. A determination by the biologist that the site is part of an area supporting less than 35 acres of suitable Habitat, and upon passive or active relocation of the species following accepted CDFW protocols. Passive relocation, including the required use of one-way doors to exclude owls from the site and the collapsing of burrows, will occur if the biologist determines that the proximity and availability of alternate habitat is suitable for successful passive relocation. Passive relocation shall follow CDFW relocation protocol and shall only occur between September 15 and February 1. If proximate alternate habitat is not				

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	present as determined by the biologist, active relocation shall follow CDFW relocation protocol. The biologist shall confirm in writing that the species has fledged the site or been relocated prior to the issuance of a grading permit. **MM BR-2:** Vegetation clearing and ground disturbance shall be prohibited during the migratory bird nesting season (February 1 through September 15), unless a migratory bird nesting survey is completed in accordance with the following requirements: a) A migratory bird nesting survey of the Project's impact footprint, including suitable habitat within a 500-foot radius, shall be conducted by a qualified biologist within three (3) days prior to initiating vegetation clearing or ground disturbance. b) A copy of the migratory nesting bird survey results report shall be provided to the City of Moreno Valley. If the survey identifies the presence of active nests, then the qualified biologist shall provide the City with a copy of maps showing the location of all nests and an appropriate buffer zone around each nest sufficient to protect the nest from direct and indirect impact. The size and location of all buffer zones, if required, shall be subject to review and approval by the City and shall be no less than a 100-foot radius around the nest for non-raptors and no more than a 500-foot radius around the nest for raptors. The nests and buffer zones shall be field checked weekly by a qualified biological monitor. The approved buffer zone shall be marked in the field with construction fencing, within which no vegetation clearing or ground disturbance shall commence until the	Project Biologist, Project Construction Contractor	City of Moreno Valley Planning Division	Within 3 days prior to initiating vegetation clearing or ground disturbance	Less than significant with mitigation incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	qualified biologist and the City verify that the nests are no longer occupied and juvenile birds can survive independently from the nests.				
Threshold d: The Project would be removing trees and low-lying vegetation across the Project site that has the potential to support nesting migratory birds that are protected by the Migratory Bird Treaty Act and California Fish and Game Code, including the burrowing owl.	**MM BR-1** and **MM BR-2** shall apply.	Refer to MM BR-1 and MM BR-2	Refer to MM BR-1 and MM BR-2	Refer to MM BR-1 and MM BR-2	Refer to MM BR-1 and MM BR-2
Cultural Resources					
Threshold c: The Project site has "High Potential/Sensitivity (High B)," which indicates that fossils are likely to be encountered at or below four feet of depth, and may be impacted during excavation by construction activities.	**MM CR-1:** Prior to the issuance of a grading permit, the Project Applicant shall provide evidence to the City of Moreno Valley that a qualified paleontologist has been retained by the Project Applicant to conduct monitoring of excavation activities and has the authority to halt and redirect earthmoving activities in the event that suspected paleontological resources are unearthed.	Project Applicant/ Project Construction Contractor, Project Paleontologist	City of Moreno Valley Planning Division	Prior to the issuance of a grading permit	Less than significant with mitigation incorporated
	MM CR-2: The paleontological monitor shall conduct full-time monitoring during grading and excavation operations in undisturbed, very old alluvial fan sediments at or below four (4) feet below ground surface and shall be equipped to salvage fossils if they are unearthed to avoid construction delays and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. The paleontological monitor shall be empowered to temporarily halt or divert equipment to allow of removal of abundant and large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or if	Project Applicant/ Project Construction Contractor, Project Paleontologist	City of Moreno Valley Planning Division	Concurrent with grading activities	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	present, are determined upon exposure and examination by qualified paleontological personnel to have a low potential to contain or yield fossil resources. **MM CR-3:** Recovered specimens shall be properly prepared to a point of identification and permanent preservation, including screen washing sediments to recover small invertebrates and vertebrates, if necessary. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage, such as the Western Science Museum in Hemet, California, is required for significant discoveries. The paleontological program should include a written repository agreement prior to the initiation of mitigation activities. **MM CR-4:** A final monitoring and mitigation report of findings and significance shall be prepared, including lists of all fossils recovered, if any, and necessary maps and graphics to accurately record the original location of the specimens. The report shall be submitted to the City of Moreno Valley prior to building final.	Project Applicant/ Project Construction Contractor, Project Paleontologist Project Applicant/ Project Construction Contractor, Project Paleontologist	City of Moreno Valley Planning Division City of Moreno Valley Planning Division	Prior to grading permit final inspection Prior to building final	
Land Use and Planning					
Threshold b: The Project would be inconsistent with the City's General Plan Land Use Plan and Zoning Ordinance, which would result in significant, adverse physical effects to the environment.	MM BR-1 and MM BR-2, MM CR-1 through MM CR-4, and TR-1 through TR-4 shall apply.	Project Applicant	City of Moreno Valley Planning Division	Prior to the issuance of a building permits	Less than significant with Mitigation Incorporated
Tribal Cultural Resources					
Thresholds a & b: Project construction has the potential to uncover tribal cultural resources	**MM TR-1:** Prior to the issuance of a grading permit, the Project Applicant shall provide evidence to the City of Moreno Valley that a	Project Archaeologist, Project Applicant, Construction	City of Moreno Valley Planning Division	Prior to the issuance of a grading permit	Less than significant with Mitigation Incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
and is subject to compliance with Assembly Bill 52.	professional archaeologist (hereafter "Project Archaeologist") has been retained to conduct monitoring of all mass grading and trenching activities. The Project Archaeologist shall have the authority to temporarily redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. The Project Archaeologist, in consultation with the Consulting Native American Tribes, the contractor, and the City, shall develop a Cultural Resources Management Plan (CRMP) to address the details, timing and responsibility of all archaeological and cultural monitoring activities that will occur on the project site. A Consulting Native American Tribe is defined as a tribe that initiated the AB 52 tribal consultation process for the Project, has not opted out of the AB52 consultation process, and has completed AB 52 consultation with the City as provided for in Public Resources Code Section 21080.3.2(b)(1), and includes the Soboba Band of Luiseño Indians and the Pechanga Band of Luiseño Indians. Details in the Plan shall include: a.) Project grading and development scheduling; b) The Project archeologist and the Consulting Native American Tribe(s) as defined in TR-1 shall attend the pre-grading meeting with the City, the construction manager and any contractors and will conduct a mandatory Cultural Resources Worker Sensitivity Training to those in attendance. The Training will include a brief review of the cultural sensitivity of the Project and the surrounding area; what resources could potentially be identified during earthmoving activities; the	Contractor, Consulting Native American Tribe(s)			

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	requirements of the monitoring program; the protocols that apply in the event inadvertent discoveries of cultural resources are identified, including who to contact and appropriate avoidance measures until the find(s) can be properly evaluated; and any other appropriate protocols. All new construction personnel that will conduct earthwork or grading activities that begin work on the Project following the initial Training must take the Cultural Sensitivity Training prior to beginning work and the Project archaeologist and Consulting Native American Tribe(s) shall make themselves available to provide the training on an as-needed basis; c) The protocols and stipulations that the contractor, City, Consulting Native American Tribe(s) and Project archaeologist will follow in the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits that shall be subject to a cultural resources evaluation.				
	MM TR-2: Prior to the issuance of a grading permit, the Project Applicant shall provide evidence to the City of Moreno Valley that Consulting Native American Tribe(s), as defined in Mitigation Measure TR-1, shall receive a minimum of 30 days advance notice of all mass grading and trenching activities. The Project Applicant also shall provide the City of Moreno Valley with copies of any monitoring agreement(s) with the Consulting Native American Tribe(s). During mass grading and trenching activities, the Native American Tribal Representatives shall have the authority to temporarily halt and redirect earth moving activities in the affected area in the event that suspected archaeological	Project Applicant, Native American Monitor	City of Moreno Valley Planning Division	Prior to the issuance of a grading permit	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	resources are unearthed. If the Native American Tribal Representatives suspect that an archaeological resource may have been unearthed, the Project Archaeologist or the Tribal Representatives shall immediately redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of the suspected resource.				
	MM TR-3: If potential tribal cultural resources are uncovered during mass grading and/or excavation activities, the Project Archaeologist shall evaluate the suspected resource in consultation with the Native American Tribal Representatives and the City of Moreno Valley and shall: make a determination of significance pursuant to Public Resources Code Section 21083.2; and recommend measures to avoid, minimize or mitigate negative effects on the tribal cultural resource. Determinations and recommendations by the Project Archaeologist shall be immediately submitted to the City of Moreno Valley Planning Division for consideration, and implemented as deemed appropriate by the Community Development Director and all Consulting Native American Tribes, as defined in Mitigation Measure TR-1, before any further work commences in the affected area.	Construction Contractor, Project Archaeologist, Native American Monitor	City of Moreno Valley Planning Division and Building & Safety Division	Concurrent with grading activities	
	MM TR-4: In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries: a) One or more of the following treatments, in order of preference, shall be employed based on consultation with the City of Moreno Valley and the Native American Tribe(s). Evidence of such shall be provided	Construction Contractor, Project Archaeologist, Native American Monitor	City of Moreno Valley Planning Division and Building & Safety Division	Concurrent with grading activities	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	to the City of Moreno Valley Planning Department: i. Preservation-In-Place of the cultural resources, if feasible. Preservation in place means avoiding the resources, leaving them in the place they were found with no development affecting the integrity of the resources. ii. Onsite reburial of the discovered items as detailed in the treatment plan required pursuant to Mitigation Measure TR-1. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. No recordation of sacred items is permitted without the written consent of all Native American Tribe(s) as defined in Mitigation Measure TR-1. iii. Donation of the discovered items and associated records to a qualified repository within Riverside County that meets federal standards per 36 CFR Part 79.				
	MM TR-5: The City shall verify that the following note is included on the Grading Plan: "If any suspected archaeological resources are discovered during ground-disturbing activities and the Project Archaeologist or Native American Tribal Representatives are not present, the construction supervisor is obligated to halt work in a 100-foot radius around the find and call the Project	Project Applicant, City of Moreno Valley Planning Division	City of Moreno Valley Planning Division and Building & Safety Division	Concurrent with grading activities	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	Archaeologist and the Tribal Representatives to the site to assess the significance of the find."				

RESOLUTION NO. 2018-44

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY RECOMMENDING THAT THE CITY COUNCIL APPROVE GENERAL PLAN AMENDMENT NO. PEN18-0024 TO CHANGE THE LAND USE DESIGNATION FROM OFFICE TO BUSINESS PARK FOR APPROXIMATELY 8.8 ACRES LOCATED AT THE NORTHEAST CORNER OF BRODIAEA AVENUE AND FREDERICK STREET (ASSESSOR PARCEL NUMBER (APN) 297-170-029

WHEREAS, the applicant, Newcastle Partners, Inc. filed Application No. PEN18-0024, requesting an amendment to the General Plan to change the land use designation of a certain property as described in the title of this resolution and the attached Exhibit A, from Office to Business Park; and

WHEREAS, the application for the General Plan Amendment has been evaluated in accordance with established City of Moreno Valley (City) procedures, and with consideration of the General Plan and other applicable regulations; and

WHEREAS, the proposed application for the General Plan Amendment has been fully evaluated and considered with respect to the City's General Plan; and

WHEREAS, the City completed an independent review of the project for consistency with the California Environmental Quality Act (CEQA). Based on a thorough analysis including preparation of a detailed Initial Study, staff determined that the project impacts are less than significant with mitigation and approval of a Mitigated Negative Declaration is recommended; and

WHEREAS, on October 11, 2018, the Planning Commission of the City of Moreno Valley held a public hearing to consider the subject applications and all of the environmental documentation prepared for the project; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred; and

WHEREAS, the Planning Commission considered the Initial Study prepared for the project for the purpose of compliance with the California Environmental Quality Act (CEQA). Based on the Initial Study, it was determined that the project impacts are less than significant with mitigation and approval of a Mitigated Negative Declaration is recommended.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

A. This Planning Commission specifically finds that all of the facts set forth above in the Resolution are true and correct.

B. Based upon substantial evidence presented to this Planning Commission during the above-referenced meeting on October 11, 2018, including written and oral staff reports, and the record from the public hearing, this Planning Commission finds as follows:

1. Conformance with General Plan Policies – The proposed General Plan Amendment is consistent with the goals, objectives, policies and programs of the General Plan.

   FACT: The General Plan Amendment is proposed to allow for the development of a 204,022 square-foot warehouse including 10,000 square feet of associated office and mezzanine space on a 8.8-acre site. The General Plan encourages a mix of industrial uses to provide a diverse economic base and ample employment opportunities. The existing General Plan Land Use Designation for the project site is Office which provides for administrative, professional, legal, medical and financial offices. The proposed Project includes a request for a General Plan Amendment to change the General Plan Land Use Designation of the subject site to Business Park which provides for manufacturing, research and development, warehousing and distribution, as well as office and support commercial activities.

   The intent of the General Plan, as expressed in Objective 2.5 of Community Development Element, is to promote a mix of industrial uses which provide a sound and diversified economic base and ample employment opportunities for the citizens of Moreno Valley with the establishment of industrial activities that have good access to the regional transportation system, accommodate the personal needs of workers and business visitors; and which meets the service needs of local businesses.

   The proposed Business Park land use designation is consistent with the goals, objectives, policies and programs of the Community Development Element of the General Plan.

2. Health, Safety and Welfare – The proposed General Plan Amendment will not be detrimental to the public health, safety and welfare.

   FACT: The proposed General Plan Amendment will change the project site's existing land use designation from Office to Business Park which will allow the construction and operation of a proposed 204,022 square-

foot warehouse facility including associated 10,000 square feet of office and mezzanine space. This proposed designation and use would be compatible with the surrounding area which primarily consists of similar light industrial uses, as well as professional office and commercial developments. Therefore, the project will not have adverse effects on residential neighborhoods or other types of sensitive land uses.

The implementation of the proposed General Plan Amendment for the 8.8-acre site, as designed and conditioned will not adversely affect the public health, safety and welfare, and is consistent with General Plan Objectives 6.1 and 6.2 to minimize the potential for loss of life and protect residents, workers and visitors from physical injury and property damage due to seismic ground shaking and flooding.

The analysis presented in the Initial Study/Mitigated Negative Declaration prepared for the Project (including the General Plan Amendment), pursuant to California Environmental Quality Act (CEQA), Public Resources Code 21000, indicates that the Project will not have a significant environmental impact as designed and mitigated.

BE IT FURTHER RESOLVED that the Planning Commission HEREBY APPROVES Resolution No. 2018-44, and RECOMMENDS that the City Council:

APPROVE the General Plan Amendment PEN18-0024, based on the findings contained in this resolution and the General Plan Map attached hereto as Exhibit A.

APPROVED this 11th day of October, 2018.

AYES:
NOES:
ABSTAIN:

_____
Jeffrey Barnes
Chair, Planning Commission

ATTEST:

_____
Albert Armijo, Interim Planning Manager
Secretary to the Planning Commission

APPROVED AS TO FORM:

_____
City Attorney

ATTACHED: Exhibit A: Proposed Amendment to the General Plan Land Use Map

GENERAL PLAN AMENDMENT
Application No. PEN18-0024
APN: 297-170-029
Resolution No. 2018-44

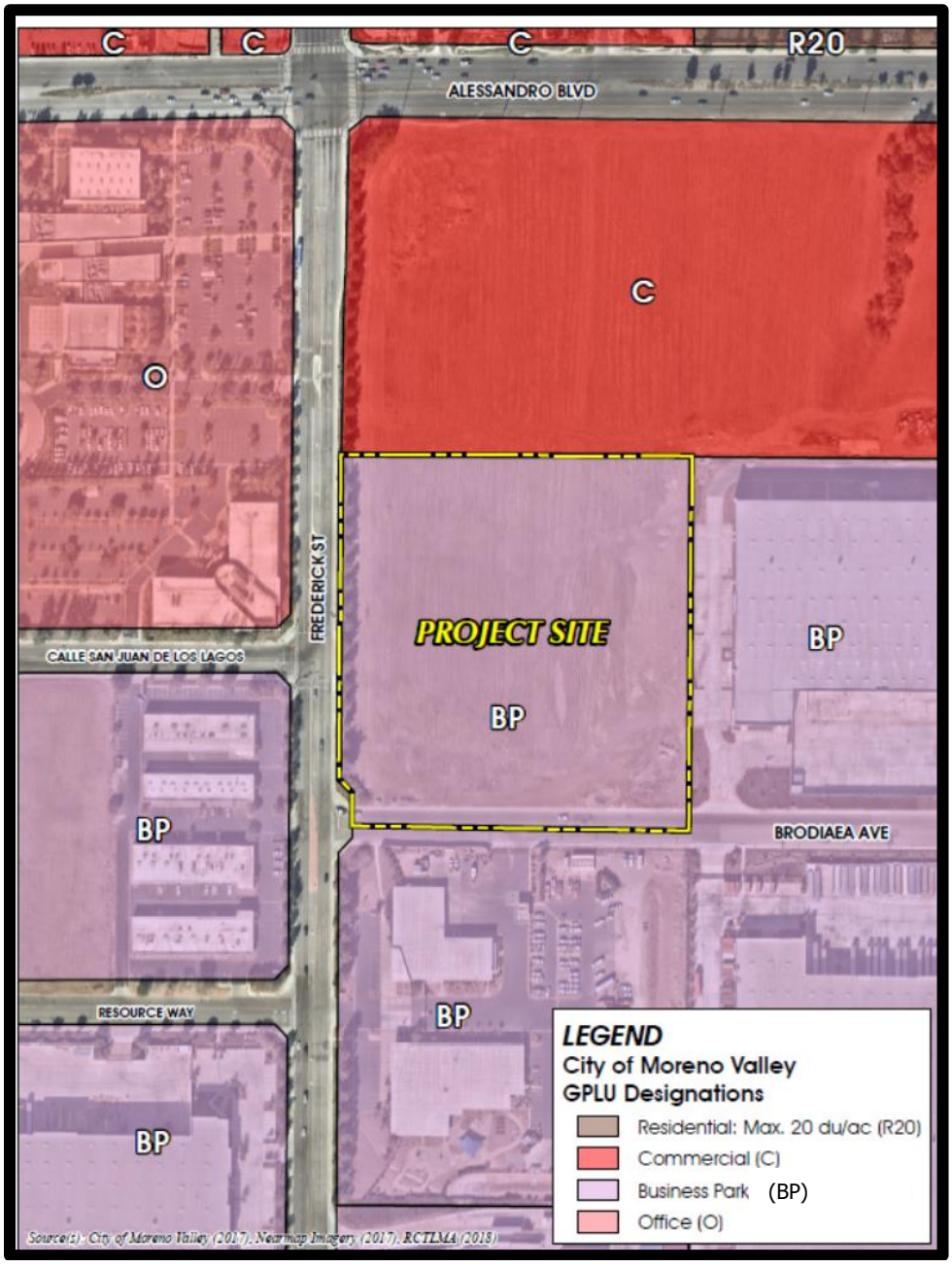


EXHIBIT A

RESOLUTION NO. 2018-45

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY RECOMMENDING THAT THE CITY COUNCIL APPROVE ZONE CHANGE APPLICATION NO. PEN18-0025: AN AMENDMENT TO THE OFFICIAL ZONING ATLAS, CHANGING THE ZONING CLASSIFICATION FROM OFFICE TO LIGHT INDUSTRIAL FOR APPROXIMATELY 8.8 ACRES LOCATED AT THE NORTHEAST CORNER OF BRODIAEA AVENUE AND FREDERICK STREET (ASSESSOR PARCEL NUMBER (APN) 297-170-029

WHEREAS, the applicant, Newcastle Partners, Inc. filed Application No. PEN18-0025, requesting an amendment to Page 96 of the Official Zoning Atlas and to the zoning classification for a certain property, as described in the title of this resolution and the attached Exhibit A; and

WHEREAS, the application for the Change of Zone has been evaluated in accordance with established City of Moreno Valley (City) procedures, and with consideration of the General Plan and other applicable regulations; and

WHEREAS, the proposed application for the Change of Zone has been fully evaluated and considered with respect to the City's General Plan; and

WHEREAS, the City completed an independent review of the project for consistency with the California Environmental Quality Act (CEQA). Based on a thorough analysis including preparation of a detailed Initial Study, staff determined that the project impacts are less than significant with mitigation and approval of a Mitigated Negative Declaration is recommended; and

WHEREAS, on October 11, 2018, the Planning Commission of the City of Moreno Valley held a public hearing to consider the subject applications and all of the environmental documentation prepared for the project; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred; and

WHEREAS, the Planning Commission considered the Initial Study prepared for the project for the purpose of compliance with the California Environmental Quality Act (CEQA). Based on the Initial Study, it was determined that the project impacts are less than significant with mitigation and approval of a Mitigated Negative Declaration is recommended.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

A. This Planning Commission specifically finds that all of the facts set forth above in the Resolution are true and correct.

B. Based upon substantial evidence presented to this Planning Commission during the above-referenced meeting on October 11, 2018, including written and oral staff reports, and the record from the public hearing, this Planning Commission finds as follows:

1. Conformance with General Plan Policies – The proposed Change of Zone is consistent with the General Plan, and its goals, objectives, policies and programs.

   FACT: The General Plan encourages a mix of industrial uses to provide a diverse economic base and ample employment opportunities. The existing General Plan Land Use Designation for the project site is "Office" which provides for administrative, professional, legal, medical and financial offices. The proposed Project includes a request for a General Plan Amendment to change the General Plan Land Use Designation of the subject site to Business Park which provides for manufacturing, research and development, warehousing and distribution, as well as office and support commercial activities.

   With the approval of the proposed General Plan Amendment PEN18-0024, the proposed Change of Zone from Office to Light Industrial will be consistent with the General Plan Land Use Designation of Business Park/Light Industrial.

   The intent of the General Plan, as expressed in Objective 2.5 of Community Development Element, is to promote a mix of industrial uses which provide a sound and diversified economic base and ample employment opportunities for the citizens of Moreno Valley with the establishment of industrial activities that have good access to the regional transportation system, accommodate the personal needs of workers and business visitors; and which meets the service needs of local businesses.

2. Conformance with the Zoning Regulations – The proposed zoning is consistent with the purposes and intent of Title 9 of the City of Moreno Valley Municipal Code

   FACT: As proposed, the Change of Zone from Office to Light Industrial for the 8.8 acre project site is consistent with the purposes and intent of

Title 9. Future warehouse development under the Light Industrial zoning district provides for light manufacturing, light industrial, research and development, warehousing and distribution and multi-tenant industrial uses, as well as certain supporting administrative and professional offices, and commercial uses on a limited basis. This district is intended as an area for light industrial uses (including buildings over 50,000 square feet) that can meet high performance standards.

The proposed warehouse development complies with all established development standards for Light Industrial zoning districts, including setbacks, height, site coverage and landscaping and site and building design considerations.

Although the proposed Zoning designation for the project site will change from Office to Light Industrial, it will be compatible with the existing developments immediately to the east, south and the southwest which are zoned Light Industrial (LI) and Business Park (BP). The property immediately to the north of the site along Alessandro Boulevard is currently undeveloped, and zoned Community Commercial (CC) with a Mixed-Use Institutional Overlay, compatible with the City Hall complex to the west.

3. Health, Safety and Welfare – The proposed Change of Zone will not be detrimental to the public health, safety and welfare.

FACT: The proposed Change of Zone will change the project site's existing zoning designation from Office to Light Industrial which will allow the construction and operation of a proposed 204,022 square-foot warehouse facility. This proposed designation and use would be compatible with the surrounding area which primarily consists of similar light industrial uses, as well as professional office and commercial developments. Therefore, the project will not have adverse effects on residential neighborhoods or other types of sensitive land uses.

The proposed Change of Zone has been reviewed by the Riverside County Airport Land Use Commission (ALUC) for consistency with the March Air Reserve Base Land Use Compatibility Plan (ALUCP). The project was found to be compatible with the ALUCP with specific conditions of approval which have been incorporated in the project conditions of approval.

The implementation of the proposed Change of Zone for the 8.8-acre site, as designed and conditioned will not adversely affect the public health, safety and welfare, and is consistent with General Plan Objectives 6.1 and 6.2 to minimize the potential for loss of life and

protect residents, workers and visitors from physical injury and property damage due to seismic ground shaking and flooding.

The analysis presented in the Initial Study/Mitigated Negative Declaration prepared for the Project (including the Change of Zone), pursuant to California Environmental Quality Act (CEQA), Public Resources Code 21000, indicates that the Project will not have a significant environmental impact as designed and mitigated.

BE IT FURTHER RESOLVED that the Planning Commission HEREBY APPROVES Resolution No. 2018-45, and RECOMMENDS that the City Council:

APPROVE the Change of Zone Application No. PEN18-0025, based on the findings contained in this resolution amending Zoning Map Page 96 of the Official Zoning Atlas attached hereto as Exhibit A.

APPROVED this 11th day of October, 2018.

AYES:
NOES:
ABSTAIN:

_____
Jeffrey Barnes
Chair, Planning Commission

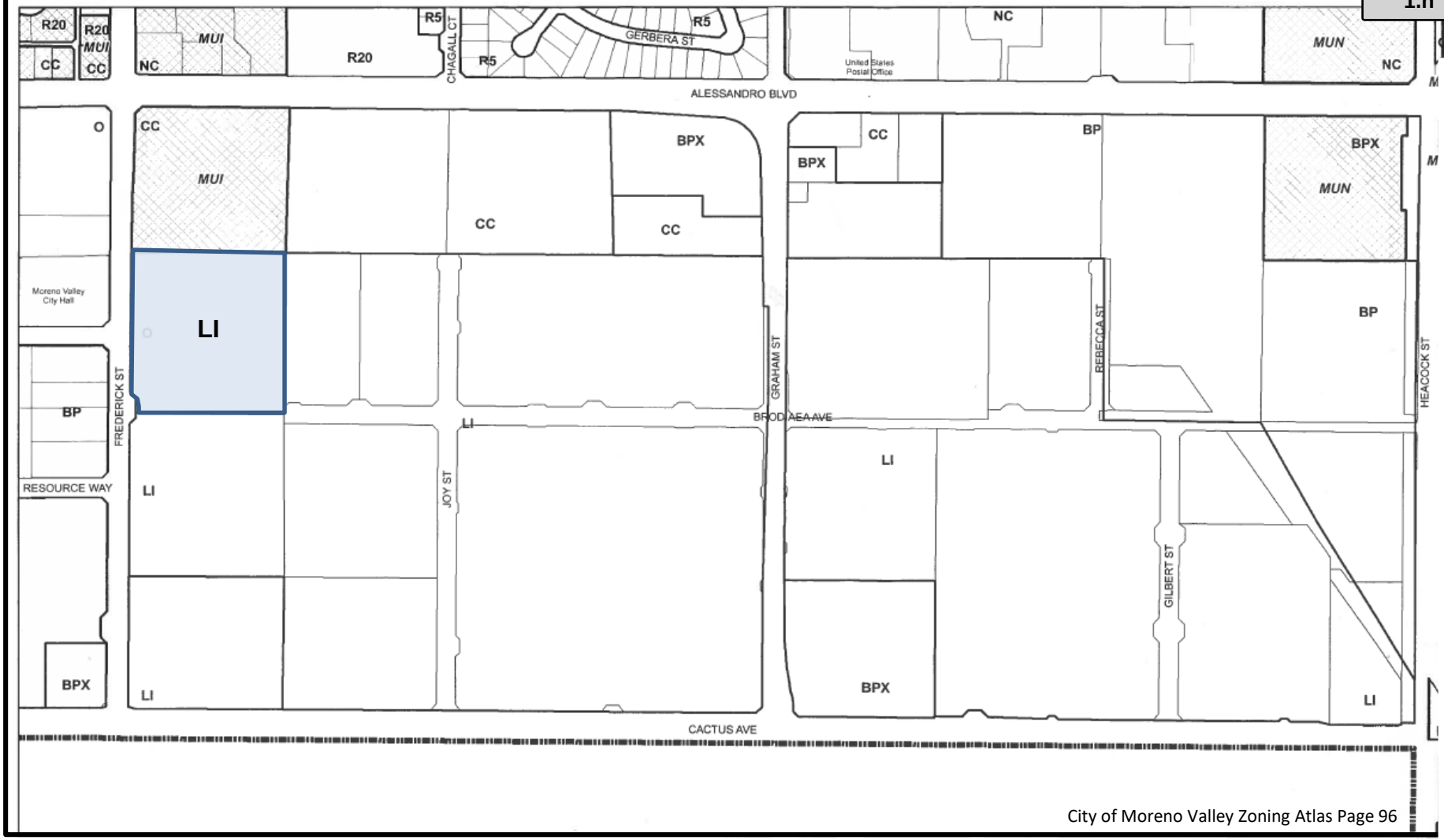
ATTEST:

_____
Albert Armijo, Interim Planning Manager
Secretary to the Planning Commission

APPROVED AS TO FORM:

_____
City Attorney

ATTACHED: Exhibit A: Proposed Changes to the Zoning Atlas



PEN18-0025 - Change of Zone

Light Industrial (LI)

Exhibit A to 2018-45

RESOLUTION NO. 2018-46

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY RECOMMENDING THAT THE CITY COUNCIL APPROVE PEN18-0023, PLOT PLAN, FOR THE CONSTRUCTION OF A 204,022 SQUARE FOOT WAREHOUSE BUILDING ON APPROXIMATELY 8.8 ACRES LOCATED AT THE NORTHEAST CORNER OF BRODIAEA AVENUE AND FREDERICK STREET (ASSESSOR PARCEL NUMBER (APN) 297-170-029

WHEREAS, the applicant, Newcastle Partners, Inc. filed Application No. PEN18-0023, requesting approval of a Plot Plan on the property as described in the title of this resolution; and

WHEREAS, the application has been evaluated in accordance with established City of Moreno Valley (City) procedures, and with consideration of the General Plan and other applicable regulations; and

WHEREAS, upon completion of a thorough development review process, the project was appropriately agendized and noticed in the Press Enterprise and posted on the site on September 18, 2018 for a public hearing before the Planning Commission on October 11, 2018; and

WHEREAS, on October 11, 2018, the Planning Commission of the City of Moreno Valley conducted a meeting to consider the applications; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred; and

WHEREAS, pursuant to Government Code Section 66020(d)(1), NOTICE IS HEREBY GIVEN that this project is subject to certain fees, dedications, reservations and other exactions as provided herein

NOW, THEREFORE, BE IT RESOLVED, by the Planning Commission of the City of Moreno Valley as follows:

A. This Planning Commission specifically finds that all of the facts set forth above in the Resolution are true and correct.

B. Based upon substantial evidence presented to this Planning Commission during meeting on October 11, 2018, including written and oral staff reports, and the record from the public hearing, this Planning Commission hereby specifically finds as follows:

1. Conformance with General Plan Policies – The proposed use is consistent with the General Plan, and its goals, objectives, policies and programs.

   FACT: The proposed Project includes a request for a General Plan Amendment to change the General Plan Land Use Designation of the subject site from Office to Business Park which provides for manufacturing, research and development, warehousing and distribution, as well as office and support commercial activities. The General Plan Amendment would allow for the development of the proposed 204,022 square-foot warehouse building on the 8.8-acre site. The intent of the General Plan, as expressed in Objective 2.5 of the Community Development Element is to promote a mix of industrial uses which provide a sound and diversified economic base and ample employment opportunities for the citizens of Moreno Valley with the establishment of industrial activities that have good access to the regional transportation system, accommodate the personal needs of workers and business visitors; and which meets the service needs of local businesses.

   With the approval of the General Plan Amendment, the Project would be consistent with the land use designation of the General Plan, and would address Objective 2.5 of the Community Development Element. The Project site's proximity to Alessandro Boulevard and Cactus Avenue provides good access to Interstate Highway 215 (I-215), the primary regional route for north-south travel which links Moreno Valley to neighboring and outlying communities.

   The proposed Business Park/Light Industrial land use designation is consistent with the applicable goals, objectives, policies and programs of the General Plan.

2. Conformance with Zoning Regulations – The proposed use complies with all applicable zoning and other regulations.

   FACT: With the approval of the Change of Zone, the project site would be zoned Light Industrial which provides for the proposed industrial warehouse building. The use at this location will be compatible with the existing developments immediately to the east, south and the southwest which are zoned Light Industrial (LI) and Business Park (BP). The property immediately to the north of the site along Alessandro Boulevard is currently undeveloped, and is zoned Community Commercial (CC) and CC with Mixed-Use with Institutional Overlay, compatible with the City Hall complex to the west.

As designed, the project will be compatible with all development standards of the Municipal Code.

3. Health, Safety and Welfare – The proposed use will not be detrimental to the public health, safety and welfare or materially injurious to properties or improvements in the vicinity.

FACT: The proposed project with a total of 204,022 square-foot warehouse facility including associated 10,000 square feet of office and mezzanine space is located within 2.1 miles of Towngate Fire Station (Station No.6), and nearby Moreno Valley Police and Riverside County Sheriff stations. This proximity to emergency and safety services furthers General Plan Goal 9.6.2 requiring emergency services that are adequate to meet minor emergency and major catastrophic situations.

The project was reviewed by the Airport Land Use Commission. The project was evaluated for consistency with the March Air Reserve Base Land Use Compatibility Plan (ALUCP), and was deemed consistent with the ALUCP with specific conditions of approval that have been incorporated into the City's conditions of approval.

The proposed project, as designed and conditioned, will result in a development that will be consistent with General Plan Objectives 6.1 and 6.2 which aim to minimize the potential for loss of life and protect residents, workers and visitors to the City from physical injury and property damage due to seismic ground shaking and flooding.

The analysis presented in the Initial Study/Mitigated Negative Declaration prepared for the Project (including the General Plan Amendment), pursuant to California Environmental Quality Act (CEQA), Public Resources Code 21000, indicates that the Project will not have a significant environmental impact as designed and mitigated.

4. Location, Design and Operation – The location, design and operation of the proposed project will be compatible with existing and planned land uses in the vicinity.

FACTS: The project is located on the north side of Brodiaea Avenue, east of Frederick Street with easy access to Alessandro Boulevard and Cactus Avenue, and less than 2 miles east of Interstate 215 (I-215). The surrounding land uses are a combination of warehouse and business park uses to the south, east and the southwest. The northern boundary of the site is vacant and zoned for commercial uses, compatible with the City Hall complex to the northwest.

The physical design and architecture of the proposed building is contemporary in style, and compatible with the surrounding existing developments. The scale of the proposed development and landscape treatments are consistent with the surrounding area.

C. FEES, DEDICATIONS, RESERVATIONS, AND OTHER EXACTIONS

1. FEES

Impact, mitigation and other fees are due and payable under currently applicable ordinances and resolutions. These fees may include but are not limited to: Development Impact Fee; Transportation Uniform Mitigation Fee (TUMF); Multi-species Habitat Conservation Plan (MSHCP) Mitigation Fee, Stephens Kangaroo Rat Habitat Fee, Underground Utilities in lieu Fee; Area Drainage Plan Fee; Bridge and Thoroughfare Mitigation Fee (Future); and Traffic Signal Mitigation Fee. The final amount of fees payable is dependent upon information provided by the applicant and will be determined at the time the fees become due and payable.

Unless otherwise provided for by this resolution, all impact fees shall be calculated and collected at the time and in the manner provided in Chapter 3.32 of the City of Moreno Valley Municipal Code or as so provided in the applicable ordinances and resolutions. The City expressly reserves the right to amend the fees and the fee calculations consistent with applicable law.

2. DEDICATIONS, RESERVATIONS, AND OTHER EXACTIONS

The adopted Conditions of Approval for PEN18-0023, incorporated herein by reference, may include dedications, reservations, and exactions pursuant to Government Code Section 66020 (d) (1).

3. CITY RIGHT TO MODIFY/ADJUST; PROTEST LIMITATIONS

The City expressly reserve the right to establish, modify or adjust any fee, dedication, reservation or other exaction to the extent permitted and as authorized by law.

Pursuant to Government Code Section 66020(d) (1), NOTICE IS FURTHER GIVEN that the 90-day period to protest the imposition of any impact fee, dedication, reservation, or other exaction described in this resolution begins on the effective date of this resolution and any such protest must be in a manner that complies with Section 66020 (a) and failure to timely follow this procedure will bar any subsequent legal action to attack, review, set aside, void or annul imposition.

The right to protest the fees, dedications, reservation, or other exactions

does not apply to planning, zoning, grading, or other similar application processing fees or service fees in connection with this project and it does not apply to any fees, dedication, reservation, or other exactions of which a notice has been given similar to this, nor does it revive challenges to any fees for which the Statute of Limitations has previously expired.

BE IT FURTHER RESOLVED that the Planning Commission **HEREBY APPROVES** Resolution No. 2018-46, and **RECOMMENDS that the City Council:**

APPROVE PEN18-0023 Plot Plan, subject to conditions of approval attached as Exhibit A.

APPROVED this 11th day of October, 2018.

AYES:
NOES:
ABSTAIN:

_____
Jeffrey Barnes
Chair, Planning Commission

ATTEST:

_____
Albert Armijo, Interim Planning Manager
Secretary to the Planning Commission

APPROVED AS TO FORM:

_____
City Attorney

ATTACHED: Exhibit A: Conditions of Approval

CITY OF MORENO VALLEY
CONDITIONS OF APPROVAL
Plot Plan (PEN18-0023)
APN: 297170029

APPROVAL DATE:
EXPIRATION DATE:

COMMUNITY DEVELOPMENT DEPARTMENT

Planning Division

1. Any expansion to this use or exterior alterations will require the submittal of a separate application(s) and shall be reviewed and approved under separate permit(s). (MC 9.02.080)

2. The developer, or the developer's successor-in-interest, shall be responsible for maintaining any undeveloped portion of the site in a manner that provides for the control of weeds, erosion and dust. (MC 9.02.030)

3. This approval shall expire three years after the approval date of this project unless used or extended as provided for by the City of Moreno Valley Municipal Code. (MC 9.02.230)

4. All landscaped areas shall be maintained in a healthy and thriving condition, free from weeds, trash and debris. (MC 9.02.030)

5. Any signs indicated on the submitted plans are not included with this approval. Any signs, whether permanent (e.g. wall, monument) or temporary (e.g. banner, flag), require separate application and approval by the Planning Division. No signs are permitted in the public right of way. (MC 9.12)

6. All site plans, grading plans, landscape and irrigation plans, fence/wall plans, lighting plans and street improvement plans shall be coordinated for consistency with this approval.

7. A change or modification to the land use or the approved site plans may require a separate approval. Prior to any change or modification, the property owner shall contact the City of Moreno Valley Community Development Department to determine if a separate approval is required.

8. The site shall be developed in accordance with the approved plans on file in the Community Development Department - Planning Division, the Municipal Code regulations, General Plan, and the conditions contained herein. Prior to any use of

the project site or business activity being commenced thereon, all Conditions of Approval shall be completed to the satisfaction of the Planning Official. (MC 9.14.020)

9. The required parking for this use shall comply with the Parking Analysis on file and all applicable requirements of the City of Moreno Valley Municipal Code (MC 9.11.040).

Special Conditions

10. The site has been approved for a 194,022 square foot industrial warehouse, 5,000 square foot office and 5,000 square foot mezzanine office building located on approximately 8.8 acres. The approval includes 23 loading dock doors, loading bays, required parking and truck trailers per the approved plans. A change or modification shall require separate approval.

11. The following Airport Land Use Commission (ALUC) Conditions of Approval apply to the project per their approval of May 10, 2018. Prior to the issuance of a grading permit, the applicant shall demonstrate to the City of Moreno Valley that the Airport Land Use Commission Conditions of Approval have been satisfied.

ALUC-1 Any outdoor lighting installed shall be hooded or shielded to prevent either the spillage of lumens or reflection into the sky. Outdoor lighting shall be downward facing.

12. ALUC-2 The following uses/activities are not included in the proposed project and shall be prohibited at this site:

A. Any use which would direct a steady light or flashing light of red, white, green, or amber colors associated with airport operations toward an aircraft engaged in an initial straight climb following takeoff or toward an aircraft engaged in a straight final approach toward a landing at an airport, other than an FAA-approved navigational signal light or visual approach slope indicator.

B. Any use which would cause sunlight to be reflected towards an aircraft engaged in an initial straight climb following takeoff or towards an aircraft engaged in a straight final approach towards a landing at an airport.

C. Any use which would generate smoke or water vapor or which would attract large concentrations of birds, or which may otherwise affect safe air navigation within the area. (Such uses include landscaping utilizing water features, aquaculture, production of cereal grains, sunflower, and row crops, composting operations, trash transfer stations that are open on one or more sides, recycling

centers containing putrescible wastes, construction and demolition debris facilities, fly ash disposal, and incinerators).

D. Any use which would generate electrical interference that may be detrimental to the operation of aircraft and/or aircraft instrumentation.

13. ALUC-3 The following disclosure notice shall be provided to all potential purchasers of the property and to any lessees of the structure (s) thereon, and shall be recorded as a deed of notice:

"NOTICE OF AIRPORT IN VICINITY

This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances can vary from person to person. You may wish to consider what airport annoyances, if any are associated with the property before you complete your purchase and determine whether they are acceptable to you. Business & Professions Code Section 1101 (b)(13)(A)."

14. ALUC-4 No detention basins are shown on the plot plan. Any new detention basins on the site (including water quality management basins) shall be designed so as to provide for a maximum 48-hour detention period following the conclusion of the storm event for the design storm (may be less, but not more), and to remain totally dry between rainfalls. Vegetation in and around the detention basins that would provide food or cover for bird species that would be incompatible with airport operations shall not be utilized in project landscaping.

15. ALUC-5 March Air Reserve Base must be notified of any land use having an electromagnetic radiation component to assess whether a potential conflict with Air Base radio communications could result. Sources of electromagnetic radiation include radio wave transmission in conjunction with remote equipment inclusive of irrigation controllers, access gates, etc.

16. ALUC-6 The Federal Aviation Administration has conducted aeronautical studies of each of the proposed buildings (Aeronautical Study Nos. 2018-AWP-7253-OE) and has determined that neither marking nor lighting of these structures is necessary for aviation safety. However, if marking and/or lighting for aviation safety are accomplished on a voluntary basis, such marking and/or lighting (if any) shall be installed in accordance with Federal Advisory Circular 70/7460-1 L Change 1 and shall be maintained therewith for the life of the project.

17. ALUC-7 The proposed buildings shall not exceed a height of 41 feet above ground

level and a maximum elevation at top point of 1,604 feet above mean sea level.

18. ALUC-8 The maximum height and top point elevation specified above shall not be amended without further review by the Airport Land Use Commission and the Federal Aviation Administration; provided, however, that reduction in structure height or elevation shall not require further review by the Airport Land Use Commission.

19. ALUC-9 Temporary construction equipment used during actual construction of the structure(s) shall not exceed 41 feet in height and a maximum elevation of 1604 feet above mean sea level, unless separate notice is provided to the Federal Aviation Administration through the Form 7460-1 process.

20. Speaker systems shall not be detectable above daytime ambient noise levels beyond the property line boundaries, and shall no exceed fifty-five (55) dBA at any one time beyond the boundaries of the property line. (MC 9.09.080 C.6 and 9.10.140)

21. Prior to the start of any construction, temporary security fencing shall be erected. The fencing shall be a minimum of six (6) feet high with locking, gated access and shall remain through the duration of construction. Security shall remain in place until the project is completed or the above conditions no longer exist. (Security fencing is required if there is: construction, unsecured structures, unenclosed storage of materials and/or equipment, and/or the condition of the site constitutes a public hazard).

22. ALUC-10 Within five (5) days after construction of each of the buildings reaches its greatest height, FAA Form 7460-2 (Part II), Notice of Actual Construction or Alteration, shall be completed by the project proponent or his/her designee, and e-filed with the Federal Aviation Administration. (Go to https://oeaaa.faa.gov for instructions.) This requirement is also applicable in the event the project is abandoned or a decision is made not to construct the applicable building.

23. The following Cultural Resources Mitigation Measures shall apply to this project:

    MM CR-1 Prior to the issuance of a grading permit, the Project Applicant shall provide evidence to the City of Moreno Valley that a qualified paleontologist has been retained by the Project Applicant to conduct monitoring of excavation activities and has the authority to halt and redirect earthmoving activities in the event that suspected paleontological resources are unearthed.

    MM CR-2 The paleontological monitor shall conduct full-time monitoring during grading and excavation operations in undisturbed, very old alluvial fan sediments at or below four (4) feet below ground surface and shall be equipped to salvage fossils

if they are unearthed to avoid construction delays and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. The paleontological monitor shall be empowered to temporarily halt or divert equipment to allow of removal of abundant and large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or if present, are determined upon exposure and examination by qualified paleontological personnel to have a low potential to contain or yield fossil resources.

MM CR-3 Recovered specimens shall be properly prepared to a point of identification and permanent preservation, including screen washing sediments to recover small invertebrates and vertebrates, if necessary. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage, such as the Western Science Museum in Hemet, California, is required for significant discoveries.

MM CR-4 A final monitoring and mitigation report of findings and significance shall be prepared, including lists of all fossils recovered and written repository agreements, if any, and necessary maps and graphics to accurately record the original location of the specimens. The report shall be submitted to the City of Moreno Valley prior to building final.

24. The following Tribal Resources Mitigation Measures shall apply to this project:

TR-1 Prior to the issuance of a grading permit, the Developer shall retain a professional archaeologist to conduct monitoring of all mass grading and trenching activities. The Project Archaeologist shall have the authority to temporarily redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. The Project Archaeologist, in consultation with the Consulting Tribe(s), the contractor, and the City, shall develop a Cultural Resources Management Plan (CRMP) in consultation pursuant to the definition in AB52 to address the details, timing and responsibility of all archaeological and cultural activities that will occur on the project site. A consulting tribe is defined as a tribe that initiated the AB 52 tribal consultation process for the Project, has not opted out of the AB52 consultation process, and has completed AB 52 consultation with the City as provided for in Cal Pub Res Code Section 21080.3.2(b)(1) of AB52. Details in the Plan shall include:

a. Project grading and development scheduling;

b. The Project archeologist and the Consulting Tribes(s) as defined in CR-1 shall attend the pre-grading meeting with the City, the construction manager and any contractors and will conduct a mandatory Cultural Resources Worker Sensitivity Training to those in attendance. The Training will include a brief review of the cultural sensitivity of the Project and the surrounding area; what resources could

potentially be identified during earthmoving activities; the requirements of the monitoring program; the protocols that apply in the event inadvertent discoveries of cultural resources are identified, including who to contact and appropriate avoidance measures until the find(s) can be properly evaluated; and any other appropriate protocols. All new construction personnel that will conduct earthwork or grading activities that begin work on the Project following the initial Training must take the Cultural Sensitivity Training prior to beginning work and the Project archaeologist and Consulting Tribe(s) shall make themselves available to provide the training on an as-needed basis;

c. The protocols and stipulations that the contractor, City, Consulting Tribe(s) and Project archaeologist will follow in the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits that shall be subject to a cultural resources evaluation.

TR-2 Prior to the issuance of a grading permit, the Developer shall secure agreements with the Pechanga Band of Luiseño Indians and Soboba Band of Luiseño Indians for tribal monitoring. The Developer is also required to provide a minimum of 30 days advance notice to the tribes of all mass grading and trenching activities. The Native American Tribal Representatives shall have the authority to temporarily halt and redirect earth moving activities in the affected area in the event that suspected archaeological resources are unearthed. If the Native American Tribal Representatives suspect that an archaeological resource may have been unearthed, the Project Archaeologist or the Tribal Representatives shall immediately redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of the suspected resource. In consultation with the Native American Tribal Representatives, the Project Archaeologist shall evaluate the suspected resource and make a determination of significance pursuant to California Public Resources Code Section 21083.2.

25. The following Tribal Resources Mitigation Measures shall apply to this project:

TR-3 In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries:

a) One or more of the following treatments, in order of preference, shall be employed with the tribes. Evidence of such shall be provided to the City of Moreno Valley Planning Department:

i. Preservation-In-Place of the cultural resources, if feasible. Preservation in place means avoiding the resources, leaving them in the place they were found with no development affecting the integrity of the resources.

ii. Onsite reburial of the discovered items as detailed in the treatment plan required pursuant to Mitigation Measure CR-1. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation

have been completed. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments as defined in CR-1.

TR-4 The City shall verify that the following note is included on the Grading Plan:
"If any suspected archaeological resources are discovered during ground-disturbing activities and the Project Archaeologist or Native American Tribal Representatives are not present, the construction supervisor is obligated to halt work in a 100-foot radius around the find and call the Project Archaeologist and the Tribal Representatives to the site to assess the significance of the find."

TR-5 If potential historic or cultural resources are uncovered during excavation or construction activities at the project site, work in the affected area must cease immediately and a qualified person meeting the Secretary of the Interior's standards (36 CFR 61), Tribal Representatives, and all site monitors per the Mitigation Measures, shall be consulted by the City to evaluate the find, and as appropriate recommend alternative measures to avoid, minimize or mitigate negative effects on the historic, or prehistoric resource. Determinations and recommendations by the consultant shall be immediately submitted to the Planning Division for consideration, and implemented as deemed appropriate by the Community Development Director, in consultation with the State Historic Preservation Officer (SHPO) and any and all Consulting Native American Tribes as defined in CR-1 before any further work commences in the affected area.

TR-6 If human remains are discovered, no further disturbance shall occur in the affected area until the County Coroner has made necessary findings as to origin. If the County Coroner determines that the remains are potentially Native American, the California Native American Heritage Commission shall be notified within 24 hours of the published finding to be given a reasonable opportunity to identify the "most likely descendant". The "most likely descendant" shall then make recommendations, and engage in consultations concerning the treatment of the remains (California Public Resources Code 5097.98). (GP Objective 23.3, CEQA).

26. Parking, access and circulation of the Project are approved based on the Plot Plan PEN 18-0023 site plan and the trip generation rates analyzed in the Plot Plan PEN 18-0023 traffic study and related technical documents. Any proposed changes in use that are not consistent with the approved Plot Plan PEN 18-0023 site plan and trip generation rates shall require a supplemental traffic study and parking study, if necessary, and if these studies identify any significant impacts that were not previously identified, the Project shall mitigate those impacts.

Prior to Grading Permit

27. At least thirty days prior to issuance of any grading permit, the developer shall retain a qualified archaeologist, provide a letter identifying the name and qualifications of the archaeologist to the Planning Division for approval, to monitor all ground disturbing activities in an effort to identify any unknown archaeological resources and to evaluate and recommend appropriate actions for any archaeological deposits exposed by construction activity.

At least thirty days prior to issuance of a grading permit, the applicant shall provide evidence that contact has been established with the appropriate Native American Tribe(s), providing notification of grading, excavation and the proposed monitoring program and to coordinate with the City and Tribe(s) to develop a cultural resources treatment and monitoring agreement. The agreement shall address treatment of known cultural resources, the designation, responsibilities and participation of Tribal monitors during grading, excavation and ground disturbing activities; project grading and development scheduling; terms of compensation; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on the site.

A report documenting the proposed methodology for grading monitoring shall be submitted to and approved by the Planning Division prior to issuance of any grading permit. The monitoring archaeologist shall be empowered to stop and redirect grading in the vicinity of an exposed archaeological deposit until that deposit can be fully evaluated. The archaeologist shall consult with affected Tribe(s) to evaluate any archaeological resources discovered on the project site. Tribal monitors shall be allowed to monitor all grading, excavation and groundbreaking activities, and shall also have authority to stop and redirect grading activities in consultation with the project archaeologist.

The property owner shall relinquish ownership to the Tribe(s) of all Native American cultural resources, including sacred items, burial goods and all archaeological artifacts that are found on the project site for proper treatment and disposition. All sacred sites, should they be encountered with the project site, shall be avoided and preserved as the preferred mitigation.
If any inadvertent discoveries of subsurface archaeological or cultural resources occur during grading, the applicant, project archaeologist, and Tribe(s) shall assess the significance of such resources and shall meet and confer regarding mitigation of such resources. Avoidance is the preferred method of preservation of archaeological resources. If the applicant, project archaeologist and Tribe(s) cannot agree on the significance or mitigation for such resources, the issue(s) will be presented to the Planning Official with adequate documentation. The Official shall make a determination based on the provisions of CEQA and consideration of

the religious beliefs, customs and practices of the Tribe(s).

28. Prior to issuance of any grading permit, all Conditions of Approval, Mitigation Measures and Airport Land Use Commission Conditions of Approval shall be printed on the grading plans.

29. Prior to the issuance of grading permits, decorative (e.g. colored/scored concrete or as approve by the Planning Official) pedestrian pathways across circulation aisles/paths shall be provided throughout the development to connect dwellings with open spaces and/or recreational uses or commercial/industrial buildings with open space and/or parking. and/or the public right-of-way. The pathways shall be shown on the precise grading plan. (GP Objective 46.8, DG)

30. Prior to approval of any grading permits, plans for any security gate system shall be submitted to and approved by to the Planning Division.

31. Prior to issuance of any grading permits, mitigation measures contained in the Mitigation Monitoring Program approved with this project shall be implemented as provided therein. A mitigation monitoring fee, as provided by City ordinance, shall be paid by the applicant within 30 days of project approval. No City permit or approval shall be issued until such fee is paid. (CEQA)

32. Prior to issuance of grading permits, the developer shall pay the applicable Stephens' Kangaroo Rat (SKR) Habitat Conservation Plan mitigation fee. (Ord)

33. Within thirty (30) days prior to any grading or other land disturbance, a pre-construction survey for Burrowing Owls shall be conducted pursuant to the established guidelines of Multiple Species Habitat Conservation Plan. The pre-construction survey shall be submitted to the Planning Division prior to any disturbance of the site and/or grading permit issuance.

34. Prior to approval of any grading permits, plans for any security gate system shall be submitted to and approved by to the Planning Division.

35. Prior to issuance of grading permits, the developer shall submit wall/fence plans to the Planning Division for review and approval as follows:

    A. A 3-foot high decorative wall, solid hedge or berm shall be placed in any setback areas between a public right of way and a parking lot for screening.

    B. Any proposed retaining walls shall also be decorative in nature, while the combination of retaining and other walls on top shall not exceed the height requirement.

    C. Screening walls for truck loading areas and required loading docks shall also

include decorative walls with pilasters and a height up to fourteen (14) feet to fully screen trucks. Screening along northern and eastern property line shall be constructed with concrete tilt-up panels to match the building, or if approved by the Planning Official, other material as approved in consideration of future development of adjacent properties.

D. Perimeter 6-foot walls along northern and eastern boundaries shall be constructed with concrete tilt-up panels with decorative design and pilasters to match screening walls and the building.

E. The final design for all open-rail fencing, including the decorative metal fence around the water detention basin along Brodiaea, shall be approved by the Planning Official.

36. Prior to the issuance of grading permits, a temporary project identification sign shall be erected on the site in a secure and visible manner. The sign shall be conspicuously posted at the site and remain in place until occupancy of the project. The sign shall include the following:

a. The name (if applicable) and address of the development.
b. The developer's name, address, and a 24-hour emergency telephone number.

37. Prior to issuance of grading permits, the location of the trash enclosure shall be included on the plans.

Building Division

38. The proposed non-residential project shall comply with the latest Federal Law, Americans with Disabilities Act, and State Law, California Code of Regulations, Title 24, Chapter 11B for accessibility standards for the disabled including access to the site, exits, bathrooms, work spaces, etc.

39. Prior to submittal, all new development, including residential second units, are required to obtain a valid property address prior to permit application. Addresses can be obtained by contacting the Building Safety Division at 951.413.3350.

40. Contact the Building Safety Division for permit application submittal requirements.

41. All new buildings 10,000 square feet and over, shall include building commissioning in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements (OPR). All requirements in The 2016 California Green Building Standards Code, sections 5.410.2 - 5.410.2.6 must be

met.

42. Any construction within the city shall only be completed between the hour of seven a.m. to seven p.m. Monday through Friday, excluding holidays and from eight a.m. to four p.m. on Saturday, unless written approval is obtained from the city building official or city engineer (Municipal Code Section 8.14.040.E).

43. Building plans submitted shall be signed and sealed by a California licensed design professional as required by the State Business and Professions Code.

44. The proposed development is subject to the payment of applicable processing fees as required by the City's current Fee Ordinance at the time a building permit application is submitted or prior to the issuance of permits as determined by the City.

45. The proposed project will be subject to approval by the Eastern Municipal Water District and all applicable fees and charges shall be paid prior to permit issuance. Contact the water district at 951.928.3777 for specific details.

46. All new structures shall be designed in conformance to the latest design standards adopted by the State of California in the California Building Code, (CBC) Part 2, Title 24, California Code of Regulations including requirements for allowable area, occupancy separations, fire suppression systems, accessibility, etc. The current code edition is the 2016 CBC.

47. The proposed non-residential project shall comply with 2016 California Green Building Standards Code, Section 5.106.5.3, mandatory requirements for Electric Vehicle Charging Station (EVCS).

48. The proposed project's occupancy shall be classified by the Building Official and must comply with exiting, occupancy separation(s) and minimum plumbing fixture requirements. Minimum plumbing fixtures shall be provided per the 2016 California Plumbing Code, Table 422.1. The occupant load and occupancy classification shall be determined in accordance with the California Building Code.

49. Prior to permit issuance, every applicant shall submit a properly completed Waste Management Plan (WMP), as a portion of the building or demolition permit process. (MC 8.80.030)

FINANCIAL & MANAGEMENT SERVICES DEPARTMENT

Moreno Valley Utility

50. This project requires the installation of electric distribution facilities. A non-exclusive

easement shall be provided to Moreno Valley Utility and shall include the rights of ingress and egress for the purpose of operation, maintenance, facility repair, and meter reading.

51. This project requires the installation of electric distribution facilities. The developer shall submit a detailed engineering plan showing design, location and schematics for the utility system to be approved by the City Engineer. In accordance with Government Code Section 66462, the Developer shall execute an agreement with the City providing for the installation, construction, improvement and dedication of the utility system following recordation of final map and/or concurrent with trenching operations and other improvements so long as said agreement incorporates the approved engineering plan and provides financial security to guarantee completion and dedication of the utility system.

    The Developer shall coordinate and receive approval from the City Engineer to install, construct, improve, and dedicate to the City all utility infrastructure including but not limited to, conduit, equipment, vaults, ducts, wires, switches, conductors, transformers, and "bring-up" facilities including electrical capacity to serve the identified development and other adjoining, abutting, or benefiting projects as determined by Moreno Valley Utility – collectively referred to as "utility system", to and through the development, along with any appurtenant real property easements, as determined by the City Engineer necessary for the distribution and/or delivery of any and all "utility services" to and within the project. For purposes of this condition, "utility services" shall mean electric, cable television, telecommunication (including video, voice, and data) and other similar services designated by the City Engineer. "Utility services" shall not include sewer, water, and natural gas services, which are addressed by other conditions of approval.

    The City, or the City's designee, shall utilize dedicated utility facilities to ensure safe, reliable, sustainable and cost effective delivery of utility services and maintain the integrity of streets and other public infrastructure. Developer shall, at developer's sole expense, install or cause the installation of such interconnection facilities as may be necessary to connect the electrical distribution infrastructure within the project to the Moreno Valley Utility owned and controlled electric distribution system.

52. Existing Moreno Valley Utility electrical infrastructure shall be preserved in place. The developer will be responsible, at developer's expense, for any and all costs associated with the relocation of any of Moreno Valley Utility's underground electrical distribution facilities, as determined by Moreno Valley Utility, which may be in conflict with any developer planned construction on the project site.

PUBLIC WORKS DEPARTMENT

Land Development

53. The developer shall comply with all applicable City ordinances and resolutions including the City's Municipal Code (MC) and if subdividing land, the Government Code (GC) of the State of California, specifically Sections 66410 through 66499.58, said sections also referred to as the Subdivision Map Act (SMA). [MC 9.14.010]

54. The final approved conditions of approval (COAs) and any applicable Mitigation Measures issued by the Planning Division shall be photographically or electronically placed on mylar sheets and included in the Grading and Street Improvement plans.

55. The developer shall monitor, supervise and control all construction related activities, so as to prevent these activities from causing a public nuisance, including but not limited to, insuring strict adherence to the following:
(a) Removal of dirt, debris, or other construction material deposited on any public street no later than the end of each working day.
(b) Observance of working hours as stipulated on permits issued by the Land Development Division.
(c) The construction site shall accommodate the parking of all motor vehicles used by persons working at or providing deliveries to the site.
(d) All dust control measures per South Coast Air Quality Management District (SCAQMD) requirements during the grading operations.
Violation of any condition, restriction or prohibition set forth in these conditions shall subject the owner, applicant, developer or contractor(s) to remedy as noted in City Municipal Code 8.14.090. In addition, the City Engineer or Building Official may suspend all construction related activities for violation of any condition, restriction or prohibition set forth in these conditions until such time as it has been determined that all operations and activities are in conformance with these conditions.

56. Drainage facilities (e.g., catch basins, water quality basins, etc.) with sump conditions shall be designed to convey the tributary 100-year storm flows. Secondary emergency escape shall also be provided.

57. If improvements associated with this project are not initiated within two (2) years of the date of approval of the Public Improvement Agreement (PIA), the City Engineer may require that the engineer's estimate for improvements associated with the project be modified to reflect current City construction costs in effect at the time of request for an extension of time for the PIA or issuance of a permit. [MC 9.14.210(B)(C)]

58. The developer shall protect downstream properties from damage caused by alteration of drainage patterns (i.e. concentration or diversion of flow, etc). Protection shall be provided by constructing adequate drainage facilities, including, but not limited to, modifying existing facilities or by securing a drainage easement.

[MC 9.14.110]

59. Public drainage easements, when required, shall be a minimum of 25 feet wide and shall be shown on the map and plan, and noted as follows: "Drainage Easement – no structures, obstructions, or encroachments by land fills are allowed." In addition, the grade within the easement area shall not exceed a 3:1 (H:V) slope, unless approved by the City Engineer.

60. The proposed private storm drain system shall connect to the existing Line "P" and Lateral "P-2" public storm drain within Brodiaea Avenue. A storm drain manhole shall be placed at the right-of-way line, at each connection, to mark the beginning of the publicly maintained portion of this storm drain.

61. This project shall submit civil engineering design plans, reports and/or documents (prepared by a registered/licensed civil engineer) for review and approval by the City Engineer per the current submittal requirements, prior to the indicated threshold or as required by the City Engineer. The submittal consists of, but is not limited to, the following:
    a. Rough grading w/ erosion control plan (prior to grading permit issuance);
    b. Precise grading w/ erosion control plan (prior to building permit issuance);
    c. Final drainage study (prior to grading plan approval);
    d. Final WQMP (prior to grading plan approval);
    e. Offers of Dedication (prior to precise grading plan approval);
    f. As-Built revision for all plans (prior to Occupancy release)

62. Water quality best management practices (BMPs) designed to meet Water Quality Management Plan (WQMP) requirements for single-family residential development shall not be used as a construction BMP. Water quality BMPs shall be maintained for the entire duration of the project construction and be used to treat runoff from those developed portions of the project. Water quality BMPs shall be protected from upstream construction related runoff by having proper best management practices in place and maintained. Water quality BMPs shall be graded per the approved design plans and once landscaping and irrigation has been installed, it and its maintenance shall be turned over to an established Homeowner's Association (HOA). The Homeowner's Association shall enter into an agreement with the City for basin maintenance.

Prior to Grading Plan Approval

63. Resolution of all drainage issues shall be as approved by the City Engineer.

64. A final detailed drainage study (prepared by a registered/licensed civil engineer) shall be submitted for review and approved by the City Engineer. The study shall include, but not be limited to: existing and proposed hydrologic conditions as well as

hydraulic calculations for all drainage control devices and storm drain lines. The study shall analyze 1, 3, 6 and 24-hour duration events for the 2, 5, 10 and 100-year storm events [MC 9.14.110(A.1)]. A digital (pdf) copy of the approved drainage study shall be submitted to the Land Development Division.

65. Emergency overflow areas shall be shown at all applicable drainage improvement locations in the event that the drainage improvement fails or exceeds full capacity. This may include, but not be limited to, overflow structures or emergency spillways within basins.

66. A final project-specific Water Quality Management Plan (WQMP) shall be submitted for review and approved by the City Engineer, which:

a. Addresses Site Design Best Management Practices (BMPs) such as minimizing impervious areas, maximizing permeability, minimizes directly connected impervious areas to the City's street and storm drain systems, and conserves natural areas;

b. Incorporates Source Control BMPs and provides a detailed description of their implementation;

c. Describes the long-term operation and maintenance requirements for BMPs requiring maintenance; and

d. Describes the mechanism for funding the long-term operation and maintenance of the BMPs.

A copy of the final WQMP template can be obtained on the City's Website or by contacting the Land Development Division. A digital (pdf) copy of the approved final project-specific Water Quality Management Plan (WQMP) shall be submitted to the Land Development Division.

67. The developer shall ensure compliance with the City Grading ordinance, these Conditions of Approval and the following criteria:

a. The project street and lot grading shall be designed in a manner that perpetuates the existing natural drainage patterns with respect to tributary drainage area and outlet points. Unless otherwise approved by the City Engineer, lot lines shall be located at the top of slopes.

b. Any grading that creates cut or fill slopes adjacent to the street shall provide erosion control, sight distance control, and slope easements as approved by the City Engineer.

c. All improvement plans are substantially complete and appropriate clearance letters are provided to the City.

d. A soils/geotechnical report (addressing the soil's stability and geological conditions of the site) shall be submitted to the Land Development Division for review. A digital (pdf) copy of the soils/geotechnical report shall be submitted to the Land Development Division.

68. Grading plans (prepared by a registered/licensed civil engineer) shall be submitted

for review and approved by the City Engineer per the current submittal requirements.

69. The developer shall select Low Impact Development (LID) Best Management Practices (BMPs) designed per the latest version of the Water Quality Management Plan (WQMP) - a guidance document for the Santa Ana region of Riverside County.

70. The developer shall pay all remaining plan check fees.

71. A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared in conformance with the State's current Construction Activities Storm Water General Permit. A copy of the current SWPPP shall be kept at the project site and be available for review upon request.

72. Any proposed trash enclosure(s) shall be dual bin (1 for trash and 1 for recycables) [MC 9.03.040 (G)]. The enclosure shall have a solid roof and appropriate drainage collection for water quality purposes. The architecture shall be approved by the Planning Division and any structural approvals shall be made by the Building & Safety Division.

73. For projects that will result in discharges of storm water associated with construction with a soil disturbance of one or more acres of land, the developer shall submit a Notice of Intent (NOI) and obtain a Waste Discharger's Identification number (WDID#) from the State Water Quality Control Board (SWQCB) which shall be noted on the grading plans.

74. Prior to rough grading plan approval, the Applicant shall prepare and submit for approval final, project-specific water quality management plan (F-WQMP). The F-WQMP shall be consistent with the approved P-WQMP, as well as in full conformance with the document; "Water Quality Management Plan - A Guidance Document for the Santa Ana Region of Riverside County" dated October 22, 2012. The F-WQMP shall be submitted and approved prior to application for and issuance of grading permits. At a minimum, the F-WQMP shall include the following: Site Design BMPs; Source Control BMPs, treatment Control BMPs, Operation and Maintenance requirements for BMPs and sources of funding for BMP implementation.

(a) The Applicant has proposed to incorporate the use of one (1) bio-retention basin and one (1) Modular Wetland System. Final design and sizing details of all BMPs must be provided in the first submittal of the F-WQMP. This will include further exploration of LID BMP options such as incorporating bio-retention basin(s) into the landscaping strip along the eastern project boundary and performing deeper percolation testing to determine if dry wells are feasible. This will also include treating the runoff from the increase of impervious surface within the proposed

busbay along Frederick Street. The Applicant acknowledges that more area than currently shown on the plans may be required to treat site runoff as required by the WQMP guidance document.
(b) The Applicant shall substantiate the applicable Hydrologic Condition of Concerns (HCOC) in Section F of the F-WQMP.
(c) All proposed LID BMP's shall be designed in accordance with the RCFC&WCD's Design Handbook for Low Impact Development Best Management Practices, dated September 2011.
(d) The proposed LID BMP's as identified in the project-specific P-WQMP shall be incorporated into the Final WQMP.
(e) The NPDES notes per City Standard Drawing No. MVFE-350-0 shall be included in the grading plans.
(f) Post-construction treatment control BMPs, once placed into operation for post-construction water quality control, shall not be used to treat runoff from construction sites or unstabilized areas of the site.
(g) Prior to precise grading plan approval, the grading plan shall show any proposed trash enclosure to include a cover (roof) and sufficient size for dual bin; one bin for trash and one bin for recyclables.

Prior to Grading Permit

75. A receipt showing payment of the Area Drainage Plan (ADP) fee to Riverside County Flood Control and Water Conservation District shall be submitted. [MC 9.14.100(O)]

76. A digital (pdf) copy of all approved grading plans shall be submitted to the Land Development Division.

77. Security, in the form of a cash deposit (preferable), or letter of credit shall be submitted as a guarantee of the implementation and maintenance of erosion control measures. At least twenty-five (25) percent of the required security shall be in the form of a cash deposit with the City. [MC 8.21.160(H)]

78. Security, in the form of a cash deposit (preferable), or letter of credit shall be submitted as a guarantee of the completion of the grading operations for the project. [MC 8.21.070]

79. The developer shall pay all applicable inspection fees.

Prior to Improvement Plan Approval

80. The developer is required to bring any existing access ramps adjacent to and fronting the project to current ADA (Americans with Disabilities Act) requirements.

However, when work is required in an intersection that involves or impacts existing access ramps, all access ramps in that intersection shall be retrofitted to comply with current ADA requirements, unless otherwise approved by the City Engineer.

81. The developer shall submit clearances from all applicable agencies, and pay all applicable plan check fees.

82. Drainage facilities (i.e. catch basins, etc.) with sump conditions shall be designed to convey the tributary 100-year storm flows. Secondary emergency escape shall also be provided.

83. Any missing or deficient existing improvements along the project frontage within Frederick Street and Brodiaea Avenue shall be constructed or secured for construction. The City Engineer may require the ultimate structural section for pavement to half-street width plus 18 feet or provide core test results confirming that existing pavement section is per current City Standards; additional signing & striping to accommodate increased traffic imposed by the development, etc.

84. For non-subdivision projects, all street dedications shall be free of encumbrances, irrevocably offered to the public and shall continue in force until the City accepts or abandons such offers, unless otherwise approved by the City Engineer.

85. The plans shall indicate any restrictions on trench repair pavement cuts to reflect the City's moratorium on disturbing newly-constructed pavement less than three (3) years old and recently slurry sealed streets less than one (1) year old. Pavement cuts for trench repairs may be allowed for emergency repairs or as specifically approved by the City Engineer.

86. All dry and wet utilities shall be shown on the plans and any crossings shall be potholed to determine actual location and elevation. Any conflicts shall be identified and addressed on the plans. The pothole survey data shall be submitted to Land Development with the public improvement plans for reference purposes only. The developer is responsible to coordinate with all affected utility companies and bear all costs of any utility relocation.

87. All driveway approaches shall be constructed per City Standard Plan No. MVSI-112C-0. This includes a four (4) foot Offer of Dedication at the back of the approaches.

Prior to Encroachment Permit

88. A digital (pdf) copy of all approved improvement plans shall be submitted to the Land Development Division.

89. All applicable inspection fees shall be paid.

90. For non-subdivision projects, execution of a Public Improvement Agreement (PIA) and/or security (in the form of a cash deposit or other approved means) may be required as determined by the City Engineer. [MC 9.14.220]

91. Any work performed within public right-of-way requires an encroachment permit.

Prior to Building Permit

92. An engineered-fill certification, rough grade certification and compaction report shall be submitted for review and approved by the City Engineer. A digital (pdf) copy of the approved compaction report shall be submitted to the Land Development Division. All pads shall meet pad elevations per approved grading plans as noted by the setting of "blue-top" markers installed by a registered land surveyor or licensed civil engineer.

93. For non-subdivision projects, the developer shall guarantee the completion of all related public improvements required for this project by executing a Public Improvement Agreement (PIA) with the City and posting the required security. [MC 9.14.220]

94. For non-subdivision projects, the developer shall comply with the requirements of the City Engineer based on recommendations of the Riverside County Flood Control District regarding the construction of County Master Plan Facilities.

95. For Commercial/Industrial projects, the owner may have to secure coverage under the State's General Industrial Activities Storm Water Permit as issued by the State Water Resources Control Board.

96. For non-subdivision projects, all street dedications shall be free of encumbrances, irrevocably offered to the public and shall continue in force until the City accepts or abandons such offers, unless otherwise approved by the City Engineer.

97. A walk through with a Land Development Inspector shall be scheduled to inspect existing improvements within public right of way along project frontage. Any missing, damaged or substandard improvements including handicap access ramps that do not meet current City standards shall be required to be installed, replaced and/or repaired. The applicant shall post security to cover the cost of the repairs and complete the repairs within the time allowed in the public improvement agreement used to secure the improvements.

98. Certification to the line, grade, flow test and system invert elevations for the water quality control BMPs shall be submitted for review and approved by the City

Engineer (excluding models homes).

Prior to Occupancy

99. All outstanding fees shall be paid.

100. All required as-built plans (prepared by a registered/licensed civil engineer) shall be submitted for review and approved by the City Engineer per the current submittal requirements.

101. The final/precise grade certification shall be submitted for review and approved by the City Engineer.

102. For commercial, industrial and multi-family projects, in compliance with Proposition 218, the developer shall agree to approve the City of Moreno Valley NPDES Regulatory Rate Schedule that is in place at the time of certificate of occupancy issuance. Under the current permit for storm water activities required as part of the National Pollutant Discharge Elimination System (NPDES) as mandated by the Federal Clean Water Act, this project is subject to the following requirements:

a. Select one of the following options to meet the financial responsibility to provide storm water utilities services for the required continuous operation, maintenance, monitoring system evaluations and enhancements, remediation and/or replacement, all in accordance with Resolution No. 2002-46.

i. Participate in the mail ballot proceeding in compliance with Proposition 218, for the Common Interest, Commercial, Industrial and Quasi-Public Use NPDES Regulatory Rate Schedule and pay all associated costs with the ballot process; or

ii. Establish an endowment to cover future City costs as specified in the Common Interest, Commercial, Industrial and Quasi-Public Use NPDES Regulatory Rate Schedule.

b. Notify the Special Districts Division of the intent to request building permits 90 days prior to their issuance and the financial option selected. The financial option selected shall be in place prior to the issuance of certificate of occupancy. [California Government Code & Municipal Code]

103. The developer shall complete all public improvements in conformance with current City standards, except as noted in the Special Conditions, including but not limited to the following:

a. Street improvements including, but not limited to: pavement, base, curb and/or gutter, cross gutters, spandrel, sidewalks, drive approaches, pedestrian ramps, street lights, signing, striping, under sidewalk drains, landscaping and irrigation, medians, pavement tapers/transitions and traffic control devices as appropriate.

b. Storm drain facilities including, but not limited to: storm drain pipe, storm drain

laterals, open channels, catch basins and local depressions.

c. City-owned utilities.

d. Sewer and water systems including, but not limited to: sanitary sewer, potable water and recycled water.

e. Under grounding of all existing and proposed utilities adjacent to and on-site. [MC 9.14.130]

f. Relocation of overhead electrical utility lines including, but not limited to: electrical, cable and telephone.

104. For commercial, industrial and multi-family projects, a "Stormwater Treatment Device and Control Measure Access and Maintenance Covenant" shall be recorded to provide public notice of the maintenance requirements to be implemented per the approved final project-specific WQMP. A boilerplate copy of the "Stormwater Treatment Device and Control Measure Access and Maintenance Covenant" can be obtained by contacting the Land Development Division.

105. The applicant shall ensure the following, pursuant to Section XII. I. of the 2010 NPDES Permit:

a. Field verification that structural Site Design, Source Control and Treatment Control BMPs are designed, constructed and functional in accordance with the approved Final Water Quality Management Plan (WQMP).

b. Certification of best management practices (BMPs) from a state licensed civil engineer. An original WQMP BMP Certification shall be submitted for review and approved by the City Engineer.

106. The Developer shall comply with the following water quality related items:

a. Notify the Land Development Division prior to construction and installation of all structural BMPs so that an inspection can be performed.

b. Demonstrate that all structural BMPs described in the approved final project-specific WQMP have been constructed and installed in conformance with the approved plans and specifications;

c. Demonstrate that Developer is prepared to implement all non-structural BMPs described in the approved final project-specific WQMP; and

d. Demonstrate that an adequate number of copies of the approved final project-specific WQMP are available for future owners/occupants.

e. Clean and repair the water quality BMP's, including re-grading to approved civil drawing if necessary.

f. Obtain approval and complete installation of the irrigation and landscaping.

Special Districts Division

107. This project is conditioned for a proposed district to provide a funding source for the operation and maintenance of public improvements and/or services associated with

new development in that territory. The Developer shall satisfy this condition with one of the options outlined below.

a. Participate in a special election for maintenance/services and pay all associated costs of the election process and formation, if any. Financing may be structured through a Community Facilities District, Landscape and Lighting Maintenance District, or other financing structure as determined by the City; or

b. Establish an endowment fund to cover the future maintenance and/or service costs.

The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org when submitting the application for building permit issuance. If the first building permit is pulled prior to formation of the district, this condition will not apply. If the district has been or is in the process of being formed the Developer must inform the Special Districts Division of its selected financing option (a. or b. above). The option for participating in a special election requires 90 days to complete the special election process. This allows adequate time to be in compliance with the provisions of Article 13C of the California Constitution.

The financial option selected shall be in place prior to the issuance of the first certificate of occupancy for the project.

108. This project is conditioned to provide a funding source for the following special financing program(s):

a. Street Lighting Services for capital improvements, energy charges, and maintenance.

The Developer's responsibility is to provide a funding source for the capital improvements and the continued maintenance. The Developer shall satisfy this condition with one of the options below.

i. Participate in a special election (mail ballot proceeding) and pay all associated costs of the special election and formation, if any. Financing may be structured through a Community Services District zone, Community Facilities District, Landscape and Lighting Maintenance District, or other financing structure as determined by the City; or

ii. Establish a Property Owner's Association (POA) or Home Owner's Association (HOA) which will be responsible for any and all operation and maintenance costs

The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org of its selected financial option when submitting the

application for building permit issuance. The option for participating in a special election requires approximately 90 days to complete the special election process. This allows adequate time to be in compliance with the provisions of Article 13C of the California Constitution.

The financial option selected shall be in place prior to the issuance of the first certificate of occupancy for the project and prior to acceptance of any improvements.

109. This project is located within the boundary of Community Facilities District No. 4–Maintenance (CFD No. 4-M) and is subject to hydrology study determination based upon the final tentative parcel map. The project is conditioned to provide a funding source which will be used for maintenance of stormwater and detention basin improvements. The Developer shall satisfy the condition with one of the financing options outlined below.

a. In compliance with Proposition 218, the property owner shall agree to approve the special election for annexation into CFD No. 4-M and pay all associated costs with the special election process and formation costs, if any; or

b. Establish an endowment fund which shall be used to cover future maintenance costs for storm water and detention basin improvements benefiting this project.

The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org of its selected financing option when submitting the application for building permit issuance. The option for participating in a special election requires 90 days to complete the special election process. This allows adequate time to be in compliance with the provisions of Article 13C of the California Constitution.

The financial option selected shall be in place prior to the first issuance of certificate of occupancy for this project.

110. Commercial (BP) If Land Development, a Division of the Public Works Department, requires this project to supply a funding source necessary to provide for, but not limited to, stormwater utilities services for the continuous operation, remediation and/or replacement, monitoring, systems evaluations and enhancement of on-site facilities and performing annual inspections of the affected areas to ensure compliance with state mandated stormwater regulations, a funding source needs to be established. The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org of its selected financial option for the National Pollution Discharge Elimination System (NPDES) program when submitting the application for the first building permit issuance (see Land Development's related condition). Participating in a special election the process

requires a 90 day period prior to the City's issuance of a building permit. This allows adequate time to be in compliance with the provisions of Article 13D of the California Constitution. (California Health and Safety Code Sections 5473 through 5473.8 (Ord. 708 Section 3.1, 2006) & City of Moreno Valley Municipal Code Title 3, Section 3.50.050.)

111. This project has been identified to be included in the formation of a Community Facilities District (Mello-Roos) for Public Safety services, including but not limited to Police, Fire Protection, Paramedic Services, Park Rangers, and Animal Control services. The property owner(s) shall not protest the formation; however, they retain the right to object to the rate and method of maximum special tax. In compliance with Proposition 218, the property owner shall agree to approve the mail ballot proceeding (special election) for either formation of the CFD or annexation into an existing district. The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org when submitting the application for building permit issuance to determine the requirement for participation. If the first building permit is pulled prior to formation of the district, this condition will not apply. If the condition applies, the special election will require a minimum of 90 days prior to issuance of the first building permit. This allows adequate time to be in compliance with the provisions of Article 13C of the California Constitution. (California Government Code Section 53313 et. seq.)

112. Inspection fees for the monitoring of landscape installation associated with the City of Moreno Valley maintained parkways/medians are due prior to the required pre-construction meeting. (MC 3.32.040)

113. The ongoing maintenance of any landscaping required to be installed behind the curb on Brodiaea Ave. shall be the responsibility of the property owner.

114. Modification of existing irrigation systems for parkway improvements may be required per the direction of, approval by and coordination with the Special Districts Division. Please contact Special District Division staff at 951.413.3480 or specialdistricts@moval.org to coordinate the modifications.

115. Any damage to existing landscape areas maintained by the City of Moreno Valley due to project construction shall be repaired/replaced by the Developer, or Developer's successors in interest, at no cost to the City of Moreno Valley.

116. The removal of existing trees with four-inch or greater trunk diameters (calipers), shall be replaced, at a three to one ratio, with minimum twenty-four (24) inch box size trees of the same species, or a minimum thirty-six (36) inch box for a one to one replacement, where approved. (MC 9.17.030)

117. The parcel(s) associated with this project have been incorporated into the Moreno Valley Community Services Districts Zones A (Parks & Community Services), C

(Arterial Street Lighting), and E-7 (Extensive Landscape Maintenance). All assessable parcels therein shall be subject to annual parcel taxes for Zone A and Zone C and an annual parcel charge for Zone E-7 for operations and capital improvements.

118. The existing parkway along the frontage of the project on Frederick St. shall be brought to current City Standards. Improvements may include but are not limited to: plant material, irrigation, and hardscape.

119. Existing landscape to remain in place on Frederick St.

Transportation Engineering Division

120. Conditions of approval may be modified or added if a phasing plan is submitted for this development.

121. All proposed on-site traffic signing and striping should be accordance with the latest California Manual on Uniform Traffic Control Devices (CAMUTCD).

122. Frederick Street is designated as a Minor Arterial (88'RW/64'CC) at the project location per City Standard Plan No. MVSI-105A-1. Any improvements undertaken by this project shall be consistent with the City's standards for this facility.

123. Brodiaea Avenue is designated as an industrial collector (78'RW/56'CC) at the project location per City Standard Plan No. MVSI-106A-0. Any improvements undertaken by this project shall be consistent with the City's standards for this facility.

124. The driveways shall conform to City of Moreno Valley Standard No. MVSI-112C-0 for Commercial Driveway Approaches. Access at the driveways shall be allowed as follows:

- Frederick Street north driveway (trucks only access): right-turn in/out only. A raised concrete median on Frederick Street shall restrict left-turn in/out.
- Frederick Street south driveway at Calle San Juan de Los Lagos intersection (passenger cars only access): full access. This driveway shall have one inbound lane, one outbound left-turn lane and one outbound shared through-right lane.
- Brodiaea Avenue driveway (both passenger cars and trucks access): full access.

125. Any gated entrance shall be provided with the following:

a) A storage lane with sufficient queuing length for entering vehicles.
b) Signing and striping.

c) A separate pedestrian entry.

126. Prior to final approval of the landscape plans and construction plans for any type of fencing or monument sign, the project plans shall demonstrate that sight distance at the project driveway conforms to City Standard Plan No. MVSI-164A-0 through MVSI-164C-0. Trees, plants, shrubs, fence and monument sign shall not be located in an area that obstructs the drivers' line-of-sight.

127. Prior to the final approval of the street improvement plans, a signing and striping plan shall be prepared per City of Moreno Valley Standard Plans - Section 4 for all streets along the project frontages. Signing and striping plans shall be prepared per the latest edition of the California Manual on Uniform Traffic Control Devices (CAMUTCD) and current City of Moreno Valley Standard Plans by a qualified registered civil or traffic engineer..

128. Prior to the final approval of the street improvement plans, a median improvement plan shall be prepared by a registered civil engineer for a raised concrete median on Frederick Street in front of the project north driveway.

129. Prior to the final approval of the street improvement plans, a traffic signal modification plan shall be prepared for the existing traffic signal at Frederick Street/Calle San Juan de Los Lagos intersection. The existing traffic signal shall be modified to accommodate one inbound lane, one outbound left-turn lane and one outbound shared through-right lane for the project driveway. Traffic signal modification plan shall be prepared per the latest edition of the California Manual on Uniform Traffic Control Devices (CAMUTCD) and current City of Moreno Valley Standard Plans by a qualified registered civil engineer.

130. Prior to the final approval of the street improvement plans, a bus turnout shall be designed per the latest City of Moreno Valley Standard Plans for northbound traffic and shall be located on the east side of Frederick Street, between the project north driveway and Frederick Street/Calle San Juan de Los Lagos intersection.

131. Prior to issuance of an encroachment permit for work within the public right-of-way, construction traffic control plans prepared by a qualified, registered Civil or Traffic engineer shall be required for plan approval by the City Traffic Engineer.

132. Prior to issuance of Certificate of Occupancy, all signing and striping shall be installed per current City Standards and the approved plans.

133. Prior to issuance of Certificate of Occupancy, raised median improvement on Frederick Street in front of the project north driveway shall be completed and fully operational per the approved plans to the satisfaction of the City Engineer. Median construction shall include but not be limited to: paving, concrete curbs, median hardscape, signing and striping.

134. Prior to issuance of Certificate of Occupancy, all modification work for the existing traffic signal at the intersection of Frederick Street/Calle San Juan de Los Lagos shall be completed and fully operational per the approved plans, to the satisfaction of the City Engineer. Signal modifications may include, but not be limited to, signal pole replacement or relocation, new video detector installation, controller cabinet relocation, controller replacement, signing & striping, curb and gutter replacement, and ADA access ramp replacement.

135. Prior to issuance of Certificate of Occupancy, a bus turnout shall be installed for northbound traffic and be located on the east side of Frederick Street, between the project north driveway and Frederick Street/Calle San Juan de Los Lagos intersection.

URBAN CROSSROADS

Centerpointe

AIR QUALITY IMPACT ANALYSIS

CITY OF MORENO VALLEY

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JUNE 4, 2018

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LIST OF ABBREVIATED TERMS

(1)	Reference
µg/m3	Microgram per Cubic Meter
AADT	Annual Average Daily Trips
AQIA	Air Quality Impact Analysis
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
BACMs	Best Available Control Measures
BMPs	Best Management Practices
CAA	Federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DPM	Diesel Particulate Matter
EPA	Environmental Protection Agency
LST	Localized Significance Threshold
MMs	Mitigation Measures
NAAQS	National Ambient Air Quality Standards
NO2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
Pb	Lead
PM10	Particulate Matter 10 microns in diameter or less
PM2.5	Particulate Matter 2.5 microns in diameter or less
PPM	Parts Per Million
Project	Centerpointe
ROG	Reactive Organic Gases
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SIPs	State Implementation Plans
SRA	Source Receptor Area

TAC	Toxic Air Contaminant
TIA	Traffic Impact Analysis
TOG	Total Organic Gases
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds

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EXECUTIVE SUMMARY

CONSTRUCTION-SOURCE EMISSIONS

REGIONAL IMPACTS

For regional emissions, the Project would not exceed the numerical thresholds of significance established by the SCAQMD for any criteria pollutants. Therefore, a less than significant impact would occur for Project-related construction-source emissions.

LOCALIZED IMPACTS

For localized emissions, the Project would not exceed the SCAQMD's localized significance threshold for any criteria pollutant. Therefore, a less than significant impact would occur.

ODORS

Established requirements addressing construction equipment operations, and construction material use, storage, and disposal requirements act to minimize odor impacts that may result from construction activities. Moreover, construction-source odor emissions would be temporary, short-term, and intermittent in nature and would not result in persistent impacts that would affect substantial numbers of people. Potential construction-source odor impacts are therefore considered less-than-significant.

OPERATIONAL-SOURCE EMISSIONS

REGIONAL IMPACTS

For regional emissions, the Project would not exceed the numerical thresholds of significance established by the SCAQMD. Therefore, Project operational-source emissions would be considered less than significant.

LOCALIZED IMPACTS

For localized emissions, the Project would not exceed the numerical thresholds established by the SCAQMD for any criteria pollutants. The proposed Project would not result in a significant CO "hotspot" as a result of Project related traffic during ongoing operations.

Project operational-source emissions would not conflict with the applicable AQMP.

Odors

Substantial odor-generating sources include land uses such as agricultural activities, feedlots, wastewater treatment facilities, landfills or various heavy industrial uses. The Project does not propose any such uses or activities that would result in potentially significant operational-source odor impacts. Potential sources of operational odors generated by the Project would include disposal of miscellaneous refuse. Moreover, SCAQMD Rule 402 acts to prevent occurrences of odor nuisances (1). Consistent with City requirements, all Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with solid waste

regulations. Potential operational-source odor impacts are therefore considered less-than-significant.

1 INTRODUCTION

This report presents the results of the air quality impact analysis (AQIA) prepared by Urban Crossroads, Inc., for the proposed Centerpointe development ("Project"). The purpose of this AQIA is to evaluate the potential impacts to air quality associated with construction and operation of the proposed Project and recommend measures to mitigate impacts considered potentially significant in comparison to thresholds established by the South Coast Air Quality Management District (SCAQMD).

1.1 SITE LOCATION

The proposed Centerpointe site is located on the northeast corner of Frederick Street and Brodiaea Avenue in the City of Moreno Valley, as shown on Exhibit 1-A. Existing uses in the Project study area include a commercial-designated vacant lot north of the Project site, existing business park/warehouse use to the east, the Riverside County Department of Waste Resources facilities to the south, and existing City of Moreno Valley offices to the west. The closest existing residential homes to the Project site are located approximately 800 feet north of the Project site across Alessandro Boulevard. The March Air Reserve Base/Inland Port Airport (MARB/IPA) runway is located approximately 1.2 miles southwest of the Project site, and Interstate 215 (I-215) is located roughly 1.2 miles west of the Project site.

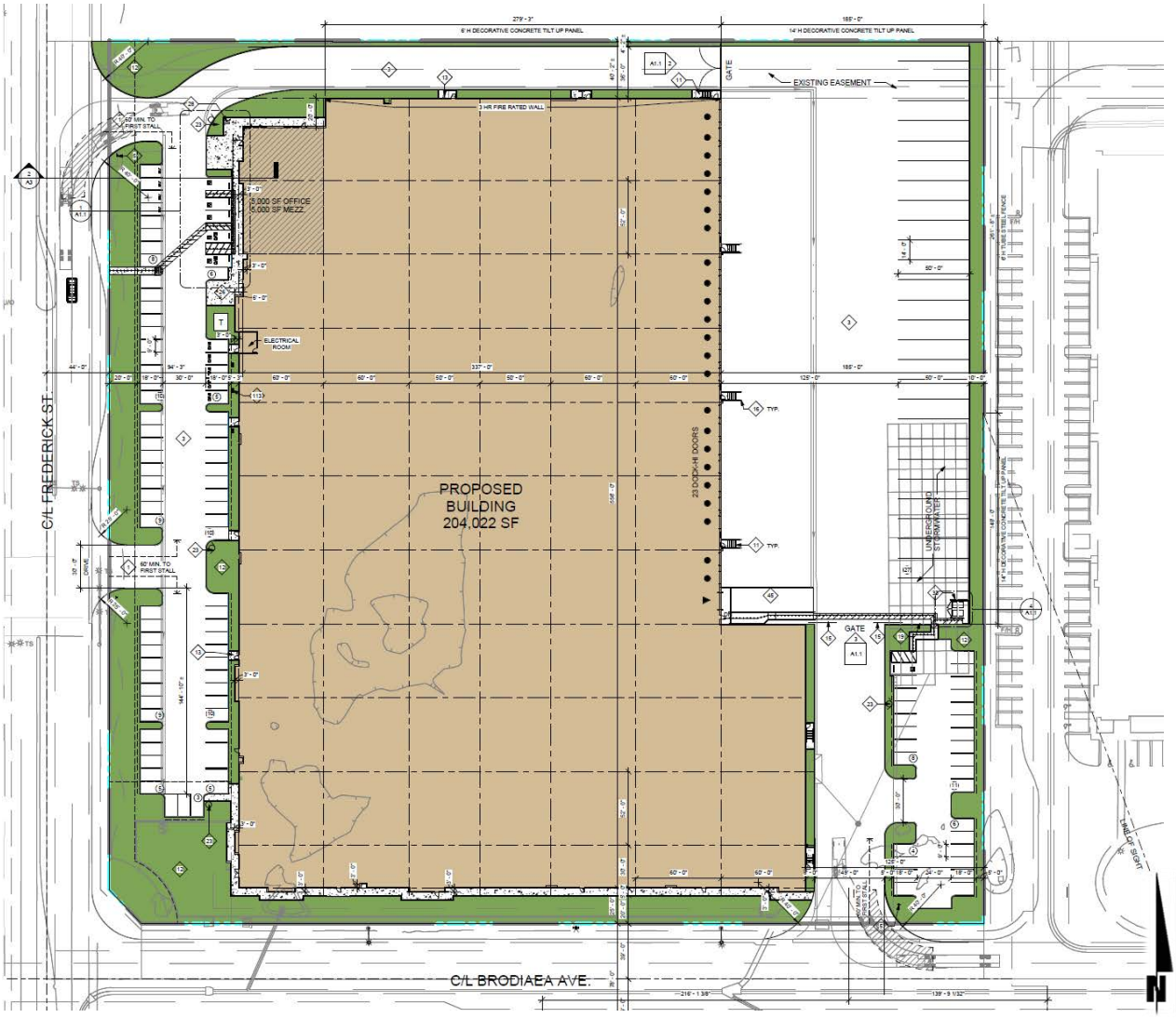
1.2 PROJECT DESCRIPTION

The Project is proposed to consist of up to 163,218 square feet (sf) of warehouse (without cold storage) use (80 percent of the total square footage) and 40,804 sf of general light industrial use (20 percent of the total square footage) for a total of 204,022 sf within a single building, as shown on Exhibit 1-B. The Project is anticipated to have an Opening Year of 2020[1]. At the time this air quality analysis was prepared the future tenants of the proposed Project were unknown. The Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. This air quality analysis is intended to describe air quality level impacts associated with the expected typical warehouse and distribution storage activities at the Project site. At the time of this analysis, no cold storage was planned at the Project site, and therefore is not analyzed in this report.

[1] The Traffic Impact Analysis (TIA) prepared for the Project evaluates an Opening Year of 2023 since the City of Moreno Valley traffic study guidelines require the Opening Year to be a minimum of 5 years from baseline (2018) conditions. Utilizing a 2020 Opening Year for purposes of this AQIA would generate more emissions than if the Project utilized a 2023 Opening Year consistent with the traffic study because as the analysis year increases, vehicle emission factors would decrease as a result of emissions regulations becoming more stringent. Utilizing a 2020 Opening Year for purposes of the AQIA herein represents a conservative estimate of emissions compared to if a 2023 Opening Year, consistent with the traffic study, were utilized.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



According to the *Centerpointe Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 486 trip-ends per day (actual vehicles) (2). The Project trip generation includes 100 truck trip-ends per day from the proposed buildings within the Project site. This air quality study relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

1.3 Construction-Source Air Pollutant Emissions Mitigation Measures

1.3.1 Monitoring of and Compliance With Standard Regulatory Requirements/Best Available Control Measures (BACMs)

Measures listed below (or equivalent language) shall appear on all Project grading plans, construction specifications and bid documents, and the City shall ensure such language is incorporated prior to issuance of any development permits. City monitoring of construction activities shall be conducted to ensure mitigation compliance.

SCAQMD Rules that are currently applicable during construction activity for this Project include but are not limited to: Rule 1113 (Architectural Coatings) (3); Rule 431.2 (Low Sulfur Fuel) (4); Rule 403 (Fugitive Dust) (5); and Rule 1186 / 1186.1 (Street Sweepers) (6). In order to facilitate monitoring and compliance, applicable SCAQMD regulatory requirements are summarized below.

BACM AQ-1

The following measures shall be incorporated into Project plans and specifications as implementation of Rule 403.

- All clearing, grading, earth-moving, or excavation activities shall cease when winds exceed 25 mph per SCAQMD guidelines in order to limit fugitive dust emissions.
- The contractor shall ensure that all disturbed unpaved roads and disturbed areas within the Project are watered at least three (3) times daily during dry weather. Watering, with complete coverage of disturbed areas, shall occur at least three times a day, preferably in the mid-morning, afternoon, and after work is done for the day.
- The contractor shall ensure that traffic speeds on unpaved roads and Project site areas are reduced to 15 miles per hour or less.

BACM AQ-2

Only "Low-Volatile Organic Compounds" paints (no more than 50 gram/liter of VOC) and/or High Pressure Low Volume (HPLV) applications consistent with South Coast Air Quality Management District Rule 1113 shall be used.

1.4 Construction and Operational-Source Air Pollutant Emissions Mitigation Measures

The Project would not result in any significant impacts during construction and operational activity. Therefore, no mitigation measures are required.

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2 AIR QUALITY SETTING

This section provides an overview of the existing air quality conditions in the Project area and region.

2.1 SOUTH COAST AIR BASIN

The Project site is located in the South Coast Air Basin (SCAB) within the jurisdiction of SCAQMD (7). The SCAQMD was created by the 1977 Lewis-Presley Air Quality Management Act, which merged four county air pollution control bodies into one regional district. Under the Act, the SCAQMD is responsible for bringing air quality in areas under its jurisdiction into conformity with federal and state air quality standards. As discussed above, the Project site is located within the South Coast Air Basin, a 6,745-square mile subregion of the SCAQMD, which includes portions of Los Angeles, Riverside, and San Bernardino Counties, and all of Orange County. The larger South Coast district boundary includes 10,743 square miles.

The SCAB is bound by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Los Angeles County portion of the Mojave Desert Air Basin is bound by the San Gabriel Mountains to the south and west, the Los Angeles / Kern County border to the north, and the Los Angeles / San Bernardino County border to the east. The Riverside County portion of the Salton Sea Air Basin is bound by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley.

2.2 REGIONAL CLIMATE

The regional climate has a substantial influence on air quality in the Basin. In addition, the temperature, wind, humidity, precipitation, and amount of sunshine influence the air quality.

The annual average temperatures throughout the Basin vary from the low to middle 60s (degrees Fahrenheit). Due to a decreased marine influence, the eastern portion of the Basin shows greater variability in average annual minimum and maximum temperatures. January is the coldest month throughout the Basin, with average minimum temperatures of 47°F in downtown Los Angeles and 36°F in San Bernardino. All portions of the Basin have recorded maximum temperatures above 100°F.

Although the climate of the Basin can be characterized as semi-arid, the air near the land surface is quite moist on most days because of the presence of a marine layer. This shallow layer of sea air is an important modifier of Basin climate. Humidity restricts visibility in the Basin, and the conversion of sulfur dioxide to sulfates is heightened in air with high relative humidity. The marine layer provides an environment for that conversion process, especially during the spring and summer months. The annual average relative humidity within the Basin is 71 percent along the coast and 59 percent inland. Since the ocean effect is dominant, periods of heavy early morning fog are frequent and low stratus clouds are a characteristic feature. These effects decrease with distance from the coast.

More than 90 percent of the Basin's rainfall occurs from November through April. The annual average rainfall varies from approximately nine inches in Riverside to fourteen inches in downtown Los Angeles. Monthly and yearly rainfall totals are extremely variable. Summer rainfall usually consists of widely scattered thunderstorms near the coast and slightly heavier shower activity in the eastern portion of the Basin with frequency being higher near the coast.

Due to its generally clear weather, about three-quarters of available sunshine is received in the Basin. The remaining one-quarter is absorbed by clouds. The ultraviolet portion of this abundant radiation is a key factor in photochemical reactions. On the shortest day of the year there are approximately 10 hours of possible sunshine, and on the longest day of the year there are approximately 14½ hours of possible sunshine.

The importance of wind to air pollution is considerable. The direction and speed of the wind determines the horizontal dispersion and transport of the air pollutants. During the late autumn to early spring rainy season, the Basin is subjected to wind flows associated with the traveling storms moving through the region from the northwest. This period also brings five to ten periods of strong, dry offshore winds, locally termed "Santa Anas" each year. During the dry season, which coincides with the months of maximum photochemical smog concentrations, the wind flow is bimodal, typified by a daytime onshore sea breeze and a nighttime offshore drainage wind. Summer wind flows are created by the pressure differences between the relatively cold ocean and the unevenly heated and cooled land surfaces that modify the general northwesterly wind circulation over southern California. Nighttime drainage begins with the radiational cooling of the mountain slopes. Heavy, cool air descends the slopes and flows through the mountain passes and canyons as it follows the lowering terrain toward the ocean. Another characteristic wind regime in the Basin is the "Catalina Eddy," a low level cyclonic (counterclockwise) flow centered over Santa Catalina Island which results in an offshore flow to the southwest. On most spring and summer days, some indication of an eddy is apparent in coastal sections.

In the Basin, there are two distinct temperature inversion structures that control vertical mixing of air pollution. During the summer, warm high-pressure descending (subsiding) air is undercut by a shallow layer of cool marine air. The boundary between these two layers of air is a persistent marine subsidence/inversion. This boundary prevents vertical mixing which effectively acts as an impervious lid to pollutants over the entire Basin. The mixing height for the inversion structure is normally situated 1,000 to 1,500 feet above mean sea level.

A second inversion-type forms in conjunction with the drainage of cool air off the surrounding mountains at night followed by the seaward drift of this pool of cool air. The top of this layer forms a sharp boundary with the warmer air aloft and creates nocturnal radiation inversions. These inversions occur primarily in the winter, when nights are longer and onshore flow is weakest. They are typically only a few hundred feet above mean sea level. These inversions effectively trap pollutants, such as NO_x and CO from vehicles, as the pool of cool air drifts seaward. Winter is therefore a period of high levels of primary pollutants along the coastline.

2.3 WIND PATTERNS AND PROJECT LOCATION

The distinctive climate of the Project area and the SCAB is determined by its terrain and geographical location. The Basin is located in a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean in the southwest quadrant with high mountains forming the remainder of the perimeter.

Wind patterns across the south coastal region are characterized by westerly and southwesterly on-shore winds during the day and easterly or northeasterly breezes at night. Winds are characteristically light although the speed is somewhat greater during the dry summer months than during the rainy winter season.

2.4 EXISTING AIR QUALITY

Existing air quality is measured at established SCAQMD air quality monitoring stations. Monitored air quality is evaluated and in the context of ambient air quality standards. These standards are the levels of air quality that are considered safe, with an adequate margin of safety, to protect the public health and welfare. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) currently in effect, as well health effects of each pollutant regulated under these standards are shown in Table 2-1 (8) (9).

The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to the state and federal standards presented in Table 2-1. The air quality in a region is considered to be in attainment by the state if the measured ambient air pollutant levels for O_3, CO, SO_2, NO_2, PM_{10}, and $PM_{2.5}$ are not equaled or exceeded at any time in any consecutive three-year period; and the federal standards (other than O_3, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not exceeded more than once per year. The O_3 standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

TABLE 2-1: AMBIENT AIR QUALITY STANDARDS (1 OF 2)

Ambient Air Quality Standards						
Pollutant	**Averaging Time**	**California Standards [1]**		**National Standards [2]**		
		Concentration [3]	**Method [4]**	**Primary [3,5]**	**Secondary [3,6]**	**Method [7]**
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flouresecence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

For more information please call ARB-PIO at (916) 322-2990

California Air Resources Board (5/4/16)

TABLE 2-1: AMBIENT AIR QUALITY STANDARDS (2 OF 2)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

For more information please call ARB-PIO at (916) 322-2990 **California Air Resources Board (5/4/16)**

2.5 REGIONAL AIR QUALITY

The SCAQMD monitors levels of various criteria pollutants at 38 permanent monitoring stations and 5 single-pollutant source Lead (Pb) air monitoring sites throughout the air district (10). In 2015, the federal and state ambient air quality standards (NAAQS and CAAQS) were exceeded on one or more days for ozone, PM_{10}, and $PM_{2.5}$ at most monitoring locations (11). No areas of the SCAB exceeded federal or state standards for NO_2, SO_2, CO, sulfates or lead. See Table 2-2, for attainment designations for the SCAB (12) (13). Appendix 2.1 provides geographic representation of the state and federal attainment status for applicable criteria pollutants within the SCAB.

TABLE 2-2: ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN THE SOUTH COAST AIR BASIN (SCAB)

Criteria Pollutant	State Designation	Federal Designation
Ozone - 1hour standard	Nonattainment	Nonattainment ("extreme")
Ozone - 8 hour standard	Nonattainment	Nonattainment ("extreme")
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment ("serious")
Carbon Monoxide	Attainment	Attainment (Maintenance)
Nitrogen Dioxide	Attainment	Unclassifiable/Attainment
Sulfur Dioxide	Attainment	Unclassifiable/Attainment
Lead[2]	Attainment	Nonattainment (Partial)

Source: State/Federal designations were taken from http://www.arb.ca.gov/desig/adm/adm.htm
Note: See Appendix 2.1 for a detailed map of State/National Area Designations within the South Coast Air Basin

2.6 LOCAL AIR QUALITY

Relative to the Project site, the nearest long-term air quality monitoring site for Ozone (O_3) and Particulate Matter ≤ 10 Microns (PM_{10}) is the South Coast Air Quality Management District Perris Valley monitoring station (SRA 24), located approximately 8.45 miles south of the Project site (14). Data for Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), and Ultra-Fine Particulates ($PM_{2.5}$) was obtained from the Metropolitan Riverside County 3 monitoring station (SRA 23), located approximately 10.65 miles northwest Project site, respectively. It should be noted that the Metropolitan Riverside County 3 monitoring station was utilized in lieu of the Perris Valley monitoring station only where data was not available from the nearest monitoring site.

The most recent three (3) years of data available is shown on Table 2-3 and identifies the number of days ambient air quality standards were exceeded for the study area, which is was considered to be representative of the local air quality at the Project site (15) (16). Additionally, data for SO_2 has been omitted as attainment is regularly met in the South Coast Air Basin and few monitoring stations measure SO_2 concentrations.

[2] The Federal nonattainment designation for lead is only applicable towards the Los Angeles County portion of the SCAB.

TABLE 2-3: PROJECT AREA AIR QUALITY MONITORING SUMMARY 2014-2016

POLLUTANT	STANDARD	YEAR		
		2014	2015	2016
Ozone (O_3)				
Maximum 1-Hour Concentration (ppm)		0.117	0.124	0.131
Maximum 8-Hour Concentration (ppm)		0.094	0.102	0.098
Number of Days Exceeding State 1-Hour Standard	> 0.09 ppm	16	25	23
Number of Days Exceeding State 8-Hour Standard	> 0.07 ppm	63	50	56
Number of Days Exceeding Federal 1-Hour Standard	> 0.12 ppm	0	0	1
Number of Days Exceeding Federal 8-Hour Standard	> 0.07 ppm	59	49	55
Carbon Monoxide (CO)				
Maximum 1-Hour Concentration (ppm)		2.0	2.5	1.9
Maximum 8-Hour Concentration (ppm)		2.4	1.7	1.4
Nitrogen Dioxide (NO_2)*				
Maximum 1-Hour Concentration (ppm)		0.058	0.068	0.065
Annual Arithmetic Mean Concentration (ppm)		0.014	0.013	0.014
Particulate Matter ≤ 10 Microns (PM_{10})				
Maximum 24-Hour Concentration ($\mu g/m^3$)		87	74	76
Annual Arithmetic Mean ($\mu g/m^3$)		35.1	30.3	32.2
Number of Samples		60	57	57
Number of Samples Exceeding State Standard	> 50 $\mu g/m^3$	6	3	5
Particulate Matter ≤ 2.5 Microns ($PM_{2.5}$)*				
Maximum 24-Hour Concentration ($\mu g/m^3$)		73.6	56.6	45.6
Annual Arithmetic Mean ($\mu g/m^3$)		14.5	13.3	14.0
Number of Samples Exceeding Federal 24-Hour Standard	> 35 $\mu g/m^3$	9	17	6

-- = data not available from SCAQMD or ARB; *Data from the Riverside County 2 monitoring station is only available up to year 2014. As such, data from the Lake Elsinore monitoring station is used for the year 2015 and 2016.

Criteria pollutants are pollutants that are regulated through the development of human health based and/or environmentally based criteria for setting permissible levels. Criteria pollutants, their typical sources, and effects are identified below:

- Carbon Monoxide (CO): Is a colorless, odorless gas produced by the incomplete combustion of carbon-containing fuels, such as gasoline or wood. CO concentrations tend to be the highest during the winter morning, when little to no wind and surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines, unlike ozone, motor vehicles operating at slow speeds are the primary source of CO in the Basin. The highest ambient CO concentrations are generally found near congested transportation corridors and intersections.
- Sulfur Dioxide (SO_2): Is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning high sulfur-content fuel oils and coal and from chemical

processes occurring at chemical plants and refineries. When SO_2 oxidizes in the atmosphere, it forms sulfates (SO_4). Collectively, these pollutants are referred to as sulfur oxides (SO_x).

- Nitrogen Oxides (Oxides of Nitrogen, or NO_x): Nitrogen oxides (NO_x) consist of nitric oxide (NO), nitrogen dioxide (NO_2) and nitrous oxide (N_2O) and are formed when nitrogen (N_2) combines with oxygen (O_2). Their lifespan in the atmosphere ranges from one to seven days for nitric oxide and nitrogen dioxide, to 170 years for nitrous oxide. Nitrogen oxides are typically created during combustion processes, and are major contributors to smog formation and acid deposition. NO_2 is a criteria air pollutant, and may result in numerous adverse health effects; it absorbs blue light, resulting in a brownish-red cast to the atmosphere and reduced visibility. Of the seven types of nitrogen oxide compounds, NO_2 is the most abundant in the atmosphere. As ambient concentrations of NO_2 are related to traffic density, commuters in heavy traffic may be exposed to higher concentrations of NO_2 than those indicated by regional monitors.
- Ozone (O_3): Is a highly reactive and unstable gas that is formed when volatile organic compounds (VOCs) and nitrogen oxides (NO_x), both byproducts of internal combustion engine exhaust, undergo slow photochemical reactions in the presence of sunlight. Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable to the formation of this pollutant.
- PM_{10} (Particulate Matter less than 10 microns): A major air pollutant consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and aerosols. The size of the particles (10 microns or smaller, about 0.0004 inches or less) allows them to easily enter the lungs where they may be deposited, resulting in adverse health effects. PM_{10} also causes visibility reduction and is a criteria air pollutant.
- $PM_{2.5}$ (Particulate Matter less than 2.5 microns): A similar air pollutant consisting of tiny solid or liquid particles which are 2.5 microns or smaller (which is often referred to as fine particles). These particles are formed in the atmosphere from primary gaseous emissions that include sulfates formed from SO_2 release from power plants and industrial facilities and nitrates that are formed from NO_x release from power plants, automobiles and other types of combustion sources. The chemical composition of fine particles highly depends on location, time of year, and weather conditions. $PM_{2.5}$ is a criteria air pollutant.
- Volatile Organic Compounds (VOC): Volatile organic compounds are hydrocarbon compounds (any compound containing various combinations of hydrogen and carbon atoms) that exist in the ambient air. VOCs contribute to the formation of smog through atmospheric photochemical reactions and/or may be toxic. Compounds of carbon (also known as organic compounds) have different levels of reactivity; that is, they do not react at the same speed or do not form ozone to the same extent when exposed to photochemical processes. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints. Exceptions to the VOC designation include: carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate. VOCs are a criteria pollutant since they are a precursor to O_3, which is a criteria pollutant. The SCAQMD uses the terms VOC and ROG (see below) interchangeably.
- Reactive Organic Gases (ROG): Similar to VOC, Reactive Organic Gases (ROG) are also precursors in forming ozone and consist of compounds containing methane, ethane, propane, butane, and longer chain hydrocarbons, which are typically the result of some type of combustion/decomposition process. Smog is formed when ROG and nitrogen oxides react in the presence of sunlight. ROGs are a criteria pollutant since they are a precursor to O_3, which is a criteria pollutant. The SCAQMD uses the terms ROG and VOC (see previous) interchangeably.

- Lead (Pb): Lead is a heavy metal that is highly persistent in the environment. In the past, the primary source of lead in the air was emissions from vehicles burning leaded gasoline. As a result of the removal of lead from gasoline, there have been no violations at any of the SCAQMD's regular air monitoring stations since 1982. Currently, emissions of lead are largely limited to stationary sources such as lead smelters. It should be noted that the Project is not anticipated to generate a quantifiable amount of lead emissions. Lead is a criteria air pollutant.

Health Effects of Air Pollutants

Ozone

Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible sub-groups for ozone effects. Short-term exposure (lasting for a few hours) to ozone at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Elevated ozone levels are associated with increased school absences. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in communities with high ozone levels.

Ozone exposure under exercising conditions is known to increase the severity of the responses described above. Animal studies suggest that exposure to a combination of pollutants that includes ozone may be more toxic than exposure to ozone alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

Carbon Monoxide

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of decreased oxygen supply to the heart. Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport and competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include fetuses, patients with diseases involving heart and blood vessels, and patients with chronic hypoxemia (oxygen deficiency) as seen at high altitudes.

Reduction in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO, resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels; these include pre-term births and heart abnormalities.

Particulate Matter

A consistent correlation between elevated ambient fine particulate matter (PM_{10} and $PM_{2.5}$) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. In recent years, some studies have reported an association between long-term exposure to air pollution dominated by fine particles and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in $PM_{2.5}$ concentration levels have also been related to hospital admissions for acute respiratory conditions in children, to school and kindergarten absences, to a decrease in respiratory lung volumes in normal children, and to increased medication use in children and adults with asthma. Recent studies show lung function growth in children is reduced with long term exposure to particulate matter.

The elderly, people with pre-existing respiratory or cardiovascular disease, and children appear to be more susceptible to the effects of high levels of PM_{10} and $PM_{2.5}$.

Nitrogen Dioxide

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposure to NO_2 at levels found in homes with gas stoves, which are higher than ambient levels found in Southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups.

In animals, exposure to levels of NO_2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of ozone and NO_2.

Sulfur Dioxide

A few minutes of exposure to low levels of SO_2 can result in airway constriction in some asthmatics, all of whom are sensitive to its effects. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, are observed after acute exposure to SO_2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_2.

Animal studies suggest that despite SO_2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. In these studies, efforts to

separate the effects of SO_2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

Lead

Fetuses, infants, and children are more sensitive than others to the adverse effects of Pb exposure. Exposure to low levels of Pb can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased Pb levels are associated with increased blood pressure.

Pb poisoning can cause anemia, lethargy, seizures, and death; although it appears that there are no direct effects of Pb on the respiratory system. Pb can be stored in the bone from early age environmental exposure, and elevated blood Pb levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland) and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of Pb because of previous environmental Pb exposure of their mothers.

Odors

The science of odor as a health concern is still new. Merely identifying the hundreds of VOCs that cause odors poses a big challenge. Offensive odors can potentially affect human health in several ways. First, odorant compounds can irritate the eye, nose, and throat, which can reduce respiratory volume. Second, studies have shown that the VOCs that cause odors can stimulate sensory nerves to cause neurochemical changes that might influence health, for instance, by compromising the immune system. Finally, unpleasant odors can trigger memories or attitudes linked to unpleasant odors, causing cognitive and emotional effects such as stress.

2.7 REGULATORY BACKGROUND

2.7.1 FEDERAL REGULATIONS

The U.S. EPA is responsible for setting and enforcing the NAAQS for O_3, CO, NO_x, SO_2, PM_{10}, and lead (8). The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Federal Clean Air Act (CAA) was first enacted in 1955 and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977, and 1990). The CAA establishes the federal air quality standards, the NAAQS, and specifies future dates for achieving compliance (17). The CAA also mandates that states submit and implement State Implementation Plans (SIPs) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA that identify specific emission reduction goals for areas not meeting the NAAQS require a demonstration of reasonable further progress toward attainment

and incorporate additional sanctions for failure to attain or to meet interim milestones. The sections of the CAA most directly applicable to the development of the Project site include Title I (Non-Attainment Provisions) and Title II (Mobile Source Provisions). Title I provisions were established with the goal of attaining the NAAQS for the following criteria pollutants O_3, NO_2, SO_2, PM_{10}, CO, $PM_{2.5}$, and lead. The NAAQS were amended in July 1997 to include an additional standard for O_3 and to adopt a NAAQS for $PM_{2.5}$. Table 2-1 (previously presented) provides the NAAQS within the basin.

Mobile source emissions are regulated in accordance with Title II provisions. These provisions require the use of cleaner burning gasoline and other cleaner burning fuels such as methanol and natural gas. Automobile manufacturers are also required to reduce tailpipe emissions of hydrocarbons and nitrogen oxides (NO_x). NO_x is a collective term that includes all forms of nitrogen oxides (NO, NO_2, NO_3) which are emitted as byproducts of the combustion process.

2.7.2 CALIFORNIA REGULATIONS

The CARB, which became part of the California EPA in 1991, is responsible for ensuring implementation of the California Clean Air Act (AB 2595), responding to the federal CAA, and for regulating emissions from consumer products and motor vehicles. The California CAA mandates achievement of the maximum degree of emissions reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date. The CARB established the CAAQS for all pollutants for which the federal government has NAAQS and, in addition, establishes standards for sulfates, visibility, hydrogen sulfide, and vinyl chloride. However, at this time, hydrogen sulfide and vinyl chloride are not measured at any monitoring stations in the SCAB because they are not considered to be a regional air quality problem. Generally, the CAAQS are more stringent than the NAAQS (9) (8).

Local air quality management districts, such as the SCAQMD, regulate air emissions from stationary sources such as commercial and industrial facilities. All air pollution control districts have been formally designated as attainment or non-attainment for each CAAQS.

Serious non-attainment areas are required to prepare air quality management plans that include specified emission reduction strategies in an effort to meet clean air goals. These plans are required to include:

- Application of Best Available Retrofit Control Technology to existing sources;
- Developing control programs for area sources (e.g., architectural coatings and solvents) and indirect sources (e.g. motor vehicle use generated by residential and commercial development);
- A District permitting system designed to allow no net increase in emissions from any new or modified permitted sources of emissions;
- Implementing reasonably available transportation control measures and assuring a substantial reduction in growth rate of vehicle trips and miles traveled;
- Significant use of low emissions vehicles by fleet operators;
- Sufficient control strategies to achieve a five percent or more annual reduction in emissions or 15 percent or more in a period of three years for ROGs, NO_x, CO and PM_{10}. However, air basins may

use alternative emission reduction strategy that achieves a reduction of less than five percent per year under certain circumstances.

2.7.3 AIR QUALITY MANAGEMENT PLANNING

Currently, the NAAQS and CAAQS are exceeded in most parts of the SCAB. In response, the SCAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the state and federal ambient air quality standards (18). AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy. A detailed discussion on the AQMP and Project consistency with the AQMP is provided in Section 3.8.

2.8 REGIONAL AIR QUALITY IMPROVEMENT

The Project is within the jurisdiction of the SCAQMD. In 1976, California adopted the Lewis Air Quality Management Act which created SCAQMD from a voluntary association of air pollution control districts in Los Angeles, Orange, Riverside, and San Bernardino counties. The geographic area of which SCAQMD consists is known as the Basin. SCAQMD develops comprehensive plans and regulatory programs for the region to attain federal standards by dates specified in federal law. The agency is also responsible for meeting state standards by the earliest date achievable, using reasonably available control measures.

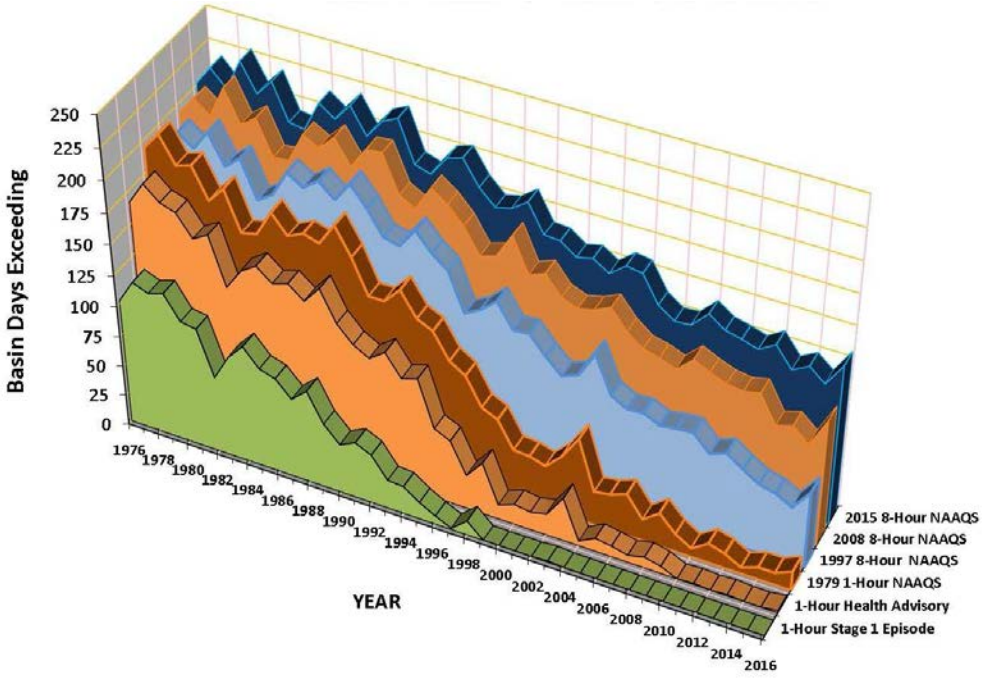
SCAQMD rule development through the 1970s and 1980s resulted in dramatic improvement in Basin air quality. Nearly all control programs developed through the early 1990s relied on (i) the development and application of cleaner technology; (ii) add-on emission controls, and (iii) uniform CEQA review throughout the Basin. Industrial emission sources have been significantly reduced by this approach and vehicular emissions have been reduced by technologies implemented at the state level by CARB.

As discussed above, the SCAQMD is the lead agency charged with regulating air quality emission reductions for the entire Basin. SCAQMD created AQMPs which represent a regional blueprint for achieving healthful air on behalf of the 16 million residents of the South Coast Basin. The remarkable historical improvement in air quality since the 1970's is the direct result of Southern California's comprehensive, multiyear strategy of reducing air pollution from all sources as outlined in its Air Quality Management Plans (AQMPs) and by utilizing uniform CEQA review throughout the Basin.

The 2012 AQMP states, "the remarkable historical improvement in air quality since the 1970's is the direct result of Southern California's comprehensive, multiyear strategy of reducing air pollution from all sources as outlined in its AQMPs," (19). Ozone, NO_x, VOC, and CO have been decreasing in the Basin since 1975 and are projected to continue to decrease through 2020 (20). These decreases result primarily from motor vehicle controls and reductions in evaporative emissions. Although vehicle miles traveled in the Basin continue to increase, NO_x and VOC levels are decreasing because of the mandated controls on motor vehicles and the replacement of older polluting vehicles with lower-emitting vehicles. NO_x emissions from electric utilities have also decreased due to use of cleaner fuels and renewable energy. Ozone contour maps show that the number of days exceeding the national 8-hour standard has decreased between 1997 and 2007.

In the 2007 period, there was an overall decrease in exceedance days compared with the 1997 period. Ozone levels in the SCAB have decreased substantially over the last 30 years as shown in Table 2-4 (21). Today, the maximum measured concentrations are approximately one-third of concentrations within the late 70's.

TABLE 2-4: SOUTH COAST AIR BASIN OZONE TREND



The overall trends of PM_{10} and $PM_{2.5}$ in the air (not emissions) show an overall improvement since 1975. Direct emissions of PM_{10}PM have remained somewhat constant in the Basin and direct emissions of $PM_{2.5}$ have decreased slightly since 1975. Area wide sources (fugitive dust from roads, dust from construction and demolition, and other sources) contribute the greatest amount of direct particulate matter emissions.

As with other pollutants, the most recent PM_{10}PM statistics also show overall improvement as illustrated in Table 2-5. During the period for which data are available, the 24-hour national annual average decreased by approximately 50 percent, from 103.7 µg/m³ in 1989 to 52.3 µg/m³ in 2016. Although the values in the late 1990's show some variability, this is probably due to meteorology rather than a change in emissions. Despite the overall decrease, ambient concentrations still exceed the State annual and 24-hour PM_{10} standards. Similar to the ambient concentrations, the calculated number of days above the 24-hour PM_{10} standards has also shown an overall drop. The most recent report to include information on the number of days above the national standard was in 2015, in which there were 6.6 calculated national standard exceedance days (22).

TABLE 2-5: SOUTH COAST AIR BASIN PM_{10} TREND

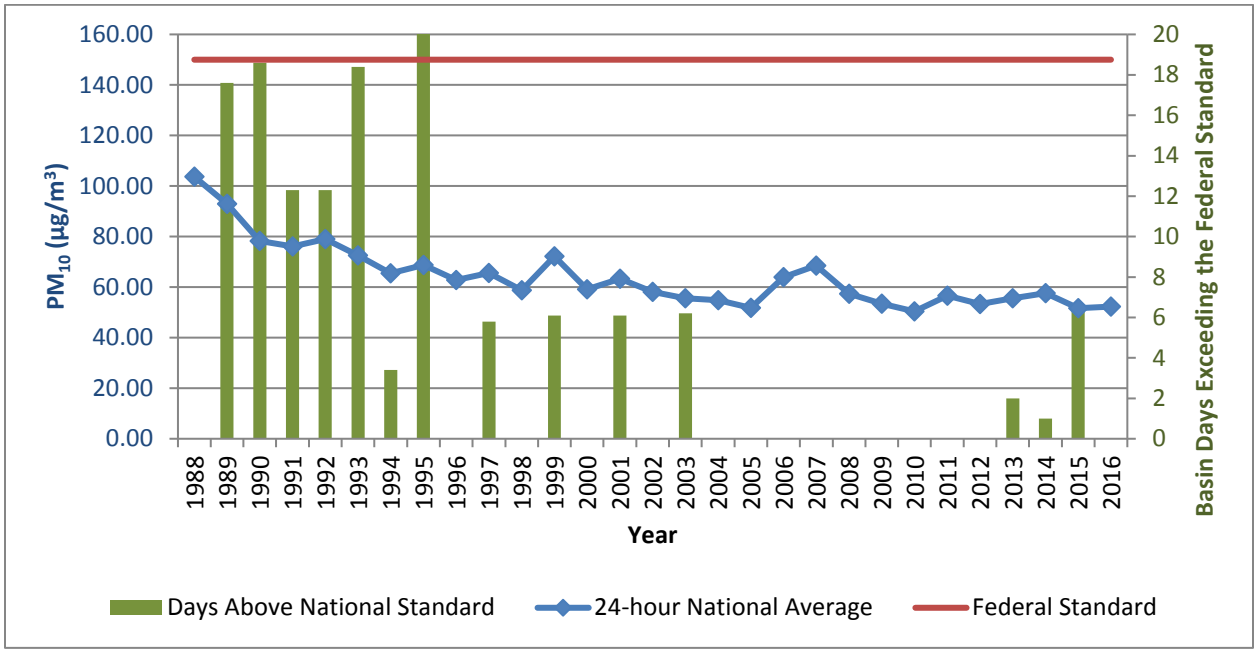
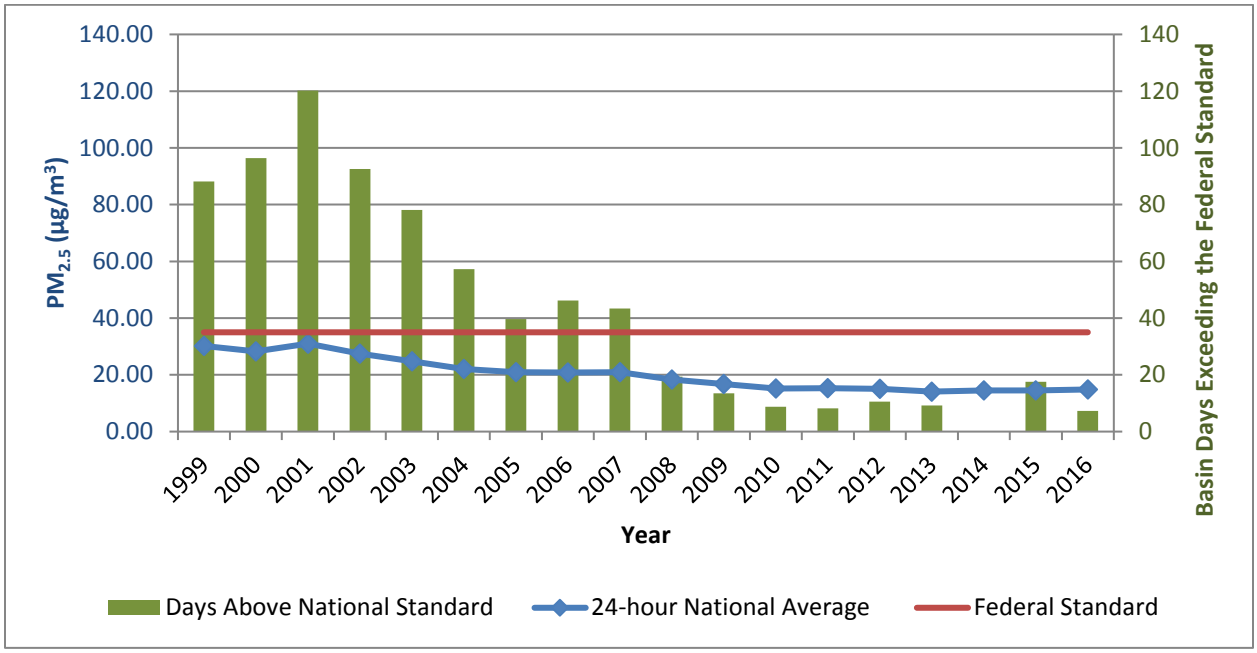


Table 2-6 shows the most recent 24-hour average $PM_{2.5}$ concentrations (national) in the SCAB from 1999 through 2016. Overall, the annual average concentrations have decreased by almost 51 percent. The calculated number of days above the national standard also decreased, from about 88 days in 1999 to about 7 days in 2016. The SCAB is currently designated as nonattainment for the State and national $PM_{2.5}$ standards.

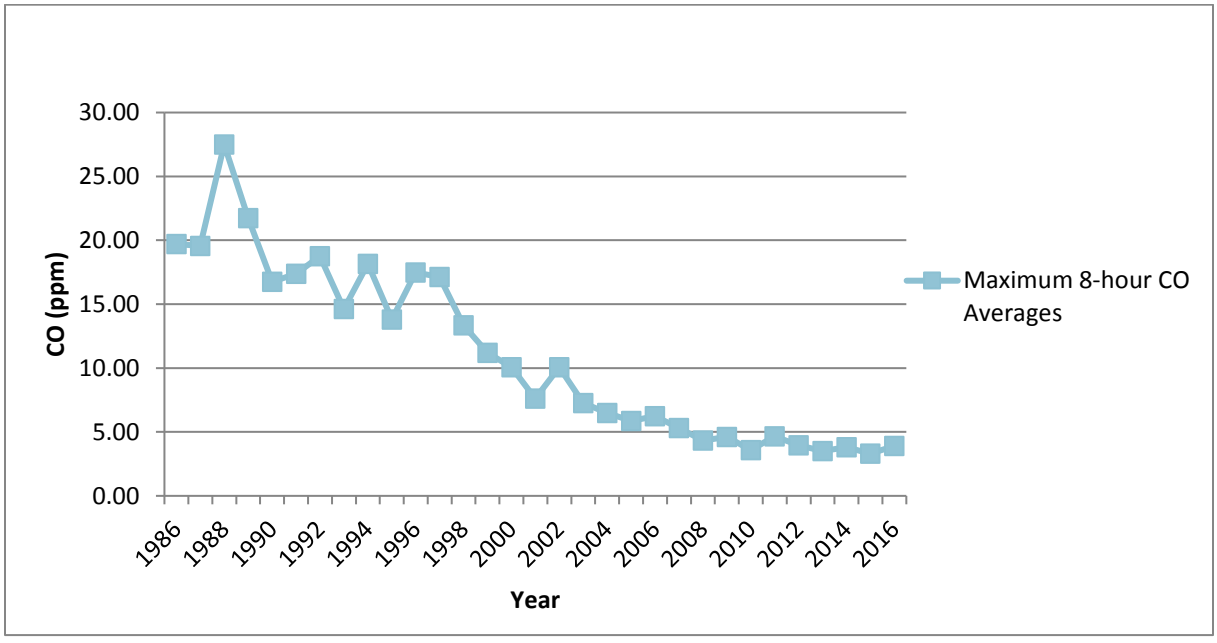
While the 2012 AQMP PM_{10} attainment demonstration and the 2015 associated supplemental SIP submission indicated that attainment of the 24-hour standard was predicted to occur by the end of 2015, it could not anticipate the effect of the ongoing drought on the measured $PM_{2.5}$. The 2006 to 2010 base period used for the 2012 attainment demonstration had near-normal rainfall. While the trend of $PM_{2.5}$- equivalent emission reductions continued through 2015, the severe drought conditions contributed to the $PM_{2.5}$ increases observed after 2012. As a result of the disrupted progress toward attainment of the federal 24-hour $PM_{2.5}$ standard, SCAQMD submitted a request and the U.S. EPA approved, in January 2016, a "bump up" to the nonattainment classification from "moderate" to "serious," with a new attainment deadline as soon as practicable, but not beyond December 31, 2019.

TABLE 2-6: SOUTH COAST AIR BASIN $PM_{2.5}$ TREND



The most recent CO concentrations in the SCAB 1986 are shown in Table 2-7 (23). CO concentrations in the SCAB have decreased markedly — a total decrease of more about 80 percent in the peak 8-hour concentration since 1986. The number of exceedance days has also declined. The entire SCAB is now designated as attainment for both the state and national CO standards. Ongoing reductions from motor vehicle control programs should continue the downward trend in ambient CO concentrations.

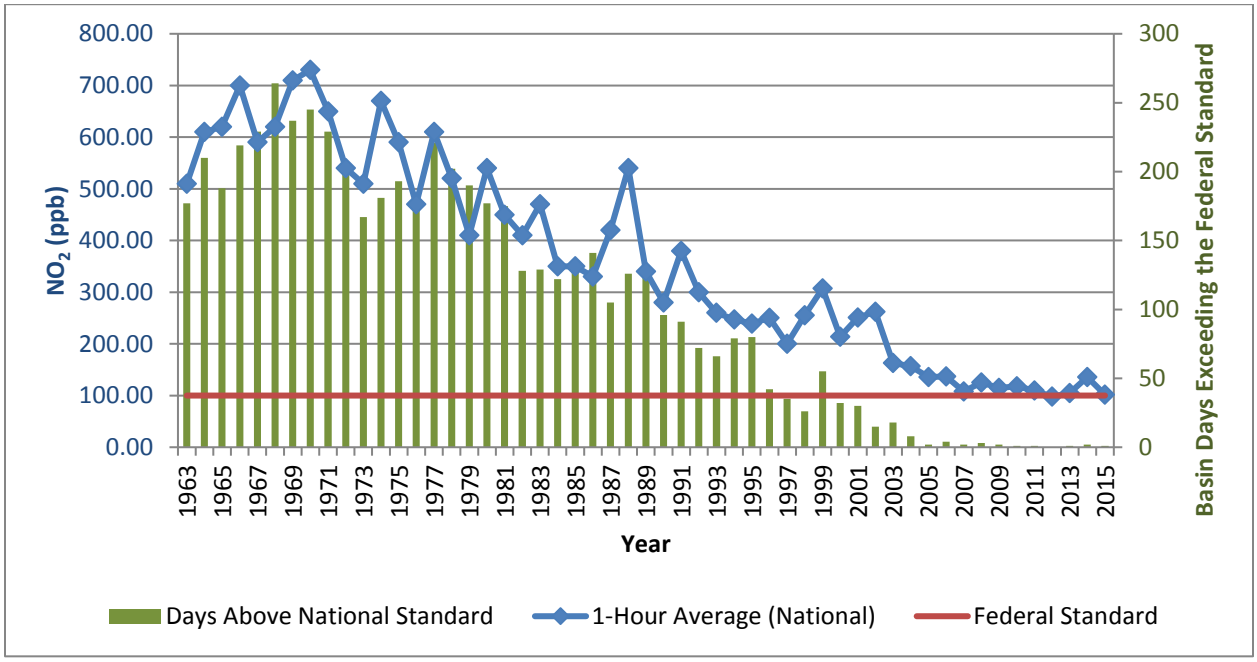
TABLE 2-7: SOUTH COAST AIR BASIN CARBON MONOXIDE TREND



Part of the control process of the SCAQMD's duty to greatly improve the air quality in the Basin is the uniform CEQA review procedures required by SCAQMD's CEQA Handbook (24). The single threshold of significance used to assess Project direct and cumulative impacts has in fact "worked" as evidenced by the track record of the air quality in the Basin dramatically improving over the course of the past decades. As stated by the SCAQMD, the District's thresholds of significance are based on factual and scientific data and are therefore appropriate thresholds of significance to use for this Project.

The most recent NO_2 data for the SCAB is shown in Table 2-8 (23). Over the last 50 years, NO_2 values have decreased significantly; the peak 1-hour average for 2016 was approximately 81 percent lower than what it was during 1963. The SCAB attained the State 1-hour NO_2 standard in 1994, bringing the entire State into attainment. A new state annual average standard of 0.030 parts per million was adopted by the ARB in February 2007 (25). The new standard is just barely exceeded in the South Coast. NO_2 is formed from NO_x emissions, which also contribute to ozone. As a result, the majority of the future emission control measures will be implemented as part of the overall ozone control strategy. Many of these control measures will target mobile sources, which account for more than three-quarters of California's NO_x emissions. These measures are expected to bring the South Coast into attainment of the State annual average standard.

TABLE 2-8: SOUTH COAST AIR BASIN NITROGEN DIOXIDE TREND



The American Lung Association website includes data collected from State air quality monitors that are used to compile an annual State of the Air report. The latest State of the Air Report compiled for the Basin was in 2015 (26). As noted in this report, air quality in the Basin has significantly improved in terms of both pollution levels and high pollution days over the past three decades. The area's average number of high ozone days dropped from 38% regionally in the initial

2000 State of the Air report (1996–1998) to 69% in the 2004 report. The region has also seen dramatic reduction in particle pollution since the initial 2000 State of the Air report (26).

TOXIC AIR CONTAMINANTS (TACS) TRENDS

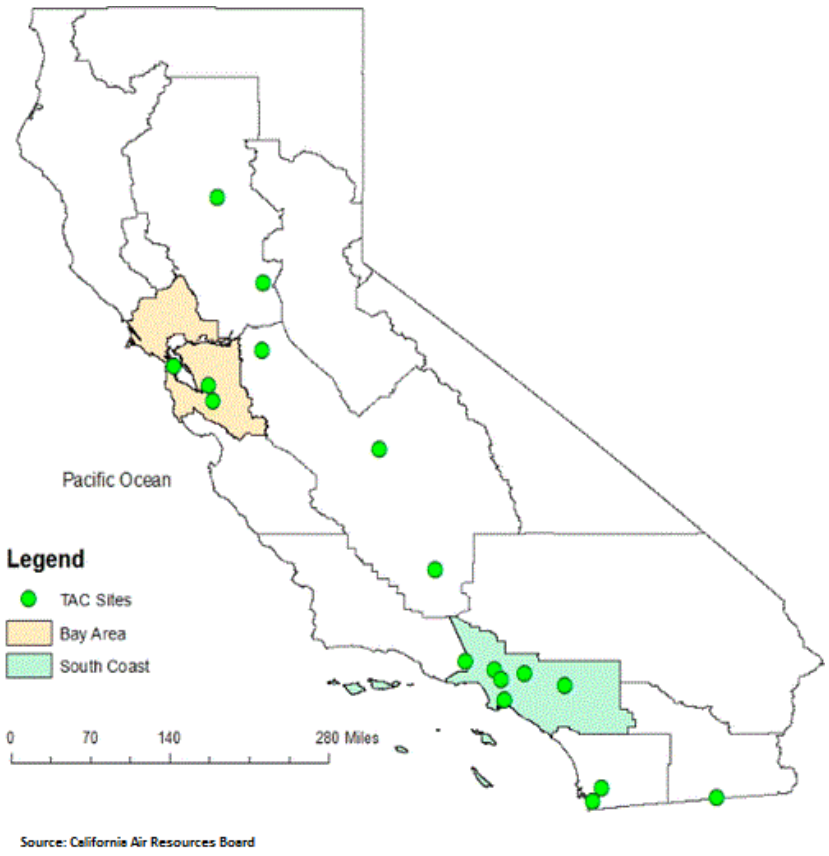
In 1984, as a result of public concern for exposure to airborne carcinogens, the CARB adopted regulations to reduce the amount of air toxic contaminant emissions resulting from mobile and area sources, such as cars, trucks, stationary products, and consumer products. According to the *Ambient and Emission Trends of Toxic Air Contaminants in California* journal article (27) which was prepared for CARB, results show that between 1990-2012, ambient concentration and emission trends for the seven TACs responsible for most of the known cancer risk associated with airborne exposure in California have declined significantly (between 1990 and 2012). The seven TACs studied include those that are derived from mobile sources: diesel particulate matter (DPM), benzene, and 1,3-butadiene; those that are derived from stationary sources: perchloroethylene and hexavalent chromium; and those derived from photochemical reactions of emitted VOCs: formaldehyde and acetaldehyde[3]. TACs data was gathered at monitoring sites from both the Bay Area and South Coast Air Basins, as shown on Exhibit 2-A; Several of the sites in the SCAB include Reseda, Compton, Rubidoux, Burbank, and Fontana. The decline in ambient concentration and emission trends of these TACs are a result of various regulations CARB has implemented to address cancer risk.

Mobile Source TACs

CARB introduced two programs that aimed at reducing mobile emissions for light and medium duty vehicles through vehicle emissions controls and cleaner fuel. In California, light-duty vehicles sold after 1996 are equipped with California's second-generation On-Board Diagnostic (OBD-II) system. The OBD II system monitors virtually every component that can affect the emission performance of the vehicle to ensure that the vehicle remains as clean as possible over its entire life, and assists repair technicians in diagnosing and fixing problems with the computerized engine controls. If a problem is detected, the OBD II system illuminates a warning lamp on the vehicle instrument panel to alert the driver. This warning lamp typically contains the phrase Check Engine or Service Engine Soon. The system will also store important information about the detected malfunction so that a repair technician can accurately find and fix the problem. ARB has recently developed similar OBD requirements for heavy-duty vehicles over 14,000 lbs. CARB's phase II Reformulated Gasoline (RFG-2) regulation, adopted in 1996, also led to a reduction of mobile source emissions. Through such regulations, benzene levels declined 88% from 1990-2012. 1,3-Butadiene concentrations also declined 85% from 1990-2012 as a result of the use of reformulated gasoline and motor vehicle regulations (27).

[3] It should be noted that ambient DPM concentrations are not measured directly. Rather, a surrogate method using the coefficient of haze (COH) and elemental carbon (EC) is used to estimate DPM concentrations.

EXHIBIT 2-A: CALIFORNIA TOXIC AIR CONTAMINANT SITES

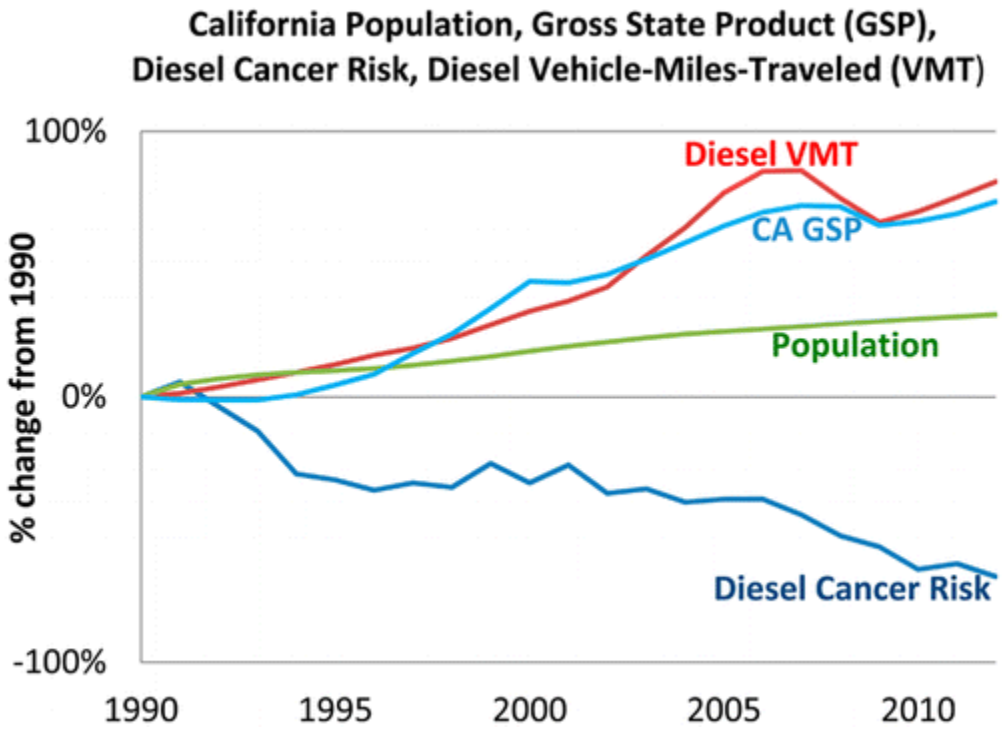


In 2000, CARB's Diesel Risk Reduction Plan (DRRP) recommended the replacement and retrofit of diesel-fueled engines and the use of ultra-low-sulfur (<15ppm) diesel fuel. As a result of these measures, DPM concentrations have declined 68% since 2000, even though the state's population increased 31% and the amount of diesel vehicles miles traveled increased 81%, as shown on Exhibit 2-B. With the implementation of these diesel-related control regulations, ARB expects a DPM decline of 71% for 2000-2020.

Stationary Source TACs

Various regulations led to a decrease in perchloroethylene and hexavalent chromium, with a 92% and 86% decline, respectively. By 1993, several local air districts required dry cleaning businesses to use a carbon absorber and refrigerated condenser, as well as, dry-to-dry machines and closed-looped machines instead of vented transfer machines. Starting in 2003, California provided financial incentives for dry cleaners to use other solvents and soon after, the CARB banned the use of perchloroethylene in automotive products, aerosol coatings, and most consumer products. In 2007, CARB's dry-cleaning regulation was amended to require phase-out of perchloroethylene machines by 2023, which would further reduce emissions to minimal levels (27).

EXHIBIT 2-B: DIESEL PARTICULATE MATTER AND DIESEL VEHICLE MILES TREND



Source: California Air Resources Board

Hexavalent chromium emissions began to decline in 1988 with the ARB-regulated regulations contributing to more than 97% emission reduction within four years. The various regulations include prohibiting the use of hexavalent chromium in cooling towers (1989), in motor vehicle and mobile equipment coatings (2001), and in thermal spraying operations (2005). By 2005, hexavalent chromium emissions were 99.97% less than in 1987, far exceeding expectations. In 2006, hexavalent chromium emissions were further reduced with the 2006 ARB regulation requiring add-on air pollution control devices and chemical fume suppressants.

Between 1996-2012, ambient concentrations of formaldehyde and acetaldehyde declined 22% and 21%, respectively. The decline in these TACs are attributed from increasingly stringent motor vehicle exhaust emission standards, vehicle fleet turnover, fuel reformulation, and the switch from MTBE (formaldehyde precursor) to ethanol in gasoline (27).

As previously discussed, ambient and emissions levels of TACs have reduced significantly from 1990-2012. The overall declining trend in TACs is expected to continue in California from implementation of toxic air controls.

DIESEL REGULATIONS

The CARB and the Ports of Los Angeles and Long Beach have adopted several iterations of regulations for diesel trucks that are aimed at reducing diesel particulate matter (DPM). More specifically, the CARB Drayage Truck Regulation (28), the CARB statewide On-road Truck and Bus Regulation (29), and the Ports of Los Angeles and Long Beach "Clean Truck Program" (CTP)

require accelerated implementation of "clean trucks" into the statewide truck fleet (30). In other words, older more polluting trucks will be replaced with newer, cleaner trucks as a function of these regulatory requirements.

Moreover, the average statewide DPM emissions for Heavy Duty Trucks (HDT), in terms of grams of DPM generated per mile traveled, will dramatically be reduced due to the aforementioned regulatory requirements.

Diesel emissions identified in this analysis would therefore overstate future DPM emissions since not all the regulatory requirements are reflected in the modeling.

CANCER RISK TRENDS

Based on information available from CARB, overall cancer risk throughout the basin has had a declining trend since 1990. In 1998, following an exhaustive 10-year scientific assessment process, the State of California Air Resources Board (ARB) identified particulate matter from diesel-fueled engines as a toxic air contaminant. The SCAQMD initiated a comprehensive urban toxic air pollution study, called MATES-II (for Multiple Air Toxics Exposure Study). Diesel particulate matter (DPM) accounts for more than 70 percent of the cancer risk.

In 2008 the SCAQMD prepared an update to the MATES-II study, referred to as MATES-III. MATES-III estimates the average excess cancer risk level from exposure to TACs is an approximately 17% decrease in comparison to the MATES-II study.

Nonetheless, the SCAQMD's most recent in-depth analysis of the toxic air contaminants and their resulting health risks for all of Southern California was from the *Multiple Air Toxics Exposure Study in the South Coast Air Basin, MATES IV,"* which shows that cancer risk has decreased more than 55% between MATES III (2005) and MATES IV (2012) (25).

MATES-IV study represents the baseline health risk for a cumulative analysis. MATES-IV calculated cancer risks based on monitoring data collected at ten fixed sites within the South Coast Air Basin (SCAB). None of the fixed monitoring sites are within the local area of the Project site. However, MATES-IV has extrapolated the excess cancer risk levels throughout the basin by modeling the specific grids. MATES-IV modeling predicted an excess cancer risk of 587.29 in one million for the Project area. DPM is included in this cancer risk along with all other TAC sources. DPM accounts for 68% of the total risk shown in MATES-IV. Cumulative Project generated TACs are limited to DPM.

2.9 EXISTING PROJECT SITE AIR QUALITY CONDITIONS

The Project site is currently vacant and as such, existing air quality conditions at the Project site would generally reflect ambient monitored conditions previously presented previously at Table 2-3.

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3 PROJECT AIR QUALITY IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will violate an air quality standard or contribute to an existing or projected air quality violation. Additionally, the Project has been evaluated to determine if it will result in a cumulatively considerable net increase of a criteria pollutant for which the SCAB is non-attainment under an applicable federal or state ambient air quality standard. The significance of these potential impacts is described in the following section.

3.2 STANDARDS OF SIGNIFICANCE

The SCAQMD has developed regional and localized significance thresholds for regulated The SCAQMD has developed regional and localized significance thresholds for regulated pollutants, as summarized at Table 3-1 (31). The SCAQMD's CEQA Air Quality Significance Thresholds (March 2015) indicate that any projects in the SCAB with daily emissions that exceed any of the indicated thresholds should be considered as having an individually and cumulatively significant air quality impact.

TABLE 3-1: MAXIMUM DAILY EMISSIONS THRESHOLDS[A]

Pollutant	Construction	Operations
Regional Thresholds		
NO_x	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
SO_x	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Localized Thresholds		
NO_x	335 lbs/day (site preparation) 422 lbs/day (grading)	488 lbs/day
CO	4,359 lbs/day (site preparation) 7,070 lbs/day (grading)	6,860 lbs/day
PM_{10}	67 lbs/day (site preparation) 91 lbs/day (grading)	23 lbs/day
$PM_{2.5}$	20 lbs/day (site preparation) 33 lbs/day (grading)	8 lbs/day

[A]: Based on SCAQMD Air Quality Significance Thresholds, March 2015

3.3 CALIFORNIA EMISSIONS ESTIMATOR MODEL™ EMPLOYED TO ESTIMATE AQ EMISSIONS

Land uses such as the Project affect air quality through construction-source and operational-source emissions.

On October 17, 2017, the SCAQMD in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the California Emissions Estimator Model™ (CalEEMod™) v2016.3.2. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (NO_x, VOC, PM_{10}, $PM_{2.5}$, SO_x, and CO) and greenhouse gas (GHG) emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (32). Accordingly, the latest version of CalEEMod™ has been used for this Project to determine construction and operational air quality emissions. Output from the model runs for both construction and operational activity are provided in Appendix 3.1 through Appendix 3.3.

3.4 CONSTRUCTION EMISSIONS

Construction activities associated with the Project will result in emissions NO_x, VOC, PM_{10}, $PM_{2.5}$, SO_x, and CO. Construction related emissions are expected from the following construction activities:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

Construction is expected to commence in December 2018 and will last through September 2019. The duration of construction activity was estimated based on information provided by the client. The construction schedule utilized in the analysis, shown in Table 3-2, represents a "worst-case" analytical scenario. The reason this schedule represents a "worst-case" analytical scenario is due to the fact that emission factors for construction equipment and vehicles decrease as time passes and as the analysis year increases due to emission regulations becoming more stringent and the natural turnover of older fleets that are replaced by newer fleets that are less polluting[4]. A detailed summary of construction, shown in Table 3-3, was estimated based on past project experience and CalEEMod model defaults. The site specific construction fleet may vary due to specific project needs at the time of construction. The duration of construction activity and associated equipment both represent a reasonable approximation of the expected construction fleet as required per CEQA guidelines. Please refer to specific detailed modeling inputs/outputs contained in Appendix 3.1 of this analysis.

[4] As shown in the California Emissions Estimator Model (CalEEMod) User's Guide Version 2016.3.2, Section 4.3"OFFROAD Equipment" as the analysis year increases, emission factors for the same equipment pieces decrease due to the natural turnover of older equipment being replaced by newer less polluting equipment and new regulatory requirements.

Dust is typically a major concern during rough grading activities. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions". Fugitive dust emissions rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). The CalEEMod model was utilized to calculate fugitive dust emissions resulting from this phase of activity. As per information provided by the Project Applicant, it is our understanding the Project will be balanced (will not require import/export of soil).

Construction emissions for construction worker vehicles traveling to and from the Project site, as well as vendor trips (construction materials delivered to the Project site) were estimated based on information from the applicant and the CalEEMod model.

TABLE 3-2: CONSTRUCTION DURATION

Phase Name	Start Date	End Date	Days
Site Preparation	12/10/2018	12/21/2018	10
Grading	12/22/2018	01/18/2019	20
Building Construction	01/19/2019	10/25/2019	200
Paving	08/01/2019	08/28/2019	20
Architectural Coating	07/01/2019	09/06/2019	50

TABLE 3-3: CONSTRUCTION EQUIPMENT ASSUMPTIONS

Activity	Equipment	Number	Hours Per Day
Site Preparation	Crawler Tractors	1	8
Grading	Crawler Tractors	1	8
	Excavators	1	8
	Graders	2	8
	Rubber Tired Dozer	1	8
Building Construction	Cranes	1	8
	Forklifts	3	8
	Generator Sets	2	8
	Welders	1	8
Paving	Pavers	1	8
	Paver Equipment	1	8
	Rollers	1	8
Architectural Coating	Air Compressors	1	8

OFF-SITE UTILITY AND INFRASTRUCTURE IMPROVEMENTS

Construction emissions associated with off-site utility and infrastructure improvements may occur, however at this time, a specific schedule of off-site utility and infrastructure improvements is unknown. However, impacts associated with these expected activities are not expected to exceed the emissions identified for Project-related construction activities. As such, no impacts beyond what has already been identified in this report are expected to occur.

3.4.1 CONSTRUCTION EMISSIONS SUMMARY

Impacts without mitigation assume compliance with applicable SCAQMD Rules. The SCAQMD Rules that are currently applicable during construction activity for this Project include but are not limited to: Rule 1113 (Architectural Coatings) (3); Rule 431.2 (Low Sulfur Fuel) (4); Rule 403 (Fugitive Dust) (5); and Rule 1186 / 1186.1 (Street Sweepers) (6). As such, credit for Rule 403(BACM AQ-1) and Rule 1113 (BACM AQ-2) have been taken.

The estimated maximum daily construction emissions without mitigation are summarized on Table 3-4. Detailed construction model outputs are presented in Appendix 3.1. Under the assumed scenarios, emissions resulting from the Project construction would not exceed criteria pollutant thresholds established by the SCAQMD.

TABLE 3-4: MAXIMUM DAILY PEAK CONSTRUCTION EMISSIONS SUMMARY (WITHOUT MITIGATION)

Year	Emissions (pounds per day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2018	3.21	38.45	14.72	0.04	4.66	2.82
2019	23.79	35.94	32.11	0.07	4.56	2.72
Maximum Daily Emissions	**23.79**	**38.45**	**32.11**	**0.07**	**4.66**	**2.82**
SCAQMD Regional Threshold	75	100	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

3.5 OPERATIONAL EMISSIONS

Operational activities associated with the proposed Project will result in emissions of NO_x, VOC, PM_{10}, $PM_{2.5}$, SO_x, and CO. Operational emissions would be expected from the following primary sources:

- Area Source Emissions
- Energy Source Emissions
- Mobile Source Emissions
- On-Site Equipment Emissions

3.5.1 AREA SOURCE EMISSIONS

Architectural Coatings

Over a period of time the buildings that are part of this Project will be subject to emissions resulting from the evaporation of solvents contained in paints, varnishes, primers, and other surface coatings as part of Project maintenance. The emissions associated with architectural coatings were calculated using the CalEEMod model.

Consumer Products

Consumer products include, but are not limited to detergents, cleaning compounds, polishes, personal care products, and lawn and garden products. Many of these products contain organic compounds which when released in the atmosphere can react to form ozone and other photochemically reactive pollutants. The emissions associated with use of consumer products were calculated based on defaults provided within the CalEEMod model.

Landscape Maintenance Equipment

Landscape maintenance equipment would generate emissions from fuel combustion and evaporation of unburned fuel. Equipment in this category would include lawnmowers, shedders/grinders, blowers, trimmers, chain saws, and hedge trimmers used to maintain the landscaping of the Project. The emissions associated with landscape maintenance equipment were calculated based on assumptions provided in the CalEEMod model.

3.5.2 ENERGY SOURCE EMISSIONS

Combustion Emissions Associated with Natural Gas and Electricity

Electricity and natural gas are used by almost every project. Criteria pollutant emissions are emitted through the generation of electricity and consumption of natural gas. However, because electrical generating facilities for the Project area are located either outside the region (state) or offset through the use of pollution credits (RECLAIM) for generation within the SCAB, criteria pollutant emissions from offsite generation of electricity is generally excluded from the evaluation of significance and only natural gas use is considered. The emissions associated with natural gas use were calculated using the CalEEMod model.

3.5.3 MOBILE SOURCE EMISSIONS

Vehicles

Project-related operational air quality impacts derive predominantly from mobile sources. In this regard, over 85 percent (by weight) of all Project operational-source emissions would be generated by mobile sources (vehicles). Neither the Project Applicant nor the City has any regulatory control over these tail pipe emissions. Rather, vehicle tail pipe source emissions are regulated by CARB and USEPA. As summarized previously herein, as the result of CARB and USEPA actions, Basin-wide vehicular-source emissions have been reduced dramatically over the past years and are expected to further decline as clean vehicle and fuel technologies improve.

The Project related operational air quality impacts derive primarily from vehicle trips generated by the Project. Trip characteristics available from the report, *Centerpointe Traffic Impact Analysis* (Urban Crossroads 2018) were utilized in this analysis (33).

Per the *Centerpointe Traffic Impact Analysis*, the Project is expected to generate a net total of approximately 486 trip-ends per day (actual vehicles) (33). The Project trip generation includes 100 truck trip-ends per day from the proposed Project site including 37.4% 2-axle trucks, 18.2% 3-axle trucks, and 44.4% 4+-axle trucks for General Light Industrial use, 16.7% 2-axle trucks, 20.7% 3-axle trucks, and 62.6% 4+-axle trucks for Warehousing use.

3.5.3.1 Trip Length

Background

A technical deficiency inherent in calculating the projected vehicle emissions associated with any project is related to the estimation of trip length and vehicle miles traveled (VMT). VMT for a given project is calculated by the total number of vehicle trips to/from the Project x average trip length. This method of estimating VMT for use in calculating vehicle emissions likely results in the over-estimation and double-counting of emissions because, for a distribution warehouse center such as the Project, the land use is likely to attract (divert) existing vehicle trips that are already on the circulation system as opposed to generating new trips. In this regard, the Project would, to a large extent, redistribute existing mobile-source emissions rather than generate additional emissions within the Basin. As such, the estimation of the Centerpointe Project's vehicular-source emissions are likely overstated in that no credit for, or reduction in, emissions is assumed based on diversion of existing trips.

Provided below is a summary of the VMT recommendations of the SCAQMD and SCAG, followed by a description of the methodology used to calculate the VMT rates used in this AQIA.

SCAQMD Recommendation

In the last five years, the SCAQMD has provided numerous comments on the trip length for warehouse/distribution and industrial land use projects (34). The SCAQMD asserts that the model-default trip length in CalEEMod™ and the URBan EMISsions (URBEMIS) 2007 model (version 9.2.4) would underestimate emissions. The SCAQMD asserts that for warehouse, distribution center, and industrial land use projects, most of the heavy-duty trucks would be hauling consumer goods, often from the Ports of Long Beach and Los Angeles (POLA and POLB) and/or to destinations outside of California. The SCAQMD states that for this reason, the CalEEMod™ and the URBan EMISsions model default trip length (approximately 12.6 miles) would not be representative of activities at like facilities. The SCAQMD generally recommends the use of a 40-mile one-way trip length.

Southern California Association of Government (SCAG) Heavy Duty Truck Model

SCAG is comprised of six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) and 190 cities in Southern California, and is the organization charged with addressing and resolving short- and long-term regional policy issues. The SCAG region also consists of 14 sub-regional entities recognized by the Regional Council as partners in the regional policy

planning process. The SCAG region has more than 19 million residents and encompasses more than 38,000 square miles, representing the largest and most diverse region in the country.

SCAG maintains a regional transportation model. In its most recent (2008) transportation validation for the 2003 Regional Model, SCAG indicates the average internal truck trip length for the SCAG region is 5.92 miles for Light Duty Trucks, 13.06 miles for Medium Duty Trucks, and 24.11 miles for Heavy Duty Trucks.

Approach for Analysis of the Project

Trip lengths and VMT estimates employed in this AQIA report generate vehicular-source emissions that would represent a maximum impact scenario. Other CEQA compliance documents for similar land use projects within the region have utilized these same or similar estimates. Though the VMT analyzed in this analysis may differ from the Project's traffic impact analysis, to maintain analytic consistency and establish the maximum impact scenario noted above, the following approach has been utilized in calculating emissions associated with vehicles accessing the Project. This approach is consistent with professional industry practice (35) (36) (37).

For passenger car trips, the CalEEMod default for a one-way trip length of 16.6 miles was assumed. For heavy duty trucks, an average trip length was derived from distances from the Project site to the far edges of the South Coast Air Basin (SCAB) as follows.

- Project site to the Port of Los Angeles/Long Beach: 78 miles;
- Project site to East on State Route 60: 30 miles;
- Project site to San Diego County line: 60 miles;
- Project site to Inland Empire: 50 miles;
- Project site to Perris destinations: 10 miles;
- Project site to Moreno Valley destinations: 10 miles;

Assuming that 50% of all delivery trips will travel to and from the Project and the Port of Los Angeles/Long Beach, 10% go East on the State Route 60, 20% go to San Diego, 10% go to the Inland Empire, 5% go to Perris destinations and the remainder as Moreno Valley destinations. The average truck trip length is calculated as 60 miles.

Two separate model runs were utilized in order to more accurately model emissions resulting from vehicle operations. The first run analyzed passenger car emissions, which incorporated a default trip length of 16.6 miles for passenger cars and a fleet mix of 100% Light-Duty-Auto vehicles (LDA). The second run analyzed truck emissions, which incorporated an average truck trip length of 60 miles.

The vehicle fleet mix, in terms of actual trucks, as derived from the traffic study for the Project is comprised of the following based on land use:

- General Light Industrial: 37.42% LHD, 18.19% MHD, and 44.39% HHD
- Warehouse (without cold storage): 16.67% LHD, 20.69% MHD, and 62.64% HHD

The estimated emissions resulting from vehicle operations are summarized in Table 3-5 (presented later in this report.) Detailed emission calculations are provided in Appendix 3.2 and 3.3.

Fugitive Dust Related to Vehicular Travel

Vehicles traveling on paved roads would be a source of fugitive emissions due to the generation of road dust inclusive of tire wear particulates. The emissions estimates for travel on paved roads were calculated using the CalEEMod model.

3.5.4 On-Site Equipment Emissions

As part of the Project's design, all on-site indoor and outdoor cargo handling equipment (CHE) (including yard trucks, hostlers, yard goats, pallet jacks, forklifts, and other on-site equipment) will be powered by non-combustion engines (e.g. electric). Since there are no exhaust emissions associated with the equipment, for purposes of the Project, emissions associated with yard trucks and forklifts are not included in the emissions totals.

3.5.5 Operational Emissions Summary

Operational-source emissions are summarized on Table 3-5. Detailed construction model outputs are presented in Appendix 3.2 and 3.3. As indicated, the Project would not exceed the applicable regional thresholds of significance established by the SCAQMD for any criteria pollutant. Therefore, a less than significant impact would occur and no mitigation measures are required.

TABLE 3-5: SUMMARY OF OPERATIONAL EMISSIONS (WITHOUT MITIGATION)

Operational Activities – Summer Scenario	**Emissions (pounds per day)**					
	VOC	**NO_x**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Source	4.59	3.50E-04	0.04	0.00	1.40E-04	1.40E-04
Energy Source	0.05	0.45	0.37	2.67E-03	0.03	0.03
Mobile (Trucks)	1.61	43.54	13.09	0.16	5.62	1.78
Mobile (Passenger Cars)	1.12	2.78	41.13	0.15	17.72	4.77
Total Maximum Daily Emissions	**7.37**	**46.77**	**54.64**	**0.32**	**23.37**	**6.58**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Operational Activities – Winter Scenario	**Emissions (pounds per day)**					
	VOC	**NO_x**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Source	4.59	3.50E-04	0.04	0.00	1.40E-04	1.40E-04
Energy Source	0.05	0.45	0.37	2.67E-03	0.03	0.03
Mobile (Trucks)	1.62	44.95	13.66	0.17	5.62	1.78
Mobile (Passenger Cars)	1.03	3.02	35.72	0.14	17.72	4.77
Total Maximum Daily Emissions	**7.29**	**48.42**	**49.79**	**0.31**	**23.37**	**6.58**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

3.6 LOCALIZED SIGNIFICANCE- CONSTRUCTION ACTIVITY

BACKGROUND ON LOCALIZED SIGNIFICANCE THRESHOLD (LST) DEVELOPMENT

The analysis makes use of methodology included in the SCAQMD *Final Localized Significance Threshold Methodology* (Methodology) (19). The SCAQMD has established that impacts to air quality are significant if there is a potential to contribute or cause localized exceedances of the federal and/or state ambient air quality standards (NAAQS/CAAQS). Collectively, these are referred to as Localized Significance Thresholds (LSTs).

The significance of localized emissions impacts depends on whether ambient levels in the vicinity of any given project are above or below State standards. In the case of CO and NO_2, if ambient levels are below the standards, a project is considered to have a significant impact if project emissions result in an exceedance of one or more of these standards. If ambient levels already exceed a state or federal standard, then project emissions are considered significant if they increase ambient concentrations by a measurable amount. This would apply to PM_{10} and $PM_{2.5}$; both of which are non-attainment pollutants.

The SCAQMD established LSTs in response to the SCAQMD Governing Board's Environmental Justice Initiative I-4. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard at the nearest residence or sensitive receptor. The SCAQMD states that lead agencies can use the LSTs as another indicator of significance in its air quality impact analyses.

LSTs were developed in response to environmental justice and health concerns raised by the public regarding exposure of individuals to criteria pollutants in local communities. To address the issue of localized significance, the SCAQMD adopted LSTs that show whether a project would cause or contribute to localized air quality impacts and thereby cause or contribute to potential localized adverse health effects. The analysis makes use of methodology included in the SCAQMD *Final Localized Significance Threshold Methodology* (LST Methodology) (38).

APPLICABILITY OF LSTS FOR THE PROJECT

For this Project, the appropriate Source Receptor Area (SRA) for the LST is the Perris Valley monitoring station (SRA 24). LSTs apply to carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter ≤ 10 microns (PM_{10}), and particulate matter ≤ 2.5 microns ($PM_{2.5}$). The SCAQMD produced look-up tables for projects less than or equal to 5 acres in size.

In order to determine the appropriate methodology for determining localized impacts that could occur as a result of Project-related construction, the following process is undertaken:

- The CalEEMod model is utilized to determine the maximum daily on-site emissions that will occur during construction activity.
- The SCAQMD's Fact Sheet for Applying CalEEMod to Localized Significance Thresholds (21) is used to determine the maximum site acreage that is actively disturbed based on the construction equipment fleet and equipment hours as estimated in CalEEMod.

- If the total acreage disturbed is less than or equal to five acres per day, then the SCAQMD's screening look-up tables are utilized to determine if a Project has the potential to result in a significant impact (the SCAQMD recommends that Projects exceeding the screening look-up tables undergo dispersion modeling to determine actual impacts). The look-up tables establish a maximum daily emissions threshold in pounds per day that can be compared to CalEEMod outputs.

EMISSIONS CONSIDERED

SCAQMD's Methodology clearly states that "off-site mobile emissions from the Project should NOT be included in the emissions compared to LSTs (39)." Therefore, for purposes of the construction LST analysis only emissions included in the CalEEMod "on-site" emissions outputs were considered.

MAXIMUM DAILY DISTURBED-ACREAGE

Table 3-6 is used to determine the maximum daily disturbed-acreage during site grading for purposes of modeling localized emissions. Based on Table 3-6, the proposed Project could actively disturb approximately 0.5 acres per day during the site preparation phase and 2 acres per day during the grading phase of construction.

TABLE 3-6: MAXIMUM DAILY DISTURBED-ACREAGE

Construction Phase	Equipment Type	Equipment Quantity	Acres graded per 8-hour day	Operating Hours per Day	Acres graded per day
Site Preparation	Crawler Tractors	1	0.5	8	0.5
	Graders	0	0.5	8	0
	Rubber Tired Dozers	0	0.5	8	0
	Scrapers	0	1	8	0
Total acres graded per day during Site Preparation					0.5
Construction Phase	**Equipment Type**	**Equipment Quantity**	**Acres graded per 8-hour day**	**Operating Hours per Day**	**Acres graded per day**
Grading	Crawler Tractors	1	0.5	8	0.5
	Graders	2	0.5	8	1
	Rubber Tired Dozers	1	0.5	8	0.5
	Scrapers	0	1	8	0
Total acres graded per day during Grading					2

Sensitive Receptors

Some people are especially sensitive to air pollution and are given special consideration when evaluating air quality impacts from projects. These groups of people include children, the elderly, persons with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Structures that house these persons or places where they gather to exercise are defined as "sensitive receptors". The nearest sensitive receptor is an existing residential tract located approximately 794 feet/242.01 meters north of the Project site.

To assess the potential for long-term operational and short-term construction air quality impacts, the following four receptor locations, as shown on Exhibit 3-A, were identified as representative locations for analysis. Sensitive receptors are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Representative sensitive receptors in the Project study area include single-family residential homes and existing office uses as described below:

R1: Located approximately 794 feet north of the Project site, R1 represents existing residential homes north of Alessandro Boulevard.

R2: Location R2 represents existing Riverside County Department of Waste Resources facilities and offices at roughly 146 feet south of the Project site.

R3: Location R3 represents the existing offices located west of the Project site at approximately 146 feet on Frederick Street.

R4: Located approximately 109 feet west of the Project site, R4 represents the existing Moreno Valley City Hall building and offices.

EXHIBIT 3-A: RECEIVER LOCATIONS

CONSTRUCTION-SOURCE EMISSIONS LST ANALYSIS

Since the total acreage disturbed is less than five acres per day for the site preparation and grading phase of construction, the SCAQMD's screening look-up tables are utilized in determining impacts. A 242.01-meter receptor distance is conservatively utilized as a screening threshold to determine the LSTs for emissions of CO, NO_2, PM_{10}, and $PM_{2.5}$.

Table 3-7 identifies the localized impacts at the nearest receptor location in the vicinity of the Project. Outputs from the model runs for construction LSTs are provided in Appendix 3.1. It should be noted that credit for BACMs AQ-1 and AQ-2 has been taken. As shown, localized construction emissions would not exceed the applicable SCAQMD LSTs for any criteria pollutants. Therefore, a less than significant impact is expected.

TABLE 3-7: LOCALIZED SIGNIFICANCE SUMMARY OF CONSTRUCTION

On-Site Site Preparation Emissions	Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	**2.63**	**2.34**	**0.19**	**0.17**
SCAQMD Localized Threshold	335	4,359	67	20
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**
On-Site Grading Emissions	**Emissions (pounds per day)**			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	**38.39**	**14.13**	**4.51**	**2.78**
SCAQMD Localized Threshold	422	7,070	91	33
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

3.7 LOCALIZED SIGNIFICANCE – LONG-TERM OPERATIONAL ACTIVITY

Generally, the maximum acreage would be the Project's building square footage, which consists of 163,218 square feet (sf) of warehouse (without cold storage) use (80 percent of the total square footage) and 40,804 sf of general light industrial use (20 percent of the total square footage) for a total of 204,022 sf within a single building , or 4.68 acres. However, for the purposes of this analysis, and as a conservative measure, the SCAQMD look-up tables of 5-acres are used to determine localized significance thresholds for operational activity. Table 3-8 shows the calculated emissions for the Project's operational activities compared with the applicable LSTs. The LST analysis includes on-site sources only; however, the CalEEMod outputs do not separate on-site and off-site emissions from mobile sources. In an effort to establish a maximum potential impact scenario for analytic purposes, the emissions shown on Table 3-9 represent all on-site Project-related stationary (area) sources and five percent (5%) of the Project-related mobile sources. Considering that the weighted trip length used in CalEEMod™ for the Project is approximately 16.6 miles for passenger cars and 60.0 miles for trucks, 5% of this total would represent an on-site travel distance of approximately 0.83 mile/4,383 feet for each passenger car and approximately 3.0 miles/ 15,840 feet for each truck. Thus the 5% assumption is conservative and would tend to overstate the actual impact. Modeling based on these assumptions

demonstrates that even within broad encompassing parameters, Project operational-source emissions would not exceed applicable LSTs.

As previously noted, a 242.01-meter receptor distance is utilized to determine the LSTs for emissions of CO, NO_2, PM_{10}, and $PM_{2.5}$.

LOCALIZED THRESHOLDS FOR OPERATIONAL ACTIVITY

Applicable localized thresholds from the SCAQMD's mass-rate LST lookup tables for a five-acre project site are as follows:

- NOx: 488 pounds per day;
- CO: 6,860 pounds per day.
- PM_{10}: 23 pounds per day; or
- $PM_{2.5}$: 8 pounds per day.

If emissions exceed the applicable LSTs for the Project site, then additional dispersion modeling needs to be conducted to determine if there is an actual exceedance of the AAQS.

TABLE 3-8: LOCALIZED SIGNIFICANCE OPERATIONS SUMMARY

Peak Operational Emissions	Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	**2.76**	**3.12**	**1.20**	**0.36**
SCAQMD Localized Threshold	488	6,860	23	8
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

As shown on Table 3-8 operational emissions will not exceed the LST thresholds for the nearest sensitive receptor. Therefore, the Project will have a less than significant localized impact during operational activity.

3.8 CO "HOT SPOT" ANALYSIS

As discussed below, the Project would not result in potentially adverse CO concentrations or "hot spots." Further, detailed modeling of Project-specific carbon monoxide (CO) "hot spots" is not needed to reach this conclusion.

An adverse CO concentration, known as a "hot spot", would occur if an exceedance of the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm were to occur. At the time of the 1993 Handbook, the SCAB was designated nonattainment under the California AAQS and National AAQS for CO (40).

It has long been recognized that CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections. In response, vehicle emissions standards have become increasingly stringent in the last twenty years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner

fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration in the SCAB is now designated as attainment, as previously noted in Table 2-2. Also, CO concentrations in the Project vicinity have steadily declined, as indicated by historical emissions data presented previously at Table 2-3.

To establish a more accurate record of baseline CO concentrations affecting the SCAB, SCAQMD conducted a CO "hot spot" analysis at four busy intersections in Los Angeles at the peak morning and afternoon time periods. The results of the SCAQMD CO "hot spot" analysis did not predict any violation of CO standards, as shown on Table 3-9.

TABLE 3-9: CO MODEL RESULTS

Intersection Location	Carbon Monoxide Concentrations (ppm)		
	Morning 1-hour	Afternoon 1-hour	8-hour
Wilshire-Veteran	4.6	3.5	4.2
Sunset-Highland	4	4.5	3.9
La Cienega-Century	3.7	3.1	5.8
Long Beach-Imperial	3	3.1	9.3

Based on the SCAQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan), peak carbon monoxide concentrations in the SCAB were a result of unusual meteorological and topographical conditions and not a result of traffic volumes and congestion at a particular intersection. As evidence of this, for example, 9.3 ppm 8-hr CO concentration measured at the Long Beach Blvd. and Imperial Hwy. intersection (highest CO generating intersection within the SCAQMD CO "hot spot" analysis), only 0.7 ppm was attributable to the traffic volumes and congestion at this intersection; the remaining 8.6 ppm were due to the ambient air measurements at the time the 2003 AQMP was prepared (40). In contrast, the ambient 8-hr CO concentration within the Project study area is estimated at 1.4 ppm—1.6 ppm (please refer to previous Table 2-3). Therefore, even if the traffic volumes for the proposed Project were double or even triple of the traffic volumes generated at the Long Beach Blvd. and Imperial Hwy. intersection, coupled with the on-going improvements in ambient air quality, the Project would not be capable of resulting in a CO "hot spot" at any study area intersections.

Similar considerations are also employed by other Air Districts when evaluating potential CO concentration impacts. More specifically, the Bay Area Air Quality Management District (BAAQMD) concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact (41).

Traffic volumes generating the CO concentrations for the SCAQMD CO "hot spot" analysis, shown on Table 3-10. The busiest intersection evaluated was that at Wilshire Blvd. and Veteran Ave., which has a daily traffic volume of approximately 100,000 vehicles per day. The 2003 AQMP estimated that the 1-hour concentration for this intersection was 4.6 ppm; this indicates that, should the daily traffic volume increase four times to 400,000 vehicles per day, CO concentrations (4.6 ppm x 4= 18.4 ppm) would still not likely exceed the most stringent 1-hour CO standard (20.0

ppm).[5] At buildout of the Project, the highest average daily trips on a segment of road would be 80,600 daily trips on east Frederick Street and Cactus Avenue which is lower than the highest daily traffic volumes generated at the busiest intersection in the SCAQMD CO "hot spot" analysis (42).

TABLE 3-10: TRAFFIC VOLUMES FOR INTERSECTIONS EVALUATED IN AQMP

Intersection Location	Peak Traffic Volumes (vph)				
	Eastbound (AM/PM)	Westbound (AM/PM)	Southbound (AM/PM)	Northbound (AM/PM)	Total (AM/PM)
Wilshire-Veteran	4,954/2,069	1,830/3,317	721/1,400	560/933	8,062/7,719
Sunset-Highland	1,417/1,764	1,342/1,540	2,304/1,832	1,551/2,238	6,614/5,374
La Cienega-Century	2,540/2,243	1,890/2,728	1,384/2,029	821/1,674	6,634/8,674
Long Beach-Imperial	1,217/2,020	1,760/1,400	479/944	756/1,150	4,212/5,514

The proposed Project considered herein would not produce the volume of traffic required to generate a CO "hot spot" either in the context of the 2003 SCAQMD CO hot spot study, or based on representative BAAQMD CO threshold considerations, as shown on Table 3-11. Therefore, CO "hot spots" are not an environmental impact of concern for the proposed Project. Localized air quality impacts related to mobile-source emissions would therefore be less than significant.

TABLE 3-11: PROJECT PEAK HOUR TRAFFIC VOLUMES

Intersection Location	Peak Traffic Volumes (vph)				
	Northbound (AM/PM)	Southbound (AM/PM)	Eastbound (AM/PM)	Westbound (AM/PM)	Total (AM/PM)
Frederick St./Alessandro Bl.	533/710	905/1,292	1,081/2,704	2,403/1,853	4,922/6,560
Frederick St./Dwy. 1	524/692	521/906	0/0	2/12	1,048/1,610
Frederick St./Calle San Juan De Los Lagos/Dwy. 2	590/509	521/907	65/281	6/27	1,182/1,724
Frederick St./Cactus Av.	0/0	372/916	2,124/3,507	3,449/2,468	5,945/6,892

Source: Centerpointe Traffic Impact Analysis (Urban Crossroads, Inc., 2018).

3.9 AIR QUALITY MANAGEMENT PLANNING

The Project site is located within the SCAB, which is characterized by relatively poor air quality. The SCAQMD has jurisdiction over an approximately 10,743 square-mile area consisting of the four-county Basin and the Los Angeles County and Riverside County portions of what use to be referred to as the Southeast Desert Air Basin. In these areas, the SCAQMD is principally responsible for air pollution control, and works directly with the Southern California Association of Governments (SCAG), county transportation commissions, local governments, as well as state and federal agencies to reduce emissions from stationary, mobile, and indirect sources to meet state and federal ambient air quality standards.

5 Based on the ratio of the CO standard (20.0 ppm) and the modeled value (4.6 ppm).

Currently, these state and federal air quality standards are exceeded in most parts of the Basin. In response, the SCAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the state and federal ambient air quality standards. AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy.

In March 2017, the AQMD released the Final 2016 AQMP. The 2016 AQMP continues to evaluate current integrated strategies and control measures to meet the NAAQS, as well as, explore new and innovative methods to reach its goals. Some of these approaches include utilizing incentive programs, recognizing existing co-benefit programs from other sectors, and developing a strategy with fair-share reductions at the federal, state, and local levels (43). Similar to the 2012 AQMP, the 2016 AQMP incorporates scientific and technological information and planning assumptions, including the 2016 RTP/SCS and updated emission inventory methodologies for various source categories (44). The Project's consistency with the AQMP will be determined using the 2016 AQMP is discussed below:

Criteria for determining consistency with the AQMP are defined in Chapter 12, Section 12.2 and Section 12.3 of the SCAQMD's CEQA Air Quality Handbook (1993) (24). These indicators are discussed below:

- Consistency Criterion No. 1: The proposed Project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

Construction Impacts

The violations that Consistency Criterion No. 1 refers to are the CAAQS and NAAQS. CAAQS and NAAQS violations would occur if localized significance thresholds (LSTs) or regional significance thresholds were exceeded. The Project would not exceed the applicable LST thresholds or regional significance thresholds for construction activity. Therefore, the Project would not conflict with the AQMP according to this criterion.

Operational Impacts

The Project would not exceed the applicable LST thresholds for operational activity. Therefore, the Project would not conflict with the AQMP according to this criterion.

On the basis of the preceding discussion, the Project is consistent with the first criterion.

- Consistency Criterion No. 2: The Project will not exceed the assumptions in the AQMP based on the years of Project build-out phase.

Overview

The 2016 AQMP demonstrates that the applicable ambient air quality standards can be achieved within the timeframes required under federal law. Growth projections from local general plans adopted by cities in the district are provided to the Southern California Association of Governments (SCAG), which develops regional growth forecasts, which are then used to develop

future air quality forecasts for the AQMP. Development consistent with the growth projections in City of Moreno Valley General Plan Update is considered to be consistent with the AQMP.

Construction Impacts

Peak day emissions generated by construction activities are largely independent of land use assignments, but rather are a function of development scope and maximum area of disturbance. Irrespective of the site's land use designation, development of the site to its maximum potential would likely occur, with disturbance of the entire site occurring during construction activities.

Operational Impacts

The Project site is currently vacant. The City of Moreno Valley's General Plan Land Use designation for the Project site is Office (O). The primary purpose of areas designated as Office is to provide for office uses, including, administrative, professional, legal, medical and financial offices. The Project is proposed to consist of up to 163,218 square feet (sf) of warehouse (without cold storage) use (80 percent of the total square footage) and 40,804 sf of general light industrial use (20 percent of the total square footage) for a total of 204,022 sf within a single building. The Project's industrial land use and development are not consistent with the land use designation stated in the General Plan. As such, the Project would require a zoning change. However, since the Project construction and operational regional and localized emissions do not exceed the thresholds of significance, the Project would not cause an exceedance of an air quality violation and is therefore considered consistent with this criterion.

On the basis of the preceding discussion, the Project is determined to be consistent with the second criterion.

AQMP Consistency Conclusion

The Project would not result in or cause NAAQS or CAAQS violations. Although the Project would not be consistent with the site land use and zoning designations, construction and operational-source impacts would not exceed the applicable SCAQMD regional and localized thresholds. As such, the Project would not have a significant impact with respect to the AQMP.

3.10 Potential Impacts to Sensitive Receptors

The potential impact of Project-generated air pollutant emissions at sensitive receptors has also been considered. Sensitive receptors can include uses such as long term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, child care centers, and athletic facilities can also be considered as sensitive receptors.

Results of the LST analysis indicate that, with application of mitigation, the Project will not exceed the SCAQMD localized significance thresholds during construction. Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations during Project construction.

Results of the LST analysis indicate that the Project will not exceed the SCAQMD localized significance thresholds during operational activity. Further Project traffic would not create or

result in a CO "hotspot." Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations as the result of Project operations.

3.11 ODORS

The potential for the Project to generate objectionable odors has also been considered. Land uses generally associated with odor complaints include:

- Agricultural uses (livestock and farming)
- Wastewater treatment plants
- Food processing plants
- Chemical plants
- Composting operations
- Refineries
- Landfills
- Dairies
- Fiberglass molding facilities

The Project does not propose any such uses or activities that would result in potentially significant operational-source odor impacts. Potential sources of operational odors generated by the Project would include disposal of miscellaneous commercial refuse. Consistent with City requirements, all Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with solid waste regulations, thereby precluding substantial generation of odors due to temporary holding of refuse on-site Moreover, SCAQMD Rule 402 acts to prevent occurrences of odor nuisances (1).

3.12 CUMULATIVE IMPACTS

The Project area is designated as an extreme non-attainment area for ozone, and a non-attainment area for PM_{10}, $PM_{2.5}$, and lead.

The SCAQMD has published a report on how to address cumulative impacts from air pollution: *White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution* (45). In this report the SCAQMD clearly states (Page D-3):

"…the SCAQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for toxic air contaminant (TAC) emissions. The project specific (project increment) significance threshold is HI > 1.0 while the cumulative (facility-wide) is HI > 3.0. It should be noted that the HI is only one of three TAC emission significance thresholds considered (when applicable) in a CEQA analysis. The other two are the maximum individual cancer risk (MICR) and the cancer burden, both of which use the same significance thresholds (MICR of 10 in 1 million and cancer burden of 0.5) for project specific and cumulative impacts.

Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."

Therefore, this analysis assumes that individual projects that do not generate operational or construction emissions that exceed the SCAQMD's recommended daily thresholds for project-specific impacts would also not cause a cumulatively considerable increase in emissions for those pollutants for which the Basin is in nonattainment, and, therefore, would not be considered to have a significant, adverse air quality impact. Alternatively, individual project-related construction and operational emissions that exceed SCAQMD thresholds for project-specific impacts would be considered cumulatively considerable.

Construction Impacts

Project construction-source air pollutant emissions would not exceed the SCAQMD regional thresholds for any criteria pollutant. Therefore, the Project would not result in a cumulatively considerable significant impact with respect to construction activity.

Operational Impacts

Project operational-source air pollutant emissions would not exceed applicable SCAQMD regional thresholds. Therefore, the Project would not result in a cumulatively considerable significant impact with respect to operational activity.

4 FINDINGS & CONCLUSIONS

CONSTRUCTION-SOURCE EMISSIONS

REGIONAL IMPACTS

For regional emissions, the Project would not exceed the numerical thresholds of significance established by the SCAQMD for any criteria pollutants. Therefore, a less than significant impact would occur for Project-related construction-source emissions.

LOCALIZED IMPACTS

For localized emissions, the Project would not exceed the SCAQMD's localized significance threshold for any criteria pollutant. Therefore, a less than significant impact would occur.

ODORS

Established requirements addressing construction equipment operations, and construction material use, storage, and disposal requirements act to minimize odor impacts that may result from construction activities. Moreover, construction-source odor emissions would be temporary, short-term, and intermittent in nature and would not result in persistent impacts that would affect substantial numbers of people. Potential construction-source odor impacts are therefore considered less-than-significant.

OPERATIONAL-SOURCE EMISSIONS

REGIONAL IMPACTS

For regional emissions, the Project would not exceed the numerical thresholds of significance established by the SCAQMD. Therefore, Project operational-source emissions would be considered less than significant.

LOCALIZED IMPACTS

For localized emissions, the Project would not exceed the numerical thresholds established by the SCAQMD for any criteria pollutants. The proposed Project would not result in a significant CO "hotspot" as a result of Project related traffic during ongoing operations.

Project operational-source emissions would not conflict with the applicable AQMP.

Odors

Substantial odor-generating sources include land uses such as agricultural activities, feedlots, wastewater treatment facilities, landfills or various heavy industrial uses. The Project does not propose any such uses or activities that would result in potentially significant operational-source odor impacts. Potential sources of operational odors generated by the Project would include disposal of miscellaneous refuse. Moreover, SCAQMD Rule 402 acts to prevent occurrences of odor nuisances (1). Consistent with City requirements, all Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with solid waste

regulations. Potential operational-source odor impacts are therefore considered less-than-significant.

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6 CERTIFICATION

The contents of this air study report represent an accurate depiction of the environmental impacts associated with the proposed Centerpointe Project. The information contained in this air quality impact report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5987.

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EDUCATION

Master of Science in Environmental Studies
California State University, Fullerton • May, 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June, 2006

PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Environmental Site Assessment – American Society for Testing and Materials • June, 2013
Planned Communities and Urban Infill – Urban Land Institute • June, 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007
AB2588 Regulatory Standards – Trinity Consultants • November, 2006
Air Dispersion Modeling – Lakes Environmental • June, 2006

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APPENDIX 2.1:

STATE/FEDERAL ATTAINMENT STATUS OF CRITERIA POLLUTANTS

TABLE 2-3

National Ambient Air Quality Standards (NAAQS) Attainment Status - South Coast Air Basin

Criteria Pollutant	Averaging Time	Designation[a]	Attainment Date[b]
Ozone (O_3)	(1979) **1-Hour** (0.12 ppm)[c]	Nonattainment ("extreme")	2/26/2023 (revised deadline)
	(2015) **8-Hour** (0.070 ppm)[d]	Pending – Expect Nonattainment ("extreme")	Pending (beyond 2032)
	(2008) **8-Hour** (0.075 ppm)[d]	Nonattainment ("extreme")	7/20/2032
	(1997) **8-Hour** (0.08 ppm)[d]	Nonattainment ("extreme")	6/15/2024
PM2.5[e]	(2006) **24-Hour** (35 µg/m³)	Nonattainment ("serious")	12/31/2019
	(2012) **Annual** (12.0 µg/m³)	Nonattainment ("moderate")	12/31/2021
	(1997) **Annual** (15.0 µg/m³)	Attainment (final determination pending)	4/5/2015 (attained 2013)
PM10[f]	(1987) **24-hour** (150 µg/m³)	Attainment (Maintenance)	7/26/2013 (attained)
Lead (Pb)[g]	(2008) **3-Months Rolling** (0.15 µg/m³)	Nonattainment (Partial) (Attainment determination to be requested)	12/31/2015
CO	(1971) **1-Hour** (35 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
	(1971) **8-Hour** (9 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
NO_2[h]	(2010) **1-Hour** (100 ppb)	Unclassifiable/Attainment	N/A (attained)
	(1971) **Annual** (0.053 ppm)	Attainment (Maintenance)	9/22/1998 (attained)
SO_2[i]	(2010) **1-Hour** (75 ppb)	Designations Pending (expect Unclassifiable/Attainment)	N/A (attained)
	(1971) **24-Hour** (0.14 ppm) (1971) **Annual** (0.03 ppm)	Unclassifiable/Attainment	3/19/1979 (attained)

a) U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for an attainment demonstration

c) The 1979 1-hour ozone NAAQS (0.12 ppm) was revoked, effective 6/15/05 ; however, the Basin has not attained this standard and therefore has some continuing obligations with respect to the revoked standard; original attainment date was 11/15/2010; the revised attainment date is 2/6/23

d) The 2008 8-hour ozone NAAQS (0.075 ppm) was revised to 0.070 ppm, effective 12/28/15 with classifications and implementation goals to be finalized by 10/1/17; the 1997 8-hour ozone NAAQS (0.08 ppm) was revoked in the 2008 ozone NAAQS implementation rule, effective 4/6/15; there are continuing obligations under the revoked 1997 and revised 2008 ozone NAAQS until they are attained

e) The attainment deadline for the 2006 24-hour PM2.5 NAAQS was 12/31/15 for the former "moderate" classification; U.S.EPA approved reclassification to "serious," effective 2/12/16 with an attainment deadline of 12/31/2019; the 2012 (proposal year) annual PM2.5 NAAQS was revised on 1/15/13, effective 3/18/13, from 15 to 12 µg/m³; new annual designations were final 1/15/15, effective 4/15/15; on July 25, 2016 U.S. EPA finalized a determination that the Basin attained the 1997 annual (15.0 µg/m³) and 24-hour PM2.5 (65 µg/m³) NAAQS, effective August 24, 2016

f) The annual PM10 NAAQS was revoked, effective 12/18/06; the 24-hour PM10 NAAQS deadline was 12/31/2006; the Basin's Attainment Re-designation Request and PM10 Maintenance Plan was approved by U.S. EPA on 6/26/13, effective 7/26/13

g) Partial Nonattainment designation – Los Angeles County portion of the Basin only for near-source monitors; expect to remain in attainment based on current monitoring data; attainment re-designation request pending

h) New 1-hour NO_2 NAAQS became effective 8/2/10, with attainment designations 1/20/12; annual NO_2 NAAQS retained

i) The 1971 annual and 24-hour SO2 NAAQS were revoked, effective 8/23/10; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO2 1-hour NAAQS; final area designations expected by 12/31/20 due to new source-specific monitoring requirements; Basin expected to be in attainment due to ongoing clean data

TABLE 2-4

National Ambient Air Quality Standards (NAAQS) Attainment Status

Coachella Valley Portion of the Salton Sea Air Basin

Criteria Pollutant	Averaging Time	Designation[a]	Attainment Date[b]
Ozone (O_3)	(1979) **1-Hour** (0.12 ppm)[c]	Attainment	11/15/2007 (attained 12/31/2013)
	(2015) **8-Hour** (0.070 ppm)[d]	Pending – Expect Nonattainment (Severe)	Pending
	(2008) **8-Hour** (0.075 ppm)[d]	Nonattainment (Severe-15)	7/20/2027
	(1997) **8-Hour** (0.08 ppm)[d]	Nonattainment (Severe-15)	6/15/2019
PM2.5[e]	(2006) **24-Hour** (35 µg/m^3)	Unclassifiable/Attainment	N/A (attained)
	(2012) **Annual** (12.0 µg/m^3)	Unclassifiable/Attainment	N/A (attained)
	(1997) **Annual** (15.0 µg/m^3)	Unclassifiable/Attainment	N/A (attained)
PM10[f]	(1987) **24-hour** (150 µg/m^3)	Nonattainment ("serious")	12/31/2006
Lead (Pb)	(2008) **3-Months Rolling** (0.15 µg/m^3)	Unclassifiable/Attainment	Unclassifiable/ Attainment
CO	(1971) **1-Hour** (35 ppm)	Unclassifiable/Attainment	N/A (attained)
	(1971) **8-Hour** (9 ppm)	Unclassifiable/Attainment	N/A (attained)
NO_2[g]	(2010) **1-Hour** (100 ppb)	Unclassifiable/Attainment	N/A (attained)
	(1971) **Annual** (0.053 ppm)	Unclassifiable/Attainment	N/A (attained)
SO_2[h]	(2010) **1-Hour** (75 ppb)	Designations Pending	N/A
	(1971) **24-Hour** (0.14 ppm) (1971) **Annual** (0.03 ppm)	Unclassifiable/Attainment	Unclassifiable/ Attainment

a) U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for an attainment demonstration

c) The 1979 1-hour ozone NAAQS (0.12 ppm) was revoked, effective 6/15/05; the Southeast Desert Modified Air Quality Management Area, including the Coachella Valley, had not timely attained this standard by the 11/15/07 "severe-17" deadline, based on 2005-2007 data; on 8/25/14, U.S. EPA proposed a clean data finding based on 2011–2013 data and a determination of attainment for the former 1-hour ozone NAAQS for the Southeast Desert nonattainment area; this rule was finalized by U.S. EPA on 4/15/15, effective 5/15/15, that included preliminary 2014 data

d) The 2008 8-hour ozone NAAQS (0.075 ppm) was revised to 0.070 ppm, effective 12/28/15 with classifications and implementation goals to be finalized by 10/1/17; the 1997 8-hour ozone NAAQS (0.08 ppm) was revoked in the 2008 ozone NAAQS implementation rule, effective 4/6/15; there are continuing obligations under the 1997 and 2008 ozone NAAQS until they are attained

e) The annual PM2.5 standard was revised on 1/15/13, effective 3/18/13, from 15 to 12 µg/m^3

f) The annual PM10 standard was revoked, effective 12/18/06; the 24-hour PM10 NAAQS attainment deadline was 12/31/2006; the Coachella Valley Attainment Re-designation Request and PM10 Maintenance Plan was postponed by U.S. EPA pending additional monitoring and analysis in the southeastern Coachella Valley

g) New 1-hour NO_2 NAAQS became effective 8/2/10; attainment designations 1/20/12; annual NO_2 NAAQS retained

h) The 1971 Annual and 24-hour SO_2 NAAQS were revoked, effective 8/23/10; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO_2 1-hour standard; final area designations expected by 12/31/2020 with SSAB expected to be designated Unclassifiable/Attainment

The current status of CAAQS attainment for the pollutants with State standards is presented in Table 2-5 for the Basin and the Riverside County portion of the SSAB (Coachella Valley).

TABLE 2-5

California Ambient Air Quality Standards (CAAQS) Attainment Status
South Coast Air Basin and Coachella Valley portion of Salton Sea Air Basin

Pollutant	Averaging Time and Level[b]	Designation[a]	
		South Coast Air Basin	Coachella Valley
Ozone (O_3)	**1-Hour** (0.09 ppm)[c]	Nonattainment	Nonattainment
	8-Hour (0.070 ppm)[d]	Nonattainment	Nonattainment
PM2.5	**Annual** (12.0 µg/m^3)	Nonattainment	Attainment
PM10	**24-Hour** (50 µg/m^3)	Nonattainment	Nonattainment
	Annual (20 µg/m^3)	Nonattainment	Nonattainment
Lead (Pb)	**30-Day Average** (1.5 µg/m^3)	Attainment	Attainment
CO	**1-Hour** (20 ppm)	Attainment	Attainment
	8-Hour (9.0 ppm)	Attainment	Attainment
NO_2	**1-Hour** (0.18 ppm)	Attainment	Attainment
	Annual (0.030 ppm)	Attainment	Attainment
SO_2	**1-Hour** (0.25 ppm)	Attainment	Attainment
	24-Hour (0.04 ppm)	Attainment	Attainment
Sulfates	**24-Hour** (25 µg/m^3)	Attainment	Attainment
H_2S[c]	**1-Hour** (0.03 ppm)	Unclassified	Unclassified [c)]

a) CA State designations shown were updated by CARB in 2016, based on the 2013–2015 3-year period; stated designations are based on a 3-year data period after consideration of outliers and exceptional events; Source: http://www.arb.ca.gov/desig/statedesig.htm#current

b) CA State standards, or CAAQS, for ozone, CO, SO_2, NO_2, PM10 and PM2.5 are values not to be exceeded; lead, sulfates, and H_2S standards are values not to be equaled or exceeded; CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations

c) SCAQMD began monitoring H_2S in the southeastern Coachella Valley in November 2013 due to odor events related to the Salton Sea; three full years of data are not yet available for a State designation, but nonattainment is anticipated for the H_2S CAAQS in at least part of the Coachella Valley

The 1979 federal 1-hour ozone standard (0.12 ppm) was revoked by the U.S. EPA and replaced by the 8-hour average ozone standard (0.08 ppm), effective June 15, 2005. However, the Basin and the former Southeast Desert Modified Air Quality Management Area (which included the Coachella Valley) had not attained the 1-hour federal ozone NAAQS by the attainment dates in 2010 and 2007, respectively, and, therefore, had continuing obligations under the former standard. On August 25, 2014, U.S. EPA

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APPENDIX 3.1:

CALEEMOD CONSTRUCTION EMISSIONS MODEL OUTPUTS (UNMITIGATED)

Centerpointe (Construction - Unmitigated)

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	163.22	1000sqft	3.75	163,218.00	0
General Light Industry	40.80	1000sqft	0.94	40,804.00	0
Parking Lot	164.00	Space	3.11	65,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage obtained from the Site Plan. Total Lot acreage is 8.78 acres.

Construction Phase - Construction schedule adjsuted as per direction provided by the Client.

Off-road Equipment - Equipment adjusted as per information provided by the Client.

Off-road Equipment - Equipment adjusted as per information provided by the Client.

Off-road Equipment - Equipment adjusted as per information provided by the Client.

Off-road Equipment - Equipment adjusted as per information provided by the Client.

Off-road Equipment - Hours are based on an 8-hour workday.

Grading -

Architectural Coating - Rule 1113

Vehicle Trips - Operations Run Only.

Energy Use - Operations Run Only.

Water And Wastewater - Operations Run Only.

Solid Waste - Operations Run Only.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	102,011.00	102,010.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	306,033.00	306,030.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	50.00
tblArchitecturalCoating	EF_Parking	100.00	50.00
tblAreaCoating	Area_Nonresidential_Exterior	102011	102010
tblAreaCoating	Area_Nonresidential_Interior	306033	306030
tblConstructionPhase	NumDays	20.00	50.00
tblConstructionPhase	NumDays	230.00	200.00
tblConstructionPhase	PhaseEndDate	2/28/2020	9/6/2019

tblConstructionPhase	PhaseEndDate	1/3/2020	10/25/2019
tblConstructionPhase	PhaseEndDate	2/15/2019	1/18/2019
tblConstructionPhase	PhaseEndDate	1/31/2020	8/28/2019
tblConstructionPhase	PhaseEndDate	1/18/2019	12/21/2018
tblConstructionPhase	PhaseStartDate	2/1/2020	7/1/2019
tblConstructionPhase	PhaseStartDate	2/16/2019	1/19/2019
tblConstructionPhase	PhaseStartDate	1/19/2019	12/22/2018
tblConstructionPhase	PhaseStartDate	1/4/2020	8/1/2019
tblConstructionPhase	PhaseStartDate	1/5/2019	12/10/2018
tblEnergyUse	LightingElect	2.93	0.00
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	LightingElect	1.17	0.00
tblEnergyUse	NT24E	5.02	0.00
tblEnergyUse	NT24E	0.82	0.00
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	NT24NG	0.03	0.00
tblEnergyUse	T24E	2.20	0.00
tblEnergyUse	T24E	0.37	0.00
tblEnergyUse	T24NG	15.36	0.00
tblEnergyUse	T24NG	2.00	0.00
tblLandUse	LotAcreage	1.48	3.11
tblOffRoadEquipment	LoadFactor	0.43	0.43
tblOffRoadEquipment	LoadFactor	0.43	0.43
tblOffRoadEquipment	OffRoadEquipmentType		Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentType		Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblSolidWaste	SolidWasteGenerationRate	50.59	0.00
tblSolidWaste	SolidWasteGenerationRate	153.43	0.00
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TL	6.90	0.00
tblVehicleTrips	CNW_TL	6.90	0.00
tblVehicleTrips	CNW_TL	6.90	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00
tblVehicleTrips	CW_TL	16.60	0.00
tblVehicleTrips	CW_TL	16.60	0.00
tblVehicleTrips	CW_TL	16.60	0.00
tblVehicleTrips	CW_TTP	59.00	0.00
tblVehicleTrips	CW_TTP	59.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00

tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	0.00
tblVehicleTrips	PR_TP	92.00	0.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	ST_TR	1.68	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	SU_TR	1.68	0.00
tblVehicleTrips	WD_TR	6.97	0.00
tblVehicleTrips	WD_TR	1.68	0.00
tblWater	IndoorWaterUseRate	9,435,000.00	0.00
tblWater	IndoorWaterUseRate	37,744,625.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.2094	38.4467	14.7230	0.0363	7.7582	1.5461	9.3043	3.5205	1.4224	4.9430	0.0000	3,656.1095	3,656.1095	1.0971	0.0000	3,683.5368
2019	23.7871	35.9358	32.1095	0.0685	7.7582	1.7683	9.2003	3.5205	1.6859	4.8473	0.0000	6,753.7798	6,753.7798	1.0951	0.0000	6,777.8505
Maximum	**23.7871**	**38.4467**	**32.1095**	**0.0685**	**7.7582**	**1.7683**	**9.3043**	**3.5205**	**1.6859**	**4.9430**	**0.0000**	**6,753.7798**	**6,753.7798**	**1.0971**	**0.0000**	**6,777.8505**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.2094	38.4467	14.7230	0.0363	3.1143	1.5461	4.6605	1.3965	1.4224	2.8190	0.0000	3,656.1095	3,656.1095	1.0971	0.0000	3,683.5368
2019	23.7871	35.9358	32.1095	0.0685	3.1143	1.7683	4.5565	1.3965	1.6859	2.7233	0.0000	6,753.7798	6,753.7798	1.0951	0.0000	6,777.8505
Maximum	**23.7871**	**38.4467**	**32.1095**	**0.0685**	**3.1143**	**1.7683**	**4.6605**	**1.3965**	**1.6859**	**2.8190**	**0.0000**	**6,753.7798**	**6,753.7798**	**1.0971**	**0.0000**	**6,777.8505**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**59.86**	**0.00**	**50.19**	**60.33**	**0.00**	**43.39**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**	**0.0000**	**0.0859**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**	**0.0000**	**0.0859**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/10/2018	12/21/2018	5	10	
2	Grading	Grading	12/22/2018	1/18/2019	5	20	
3	Building Construction	Building Construction	1/19/2019	10/25/2019	5	200	
4	Architectural Coating	Architectural Coating	7/1/2019	9/6/2019	5	50	
5	Paving	Paving	8/1/2019	8/28/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 30

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 306,030; Non-Residential Outdoor: 102,010; Striped Parking Area: 3,936 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	8.00	78	0.48
Site Preparation	Crawler Tractors	0		212	0.43
Grading	Crawler Tractors	1	8.00	212	0.43
Grading	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	1	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Grading	Graders	2	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	113.00	44.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.2661	2.6297	2.3367	3.1100e-003		0.1863	0.1863		0.1714	0.1714		312.7760	312.7760	0.0974		315.2102
Total	**0.2661**	**2.6297**	**2.3367**	**3.1100e-003**	**0.0000**	**0.1863**	**0.1863**	**0.0000**	**0.1714**	**0.1714**		**312.7760**	**312.7760**	**0.0974**		**315.2102**

3.2 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0176	0.0127	0.1362	3.4000e-004	0.0335	2.7000e-004	0.0338	8.8900e-003	2.5000e-004	9.1400e-003		34.2204	34.2204	1.1700e-003		34.2496
Total	**0.0176**	**0.0127**	**0.1362**	**3.4000e-004**	**0.0335**	**2.7000e-004**	**0.0338**	**8.8900e-003**	**2.5000e-004**	**9.1400e-003**		**34.2204**	**34.2204**	**1.1700e-003**		**34.2496**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.2661	2.6297	2.3367	3.1100e-003		0.1863	0.1863		0.1714	0.1714	0.0000	312.7760	312.7760	0.0974		315.2102
Total	**0.2661**	**2.6297**	**2.3367**	**3.1100e-003**	**0.0000**	**0.1863**	**0.1863**	**0.0000**	**0.1714**	**0.1714**	**0.0000**	**312.7760**	**312.7760**	**0.0974**		**315.2102**

3.2 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0176	0.0127	0.1362	3.4000e-004	0.0335	2.7000e-004	0.0338	8.8900e-003	2.5000e-004	9.1400e-003		34.2204	34.2204	1.1700e-003		34.2496
Total	**0.0176**	**0.0127**	**0.1362**	**3.4000e-004**	**0.0335**	**2.7000e-004**	**0.0338**	**8.8900e-003**	**2.5000e-004**	**9.1400e-003**		**34.2204**	**34.2204**	**1.1700e-003**		**34.2496**

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.6128	0.0000	7.6128	3.4820	0.0000	3.4820			0.0000			0.0000
Off-Road	3.1332	38.3917	14.1326	0.0348		1.5450	1.5450		1.4214	1.4214		3,507.8212	3,507.8212	1.0920		3,535.1220
Total	**3.1332**	**38.3917**	**14.1326**	**0.0348**	**7.6128**	**1.5450**	**9.1578**	**3.4820**	**1.4214**	**4.9034**		**3,507.8212**	**3,507.8212**	**1.0920**		**3,535.1220**

3.3 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0762	0.0550	0.5903	1.4900e-003	0.1453	1.1600e-003	0.1465	0.0385	1.0700e-003	0.0396		148.2883	148.2883	5.0600e-003		148.4148
Total	**0.0762**	**0.0550**	**0.5903**	**1.4900e-003**	**0.1453**	**1.1600e-003**	**0.1465**	**0.0385**	**1.0700e-003**	**0.0396**		**148.2883**	**148.2883**	**5.0600e-003**		**148.4148**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.9690	0.0000	2.9690	1.3580	0.0000	1.3580			0.0000			0.0000
Off-Road	3.1332	38.3917	14.1326	0.0348		1.5450	1.5450		1.4214	1.4214	0.0000	3,507.8212	3,507.8212	1.0920		3,535.1220
Total	**3.1332**	**38.3917**	**14.1326**	**0.0348**	**2.9690**	**1.5450**	**4.5140**	**1.3580**	**1.4214**	**2.7794**	**0.0000**	**3,507.8212**	**3,507.8212**	**1.0920**		**3,535.1220**

3.3 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0762	0.0550	0.5903	1.4900e-003	0.1453	1.1600e-003	0.1465	0.0385	1.0700e-003	0.0396		148.2883	148.2883	5.0600e-003		148.4148
Total	**0.0762**	**0.0550**	**0.5903**	**1.4900e-003**	**0.1453**	**1.1600e-003**	**0.1465**	**0.0385**	**1.0700e-003**	**0.0396**		**148.2883**	**148.2883**	**5.0600e-003**		**148.4148**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.6128	0.0000	7.6128	3.4820	0.0000	3.4820			0.0000			0.0000
Off-Road	2.9774	35.8872	13.7958	0.0348		1.4410	1.4410		1.3257	1.3257		3,446.9221	3,446.9221	1.0906		3,474.1864
Total	**2.9774**	**35.8872**	**13.7958**	**0.0348**	**7.6128**	**1.4410**	**9.0539**	**3.4820**	**1.3257**	**4.8077**		**3,446.9221**	**3,446.9221**	**1.0906**		**3,474.1864**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0693	0.0485	0.5270	1.4400e-003	0.1453	1.1300e-003	0.1464	0.0385	1.0400e-003	0.0396		143.6053	143.6053	4.4900e-003		143.7174
Total	**0.0693**	**0.0485**	**0.5270**	**1.4400e-003**	**0.1453**	**1.1300e-003**	**0.1464**	**0.0385**	**1.0400e-003**	**0.0396**		**143.6053**	**143.6053**	**4.4900e-003**		**143.7174**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.9690	0.0000	2.9690	1.3580	0.0000	1.3580			0.0000			0.0000
Off-Road	2.9774	35.8872	13.7958	0.0348		1.4410	1.4410		1.3257	1.3257	0.0000	3,446.9221	3,446.9221	1.0906		3,474.1864
Total	**2.9774**	**35.8872**	**13.7958**	**0.0348**	**2.9690**	**1.4410**	**4.4100**	**1.3580**	**1.3257**	**2.6837**	**0.0000**	**3,446.9221**	**3,446.9221**	**1.0906**		**3,474.1864**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0693	0.0485	0.5270	1.4400e-003	0.1453	1.1300e-003	0.1464	0.0385	1.0400e-003	0.0396		143.6053	143.6053	4.4900e-003		143.7174
Total	**0.0693**	**0.0485**	**0.5270**	**1.4400e-003**	**0.1453**	**1.1300e-003**	**0.1464**	**0.0385**	**1.0400e-003**	**0.0396**		**143.6053**	**143.6053**	**4.4900e-003**		**143.7174**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2571	19.4720	15.1290	0.0261		1.1379	1.1379		1.0910	1.0910		2,478.7187	2,478.7187	0.4380		2,489.6679
Total	**2.2571**	**19.4720**	**15.1290**	**0.0261**		**1.1379**	**1.1379**		**1.0910**	**1.0910**		**2,478.7187**	**2,478.7187**	**0.4380**		**2,489.6679**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1772	5.0382	1.3555	0.0111	0.2816	0.0339	0.3155	0.0811	0.0324	0.1135		1,180.5916	1,180.5916	0.0864		1,182.7519
Worker	0.6026	0.4218	4.5808	0.0125	1.2631	9.8300e-003	1.2729	0.3350	9.0600e-003	0.3440		1,248.2610	1,248.2610	0.0390		1,249.2360
Total	**0.7798**	**5.4600**	**5.9363**	**0.0236**	**1.5447**	**0.0437**	**1.5884**	**0.4160**	**0.0415**	**0.4575**		**2,428.8526**	**2,428.8526**	**0.1254**		**2,431.9879**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2571	19.4720	15.1290	0.0261		1.1379	1.1379		1.0910	1.0910	0.0000	2,478.7187	2,478.7187	0.4380		2,489.6679
Total	**2.2571**	**19.4720**	**15.1290**	**0.0261**		**1.1379**	**1.1379**		**1.0910**	**1.0910**	**0.0000**	**2,478.7187**	**2,478.7187**	**0.4380**		**2,489.6679**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1772	5.0382	1.3555	0.0111	0.2816	0.0339	0.3155	0.0811	0.0324	0.1135		1,180.5916	1,180.5916	0.0864		1,182.7519
Worker	0.6026	0.4218	4.5808	0.0125	1.2631	9.8300e-003	1.2729	0.3350	9.0600e-003	0.3440		1,248.2610	1,248.2610	0.0390		1,249.2360
Total	**0.7798**	**5.4600**	**5.9363**	**0.0236**	**1.5447**	**0.0437**	**1.5884**	**0.4160**	**0.0415**	**0.4575**		**2,428.8526**	**2,428.8526**	**0.1254**		**2,431.9879**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	19.0951					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3553	2.4472	2.4551	3.9600e-003		0.1717	0.1717		0.1717	0.1717		375.2641	375.2641	0.0317		376.0565
Total	**19.4504**	**2.4472**	**2.4551**	**3.9600e-003**		**0.1717**	**0.1717**		**0.1717**	**0.1717**		**375.2641**	**375.2641**	**0.0317**		**376.0565**

3.5 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1226	0.0859	0.9324	2.5500e-003	0.2571	2.0000e-003	0.2591	0.0682	1.8400e-003	0.0700		254.0708	254.0708	7.9400e-003		254.2693
Total	**0.1226**	**0.0859**	**0.9324**	**2.5500e-003**	**0.2571**	**2.0000e-003**	**0.2591**	**0.0682**	**1.8400e-003**	**0.0700**		**254.0708**	**254.0708**	**7.9400e-003**		**254.2693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	19.0951					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3553	2.4472	2.4551	3.9600e-003		0.1717	0.1717		0.1717	0.1717	0.0000	375.2641	375.2641	0.0317		376.0565
Total	**19.4504**	**2.4472**	**2.4551**	**3.9600e-003**		**0.1717**	**0.1717**		**0.1717**	**0.1717**	**0.0000**	**375.2641**	**375.2641**	**0.0317**		**376.0565**

3.5 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1226	0.0859	0.9324	2.5500e-003	0.2571	2.0000e-003	0.2591	0.0682	1.8400e-003	0.0700		254.0708	254.0708	7.9400e-003		254.2693
Total	**0.1226**	**0.0859**	**0.9324**	**2.5500e-003**	**0.2571**	**2.0000e-003**	**0.2591**	**0.0682**	**1.8400e-003**	**0.0700**		**254.0708**	**254.0708**	**7.9400e-003**		**254.2693**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7272	7.6220	7.3324	0.0114		0.4123	0.4123		0.3793	0.3793		1,128.5012	1,128.5012	0.3571		1,137.4274
Paving	0.4074					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1346**	**7.6220**	**7.3324**	**0.0114**		**0.4123**	**0.4123**		**0.3793**	**0.3793**		**1,128.5012**	**1,128.5012**	**0.3571**		**1,137.4274**

3.6 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415
Total	**0.0427**	**0.0299**	**0.3243**	**8.9000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**88.3725**	**88.3725**	**2.7600e-003**		**88.4415**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7272	7.6220	7.3324	0.0114		0.4123	0.4123		0.3793	0.3793	0.0000	1,128.5012	1,128.5012	0.3571		1,137.4274
Paving	0.4074					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1346**	**7.6220**	**7.3324**	**0.0114**		**0.4123**	**0.4123**		**0.3793**	**0.3793**	**0.0000**	**1,128.5012**	**1,128.5012**	**0.3571**		**1,137.4274**

3.6 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415
Total	**0.0427**	**0.0299**	**0.3243**	**8.9000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**88.3725**	**88.3725**	**2.7600e-003**		**88.4415**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Unrefrigerated Warehouse-No Rail	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Unmitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Centerpointe (Construction - Unmitigated)

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	163.22	1000sqft	3.75	163,218.00	0
General Light Industry	40.80	1000sqft	0.94	40,804.00	0
Parking Lot	164.00	Space	3.11	65,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage obtained from the Site Plan. Total Lot acreage is 8.78 acres.

Construction Phase - Construction schedule adjsuted as per direction provided by the Client.

Off-road Equipment - Equipment adjusted as per information provided by the Client.

Off-road Equipment - Equipment adjusted as per information provided by the Client.

Off-road Equipment - Equipment adjusted as per information provided by the Client.

Off-road Equipment - Equipment adjusted as per information provided by the Client.

Off-road Equipment - Hours are based on an 8-hour workday.

Grading -

Architectural Coating - Rule 1113

Vehicle Trips - Operations Run Only.

Energy Use - Operations Run Only.

Water And Wastewater - Operations Run Only.

Solid Waste - Operations Run Only.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	102,011.00	102,010.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	306,033.00	306,030.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	50.00
tblArchitecturalCoating	EF_Parking	100.00	50.00
tblAreaCoating	Area_Nonresidential_Exterior	102011	102010
tblAreaCoating	Area_Nonresidential_Interior	306033	306030
tblConstructionPhase	NumDays	20.00	50.00
tblConstructionPhase	NumDays	230.00	200.00
tblConstructionPhase	PhaseEndDate	2/28/2020	9/6/2019

tblConstructionPhase	PhaseEndDate	1/3/2020	10/25/2019
tblConstructionPhase	PhaseEndDate	2/15/2019	1/18/2019
tblConstructionPhase	PhaseEndDate	1/31/2020	8/28/2019
tblConstructionPhase	PhaseEndDate	1/18/2019	12/21/2018
tblConstructionPhase	PhaseStartDate	2/1/2020	7/1/2019
tblConstructionPhase	PhaseStartDate	2/16/2019	1/19/2019
tblConstructionPhase	PhaseStartDate	1/19/2019	12/22/2018
tblConstructionPhase	PhaseStartDate	1/4/2020	8/1/2019
tblConstructionPhase	PhaseStartDate	1/5/2019	12/10/2018
tblEnergyUse	LightingElect	2.93	0.00
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	LightingElect	1.17	0.00
tblEnergyUse	NT24E	5.02	0.00
tblEnergyUse	NT24E	0.82	0.00
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	NT24NG	0.03	0.00
tblEnergyUse	T24E	2.20	0.00
tblEnergyUse	T24E	0.37	0.00
tblEnergyUse	T24NG	15.36	0.00
tblEnergyUse	T24NG	2.00	0.00
tblLandUse	LandUseSquareFeet	163,220.00	163,218.00
tblLandUse	LandUseSquareFeet	40,800.00	40,804.00
tblLandUse	LotAcreage	1.48	3.11
tblOffRoadEquipment	LoadFactor	0.43	0.43
tblOffRoadEquipment	LoadFactor	0.43	0.43
tblOffRoadEquipment	OffRoadEquipmentType		Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentType		Crawler Tractors

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblSolidWaste	SolidWasteGenerationRate	50.59	0.00
tblSolidWaste	SolidWasteGenerationRate	153.43	0.00
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TL	6.90	0.00
tblVehicleTrips	CNW_TL	6.90	0.00
tblVehicleTrips	CNW_TL	6.90	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00
tblVehicleTrips	CW_TL	16.60	0.00
tblVehicleTrips	CW_TL	16.60	0.00
tblVehicleTrips	CW_TL	16.60	0.00
tblVehicleTrips	CW_TTP	59.00	0.00

tblVehicleTrips	CW_TTP	59.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	0.00
tblVehicleTrips	PR_TP	92.00	0.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	ST_TR	1.68	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	SU_TR	1.68	0.00
tblVehicleTrips	WD_TR	6.97	0.00
tblVehicleTrips	WD_TR	1.68	0.00
tblWater	IndoorWaterUseRate	9,435,000.00	0.00
tblWater	IndoorWaterUseRate	37,744,625.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.2032	38.4419	14.7849	0.0364	7.7582	1.5461	9.3043	3.5205	1.4224	4.9430	0.0000	3,666.3369	3,666.3369	1.0974	0.0000	3,693.7728
2019	23.7169	35.9315	32.6040	0.0699	7.7582	1.7678	9.2003	3.5205	1.6854	4.8473	0.0000	6,898.4749	6,898.4749	1.0954	0.0000	6,922.4828
Maximum	**23.7169**	**38.4419**	**32.6040**	**0.0699**	**7.7582**	**1.7678**	**9.3043**	**3.5205**	**1.6854**	**4.9430**	**0.0000**	**6,898.4749**	**6,898.4749**	**1.0974**	**0.0000**	**6,922.4828**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.2032	38.4419	14.7849	0.0364	3.1143	1.5461	4.6605	1.3965	1.4224	2.8190	0.0000	3,666.3369	3,666.3369	1.0974	0.0000	3,693.7728
2019	23.7169	35.9315	32.6040	0.0699	3.1143	1.7678	4.5565	1.3965	1.6854	2.7233	0.0000	6,898.4749	6,898.4749	1.0954	0.0000	6,922.4828
Maximum	**23.7169**	**38.4419**	**32.6040**	**0.0699**	**3.1143**	**1.7678**	**4.6605**	**1.3965**	**1.6854**	**2.8190**	**0.0000**	**6,898.4749**	**6,898.4749**	**1.0974**	**0.0000**	**6,922.4828**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**59.86**	**0.00**	**50.19**	**60.33**	**0.00**	**43.39**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**	**0.0000**	**0.0859**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**	**0.0000**	**0.0859**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/10/2018	12/21/2018	5	10	
2	Grading	Grading	12/22/2018	1/18/2019	5	20	
3	Building Construction	Building Construction	1/19/2019	10/25/2019	5	200	
4	Architectural Coating	Architectural Coating	7/1/2019	9/6/2019	5	50	
5	Paving	Paving	8/1/2019	8/28/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 30

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 306,030; Non-Residential Outdoor: 102,010; Striped Parking Area: 3,936 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	8.00	78	0.48
Site Preparation	Crawler Tractors	0		212	0.43
Grading	Crawler Tractors	1	8.00	212	0.43
Grading	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	1	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Grading	Graders	2	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	113.00	44.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.2661	2.6297	2.3367	3.1100e-003		0.1863	0.1863		0.1714	0.1714		312.7760	312.7760	0.0974		315.2102
Total	**0.2661**	**2.6297**	**2.3367**	**3.1100e-003**	**0.0000**	**0.1863**	**0.1863**	**0.0000**	**0.1714**	**0.1714**		**312.7760**	**312.7760**	**0.0974**		**315.2102**

3.2 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0162	0.0116	0.1505	3.7000e-004	0.0335	2.7000e-004	0.0338	8.8900e-003	2.5000e-004	9.1400e-003		36.5806	36.5806	1.2500e-003		36.6117
Total	**0.0162**	**0.0116**	**0.1505**	**3.7000e-004**	**0.0335**	**2.7000e-004**	**0.0338**	**8.8900e-003**	**2.5000e-004**	**9.1400e-003**		**36.5806**	**36.5806**	**1.2500e-003**		**36.6117**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.2661	2.6297	2.3367	3.1100e-003		0.1863	0.1863		0.1714	0.1714	0.0000	312.7760	312.7760	0.0974		315.2102
Total	**0.2661**	**2.6297**	**2.3367**	**3.1100e-003**	**0.0000**	**0.1863**	**0.1863**	**0.0000**	**0.1714**	**0.1714**	**0.0000**	**312.7760**	**312.7760**	**0.0974**		**315.2102**

3.2 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0162	0.0116	0.1505	3.7000e-004	0.0335	2.7000e-004	0.0338	8.8900e-003	2.5000e-004	9.1400e-003		36.5806	36.5806	1.2500e-003		36.6117
Total	**0.0162**	**0.0116**	**0.1505**	**3.7000e-004**	**0.0335**	**2.7000e-004**	**0.0338**	**8.8900e-003**	**2.5000e-004**	**9.1400e-003**		**36.5806**	**36.5806**	**1.2500e-003**		**36.6117**

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.6128	0.0000	7.6128	3.4820	0.0000	3.4820			0.0000			0.0000
Off-Road	3.1332	38.3917	14.1326	0.0348		1.5450	1.5450		1.4214	1.4214		3,507.8212	3,507.8212	1.0920		3,535.1220
Total	**3.1332**	**38.3917**	**14.1326**	**0.0348**	**7.6128**	**1.5450**	**9.1578**	**3.4820**	**1.4214**	**4.9034**		**3,507.8212**	**3,507.8212**	**1.0920**		**3,535.1220**

3.3 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0701	0.0502	0.6523	1.5900e-003	0.1453	1.1600e-003	0.1465	0.0385	1.0700e-003	0.0396		158.5157	158.5157	5.4100e-003		158.6508
Total	**0.0701**	**0.0502**	**0.6523**	**1.5900e-003**	**0.1453**	**1.1600e-003**	**0.1465**	**0.0385**	**1.0700e-003**	**0.0396**		**158.5157**	**158.5157**	**5.4100e-003**		**158.6508**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.9690	0.0000	2.9690	1.3580	0.0000	1.3580			0.0000			0.0000
Off-Road	3.1332	38.3917	14.1326	0.0348		1.5450	1.5450		1.4214	1.4214	0.0000	3,507.8212	3,507.8212	1.0920		3,535.1220
Total	**3.1332**	**38.3917**	**14.1326**	**0.0348**	**2.9690**	**1.5450**	**4.5140**	**1.3580**	**1.4214**	**2.7794**	**0.0000**	**3,507.8212**	**3,507.8212**	**1.0920**		**3,535.1220**

3.3 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0701	0.0502	0.6523	1.5900e-003	0.1453	1.1600e-003	0.1465	0.0385	1.0700e-003	0.0396		158.5157	158.5157	5.4100e-003		158.6508
Total	**0.0701**	**0.0502**	**0.6523**	**1.5900e-003**	**0.1453**	**1.1600e-003**	**0.1465**	**0.0385**	**1.0700e-003**	**0.0396**		**158.5157**	**158.5157**	**5.4100e-003**		**158.6508**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.6128	0.0000	7.6128	3.4820	0.0000	3.4820			0.0000			0.0000
Off-Road	2.9774	35.8872	13.7958	0.0348		1.4410	1.4410		1.3257	1.3257		3,446.9221	3,446.9221	1.0906		3,474.1864
Total	**2.9774**	**35.8872**	**13.7958**	**0.0348**	**7.6128**	**1.4410**	**9.0539**	**3.4820**	**1.3257**	**4.8077**		**3,446.9221**	**3,446.9221**	**1.0906**		**3,474.1864**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0637	0.0443	0.5841	1.5400e-003	0.1453	1.1300e-003	0.1464	0.0385	1.0400e-003	0.0396		153.5286	153.5286	4.8000e-003		153.6486
Total	**0.0637**	**0.0443**	**0.5841**	**1.5400e-003**	**0.1453**	**1.1300e-003**	**0.1464**	**0.0385**	**1.0400e-003**	**0.0396**		**153.5286**	**153.5286**	**4.8000e-003**		**153.6486**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.9690	0.0000	2.9690	1.3580	0.0000	1.3580			0.0000			0.0000
Off-Road	2.9774	35.8872	13.7958	0.0348		1.4410	1.4410		1.3257	1.3257	0.0000	3,446.9221	3,446.9221	1.0906		3,474.1864
Total	**2.9774**	**35.8872**	**13.7958**	**0.0348**	**2.9690**	**1.4410**	**4.4100**	**1.3580**	**1.3257**	**2.6837**	**0.0000**	**3,446.9221**	**3,446.9221**	**1.0906**		**3,474.1864**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0637	0.0443	0.5841	1.5400e-003	0.1453	1.1300e-003	0.1464	0.0385	1.0400e-003	0.0396		153.5286	153.5286	4.8000e-003		153.6486
Total	**0.0637**	**0.0443**	**0.5841**	**1.5400e-003**	**0.1453**	**1.1300e-003**	**0.1464**	**0.0385**	**1.0400e-003**	**0.0396**		**153.5286**	**153.5286**	**4.8000e-003**		**153.6486**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2571	19.4720	15.1290	0.0261		1.1379	1.1379		1.0910	1.0910		2,478.7187	2,478.7187	0.4380		2,489.6679
Total	**2.2571**	**19.4720**	**15.1290**	**0.0261**		**1.1379**	**1.1379**		**1.0910**	**1.0910**		**2,478.7187**	**2,478.7187**	**0.4380**		**2,489.6679**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1696	5.0347	1.2171	0.0114	0.2816	0.0334	0.3150	0.0811	0.0319	0.1130		1,215.3667	1,215.3667	0.0804		1,217.3771
Worker	0.5534	0.3851	5.0775	0.0134	1.2631	9.8300e-003	1.2729	0.3350	9.0600e-003	0.3440		1,334.5176	1,334.5176	0.0417		1,335.5610
Total	**0.7230**	**5.4198**	**6.2946**	**0.0248**	**1.5447**	**0.0432**	**1.5879**	**0.4160**	**0.0410**	**0.4570**		**2,549.8843**	**2,549.8843**	**0.1222**		**2,552.9381**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2571	19.4720	15.1290	0.0261		1.1379	1.1379		1.0910	1.0910	0.0000	2,478.7187	2,478.7187	0.4380		2,489.6679
Total	**2.2571**	**19.4720**	**15.1290**	**0.0261**		**1.1379**	**1.1379**		**1.0910**	**1.0910**	**0.0000**	**2,478.7187**	**2,478.7187**	**0.4380**		**2,489.6679**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1696	5.0347	1.2171	0.0114	0.2816	0.0334	0.3150	0.0811	0.0319	0.1130		1,215.3667	1,215.3667	0.0804		1,217.3771
Worker	0.5534	0.3851	5.0775	0.0134	1.2631	9.8300e-003	1.2729	0.3350	9.0600e-003	0.3440		1,334.5176	1,334.5176	0.0417		1,335.5610
Total	**0.7230**	**5.4198**	**6.2946**	**0.0248**	**1.5447**	**0.0432**	**1.5879**	**0.4160**	**0.0410**	**0.4570**		**2,549.8843**	**2,549.8843**	**0.1222**		**2,552.9381**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	19.0951					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3553	2.4472	2.4551	3.9600e-003		0.1717	0.1717		0.1717	0.1717		375.2641	375.2641	0.0317		376.0565
Total	**19.4504**	**2.4472**	**2.4551**	**3.9600e-003**		**0.1717**	**0.1717**		**0.1717**	**0.1717**		**375.2641**	**375.2641**	**0.0317**		**376.0565**

3.5 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1126	0.0784	1.0335	2.7300e-003	0.2571	2.0000e-003	0.2591	0.0682	1.8400e-003	0.0700		271.6275	271.6275	8.5000e-003		271.8399
Total	**0.1126**	**0.0784**	**1.0335**	**2.7300e-003**	**0.2571**	**2.0000e-003**	**0.2591**	**0.0682**	**1.8400e-003**	**0.0700**		**271.6275**	**271.6275**	**8.5000e-003**		**271.8399**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	19.0951					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3553	2.4472	2.4551	3.9600e-003		0.1717	0.1717		0.1717	0.1717	0.0000	375.2641	375.2641	0.0317		376.0565
Total	**19.4504**	**2.4472**	**2.4551**	**3.9600e-003**		**0.1717**	**0.1717**		**0.1717**	**0.1717**	**0.0000**	**375.2641**	**375.2641**	**0.0317**		**376.0565**

3.5 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1126	0.0784	1.0335	2.7300e-003	0.2571	2.0000e-003	0.2591	0.0682	1.8400e-003	0.0700		271.6275	271.6275	8.5000e-003		271.8399
Total	**0.1126**	**0.0784**	**1.0335**	**2.7300e-003**	**0.2571**	**2.0000e-003**	**0.2591**	**0.0682**	**1.8400e-003**	**0.0700**		**271.6275**	**271.6275**	**8.5000e-003**		**271.8399**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7272	7.6220	7.3324	0.0114		0.4123	0.4123		0.3793	0.3793		1,128.5012	1,128.5012	0.3571		1,137.4274
Paving	0.4074					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1346**	**7.6220**	**7.3324**	**0.0114**		**0.4123**	**0.4123**		**0.3793**	**0.3793**		**1,128.5012**	**1,128.5012**	**0.3571**		**1,137.4274**

3.6 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530
Total	**0.0392**	**0.0273**	**0.3595**	**9.5000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**94.4791**	**94.4791**	**2.9500e-003**		**94.5530**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7272	7.6220	7.3324	0.0114		0.4123	0.4123		0.3793	0.3793	0.0000	1,128.5012	1,128.5012	0.3571		1,137.4274
Paving	0.4074					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1346**	**7.6220**	**7.3324**	**0.0114**		**0.4123**	**0.4123**		**0.3793**	**0.3793**	**0.0000**	**1,128.5012**	**1,128.5012**	**0.3571**		**1,137.4274**

3.6 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530
Total	**0.0392**	**0.0273**	**0.3595**	**9.5000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**94.4791**	**94.4791**	**2.9500e-003**		**94.5530**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Unrefrigerated Warehouse-No Rail	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Unmitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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APPENDIX 3.2:

CALEEMOD OPERATIONAL EMISSIONS MODEL OUTPUTS (TRUCKS)

Centerpointe (Operations - Trucks)

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	163.22	1000sqft	3.75	163,218.00	0
General Light Industry	40.80	1000sqft	0.94	40,804.00	0
Parking Lot	164.00	Space	3.11	65,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot Acreage based on information provided in the Site Plan. Total Lot Acreage is 8.78.

Construction Phase - Operations Run Only.

Off-road Equipment - Operations Run Only.

Trips and VMT - Operations Run Only.

Vehicle Trips - Operations Run Only.

Fleet Mix - Operations Run Only.

Centerpointe (Operations - Trucks) - South Coast AQMD Air District, Summer

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	PhaseEndDate	1/18/2019	12/10/2018
tblConstructionPhase	PhaseStartDate	1/5/2019	12/10/2018
tblFleetMix	HHD	0.03	0.44
tblFleetMix	HHD	0.03	0.63
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LHD1	0.02	0.37
tblFleetMix	LHD1	0.02	0.17
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MHD	0.02	0.18
tblFleetMix	MHD	0.02	0.21
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	SBUS	7.0500e-004	0.00

tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblLandUse	LandUseSquareFeet	163,220.00	163,218.00
tblLandUse	LandUseSquareFeet	40,800.00	40,804.00
tblLandUse	LotAcreage	1.48	3.11
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	1.06
tblVehicleTrips	ST_TR	1.68	0.35
tblVehicleTrips	SU_TR	0.68	1.06
tblVehicleTrips	SU_TR	1.68	0.35
tblVehicleTrips	WD_TR	6.97	1.06

tblVehicleTrips	WD_TR	1.68	0.35

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
Mobile	1.6100	43.5439	13.0930	0.1643	5.3284	0.2947	5.6230	1.4994	0.2818	1.7812		17,518.0782	17,518.0782	0.7920		17,537.8781
Total	**6.2486**	**43.9893**	**13.5047**	**0.1669**	**5.3284**	**0.3286**	**5.6570**	**1.4994**	**0.3158**	**1.8152**		**18,052.2617**	**18,052.2617**	**0.8025**	**9.7900e-003**	**18,075.2409**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
Mobile	1.6100	43.5439	13.0930	0.1643	5.3284	0.2947	5.6230	1.4994	0.2818	1.7812		17,518.0782	17,518.0782	0.7920		17,537.8781
Total	**6.2486**	**43.9893**	**13.5047**	**0.1669**	**5.3284**	**0.3286**	**5.6570**	**1.4994**	**0.3158**	**1.8152**		**18,052.2617**	**18,052.2617**	**0.8025**	**9.7900e-003**	**18,075.2409**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/10/2018	12/10/2018	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.2 Site Preparation - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.6100	43.5439	13.0930	0.1643	5.3284	0.2947	5.6230	1.4994	0.2818	1.7812		17,518.0782	17,518.0782	0.7920		17,537.8781
Unmitigated	1.6100	43.5439	13.0930	0.1643	5.3284	0.2947	5.6230	1.4994	0.2818	1.7812		17,518.0782	17,518.0782	0.7920		17,537.8781

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	43.29	43.29	43.29	945,427	945,427
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	56.80	56.80	56.80	1,240,524	1,240,524
Total	100.09	100.09	100.09	2,185,952	2,185,952

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0
Parking Lot	60.00	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.000000	0.000000	0.000000	0.000000	0.374200	0.000000	0.181900	0.443900	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Unrefrigerated Warehouse-No Rail	0.000000	0.000000	0.000000	0.000000	0.166700	0.000000	0.206900	0.626400	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
NaturalGas Unmitigated	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3632.11	0.0392	0.3561	0.2991	2.1400e-003		0.0271	0.0271		0.0271	0.0271		427.3076	427.3076	8.1900e-003	7.8300e-003	429.8469
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	907.76	9.7900e-003	0.0890	0.0748	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003		106.7953	106.7953	2.0500e-003	1.9600e-003	107.4300
Total		**0.0490**	**0.4451**	**0.3739**	**2.6700e-003**		**0.0338**	**0.0338**		**0.0338**	**0.0338**		**534.1030**	**534.1030**	**0.0102**	**9.7900e-003**	**537.2769**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3.63211	0.0392	0.3561	0.2991	2.1400e-003		0.0271	0.0271		0.0271	0.0271		427.3076	427.3076	8.1900e-003	7.8300e-003	429.8469
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.90776	9.7900e-003	0.0890	0.0748	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003		106.7953	106.7953	2.0500e-003	1.9600e-003	107.4300
Total		**0.0490**	**0.4451**	**0.3739**	**2.6700e-003**		**0.0338**	**0.0338**		**0.0338**	**0.0338**		**534.1030**	**534.1030**	**0.0102**	**9.7900e-003**	**537.2769**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Unmitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Centerpointe (Operations - Trucks)

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	163.22	1000sqft	3.75	163,218.00	0
General Light Industry	40.80	1000sqft	0.94	40,804.00	0
Parking Lot	164.00	Space	3.11	65,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot Acreage based on information provided in the Site Plan. Total Lot Acreage is 8.78.

Construction Phase - Operations Run Only.

Off-road Equipment - Operations Run Only.

Trips and VMT - Operations Run Only.

Vehicle Trips - Operations Run Only.

Fleet Mix - Operations Run Only.

Centerpointe (Operations - Trucks) - South Coast AQMD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	PhaseEndDate	1/18/2019	12/10/2018
tblConstructionPhase	PhaseStartDate	1/5/2019	12/10/2018
tblFleetMix	HHD	0.03	0.44
tblFleetMix	HHD	0.03	0.63
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LHD1	0.02	0.37
tblFleetMix	LHD1	0.02	0.17
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MHD	0.02	0.18
tblFleetMix	MHD	0.02	0.21
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	SBUS	7.0500e-004	0.00

tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblLandUse	LandUseSquareFeet	163,220.00	163,218.00
tblLandUse	LandUseSquareFeet	40,800.00	40,804.00
tblLandUse	LotAcreage	1.48	3.11
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	1.06
tblVehicleTrips	ST_TR	1.68	0.35
tblVehicleTrips	SU_TR	0.68	1.06
tblVehicleTrips	SU_TR	1.68	0.35
tblVehicleTrips	WD_TR	6.97	1.06

tblVehicleTrips	WD_TR	1.68	0.35

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
Mobile	1.6218	44.9475	13.2458	0.1635	5.3284	0.2955	5.6238	1.4994	0.2826	1.7820		17,432.6581	17,432.6581	0.8038		17,452.7537
Total	**6.2603**	**45.3930**	**13.6575**	**0.1661**	**5.3284**	**0.3294**	**5.6578**	**1.4994**	**0.3165**	**1.8159**		**17,966.8417**	**17,966.8417**	**0.8143**	**9.7900e-003**	**17,990.1165**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
Mobile	1.6218	44.9475	13.2458	0.1635	5.3284	0.2955	5.6238	1.4994	0.2826	1.7820		17,432.6581	17,432.6581	0.8038		17,452.7537
Total	**6.2603**	**45.3930**	**13.6575**	**0.1661**	**5.3284**	**0.3294**	**5.6578**	**1.4994**	**0.3165**	**1.8159**		**17,966.8417**	**17,966.8417**	**0.8143**	**9.7900e-003**	**17,990.1165**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/10/2018	12/10/2018	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.2 Site Preparation - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.6218	44.9475	13.2458	0.1635	5.3284	0.2955	5.6238	1.4994	0.2826	1.7820		17,432.6581	17,432.6581	0.8038		17,452.7537
Unmitigated	1.6218	44.9475	13.2458	0.1635	5.3284	0.2955	5.6238	1.4994	0.2826	1.7820		17,432.6581	17,432.6581	0.8038		17,452.7537

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	43.29	43.29	43.29	945,427	945,427
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	56.80	56.80	56.80	1,240,524	1,240,524
Total	100.09	100.09	100.09	2,185,952	2,185,952

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0
Parking Lot	60.00	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.000000	0.000000	0.000000	0.000000	0.374200	0.000000	0.181900	0.443900	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Unrefrigerated Warehouse-No Rail	0.000000	0.000000	0.000000	0.000000	0.166700	0.000000	0.206900	0.626400	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
NaturalGas Unmitigated	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3632.11	0.0392	0.3561	0.2991	2.1400e-003		0.0271	0.0271		0.0271	0.0271		427.3076	427.3076	8.1900e-003	7.8300e-003	429.8469
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	907.76	9.7900e-003	0.0890	0.0748	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003		106.7953	106.7953	2.0500e-003	1.9600e-003	107.4300
Total		**0.0490**	**0.4451**	**0.3739**	**2.6700e-003**		**0.0338**	**0.0338**		**0.0338**	**0.0338**		**534.1030**	**534.1030**	**0.0102**	**9.7900e-003**	**537.2769**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3.63211	0.0392	0.3561	0.2991	2.1400e-003		0.0271	0.0271		0.0271	0.0271		427.3076	427.3076	8.1900e-003	7.8300e-003	429.8469
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.90776	9.7900e-003	0.0890	0.0748	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003		106.7953	106.7953	2.0500e-003	1.9600e-003	107.4300
Total		**0.0490**	**0.4451**	**0.3739**	**2.6700e-003**		**0.0338**	**0.0338**		**0.0338**	**0.0338**		**534.1030**	**534.1030**	**0.0102**	**9.7900e-003**	**537.2769**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Unmitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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APPENDIX 3.3:

CALEEMOD OPERATIONAL EMISSIONS MODEL OUTPUTS (PASSENGER CARS)

Centerpointe (Operations - Passenger Cars)

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	163.22	1000sqft	3.75	163,218.00	0
General Light Industry	40.80	1000sqft	0.94	40,804.00	0
Parking Lot	164.00	Space	3.11	65,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Centerpointe (Operations - Passenger Cars) - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use - Lot acreaged based on information from Site Plan. Total Lot acreage is 8.78 acres.

Construction Phase - Operations Run Only.

Off-road Equipment - Operations Run Only.

Trips and VMT - Operations Run Only.

On-road Fugitive Dust - Operations Run Only.

Vehicle Trips - Trip Rates based on information provided in the TIA (2018)

Fleet Mix - Based on information provided in the TIA (2018)

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	PhaseEndDate	1/18/2019	12/10/2018
tblConstructionPhase	PhaseStartDate	1/5/2019	12/10/2018
tblFleetMix	HHD	0.03	0.00
tblFleetMix	HHD	0.03	0.00
tblFleetMix	LDA	0.55	1.00
tblFleetMix	LDA	0.55	1.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00

tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblLandUse	LandUseSquareFeet	163,220.00	163,218.00
tblLandUse	LandUseSquareFeet	40,800.00	40,804.00
tblLandUse	LotAcreage	1.48	3.11
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOnRoadDust	HaulingPercentPave	100.00	0.00
tblOnRoadDust	VendorPercentPave	100.00	0.00
tblOnRoadDust	WorkerPercentPave	100.00	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	CW_TTP	59.00	100.00

tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	2.54
tblVehicleTrips	ST_TR	1.68	0.15
tblVehicleTrips	SU_TR	0.68	1.24
tblVehicleTrips	SU_TR	1.68	0.06
tblVehicleTrips	WD_TR	6.97	3.90
tblVehicleTrips	WD_TR	1.68	1.39

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
Mobile	1.1186	2.7766	41.1349	0.1548	17.6078	0.1092	17.7170	4.6676	0.1007	4.7683		15,443.2052	15,443.2052	0.3205		15,451.2188
Total	**5.7572**	**3.2221**	**41.5466**	**0.1574**	**17.6078**	**0.1432**	**17.7509**	**4.6676**	**0.1347**	**4.8023**		**15,977.3887**	**15,977.3887**	**0.3310**	**9.7900e-003**	**15,988.5816**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
Mobile	1.1186	2.7766	41.1349	0.1548	17.6078	0.1092	17.7170	4.6676	0.1007	4.7683		15,443.2052	15,443.2052	0.3205		15,451.2188
Total	**5.7572**	**3.2221**	**41.5466**	**0.1574**	**17.6078**	**0.1432**	**17.7509**	**4.6676**	**0.1347**	**4.8023**		**15,977.3887**	**15,977.3887**	**0.3310**	**9.7900e-003**	**15,988.5816**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/10/2018	12/10/2018	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.2 Site Preparation - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.1186	2.7766	41.1349	0.1548	17.6078	0.1092	17.7170	4.6676	0.1007	4.7683		15,443.2052	15,443.2052	0.3205		15,451.2188
Unmitigated	1.1186	2.7766	41.1349	0.1548	17.6078	0.1092	17.7170	4.6676	0.1007	4.7683		15,443.2052	15,443.2052	0.3205		15,451.2188

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	159.08	103.63	50.59	2,962,814	2,962,814
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	227.20	24.48	9.79	3,651,297	3,651,297
Total	386.28	128.12	60.39	6,614,111	6,614,111

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Unrefrigerated Warehouse-No Rail	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
NaturalGas Unmitigated	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3632.11	0.0392	0.3561	0.2991	2.1400e-003		0.0271	0.0271		0.0271	0.0271		427.3076	427.3076	8.1900e-003	7.8300e-003	429.8469
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	907.76	9.7900e-003	0.0890	0.0748	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003		106.7953	106.7953	2.0500e-003	1.9600e-003	107.4300
Total		**0.0490**	**0.4451**	**0.3739**	**2.6700e-003**		**0.0338**	**0.0338**		**0.0338**	**0.0338**		**534.1030**	**534.1030**	**0.0102**	**9.7900e-003**	**537.2769**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3.63211	0.0392	0.3561	0.2991	2.1400e-003		0.0271	0.0271		0.0271	0.0271		427.3076	427.3076	8.1900e-003	7.8300e-003	429.8469
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.90776	9.7900e-003	0.0890	0.0748	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003		106.7953	106.7953	2.0500e-003	1.9600e-003	107.4300
Total		**0.0490**	**0.4451**	**0.3739**	**2.6700e-003**		**0.0338**	**0.0338**		**0.0338**	**0.0338**		**534.1030**	**534.1030**	**0.0102**	**9.7900e-003**	**537.2769**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Unmitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Centerpointe (Operations - Passenger Cars)

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	163.22	1000sqft	3.75	163,218.00	0
General Light Industry	40.80	1000sqft	0.94	40,804.00	0
Parking Lot	164.00	Space	3.11	65,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Centerpointe (Operations - Passenger Cars) - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use - Lot acreaged based on information from Site Plan. Total Lot acreage is 8.78 acres.

Construction Phase - Operations Run Only.

Off-road Equipment - Operations Run Only.

Trips and VMT - Operations Run Only.

On-road Fugitive Dust - Operations Run Only.

Vehicle Trips - Trip Rates based on information provided in the TIA (2018)

Fleet Mix - Based on information provided in the TIA (2018)

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	PhaseEndDate	1/18/2019	12/10/2018
tblConstructionPhase	PhaseStartDate	1/5/2019	12/10/2018
tblFleetMix	HHD	0.03	0.00
tblFleetMix	HHD	0.03	0.00
tblFleetMix	LDA	0.55	1.00
tblFleetMix	LDA	0.55	1.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00

tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblLandUse	LandUseSquareFeet	163,220.00	163,218.00
tblLandUse	LandUseSquareFeet	40,800.00	40,804.00
tblLandUse	LotAcreage	1.48	3.11
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOnRoadDust	HaulingPercentPave	100.00	0.00
tblOnRoadDust	VendorPercentPave	100.00	0.00
tblOnRoadDust	WorkerPercentPave	100.00	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	CW_TTP	59.00	100.00

tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	2.54
tblVehicleTrips	ST_TR	1.68	0.15
tblVehicleTrips	SU_TR	0.68	1.24
tblVehicleTrips	SU_TR	1.68	0.06
tblVehicleTrips	WD_TR	6.97	3.90
tblVehicleTrips	WD_TR	1.68	1.39

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
Mobile	1.0256	3.0243	35.7227	0.1443	17.6078	0.1092	17.7170	4.6676	0.1007	4.7683		14,408.0518	14,408.0518	0.2942		14,415.4068
Total	**5.6641**	**3.4697**	**36.1344**	**0.1470**	**17.6078**	**0.1432**	**17.7509**	**4.6676**	**0.1347**	**4.8023**		**14,942.2353**	**14,942.2353**	**0.3047**	**9.7900e-003**	**14,952.7696**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Energy	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
Mobile	1.0256	3.0243	35.7227	0.1443	17.6078	0.1092	17.7170	4.6676	0.1007	4.7683		14,408.0518	14,408.0518	0.2942		14,415.4068
Total	**5.6641**	**3.4697**	**36.1344**	**0.1470**	**17.6078**	**0.1432**	**17.7509**	**4.6676**	**0.1347**	**4.8023**		**14,942.2353**	**14,942.2353**	**0.3047**	**9.7900e-003**	**14,952.7696**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/10/2018	12/10/2018	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.2 Site Preparation - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0256	3.0243	35.7227	0.1443	17.6078	0.1092	17.7170	4.6676	0.1007	4.7683		14,408.0518	14,408.0518	0.2942		14,415.4068
Unmitigated	1.0256	3.0243	35.7227	0.1443	17.6078	0.1092	17.7170	4.6676	0.1007	4.7683		14,408.0518	14,408.0518	0.2942		14,415.4068

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	159.08	103.63	50.59	2,962,814	2,962,814
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	227.20	24.48	9.79	3,651,297	3,651,297
Total	386.28	128.12	60.39	6,614,111	6,614,111

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Unrefrigerated Warehouse-No Rail	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769
NaturalGas Unmitigated	0.0490	0.4451	0.3739	2.6700e-003		0.0338	0.0338		0.0338	0.0338		534.1030	534.1030	0.0102	9.7900e-003	537.2769

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3632.11	0.0392	0.3561	0.2991	2.1400e-003		0.0271	0.0271		0.0271	0.0271		427.3076	427.3076	8.1900e-003	7.8300e-003	429.8469
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	907.76	9.7900e-003	0.0890	0.0748	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003		106.7953	106.7953	2.0500e-003	1.9600e-003	107.4300
Total		**0.0490**	**0.4451**	**0.3739**	**2.6700e-003**		**0.0338**	**0.0338**		**0.0338**	**0.0338**		**534.1030**	**534.1030**	**0.0102**	**9.7900e-003**	**537.2769**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3.63211	0.0392	0.3561	0.2991	2.1400e-003		0.0271	0.0271		0.0271	0.0271		427.3076	427.3076	8.1900e-003	7.8300e-003	429.8469
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.90776	9.7900e-003	0.0890	0.0748	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003		106.7953	106.7953	2.0500e-003	1.9600e-003	107.4300
Total		**0.0490**	**0.4451**	**0.3739**	**2.6700e-003**		**0.0338**	**0.0338**		**0.0338**	**0.0338**		**534.1030**	**534.1030**	**0.0102**	**9.7900e-003**	**537.2769**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Unmitigated	4.5896	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5232					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.0629					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.5600e-003	3.5000e-004	0.0378	0.0000		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004		0.0805	0.0805	2.2000e-004		0.0859
Total	**4.5896**	**3.5000e-004**	**0.0378**	**0.0000**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**		**0.0805**	**0.0805**	**2.2000e-004**		**0.0859**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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URBAN CROSSROADS

Centerpointe

MOBILE SOURCE HEALTH RISK ASSESSMENT

CITY OF MORENO VALLEY

PREPARED BY:

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JUNE 4, 2018

TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

(1)	Reference
µg	Microgram
AERMOD	Atmospheric Dispersion Modeling System
APS	Auxiliary Power System
AQMD	Air Quality Management District
ARB	Air Resources Board
CEQA	California Environmental Quality Act
CPF	Cancer Potency Factor
DPM	Diesel Particulate Matter
EMFAC	Emission Factor Model
EPA	Environmental Protection Agency
HHD	Heavy Heavy-Duty
HI	Hazard Index
HRA	Health Risk Assessment
LHD	Light Heavy-Duty
MATES	Multiple Air Toxics Exposure Study
MEIR	Maximally Exposed Individual Receptor
MEISC	Maximally Exposed Individual School Child
MEIW	Maximally Exposed Individual Worker
MHD	Medium Heavy-Duty
NAD	North American Datum
OEHHA	Office of Environmental Health Hazard
PCE	Passenger Car Equivalent
PM10	Particulate Matter 10 microns in diameter or less
Project	Centerpointe
REL	Reference Exposure Level
RM	Recommended Measures
SCAQMD	South Coast Air Quality Management District
SRA	Source Receptor Area
TAC	Toxic Air Contaminant
TIA	Traffic Impact Analysis
URF	Unit Risk Factor
UTM	Universal Transverse Mercator
VMT	Vehicle Miles Traveled

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EXECUTIVE SUMMARY

This report evaluated the potential mobile source health risk impacts to sensitive receptors (residents) and adjacent workers associated with the development of the proposed Project, more specifically, health risk impacts as a result of exposure to diesel particulate matter (DPM) as a result of heavy-duty diesel trucks accessing the site. This section summarizes the significance criteria and Project mobile source health risks.

The results of the health risk assessment of lifetime cancer risk from Project-generated DPM emissions are provided in Table ES-1 below for the Project.

Residential Exposure Scenario:

The residential land use with the greatest potential exposure to Project DPM source emissions is located north of Alessandro Boulevard and west of Frederick Street at an existing residential home. At the maximally exposed individual receptor (MEIR), the maximum incremental cancer risk attributable to Project DPM source emissions is estimated at 0.24 in one million, which is less than the threshold of 10 in one million. At this same location, non-cancer risks were estimated to be 0.00009, which would not exceed the applicable threshold of 1.0. As such, the Project will not cause a significant human health or cancer risk to adjacent residences.

Worker Exposure Scenario:

The worker receptor land use with the greatest potential exposure to Project DPM source emissions is located immediately adjacent to the east of the Project site at an existing warehouse building. At the maximally exposed individual worker (MEIW), the maximum incremental cancer risk impact at this location is 0.23 in one million which is less than the threshold of 10 in one million. Maximum non-cancer risks at this same location were estimated to be 0.0007, which would not exceed the applicable threshold of 1.0. As such, the Project will not cause a significant human health or cancer risk to adjacent workers.

School Child Exposure Scenario:

There are no schools located within a ¼ mile of the Project site. As such, there would be no significant impacts that would occur to any schools in the vicinity of the Project.

TABLE ES-1: SUMMARY OF CANCER AND NON-CANCER RISKS

Time Period	Location	Maximum Lifetime Cancer Risk (Risk per Million)	Significance Threshold (Risk per Million)	Exceeds Significance Threshold
30 Year Exposure	Maximum Exposed Sensitive Receptor	0.24	10	NO
25 Year Exposure	Maximum Exposed Worker Receptor	0.23	10	NO
Time Period	**Location**	**Maximum Hazard Index**	**Significance Threshold**	**Exceeds Significance Threshold**
30 Year Exposure	Maximum Exposed Sensitive Receptor	0.00009	1.0	NO
25 Year Exposure	Maximum Exposed Worker Receptor	0.0007	1.0	NO

1 INTRODUCTION

The purpose of this Health Risk Assessment (HRA) is to evaluate Project-related impacts to sensitive receptors (residential) and adjacent workers as a result of heavy-duty diesel trucks accessing the site.

The South Coast Air Quality Management District (SCAQMD) typically issues a comment letter on the Notice of Preparation of a CEQA Document. Per the SCAQMD's typical comment letter, if a proposed Project is expected to generate/attract diesel trucks, which emit diesel particulate matter (DPM), preparation of a HRA is necessary. This document serves to meet the SCAQMD's request for preparation of a HRA. The mobile source HRA has been prepared in accordance with the document Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis (1) and is comprised of all relevant and appropriate procedures presented by the U.S. EPA, California Environmental Protection Agency and SCAQMD. Cancer risk is expressed in terms of expected incremental incidence per million population. The SCAQMD has established an incidence rate of ten (10) persons per million as the maximum acceptable incremental cancer risk due to DPM exposure. This threshold serves to determine whether or not a given project has a potentially significant development-specific and cumulative impact.

The SCAQMD has published a report on how to address cumulative impacts from air pollution: *White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution* (2). In this report the SCAQMD clearly states (Page D-3):

"…the SCAQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for toxic air contaminant (TAC) emissions. The project specific (project increment) significance threshold is HI > 1.0 while the cumulative (facility-wide) is HI > 3.0. It should be noted that the HI is only one of three TAC emission significance thresholds considered (when applicable) in a CEQA analysis. The other two are the maximum individual cancer risk (MICR) and the cancer burden, both of which use the same significance thresholds (MICR of 10 in 1 million and cancer burden of 0.5) for project specific and cumulative impacts.

Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."

The SCAQMD has also established non-carcinogenic risk parameters for use in HRAs. Non-carcinogenic risks are quantified by calculating a "hazard index," expressed as the ratio between the ambient pollutant concentration and its toxicity or Reference Exposure Level (REL). An REL is a concentration at or below which health effects are not likely to occur. A hazard index less of than one (1.0) means that adverse health effects are not expected. Within this analysis, non-carcinogenic exposures of less than 1.0 are considered less-than-significant.

1.1 SITE LOCATION

The proposed Centerpointe site is located on the northeast corner of Frederick Street and Brodiaea Avenue in the City of Moreno Valley, as shown on Exhibit 1-A. Existing uses in the Project study area include a commercial-designated vacant lot north of the Project site, existing business park/warehouse use to the east, the Riverside County Department of Waste Resources facilities to the south, and existing City of Moreno Valley offices to the west. The closest existing residential homes to the Project site are located approximately 800 feet north of the Project site across Alessandro Boulevard. The March Air Reserve Base/Inland Port Airport (MARB/IPA) runway is located approximately 1.2 miles southwest of the Project site, and Interstate 215 (I-215) is located roughly 1.2 miles west of the Project site.

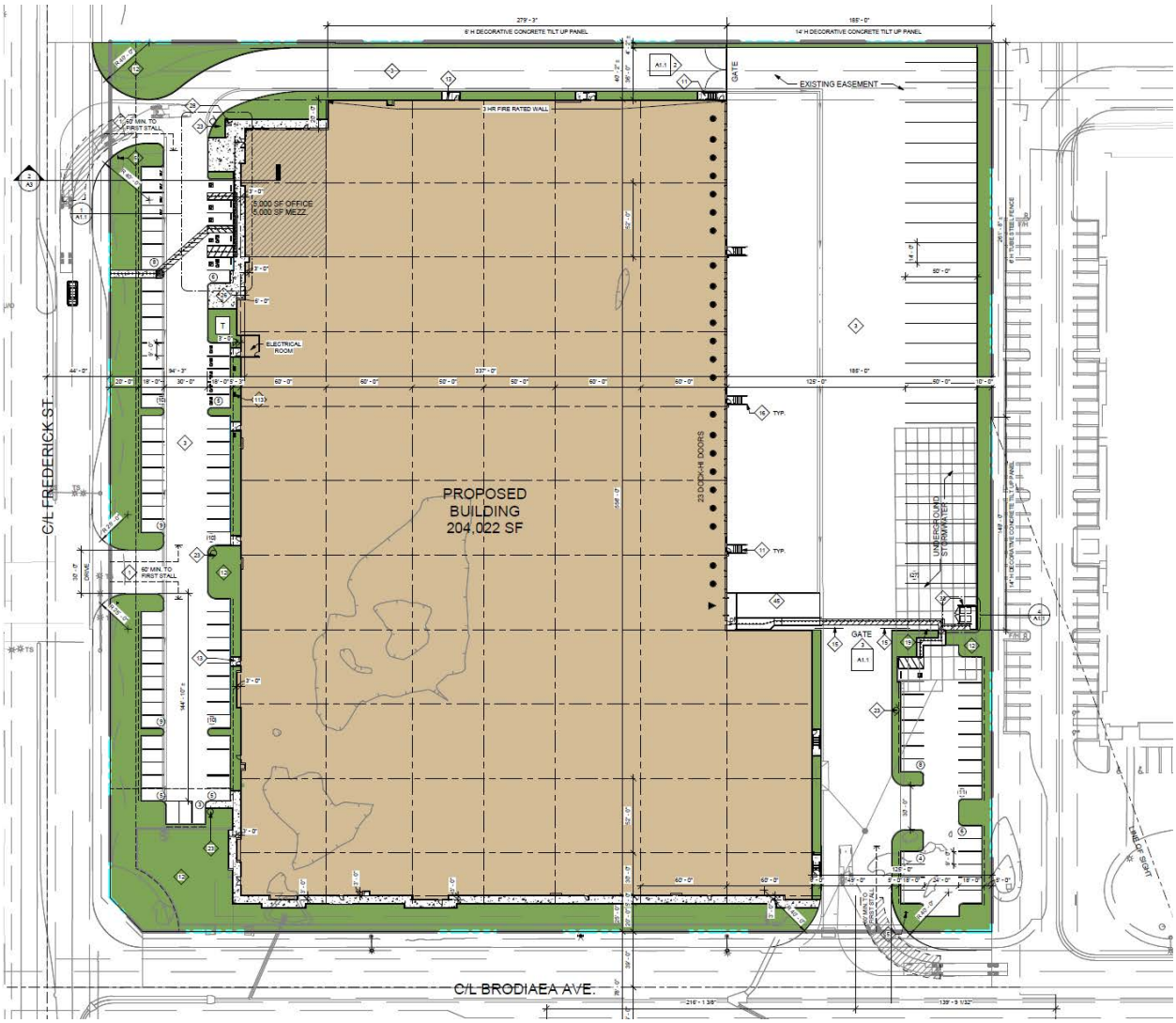
1.2 PROJECT DESCRIPTION

The Project is proposed to consist of up to 163,218 square feet (sf) of warehouse (without cold storage) use (80 percent of the total square footage) and 40,804 sf of general light industrial use (20 percent of the total square footage) for a total of 204,022 sf within a single building, as shown on Exhibit 1-B. The Project is anticipated to have an Opening Year of 2020[1]. At the time this air quality analysis was prepared the future tenants of the proposed Project were unknown. The Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. This air quality analysis is intended to describe air quality level impacts associated with the expected typical warehouse and distribution storage activities at the Project site. At the time of this analysis, no cold storage was planned at the Project site, and therefore is not analyzed in this report.

[1] The Traffic Impact Analysis (TIA) prepared for the Project evaluates an Opening Year of 2023 since the City of Moreno Valley traffic study guidelines require the Opening Year to be a minimum of 5 years from baseline (2018) conditions. Utilizing a 2020 Opening Year for purposes of this AQIA would generate more emissions than if the Project utilized a 2023 Opening Year consistent with the traffic study because as the analysis year increases, vehicle emission factors would decrease as a result of emissions regulations becoming more stringent. Utilizing a 2020 Opening Year for purposes of the HRA herein represents a conservative estimate of emissions compared to if a 2023 Opening Year, consistent with the traffic study, were utilized.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



2 BACKGROUND

2.1 REGULATORY SETTING

ARB estimates that the average Californian is exposed to 1.2-1.8 µg/m^3 of DPM annually, this exposure results in an average cancer risk of 360-540 in one million for the average Californian exposed to DPM (3).

As noted above, this HRA is based on SCAQMD guidelines to produce conservative estimates of risk posed by exposure to DPM. The conservative nature of this analysis is due primarily to the following factors:

- The ARB-adopted diesel exhaust Unit Risk Factor (URF) of 300 in one million per µg/m3 is based upon the upper 95 percentile of estimated risk for each of the epidemiological studies utilized to develop the URF. Using the 95th percentile URF represents a very conservative (health-protective) risk posed by DPM.
- The risk estimates assume sensitive receptors will be subject to DPM for 24 hours a day, 350 days a year.
- The emissions derived assume that every truck accessing the project site will idle for 15 minutes under the unmitigated scenario, this is an overestimation of actual idling times and thus conservative.[2] It should be noted that ARB's anti-idling requirements impose a 5-minute maximum idling time and therefore the analysis conservatively overestimates DPM emissions from idling by a factor of 3.

2.2 EMISSIONS ESTIMATION

2.2.1 ON-SITE AND OFF-SITE TRUCK ACTIVITY

Vehicle DPM emissions were estimated using emission factors for particulate matter less than 10µm in diameter (PM_{10}) generated with the 2014 version of the Emission FACtor model (EMFAC) developed by the ARB. EMFAC 2014 is a mathematical model that was developed to calculate emission rates from motor vehicles that operate on highways, freeways, and local roads in California and is commonly used by the ARB to project changes in future emissions from on-road mobile sources (4). The most recent version of this model, EMFAC 2014, incorporates regional motor vehicle data, information and estimates regarding the distribution of vehicle miles traveled (VMT) by speed, and number of starts per day.

Several distinct emission processes are included in EMFAC 2014. Emission factors calculated using EMFAC 2014 are expressed in units of grams per vehicle miles traveled (g/VMT) or grams per idle-hour (g/idle-hr), depending on the emission process. The emission processes and corresponding emission factor units associated with diesel particulate exhaust for this Project are presented below.

[2] Although the Project is required to comply with ARB's idling limit of 5 minutes, staff at SCAQMD recommends that the on-site idling emissions should be estimated for 15 minutes of truck idling (personal communication, in person, with Jillian Wong, December 22, 2016), which would take into account on-site idling which occurs while the trucks are waiting to pull up to the truck bays, idling at the bays, idling at check-in and check-out, etc.

For this Project, annual average PM_{10} emission factors were generated by running EMFAC 2014 in EMFAC Mode for vehicles in the SCAQMD jurisdiction. The EMFAC Mode generates emission factors in terms of grams of pollutant emitted per vehicle activity and can calculate a matrix of emission factors at specific values of temperature, relative humidity, and vehicle speed. The model was run for speeds traveled in the vicinity of the Project. The vehicle travel speeds for each segment modeled are summarized below.

- Idling – on-site loading/unloading and truck gate
- 5 miles per hour – on-site vehicle movement including driving and maneuvering
- 25 miles per hour – off-site vehicle movement including driving and maneuvering.

Calculated emission factors are shown at Table 2-1. As a conservative measure, a 2020 EMFAC 2014 run was conducted and a static 2020 emissions factor data set was used for the entire duration of analysis herein (e.g., 30 years). Use of 2020 emission factors would overstate potential impacts since this approach assumes that emission factors remain "static" and do not change over time due to fleet turnover or cleaner technology with lower emissions that would incorporated after 2020. Additionally, based on EMFAC2014, Light-Heavy-Duty Trucks comprise of 43.15% diesel, Medium-Heavy-Duty Trucks comprise of 87.2% diesel, and Heavy-Heavy-Duty Trucks comprise of 99.15% diesel trucks and have been accounted for accordingly in the emissions factor generation.

The vehicle DPM exhaust emissions were calculated for running exhaust emissions. The running exhaust emissions were calculated by applying the running exhaust PM10 emission factor (g/VMT) from EMFAC over the total distance traveled. The following equation was used to estimate off-site emissions for each of the different vehicle classes comprising the mobile sources (4):

$Emissions_{speedA}$ (g/s) = $EF_{RunExhaust}$ (g/VMT) * Distance (VMT/trip) * Number of Trips (trips/day) / seconds per day

Where:

$Emissions_{speedA}$ (g/s): Vehicle emissions at a given speed A;

$EF_{RunExhaust}$ (g/VMT): EMFAC running exhaust PM_{10} emission factor at speed A;

Distance (VMT/trip): Total distance traveled per trip.

Similar to off-site traffic, on-site vehicle running emissions were calculated by applying the running exhaust PM_{10} emission factor (g/VMT) from EMFAC and the total vehicle trip number over the length of the driving path using the same formula presented above for on-site emissions. In addition, on-site vehicle idling exhaust emissions were calculated by applying the idle exhaust PM_{10} emission factor (g/idle-hr) from EMFAC and the total truck trip over the total idle time (15 minutes). The following equation was used to estimate the on-site vehicle idling emissions for each of the different vehicle classes (4):

$Emissions_{idle}$ (g/s) = EF_{idle} (g/hr) * Number of Trips (trips/day) * Idling Time (min/trip) *

60 minutes per hour / seconds per day

Where:

$Emissions_{idle}$ (g/s): Vehicle emissions during idling;

EF_{idle}(g/s): EMFAC idle exhaust PM_{10} emission factor.

TABLE 2-1: 2020 WEIGHTED AVERAGE DPM EMISSIONS FACTORS

Speed	Weighted Average
0 (idling)	0.12132 (g/idle-hr)
5	0.04603 (g/s)
25	0.02494 (g/s)

Each roadway was modeled as a line source (made up of multiple adjacent volume sources). Due to the large number of volume sources modeled for this analysis, the corresponding coordinates of each volume source have not been included in this report but are included in Appendix "2.1". The DPM emission rate for each volume source was calculated by multiplying the emission factor (based on the average travel speed along the roadway) by the number of trips and the distance traveled along each roadway segment and dividing the result by the number of volume sources along that roadway, as illustrated on Table 2-2. The modeled emission sources are illustrated on Exhibits 2-A and 2-B. The modeled truck travel routes included in the HRA are based on the truck trip distributions (inbound and outbound) available from the Project's Traffic Impact Analysis (TIA) (5). The modeled truck route is consistent with the trip distribution patterns identified in the Project's traffic study is supported by substantial evidence and was modeled to determine the potential impacts to sensitive receptors along the primary truck routes. The modeling domain is limited to the Project's primary truck route and includes off-site sources in the study area for approximately ¼ mile to over ½ mile. This modeling domain is consistent with and more conservative than using only a ¼ mile modeling domain which is supported by substantial evidence since several studies have shown that the greatest potential risks occur within a ¼ mile of the primary source of emissions (in the case of the Project this is the on-site idling, and on-site travel).

On-site truck idling was estimated to occur as trucks enter and travel through the facility. Although the Project is required to comply with CARB's idling limit of 5 minutes, staff at SCAQMD recommends that the on-site idling emissions should be estimated for 15 minutes of truck idling (6), which would take into account on-site idling which occurs while the trucks are waiting to pull up to the truck bays, idling at the bays, idling at check-in and check-out, etc. As such, this analysis estimated truck idling at 15 minutes, consistent with SCAQMD's recommendation.

TABLE 2-2: DPM EMISSIONS FROM PROJECT TRUCKS

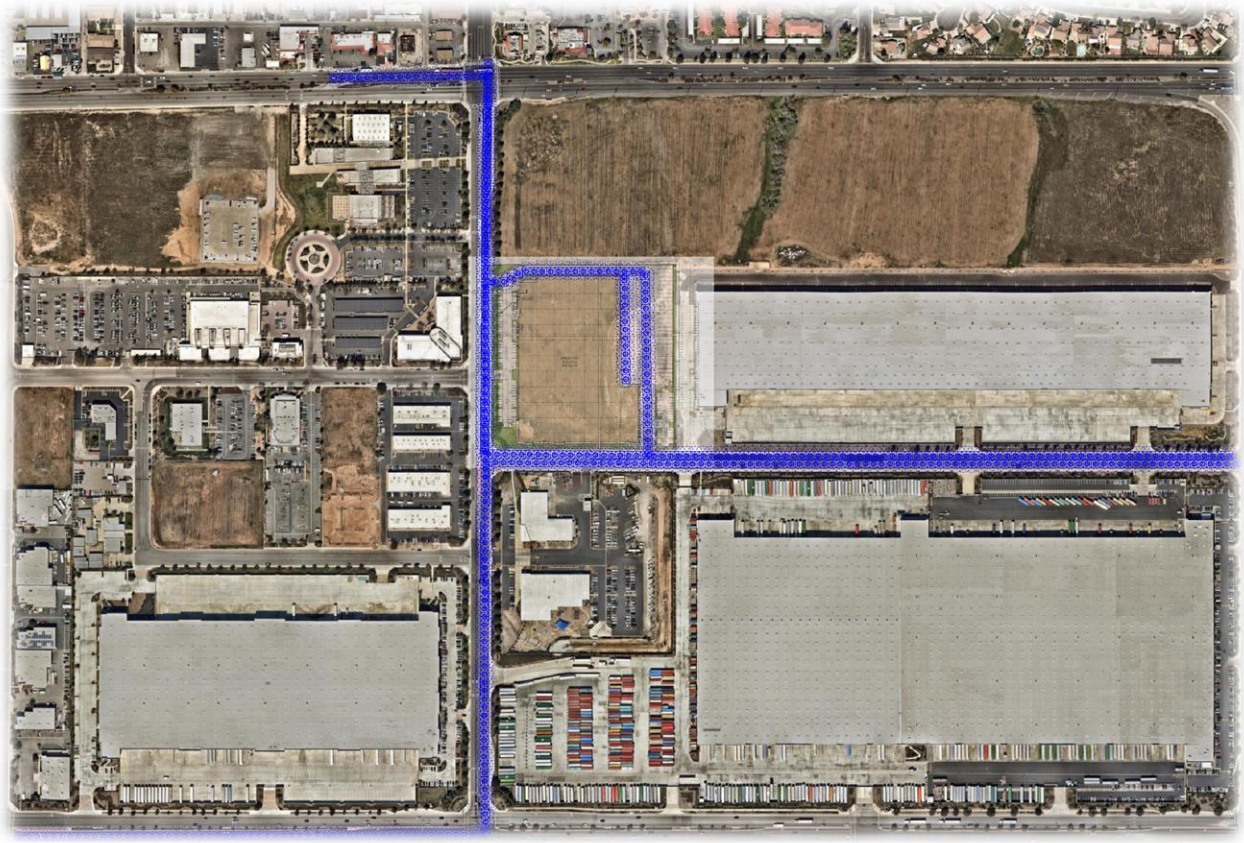
Truck Emission Rates						
Source	Trucks Per Day	VMT [a] (miles/day)	Truck Emission Rate [b] (grams/mile)	Truck Emission Rate [b] (grams/idle-hour)	Daily Truck Emissions [c] (grams/day)	Modeled Emission Rates (g/second)
On-Site Idling	50			0.1213	1.52	1.755E-05
On-Site Travel	100	21.65	0.0460		1.00	1.154E-05
Off-Site Travel 20% Inbound on Brodiea Av.	10	3.81	0.0249		0.09	1.099E-06
Off-Site Travel 40% Outbound on Brodiea Av.	20	7.62	0.0249		0.19	2.198E-06
Off-Site Travel 35% Inbound Dwy 1	18	11.61	0.0249		0.29	3.350E-06
Off-Site Travel 45% Inbound Dwy 3	23	14.72	0.0249		0.37	4.250E-06
Off-Site Travel 10% Outbound Dwy 3	5	1.82	0.0249		0.05	5.247E-07
Off-Site Travel 50% Outbound Dwy 1	25	5.95	0.0249		0.15	1.718E-06

[a] Vehicle miles traveled are for modeled truck route only.

[b] Emission rates determined using EMFAC 2014. Idle emission rates are expressed in grams per idle hour rather than grams per mile.

[c] This column includes the total truck travel and truck idle emissions. For idle emissions this column includes emissions based on the assumption that each truck idles for 15 minutes.

EXHIBIT 2-A: MODELED EMISSION SOURCES



According to the *Centerpointe Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 486 trip-ends per day (actual vehicles) (5). The Project trip generation includes 100 truck trip-ends per day from the proposed buildings within the Project site. This air quality study relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

The vehicle fleet mix, in terms of actual trucks, as derived from the traffic study for the Project is comprised of the following based on land use:

- General Light Industrial: 37.42% LHD, 18.19% MHD, and 44.39% HHD
- Warehouse (without cold storage): 16.67% LHD, 20.69% MHD, and 62.64% HHD

2.3 EXPOSURE QUANTIFICATION

The analysis herein has been conducted in accordance with the guidelines in the Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis (1). SCAQMD recommends using the Environmental Protection Agency's (U.S. EPA's) AERMOD model. For purposes of this analysis, the model was used to calculate annual average particulate concentrations associated with site operations.

The model offers additional flexibility by allowing the user to assign an initial release height and vertical dispersion parameters for mobile sources representative of a roadway. For this HRA, the roadways were modeled as adjacent volume sources. Roadways were modeled using the U.S. EPA's haul route methodology for modeling of on-site and off-site truck movement. More specifically, the Haul Road Volume Source Calculator in AERMOD View has been utilized to determine the release height parameters. Based on the US EPA methodology, the Project's modeled sources would result in a release height of 3.49 meters, and an initial lateral dimension of 4.0 meters, and an initial vertical dimension of 3.25 meters.

SCAQMD required model parameters are presented in Table 2-4 (7). The model requires additional input parameters including emission data and local meteorology. Meteorological data from the SCAQMD's Perris Monitoring Station (SRA 24) was used to represent local weather conditions and prevailing winds (8).

TABLE 2-4: AERMOD MODEL PARAMETERS

Dispersion Coefficient (Urban/Rural)	Urban
Terrain (Flat/Elevated)	Elevated (Regulatory Default)
Averaging Time	1 year (5-year Meteorological Data Set)
Receptor Height	0 meters (Regulatory Default)

Universal Transverse Mercator (UTM) coordinates for World Geodetic System (WGS) 84 were used to locate the project boundaries, each volume source location, and receptor locations in the project vicinity. The AERMOD dispersion model summary output files for the proposed facility are presented in Appendix "2.1".

Modeled sensitive receptors were placed at residential and non-residential locations. Based on recommendations from SCAMD staff, a receptor grids with a maximum of 100 meters spacing were placed at residential and worker locations to ensure that the maximum impacts are properly analyzed.

Receptors may be placed at applicable structure locations for residential and worker property and not the necessarily the boundaries of these uses. It should be noted that the primary purpose of receptor placement is focused on long-term exposure. For example, the HRA evaluates the potential health risks to residential and worker over a period of 30 or 25 years of exposure respectively. As such, even though it is unlikely to occur in practical terms (because the amount of time spent indoors), this study assumes that a resident or worker would be exposed over a long-period of time for 12 or 24-hours per day at the structure they reside or work.

Furthermore, worker receptors immediately adjacent to the Project site have been evaluated in the HRA. Any impacts to workers located further away from the Project site than the modeled worker receptors would have a lesser impact than what has already been disclosed in the HRA at the MEIW.

Discrete variants for daily breathing rates, exposure frequency, and exposure duration were obtained from relevant distribution profiles presented in the 2015 OEHHA Guidelines. Tables 2-5 and 2-6 summarize the Exposure Parameters for Residents and Offsite Worker scenarios based on 2015 OEHHA Guidelines. Appendix 2.2 includes the detailed risk calculation.

TABLE 2-5: EXPOSURE ASSUMPTIONS FOR INDIVIDUAL CANCER RISK (30 YEAR RESIDENTIAL)

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (days/year)	Exposure Time (hours/day)
-0.25 to 0	361	10	0.25	1	350	24
0 to 2	1090	10	2	1	350	24
2 to 16	572	3	14	1	350	24
16 to 30	261	1	14	0.73	350	24

TABLE 2-6: EXPOSURE ASSUMPTIONS FOR INDIVIDUAL CANCER RISK (25 YEAR WORKER)

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Exposure Frequency (days/year)	Exposure Time (hours/day)
16 to 41	271	1	25	250	12

2.4 CARCINOGENIC CHEMICAL RISK

The SCAQMD CEQA Air Quality Handbook (1993) states that emissions of toxic air contaminants (TACs) are considered significant if a HRA shows an increased risk of greater than 10 in one million. Based on guidance from the SCAQMD in the document Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis (1), for purposes of this analysis, 10 in one million is used as the cancer risk threshold for the proposed Project.

Excess cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens over a specified exposure duration. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical-specific cancer potency factor (CPF). A risk level of 10 in one million implies a likelihood that up to 10 people, out of one million equally exposed people would contract cancer if exposed continuously (24 hours per day) to the levels of toxic air contaminants over a specified duration of time. As an example, the risk of dying from accidental drowning is 1,000 in a million which is 100 times more than the SCAQMD's threshold of 10 in one million, the nearest comparison to 10 in one million is the 7 in one million lifetime chance that an individual would be struck by lightning.

Guidance from CARB and the California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA) recommends a refinement to the standard point estimate approach when alternate human body weights and breathing rates are utilized to assess risk for susceptible subpopulations such as children. For the inhalation pathway, the procedure requires the incorporation of several discrete variates to effectively quantify dose. Once determined, contaminant dose is multiplied by the cancer potency factor (CPF) in units of inverse dose expressed in milligrams per kilogram per day (mg/kg/day)-1 to derive the cancer risk estimate. Therefore, to assess exposures, the following dose algorithm was utilized.

$$DOSEair = (Cair \times [BR/BW] \times A \times EF) \times (1 \times 10^{-6})$$

Where:

DOSEair	=	chronic daily intake (mg/kg/day)
Cair	=	concentration of contaminant in air (ug/m3)
[BR/BW]	=	daily breathing rate normalized to body weight (L/kg BW-day)
A	=	inhalation absorption factor
EF	=	exposure frequency (days/365 days)
BW	=	body weight (kg)
1 x 10 -6	=	conversion factors (ug to mg, L to m3)

RISKair = DOSEair x CPF x ED/AT

Where:

DOSEair	=	chronic daily intake (mg/kg/day)
CPF	=	cancer potency factor
ED	=	number of years within particular age group
AT	=	averaging time

2.5 NON-CARCINOGENIC EXPOSURES

An evaluation of the potential noncarcinogenic effects of chronic exposures was also conducted. Adverse health effects are evaluated by comparing a compound's annual concentration with its toxicity factor or Reference Exposure Level (REL). The REL for diesel particulates was obtained from OEHHA for this analysis. The chronic reference exposure level (REL) for DPM was established by OEHHA as 5 µg/m^3 (OEHHA Toxicity Criteria Database, http://www.oehha.org/risk/chemicaldb/index.asp).

The non-cancer hazard index was calculated (consistent with SCAQMD methodology) as follows:

The relationship for the non-cancer health effects of DPM is given by the following equation:

$$HI_{DPM} = C_{DPM}/REL_{DPM}$$

Where:

HI_{DPM}	=	Hazard Index; an expression of the potential for non-cancer health effects.
C_{DPM}	=	Annual average DPM concentration (µg/m^3).
REL_{DPM}	=	Reference exposure level (REL) for DPM; the DPM concentration at which no adverse health effects are anticipated.

For purposes of this analysis the hazard index for the respiratory endpoint totaled less than one for all receptors in the project vicinity, and thus is less than significant.

2.6 POTENTIAL PROJECT-RELATED DPM SOURCE CANCER AND NON-CANCER RISKS[3]

Residential Exposure Scenario:

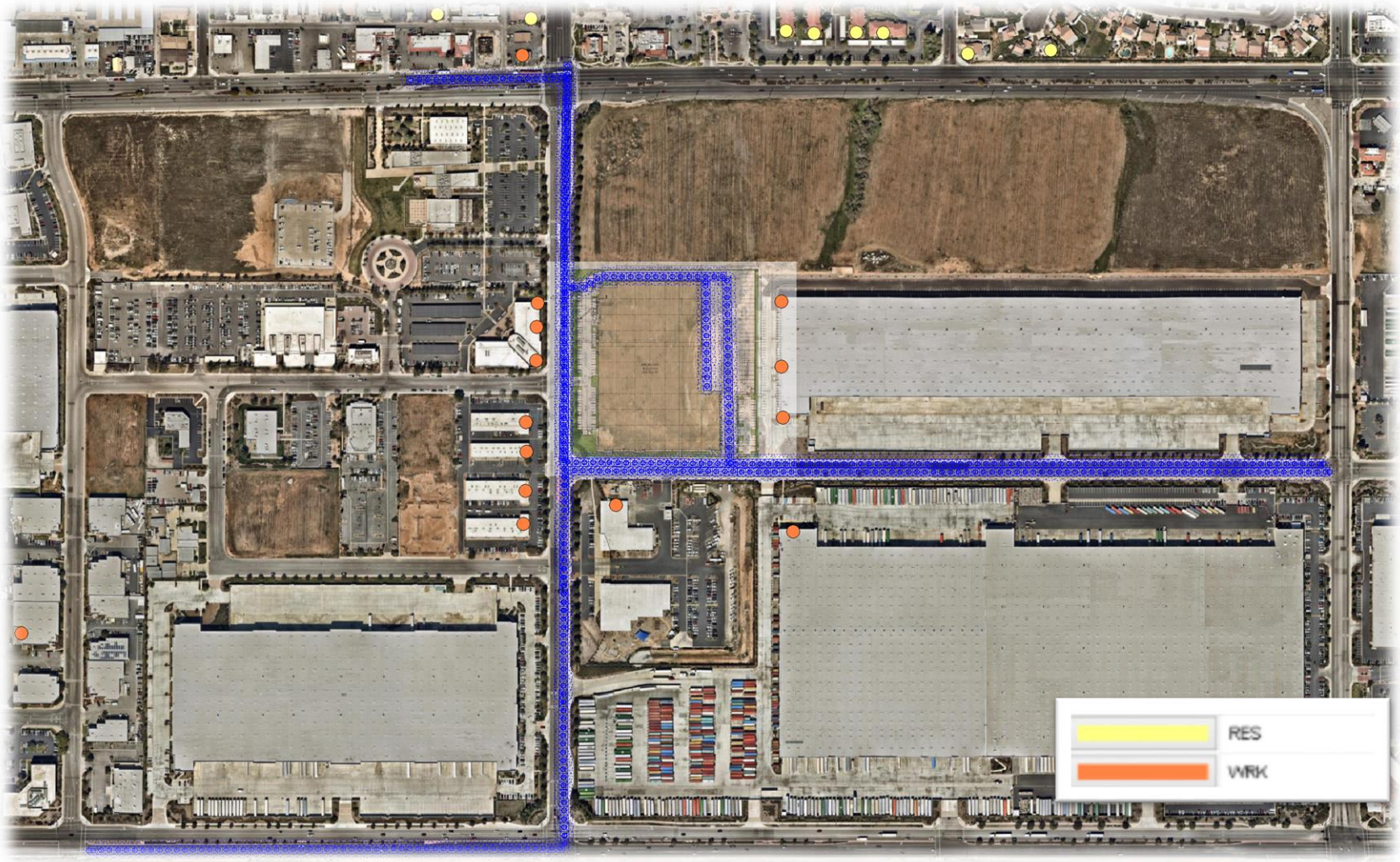
The residential land use with the greatest potential exposure to Project DPM source emissions is located north of Alessandro Boulevard and west of Frederick Street at an existing residential home. At the maximally exposed individual receptor (MEIR), the maximum incremental cancer risk attributable to Project DPM source emissions is estimated at 0.24 in one million, which is less than the threshold of 10 in one million. At this same location, non-cancer risks were estimated to be 0.00009, which would not exceed the applicable threshold of 1.0. As such, the Project will not cause a significant human health or cancer risk to adjacent residences. The nearest modeled receptors are illustrated on Exhibit 2-B.

Worker Exposure Scenario:

The worker receptor land use with the greatest potential exposure to Project DPM source emissions is located immediately adjacent to the east of the Project site at an existing warehouse building. At the maximally exposed individual worker (MEIW), the maximum incremental cancer risk impact at this location is 0.23 in one million which is less than the threshold of 10 in one million. Maximum non-cancer risks at this same location were estimated to be 0.0007, which would not exceed the applicable threshold of 1.0. As such, the Project will not cause a significant human health or cancer risk to adjacent workers. The nearest modeled receptors are illustrated on Exhibit 2-B.

3 SCAQMD guidance does not require assessment of the potential health risk to on-site workers. Excerpts from the document OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines—The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2003), also indicate that it is not necessary to examine the health effects to on-site workers unless required by RCRA (Resource Conservation and Recovery Act) / CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) or the worker resides on-site.

EXHIBIT 2-B: MODELED RECEPTORS



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6. **Koizumi, James.** *Planning, Rule Development & Area Sources.* May 6, 2009.
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4 CERTIFICATION

The contents of this health risk assessment represent an accurate depiction of the impacts to sensitive receptors associated with the proposed Centerpointe Project. The information contained in this health risk assessment report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5987.

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EDUCATION

Master of Science in Environmental Studies
California State University, Fullerton • May, 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June, 2006

PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Environmental Site Assessment – American Society for Testing and Materials • June, 2013
Planned Communities and Urban Infill – Urban Land Institute • June, 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007
AB2588 Regulatory Standards – Trinity Consultants • November, 2006
Air Dispersion Modeling – Lakes Environmental • June, 2006

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APPENDIX 2.1:

AERMOD MODEL INPUT/OUTPUT

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** Lakes Environmental AERMOD MPI
**
****************************************
**
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** AERMOD VIEW VER. 9.5.0
** LAKES ENVIRONMENTAL SOFTWARE INC.
** DATE: 5/24/2018
** FILE: C:\LAKES\AERMOD VIEW\11411 HRA\11411 HRA.ADI
**
****************************************
**
**
****************************************
** AERMOD CONTROL PATHWAY
****************************************
**
**
CO STARTING
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   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   URBANOPT 2189641
   POLLUTID DPM
   RUNORNOT RUN
   ERRORFIL "11411 HRA.ERR"
CO FINISHED
**
****************************************
** AERMOD SOURCE PATHWAY
****************************************
**
**
SO STARTING
** SOURCE LOCATION **
** SOURCE ID - TYPE - X COORD. - Y COORD. **
** ------------------------------------------------------------------------
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** DESCRSRC ON-SITE IDLING
** PREFIX
** LENGTH OF SIDE = 8.59
** CONFIGURATION = ADJACENT
** EMISSION RATE = 0.00001755
** VERTICAL DIMENSION = 6.99
** SZINIT = 3.25
** NODES = 2
** 476010.540, 3752803.313, 476.87, 3.49, 4.00
** 476011.884, 3752689.849, 476.00, 3.49, 4.00
** ------------------------------------------------------------------------
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   LOCATION L0002468     VOLUME   476010.693 3752790.429 476.62
   LOCATION L0002469     VOLUME   476010.794 3752781.839 476.42
   LOCATION L0002470     VOLUME   476010.896 3752773.250 476.26
   LOCATION L0002471     VOLUME   476010.998 3752764.660 476.18
   LOCATION L0002472     VOLUME   476011.100 3752756.071 476.09
   LOCATION L0002473     VOLUME   476011.202 3752747.482 476.01
   LOCATION L0002474     VOLUME   476011.303 3752738.892 476.00
   LOCATION L0002475     VOLUME   476011.405 3752730.303 476.00
   LOCATION L0002476     VOLUME   476011.507 3752721.713 476.00
   LOCATION L0002477     VOLUME   476011.609 3752713.124 476.00
   LOCATION L0002478     VOLUME   476011.710 3752704.535 476.00
   LOCATION L0002479     VOLUME   476011.812 3752695.945 476.00
** END OF LINE VOLUME SOURCE ID = SLINE1
** ------------------------------------------------------------------------
** LINE SOURCE REPRESENTED BY ADJACENT VOLUME SOURCES
** LINE VOLUME SOURCE ID = SLINE2
```

```
** DESCRSRC ON-SITE TRAVEL
** PREFIX
** LENGTH OF SIDE = 8.59
** CONFIGURATION = ADJACENT
** EMISSION RATE = 0.00001154
** VERTICAL DIMENSION = 6.99
** SZINIT = 3.25
** NODES = 6
** 475871.803, 3752797.129, 476.00, 3.49, 4.00
** 475885.515, 3752797.666, 476.00, 3.49, 4.00
** 475893.581, 3752802.775, 476.03, 3.49, 4.00
** 475903.530, 3752808.421, 476.03, 3.49, 4.00
** 476032.050, 3752808.421, 476.64, 3.49, 4.00
** 476035.007, 3752623.170, 475.46, 3.49, 4.00
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   LOCATION L0002480     VOLUME   475876.095 3752797.297 476.00
   LOCATION L0002481     VOLUME   475884.678 3752797.634 476.00
   LOCATION L0002482     VOLUME   475892.064 3752801.814 476.00
   LOCATION L0002483     VOLUME   475899.490 3752806.129 476.00
   LOCATION L0002484     VOLUME   475907.475 3752808.421 476.30
   LOCATION L0002485     VOLUME   475916.065 3752808.421 476.57
   LOCATION L0002486     VOLUME   475924.655 3752808.421 476.84
   LOCATION L0002487     VOLUME   475933.245 3752808.421 476.89
   LOCATION L0002488     VOLUME   475941.835 3752808.421 476.62
   LOCATION L0002489     VOLUME   475950.425 3752808.421 476.35
   LOCATION L0002490     VOLUME   475959.015 3752808.421 476.08
   LOCATION L0002491     VOLUME   475967.605 3752808.421 476.31
   LOCATION L0002492     VOLUME   475976.195 3752808.421 476.58
   LOCATION L0002493     VOLUME   475984.785 3752808.421 476.85
   LOCATION L0002494     VOLUME   475993.375 3752808.421 477.00
   LOCATION L0002495     VOLUME   476001.965 3752808.421 477.00
   LOCATION L0002496     VOLUME   476010.555 3752808.421 477.00
   LOCATION L0002497     VOLUME   476019.145 3752808.421 477.00
   LOCATION L0002498     VOLUME   476027.735 3752808.421 476.75
   LOCATION L0002499     VOLUME   476032.118 3752804.146 476.54
   LOCATION L0002500     VOLUME   476032.255 3752795.557 476.37
   LOCATION L0002501     VOLUME   476032.392 3752786.968 476.20
   LOCATION L0002502     VOLUME   476032.529 3752778.380 476.03
   LOCATION L0002503     VOLUME   476032.666 3752769.791 476.00
   LOCATION L0002504     VOLUME   476032.803 3752761.202 476.00
   LOCATION L0002505     VOLUME   476032.941 3752752.613 476.00
   LOCATION L0002506     VOLUME   476033.078 3752744.024 476.00
   LOCATION L0002507     VOLUME   476033.215 3752735.435 476.00
   LOCATION L0002508     VOLUME   476033.352 3752726.846 476.00
   LOCATION L0002509     VOLUME   476033.489 3752718.257 476.00
   LOCATION L0002510     VOLUME   476033.626 3752709.668 476.00
   LOCATION L0002511     VOLUME   476033.763 3752701.079 476.00
   LOCATION L0002512     VOLUME   476033.900 3752692.491 476.00
   LOCATION L0002513     VOLUME   476034.038 3752683.902 476.00
   LOCATION L0002514     VOLUME   476034.175 3752675.313 476.00
   LOCATION L0002515     VOLUME   476034.312 3752666.724 476.00
   LOCATION L0002516     VOLUME   476034.449 3752658.135 476.00
   LOCATION L0002517     VOLUME   476034.586 3752649.546 475.88
   LOCATION L0002518     VOLUME   476034.723 3752640.957 475.74
   LOCATION L0002519     VOLUME   476034.860 3752632.368 475.59
   LOCATION L0002520     VOLUME   476034.997 3752623.779 475.45
** END OF LINE VOLUME SOURCE ID = SLINE2
** ----------------------------------------------------------------------
** LINE SOURCE REPRESENTED BY ADJACENT VOLUME SOURCES
** LINE VOLUME SOURCE ID = SLINE3
** DESCRSRC 20% INBOUND ON BRODIEA AV.
** PREFIX
** LENGTH OF SIDE = 8.59
** CONFIGURATION = ADJACENT
** EMISSION RATE = 1.099E-06
** VERTICAL DIMENSION = 6.99
** SZINIT = 3.25
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** NODES = 2
** 476646.810, 3752615.821, 475.00, 3.49, 4.00
** 476034.005, 3752615.821, 475.45, 3.49, 4.00
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   LOCATION L0002592     VOLUME   476642.515 3752615.821 475.00
   LOCATION L0002593     VOLUME   476633.925 3752615.821 475.00
   LOCATION L0002594     VOLUME   476625.335 3752615.821 475.00
   LOCATION L0002595     VOLUME   476616.745 3752615.821 475.10
   LOCATION L0002596     VOLUME   476608.155 3752615.821 475.39
   LOCATION L0002597     VOLUME   476599.565 3752615.821 475.67
   LOCATION L0002598     VOLUME   476590.975 3752615.821 475.96
   LOCATION L0002599     VOLUME   476582.385 3752615.821 476.00
   LOCATION L0002600     VOLUME   476573.795 3752615.821 476.00
   LOCATION L0002601     VOLUME   476565.205 3752615.821 476.00
   LOCATION L0002602     VOLUME   476556.615 3752615.821 476.00
   LOCATION L0002603     VOLUME   476548.025 3752615.821 476.00
   LOCATION L0002604     VOLUME   476539.435 3752615.821 476.00
   LOCATION L0002605     VOLUME   476530.845 3752615.821 476.00
   LOCATION L0002606     VOLUME   476522.255 3752615.821 476.00
   LOCATION L0002607     VOLUME   476513.665 3752615.821 476.00
   LOCATION L0002608     VOLUME   476505.075 3752615.821 476.00
   LOCATION L0002609     VOLUME   476496.485 3752615.821 475.89
   LOCATION L0002610     VOLUME   476487.895 3752615.821 475.60
   LOCATION L0002611     VOLUME   476479.305 3752615.821 475.32
   LOCATION L0002612     VOLUME   476470.715 3752615.821 475.03
   LOCATION L0002613     VOLUME   476462.125 3752615.821 475.00
   LOCATION L0002614     VOLUME   476453.535 3752615.821 475.00
   LOCATION L0002615     VOLUME   476444.945 3752615.821 475.00
   LOCATION L0002616     VOLUME   476436.355 3752615.821 475.07
   LOCATION L0002617     VOLUME   476427.765 3752615.821 475.26
   LOCATION L0002618     VOLUME   476419.175 3752615.821 475.44
   LOCATION L0002619     VOLUME   476410.585 3752615.821 475.62
   LOCATION L0002620     VOLUME   476401.995 3752615.821 475.73
   LOCATION L0002621     VOLUME   476393.405 3752615.821 475.84
   LOCATION L0002622     VOLUME   476384.815 3752615.821 475.94
   LOCATION L0002623     VOLUME   476376.225 3752615.821 476.00
   LOCATION L0002624     VOLUME   476367.635 3752615.821 476.00
   LOCATION L0002625     VOLUME   476359.045 3752615.821 476.00
   LOCATION L0002626     VOLUME   476350.455 3752615.821 476.00
   LOCATION L0002627     VOLUME   476341.865 3752615.821 476.00
   LOCATION L0002628     VOLUME   476333.275 3752615.821 476.00
   LOCATION L0002629     VOLUME   476324.685 3752615.821 476.00
   LOCATION L0002630     VOLUME   476316.095 3752615.821 475.88
   LOCATION L0002631     VOLUME   476307.505 3752615.821 475.59
   LOCATION L0002632     VOLUME   476298.915 3752615.821 475.31
   LOCATION L0002633     VOLUME   476290.325 3752615.821 475.02
   LOCATION L0002634     VOLUME   476281.735 3752615.821 475.00
   LOCATION L0002635     VOLUME   476273.145 3752615.821 475.00
   LOCATION L0002636     VOLUME   476264.555 3752615.821 475.00
   LOCATION L0002637     VOLUME   476255.965 3752615.821 475.08
   LOCATION L0002638     VOLUME   476247.375 3752615.821 475.26
   LOCATION L0002639     VOLUME   476238.785 3752615.821 475.45
   LOCATION L0002640     VOLUME   476230.195 3752615.821 475.63
   LOCATION L0002641     VOLUME   476221.605 3752615.821 475.74
   LOCATION L0002642     VOLUME   476213.015 3752615.821 475.84
   LOCATION L0002643     VOLUME   476204.425 3752615.821 475.94
   LOCATION L0002644     VOLUME   476195.835 3752615.821 476.00
   LOCATION L0002645     VOLUME   476187.245 3752615.821 476.00
   LOCATION L0002646     VOLUME   476178.655 3752615.821 476.00
   LOCATION L0002647     VOLUME   476170.065 3752615.821 476.00
   LOCATION L0002648     VOLUME   476161.475 3752615.821 476.00
   LOCATION L0002649     VOLUME   476152.885 3752615.821 476.00
   LOCATION L0002650     VOLUME   476144.295 3752615.821 476.00
   LOCATION L0002651     VOLUME   476135.705 3752615.821 475.91
   LOCATION L0002652     VOLUME   476127.115 3752615.821 475.73
   LOCATION L0002653     VOLUME   476118.525 3752615.821 475.55
   LOCATION L0002654     VOLUME   476109.935 3752615.821 475.36
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   LOCATION L0002655     VOLUME   476101.345 3752615.821 475.26
   LOCATION L0002656     VOLUME   476092.755 3752615.821 475.16
   LOCATION L0002657     VOLUME   476084.165 3752615.821 475.05
   LOCATION L0002658     VOLUME   476075.575 3752615.821 475.00
   LOCATION L0002659     VOLUME   476066.985 3752615.821 475.00
   LOCATION L0002660     VOLUME   476058.395 3752615.821 475.00
   LOCATION L0002661     VOLUME   476049.805 3752615.821 475.00
   LOCATION L0002662     VOLUME   476041.215 3752615.821 475.18
** END OF LINE VOLUME SOURCE ID = SLINE3
** ----------------------------------------------------------------------
** LINE SOURCE REPRESENTED BY ADJACENT VOLUME SOURCES
** LINE VOLUME SOURCE ID = SLINE6
** DESCRSRC 40%OUTBOUND ON BRODIEA AV.
** PREFIX
** LENGTH OF SIDE = 8.59
** CONFIGURATION = ADJACENT
** EMISSION RATE = 2.198E-06
** VERTICAL DIMENSION = 6.99
** SZINIT = 3.25
** NODES = 2
** 476653.087, 3752607.396, 475.00, 3.49, 4.00
** 476040.282, 3752607.396, 475.00, 3.49, 4.00
** ----------------------------------------------------------------------
   LOCATION L0002734     VOLUME   476648.792 3752607.396 475.00
   LOCATION L0002735     VOLUME   476640.202 3752607.396 475.00
   LOCATION L0002736     VOLUME   476631.612 3752607.396 475.00
   LOCATION L0002737     VOLUME   476623.022 3752607.396 475.00
   LOCATION L0002738     VOLUME   476614.432 3752607.396 475.18
   LOCATION L0002739     VOLUME   476605.842 3752607.396 475.46
   LOCATION L0002740     VOLUME   476597.252 3752607.396 475.75
   LOCATION L0002741     VOLUME   476588.662 3752607.396 476.00
   LOCATION L0002742     VOLUME   476580.072 3752607.396 476.00
   LOCATION L0002743     VOLUME   476571.482 3752607.396 476.00
   LOCATION L0002744     VOLUME   476562.892 3752607.396 476.00
   LOCATION L0002745     VOLUME   476554.302 3752607.396 476.00
   LOCATION L0002746     VOLUME   476545.712 3752607.396 476.00
   LOCATION L0002747     VOLUME   476537.122 3752607.396 476.00
   LOCATION L0002748     VOLUME   476528.532 3752607.396 476.00
   LOCATION L0002749     VOLUME   476519.942 3752607.396 476.00
   LOCATION L0002750     VOLUME   476511.352 3752607.396 476.00
   LOCATION L0002751     VOLUME   476502.762 3752607.396 476.00
   LOCATION L0002752     VOLUME   476494.172 3752607.396 475.81
   LOCATION L0002753     VOLUME   476485.582 3752607.396 475.53
   LOCATION L0002754     VOLUME   476476.992 3752607.396 475.24
   LOCATION L0002755     VOLUME   476468.402 3752607.396 475.00
   LOCATION L0002756     VOLUME   476459.812 3752607.396 475.00
   LOCATION L0002757     VOLUME   476451.222 3752607.396 475.00
   LOCATION L0002758     VOLUME   476442.632 3752607.396 475.00
   LOCATION L0002759     VOLUME   476434.042 3752607.396 475.07
   LOCATION L0002760     VOLUME   476425.452 3752607.396 475.17
   LOCATION L0002761     VOLUME   476416.862 3752607.396 475.28
   LOCATION L0002762     VOLUME   476408.272 3752607.396 475.39
   LOCATION L0002763     VOLUME   476399.682 3752607.396 475.58
   LOCATION L0002764     VOLUME   476391.092 3752607.396 475.76
   LOCATION L0002765     VOLUME   476382.502 3752607.396 475.94
   LOCATION L0002766     VOLUME   476373.912 3752607.396 476.00
   LOCATION L0002767     VOLUME   476365.322 3752607.396 476.00
   LOCATION L0002768     VOLUME   476356.732 3752607.396 476.00
   LOCATION L0002769     VOLUME   476348.142 3752607.396 476.00
   LOCATION L0002770     VOLUME   476339.552 3752607.396 476.00
   LOCATION L0002771     VOLUME   476330.962 3752607.396 476.00
   LOCATION L0002772     VOLUME   476322.372 3752607.396 476.00
   LOCATION L0002773     VOLUME   476313.782 3752607.396 475.80
   LOCATION L0002774     VOLUME   476305.192 3752607.396 475.51
   LOCATION L0002775     VOLUME   476296.602 3752607.396 475.23
   LOCATION L0002776     VOLUME   476288.012 3752607.396 475.00
   LOCATION L0002777     VOLUME   476279.422 3752607.396 475.00
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   LOCATION L0002778     VOLUME   476270.832 3752607.396 475.00
   LOCATION L0002779     VOLUME   476262.242 3752607.396 475.00
   LOCATION L0002780     VOLUME   476253.652 3752607.396 475.07
   LOCATION L0002781     VOLUME   476245.062 3752607.396 475.18
   LOCATION L0002782     VOLUME   476236.472 3752607.396 475.28
   LOCATION L0002783     VOLUME   476227.882 3752607.396 475.40
   LOCATION L0002784     VOLUME   476219.292 3752607.396 475.58
   LOCATION L0002785     VOLUME   476210.702 3752607.396 475.77
   LOCATION L0002786     VOLUME   476202.112 3752607.396 475.95
   LOCATION L0002787     VOLUME   476193.522 3752607.396 476.00
   LOCATION L0002788     VOLUME   476184.932 3752607.396 476.00
   LOCATION L0002789     VOLUME   476176.342 3752607.396 476.00
   LOCATION L0002790     VOLUME   476167.752 3752607.396 476.00
   LOCATION L0002791     VOLUME   476159.162 3752607.396 476.00
   LOCATION L0002792     VOLUME   476150.572 3752607.396 476.00
   LOCATION L0002793     VOLUME   476141.982 3752607.396 476.00
   LOCATION L0002794     VOLUME   476133.392 3752607.396 475.92
   LOCATION L0002795     VOLUME   476124.802 3752607.396 475.82
   LOCATION L0002796     VOLUME   476116.212 3752607.396 475.72
   LOCATION L0002797     VOLUME   476107.622 3752607.396 475.59
   LOCATION L0002798     VOLUME   476099.032 3752607.396 475.41
   LOCATION L0002799     VOLUME   476090.442 3752607.396 475.23
   LOCATION L0002800     VOLUME   476081.852 3752607.396 475.04
   LOCATION L0002801     VOLUME   476073.262 3752607.396 475.00
   LOCATION L0002802     VOLUME   476064.672 3752607.396 475.00
   LOCATION L0002803     VOLUME   476056.082 3752607.396 475.00
   LOCATION L0002804     VOLUME   476047.492 3752607.396 475.03
** END OF LINE VOLUME SOURCE ID = SLINE6
** ----------------------------------------------------------------------
** LINE SOURCE REPRESENTED BY ADJACENT VOLUME SOURCES
** LINE VOLUME SOURCE ID = SLINE4
** DESCRSRC 35% INBOUND DWY 1
** PREFIX
** LENGTH OF SIDE = 8.59
** CONFIGURATION = ADJACENT
** EMISSION RATE = 3.35E-06
** VERTICAL DIMENSION = 6.99
** SZINIT = 3.25
** NODES = 4
** 475375.353, 3752217.462, 472.00, 3.49, 4.00
** 475865.271, 3752220.037, 472.00, 3.49, 4.00
** 475863.725, 3752305.039, 473.00, 3.49, 4.00
** 475865.271, 3752797.533, 476.00, 3.49, 4.00
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   LOCATION L0002929     VOLUME   475379.648 3752217.484 472.00
   LOCATION L0002930     VOLUME   475388.238 3752217.529 472.00
   LOCATION L0002931     VOLUME   475396.827 3752217.575 472.00
   LOCATION L0002932     VOLUME   475405.417 3752217.620 472.00
   LOCATION L0002933     VOLUME   475414.007 3752217.665 472.00
   LOCATION L0002934     VOLUME   475422.597 3752217.710 472.00
   LOCATION L0002935     VOLUME   475431.187 3752217.755 472.00
   LOCATION L0002936     VOLUME   475439.777 3752217.800 472.00
   LOCATION L0002937     VOLUME   475448.367 3752217.846 472.00
   LOCATION L0002938     VOLUME   475456.957 3752217.891 472.00
   LOCATION L0002939     VOLUME   475465.547 3752217.936 472.00
   LOCATION L0002940     VOLUME   475474.136 3752217.981 472.00
   LOCATION L0002941     VOLUME   475482.726 3752218.026 472.00
   LOCATION L0002942     VOLUME   475491.316 3752218.071 472.00
   LOCATION L0002943     VOLUME   475499.906 3752218.116 472.00
   LOCATION L0002944     VOLUME   475508.496 3752218.162 472.00
   LOCATION L0002945     VOLUME   475517.086 3752218.207 472.00
   LOCATION L0002946     VOLUME   475525.676 3752218.252 472.00
   LOCATION L0002947     VOLUME   475534.266 3752218.297 472.00
   LOCATION L0002948     VOLUME   475542.855 3752218.342 472.00
   LOCATION L0002949     VOLUME   475551.445 3752218.387 472.00
   LOCATION L0002950     VOLUME   475560.035 3752218.433 472.00
   LOCATION L0002951     VOLUME   475568.625 3752218.478 472.00
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LOCATION L0002952     VOLUME   475577.215 3752218.523 472.00
LOCATION L0002953     VOLUME   475585.805 3752218.568 472.00
LOCATION L0002954     VOLUME   475594.395 3752218.613 472.00
LOCATION L0002955     VOLUME   475602.985 3752218.658 472.00
LOCATION L0002956     VOLUME   475611.575 3752218.704 472.00
LOCATION L0002957     VOLUME   475620.164 3752218.749 472.00
LOCATION L0002958     VOLUME   475628.754 3752218.794 472.00
LOCATION L0002959     VOLUME   475637.344 3752218.839 472.00
LOCATION L0002960     VOLUME   475645.934 3752218.884 472.00
LOCATION L0002961     VOLUME   475654.524 3752218.929 472.00
LOCATION L0002962     VOLUME   475663.114 3752218.975 472.00
LOCATION L0002963     VOLUME   475671.704 3752219.020 472.00
LOCATION L0002964     VOLUME   475680.294 3752219.065 472.00
LOCATION L0002965     VOLUME   475688.883 3752219.110 472.00
LOCATION L0002966     VOLUME   475697.473 3752219.155 472.00
LOCATION L0002967     VOLUME   475706.063 3752219.200 472.00
LOCATION L0002968     VOLUME   475714.653 3752219.246 472.00
LOCATION L0002969     VOLUME   475723.243 3752219.291 472.00
LOCATION L0002970     VOLUME   475731.833 3752219.336 472.00
LOCATION L0002971     VOLUME   475740.423 3752219.381 472.00
LOCATION L0002972     VOLUME   475749.013 3752219.426 472.00
LOCATION L0002973     VOLUME   475757.603 3752219.471 472.00
LOCATION L0002974     VOLUME   475766.192 3752219.517 472.00
LOCATION L0002975     VOLUME   475774.782 3752219.562 472.00
LOCATION L0002976     VOLUME   475783.372 3752219.607 472.00
LOCATION L0002977     VOLUME   475791.962 3752219.652 472.00
LOCATION L0002978     VOLUME   475800.552 3752219.697 472.00
LOCATION L0002979     VOLUME   475809.142 3752219.742 472.00
LOCATION L0002980     VOLUME   475817.732 3752219.787 472.00
LOCATION L0002981     VOLUME   475826.322 3752219.833 472.00
LOCATION L0002982     VOLUME   475834.911 3752219.878 472.00
LOCATION L0002983     VOLUME   475843.501 3752219.923 472.00
LOCATION L0002984     VOLUME   475852.091 3752219.968 472.00
LOCATION L0002985     VOLUME   475860.681 3752220.013 472.00
LOCATION L0002986     VOLUME   475865.198 3752224.037 472.00
LOCATION L0002987     VOLUME   475865.042 3752232.626 472.00
LOCATION L0002988     VOLUME   475864.886 3752241.214 472.16
LOCATION L0002989     VOLUME   475864.730 3752249.803 472.44
LOCATION L0002990     VOLUME   475864.573 3752258.391 472.73
LOCATION L0002991     VOLUME   475864.417 3752266.980 473.00
LOCATION L0002992     VOLUME   475864.261 3752275.569 473.00
LOCATION L0002993     VOLUME   475864.105 3752284.157 473.00
LOCATION L0002994     VOLUME   475863.949 3752292.746 473.00
LOCATION L0002995     VOLUME   475863.793 3752301.334 473.00
LOCATION L0002996     VOLUME   475863.741 3752309.924 473.00
LOCATION L0002997     VOLUME   475863.768 3752318.514 473.00
LOCATION L0002998     VOLUME   475863.794 3752327.104 473.00
LOCATION L0002999     VOLUME   475863.821 3752335.694 473.00
LOCATION L0003000     VOLUME   475863.848 3752344.283 473.00
LOCATION L0003001     VOLUME   475863.875 3752352.873 473.00
LOCATION L0003002     VOLUME   475863.902 3752361.463 473.03
LOCATION L0003003     VOLUME   475863.929 3752370.053 473.09
LOCATION L0003004     VOLUME   475863.956 3752378.643 473.14
LOCATION L0003005     VOLUME   475863.983 3752387.233 473.21
LOCATION L0003006     VOLUME   475864.010 3752395.823 473.44
LOCATION L0003007     VOLUME   475864.037 3752404.413 473.67
LOCATION L0003008     VOLUME   475864.064 3752413.003 473.90
LOCATION L0003009     VOLUME   475864.091 3752421.593 474.00
LOCATION L0003010     VOLUME   475864.118 3752430.183 474.00
LOCATION L0003011     VOLUME   475864.145 3752438.773 474.00
LOCATION L0003012     VOLUME   475864.172 3752447.363 474.00
LOCATION L0003013     VOLUME   475864.199 3752455.953 474.00
LOCATION L0003014     VOLUME   475864.226 3752464.543 474.00
LOCATION L0003015     VOLUME   475864.253 3752473.133 474.00
LOCATION L0003016     VOLUME   475864.280 3752481.723 474.00
LOCATION L0003017     VOLUME   475864.307 3752490.313 474.00
LOCATION L0003018     VOLUME   475864.334 3752498.903 474.00
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   LOCATION L0003019     VOLUME   475864.361 3752507.493 474.03
   LOCATION L0003020     VOLUME   475864.388 3752516.083 474.32
   LOCATION L0003021     VOLUME   475864.414 3752524.673 474.60
   LOCATION L0003022     VOLUME   475864.441 3752533.263 474.89
   LOCATION L0003023     VOLUME   475864.468 3752541.852 475.00
   LOCATION L0003024     VOLUME   475864.495 3752550.442 475.00
   LOCATION L0003025     VOLUME   475864.522 3752559.032 475.00
   LOCATION L0003026     VOLUME   475864.549 3752567.622 475.00
   LOCATION L0003027     VOLUME   475864.576 3752576.212 475.00
   LOCATION L0003028     VOLUME   475864.603 3752584.802 475.00
   LOCATION L0003029     VOLUME   475864.630 3752593.392 475.00
   LOCATION L0003030     VOLUME   475864.657 3752601.982 475.00
   LOCATION L0003031     VOLUME   475864.684 3752610.572 475.00
   LOCATION L0003032     VOLUME   475864.711 3752619.162 475.00
   LOCATION L0003033     VOLUME   475864.738 3752627.752 475.00
   LOCATION L0003034     VOLUME   475864.765 3752636.342 475.00
   LOCATION L0003035     VOLUME   475864.792 3752644.932 475.00
   LOCATION L0003036     VOLUME   475864.819 3752653.522 475.00
   LOCATION L0003037     VOLUME   475864.846 3752662.112 475.19
   LOCATION L0003038     VOLUME   475864.873 3752670.702 475.47
   LOCATION L0003039     VOLUME   475864.900 3752679.292 475.76
   LOCATION L0003040     VOLUME   475864.927 3752687.882 476.00
   LOCATION L0003041     VOLUME   475864.954 3752696.472 476.00
   LOCATION L0003042     VOLUME   475864.981 3752705.062 476.00
   LOCATION L0003043     VOLUME   475865.008 3752713.652 476.00
   LOCATION L0003044     VOLUME   475865.034 3752722.242 476.00
   LOCATION L0003045     VOLUME   475865.061 3752730.832 476.00
   LOCATION L0003046     VOLUME   475865.088 3752739.422 476.00
   LOCATION L0003047     VOLUME   475865.115 3752748.011 476.00
   LOCATION L0003048     VOLUME   475865.142 3752756.601 476.00
   LOCATION L0003049     VOLUME   475865.169 3752765.191 476.00
   LOCATION L0003050     VOLUME   475865.196 3752773.781 476.00
   LOCATION L0003051     VOLUME   475865.223 3752782.371 476.00
   LOCATION L0003052     VOLUME   475865.250 3752790.961 476.00
** END OF LINE VOLUME SOURCE ID = SLINE4
** ----------------------------------------------------------------------
** LINE SOURCE REPRESENTED BY ADJACENT VOLUME SOURCES
** LINE VOLUME SOURCE ID = SLINE5
** DESCRSRC 45% INBOUND DWY 3
** PREFIX
** LENGTH OF SIDE = 8.59
** CONFIGURATION = ADJACENT
** EMISSION RATE = 4.25E-06
** VERTICAL DIMENSION = 6.99
** SZINIT = 3.25
** NODES = 5
** 475375.353, 3752217.462, 472.00, 3.49, 4.00
** 475865.271, 3752220.037, 472.00, 3.49, 4.00
** 475863.725, 3752305.039, 473.00, 3.49, 4.00
** 475864.983, 3752608.618, 475.00, 3.49, 4.00
** 476039.663, 3752607.883, 475.00, 3.49, 4.00
** ----------------------------------------------------------------------
   LOCATION L0003176     VOLUME   475379.648 3752217.484 472.00
   LOCATION L0003177     VOLUME   475388.238 3752217.529 472.00
   LOCATION L0003178     VOLUME   475396.827 3752217.575 472.00
   LOCATION L0003179     VOLUME   475405.417 3752217.620 472.00
   LOCATION L0003180     VOLUME   475414.007 3752217.665 472.00
   LOCATION L0003181     VOLUME   475422.597 3752217.710 472.00
   LOCATION L0003182     VOLUME   475431.187 3752217.755 472.00
   LOCATION L0003183     VOLUME   475439.777 3752217.800 472.00
   LOCATION L0003184     VOLUME   475448.367 3752217.846 472.00
   LOCATION L0003185     VOLUME   475456.957 3752217.891 472.00
   LOCATION L0003186     VOLUME   475465.547 3752217.936 472.00
   LOCATION L0003187     VOLUME   475474.136 3752217.981 472.00
   LOCATION L0003188     VOLUME   475482.726 3752218.026 472.00
   LOCATION L0003189     VOLUME   475491.316 3752218.071 472.00
   LOCATION L0003190     VOLUME   475499.906 3752218.116 472.00
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LOCATION	L0003191	VOLUME	475508.496	3752218.162	472.00
LOCATION	L0003192	VOLUME	475517.086	3752218.207	472.00
LOCATION	L0003193	VOLUME	475525.676	3752218.252	472.00
LOCATION	L0003194	VOLUME	475534.266	3752218.297	472.00
LOCATION	L0003195	VOLUME	475542.855	3752218.342	472.00
LOCATION	L0003196	VOLUME	475551.445	3752218.387	472.00
LOCATION	L0003197	VOLUME	475560.035	3752218.433	472.00
LOCATION	L0003198	VOLUME	475568.625	3752218.478	472.00
LOCATION	L0003199	VOLUME	475577.215	3752218.523	472.00
LOCATION	L0003200	VOLUME	475585.805	3752218.568	472.00
LOCATION	L0003201	VOLUME	475594.395	3752218.613	472.00
LOCATION	L0003202	VOLUME	475602.985	3752218.658	472.00
LOCATION	L0003203	VOLUME	475611.575	3752218.704	472.00
LOCATION	L0003204	VOLUME	475620.164	3752218.749	472.00
LOCATION	L0003205	VOLUME	475628.754	3752218.794	472.00
LOCATION	L0003206	VOLUME	475637.344	3752218.839	472.00
LOCATION	L0003207	VOLUME	475645.934	3752218.884	472.00
LOCATION	L0003208	VOLUME	475654.524	3752218.929	472.00
LOCATION	L0003209	VOLUME	475663.114	3752218.975	472.00
LOCATION	L0003210	VOLUME	475671.704	3752219.020	472.00
LOCATION	L0003211	VOLUME	475680.294	3752219.065	472.00
LOCATION	L0003212	VOLUME	475688.883	3752219.110	472.00
LOCATION	L0003213	VOLUME	475697.473	3752219.155	472.00
LOCATION	L0003214	VOLUME	475706.063	3752219.200	472.00
LOCATION	L0003215	VOLUME	475714.653	3752219.246	472.00
LOCATION	L0003216	VOLUME	475723.243	3752219.291	472.00
LOCATION	L0003217	VOLUME	475731.833	3752219.336	472.00
LOCATION	L0003218	VOLUME	475740.423	3752219.381	472.00
LOCATION	L0003219	VOLUME	475749.013	3752219.426	472.00
LOCATION	L0003220	VOLUME	475757.603	3752219.471	472.00
LOCATION	L0003221	VOLUME	475766.192	3752219.517	472.00
LOCATION	L0003222	VOLUME	475774.782	3752219.562	472.00
LOCATION	L0003223	VOLUME	475783.372	3752219.607	472.00
LOCATION	L0003224	VOLUME	475791.962	3752219.652	472.00
LOCATION	L0003225	VOLUME	475800.552	3752219.697	472.00
LOCATION	L0003226	VOLUME	475809.142	3752219.742	472.00
LOCATION	L0003227	VOLUME	475817.732	3752219.787	472.00
LOCATION	L0003228	VOLUME	475826.322	3752219.833	472.00
LOCATION	L0003229	VOLUME	475834.911	3752219.878	472.00
LOCATION	L0003230	VOLUME	475843.501	3752219.923	472.00
LOCATION	L0003231	VOLUME	475852.091	3752219.968	472.00
LOCATION	L0003232	VOLUME	475860.681	3752220.013	472.00
LOCATION	L0003233	VOLUME	475865.198	3752224.037	472.00
LOCATION	L0003234	VOLUME	475865.042	3752232.626	472.00
LOCATION	L0003235	VOLUME	475864.886	3752241.214	472.16
LOCATION	L0003236	VOLUME	475864.730	3752249.803	472.44
LOCATION	L0003237	VOLUME	475864.573	3752258.391	472.73
LOCATION	L0003238	VOLUME	475864.417	3752266.980	473.00
LOCATION	L0003239	VOLUME	475864.261	3752275.569	473.00
LOCATION	L0003240	VOLUME	475864.105	3752284.157	473.00
LOCATION	L0003241	VOLUME	475863.949	3752292.746	473.00
LOCATION	L0003242	VOLUME	475863.793	3752301.334	473.00
LOCATION	L0003243	VOLUME	475863.745	3752309.924	473.00
LOCATION	L0003244	VOLUME	475863.781	3752318.514	473.00
LOCATION	L0003245	VOLUME	475863.817	3752327.103	473.00
LOCATION	L0003246	VOLUME	475863.852	3752335.693	473.00
LOCATION	L0003247	VOLUME	475863.888	3752344.283	473.00
LOCATION	L0003248	VOLUME	475863.923	3752352.873	473.00
LOCATION	L0003249	VOLUME	475863.959	3752361.463	473.03
LOCATION	L0003250	VOLUME	475863.995	3752370.053	473.09
LOCATION	L0003251	VOLUME	475864.030	3752378.643	473.14
LOCATION	L0003252	VOLUME	475864.066	3752387.233	473.21
LOCATION	L0003253	VOLUME	475864.101	3752395.823	473.44
LOCATION	L0003254	VOLUME	475864.137	3752404.413	473.67
LOCATION	L0003255	VOLUME	475864.173	3752413.003	473.90
LOCATION	L0003256	VOLUME	475864.208	3752421.593	474.00
LOCATION	L0003257	VOLUME	475864.244	3752430.183	474.00

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   LOCATION L0003258     VOLUME   475864.279 3752438.773 474.00
   LOCATION L0003259     VOLUME   475864.315 3752447.362 474.00
   LOCATION L0003260     VOLUME   475864.351 3752455.952 474.00
   LOCATION L0003261     VOLUME   475864.386 3752464.542 474.00
   LOCATION L0003262     VOLUME   475864.422 3752473.132 474.00
   LOCATION L0003263     VOLUME   475864.457 3752481.722 474.00
   LOCATION L0003264     VOLUME   475864.493 3752490.312 474.00
   LOCATION L0003265     VOLUME   475864.529 3752498.902 474.00
   LOCATION L0003266     VOLUME   475864.564 3752507.492 474.03
   LOCATION L0003267     VOLUME   475864.600 3752516.082 474.32
   LOCATION L0003268     VOLUME   475864.635 3752524.672 474.60
   LOCATION L0003269     VOLUME   475864.671 3752533.262 474.89
   LOCATION L0003270     VOLUME   475864.707 3752541.852 475.00
   LOCATION L0003271     VOLUME   475864.742 3752550.442 475.00
   LOCATION L0003272     VOLUME   475864.778 3752559.031 475.00
   LOCATION L0003273     VOLUME   475864.813 3752567.621 475.00
   LOCATION L0003274     VOLUME   475864.849 3752576.211 475.00
   LOCATION L0003275     VOLUME   475864.884 3752584.801 475.00
   LOCATION L0003276     VOLUME   475864.920 3752593.391 475.00
   LOCATION L0003277     VOLUME   475864.956 3752601.981 475.00
   LOCATION L0003278     VOLUME   475866.936 3752608.610 475.00
   LOCATION L0003279     VOLUME   475875.526 3752608.573 475.00
   LOCATION L0003280     VOLUME   475884.116 3752608.537 475.00
   LOCATION L0003281     VOLUME   475892.706 3752608.501 475.00
   LOCATION L0003282     VOLUME   475901.296 3752608.465 475.00
   LOCATION L0003283     VOLUME   475909.886 3752608.429 475.00
   LOCATION L0003284     VOLUME   475918.476 3752608.393 475.00
   LOCATION L0003285     VOLUME   475927.066 3752608.357 475.00
   LOCATION L0003286     VOLUME   475935.656 3752608.321 475.00
   LOCATION L0003287     VOLUME   475944.246 3752608.284 475.00
   LOCATION L0003288     VOLUME   475952.836 3752608.248 475.00
   LOCATION L0003289     VOLUME   475961.426 3752608.212 475.02
   LOCATION L0003290     VOLUME   475970.016 3752608.176 475.13
   LOCATION L0003291     VOLUME   475978.606 3752608.140 475.24
   LOCATION L0003292     VOLUME   475987.195 3752608.104 475.35
   LOCATION L0003293     VOLUME   475995.785 3752608.068 475.38
   LOCATION L0003294     VOLUME   476004.375 3752608.032 475.38
   LOCATION L0003295     VOLUME   476012.965 3752607.996 475.38
   LOCATION L0003296     VOLUME   476021.555 3752607.959 475.36
   LOCATION L0003297     VOLUME   476030.145 3752607.923 475.25
   LOCATION L0003298     VOLUME   476038.735 3752607.887 475.14
** END OF LINE VOLUME SOURCE ID = SLINE5
** ------------------------------------------------------------------------
** LINE SOURCE REPRESENTED BY ADJACENT VOLUME SOURCES
** LINE VOLUME SOURCE ID = SLINE7
** DESCRSRC 10% OUTBOUND
** PREFIX
** LENGTH OF SIDE = 8.59
** CONFIGURATION = ADJACENT
** EMISSION RATE = 5.247E-07
** VERTICAL DIMENSION = 6.99
** SZINIT = 3.25
** NODES = 5
** 476036.027, 3752615.893, 475.39, 3.49, 4.00
** 475864.030, 3752617.448, 475.00, 3.49, 4.00
** 475865.399, 3752808.694, 476.00, 3.49, 4.00
** 475865.399, 3752905.135, 477.06, 3.49, 4.00
** 475868.377, 3753030.620, 478.00, 3.49, 4.00
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   LOCATION L0003367     VOLUME   476031.732 3752615.932 475.39
   LOCATION L0003368     VOLUME   476023.143 3752616.009 475.57
   LOCATION L0003369     VOLUME   476014.553 3752616.087 475.65
   LOCATION L0003370     VOLUME   476005.963 3752616.165 475.65
   LOCATION L0003371     VOLUME   475997.374 3752616.242 475.66
   LOCATION L0003372     VOLUME   475988.784 3752616.320 475.64
   LOCATION L0003373     VOLUME   475980.194 3752616.397 475.45
   LOCATION L0003374     VOLUME   475971.605 3752616.475 475.26
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                                                    11411 HRA
   LOCATION L0003375     VOLUME   475963.015 3752616.553 475.07
   LOCATION L0003376     VOLUME   475954.425 3752616.630 475.00
   LOCATION L0003377     VOLUME   475945.836 3752616.708 475.00
   LOCATION L0003378     VOLUME   475937.246 3752616.786 475.00
   LOCATION L0003379     VOLUME   475928.656 3752616.863 475.00
   LOCATION L0003380     VOLUME   475920.067 3752616.941 475.00
   LOCATION L0003381     VOLUME   475911.477 3752617.019 475.00
   LOCATION L0003382     VOLUME   475902.888 3752617.096 475.00
   LOCATION L0003383     VOLUME   475894.298 3752617.174 475.00
   LOCATION L0003384     VOLUME   475885.708 3752617.252 475.00
   LOCATION L0003385     VOLUME   475877.119 3752617.329 475.00
   LOCATION L0003386     VOLUME   475868.529 3752617.407 475.00
   LOCATION L0003387     VOLUME   475864.060 3752621.539 475.00
   LOCATION L0003388     VOLUME   475864.121 3752630.129 475.00
   LOCATION L0003389     VOLUME   475864.183 3752638.718 475.00
   LOCATION L0003390     VOLUME   475864.244 3752647.308 475.00
   LOCATION L0003391     VOLUME   475864.306 3752655.898 475.00
   LOCATION L0003392     VOLUME   475864.367 3752664.488 475.26
   LOCATION L0003393     VOLUME   475864.428 3752673.077 475.55
   LOCATION L0003394     VOLUME   475864.490 3752681.667 475.84
   LOCATION L0003395     VOLUME   475864.551 3752690.257 476.00
   LOCATION L0003396     VOLUME   475864.613 3752698.847 476.00
   LOCATION L0003397     VOLUME   475864.674 3752707.437 476.00
   LOCATION L0003398     VOLUME   475864.736 3752716.026 476.00
   LOCATION L0003399     VOLUME   475864.797 3752724.616 476.00
   LOCATION L0003400     VOLUME   475864.859 3752733.206 476.00
   LOCATION L0003401     VOLUME   475864.920 3752741.796 476.00
   LOCATION L0003402     VOLUME   475864.981 3752750.385 476.00
   LOCATION L0003403     VOLUME   475865.043 3752758.975 476.00
   LOCATION L0003404     VOLUME   475865.104 3752767.565 476.00
   LOCATION L0003405     VOLUME   475865.166 3752776.155 476.00
   LOCATION L0003406     VOLUME   475865.227 3752784.745 476.00
   LOCATION L0003407     VOLUME   475865.289 3752793.334 476.00
   LOCATION L0003408     VOLUME   475865.350 3752801.924 476.00
   LOCATION L0003409     VOLUME   475865.399 3752810.514 476.13
   LOCATION L0003410     VOLUME   475865.399 3752819.104 476.42
   LOCATION L0003411     VOLUME   475865.399 3752827.694 476.70
   LOCATION L0003412     VOLUME   475865.399 3752836.284 476.99
   LOCATION L0003413     VOLUME   475865.399 3752844.874 477.00
   LOCATION L0003414     VOLUME   475865.399 3752853.464 477.00
   LOCATION L0003415     VOLUME   475865.399 3752862.054 477.00
   LOCATION L0003416     VOLUME   475865.399 3752870.644 477.00
   LOCATION L0003417     VOLUME   475865.399 3752879.234 477.00
   LOCATION L0003418     VOLUME   475865.399 3752887.824 477.00
   LOCATION L0003419     VOLUME   475865.399 3752896.414 477.00
   LOCATION L0003420     VOLUME   475865.399 3752905.004 477.24
   LOCATION L0003421     VOLUME   475865.599 3752913.592 477.49
   LOCATION L0003422     VOLUME   475865.803 3752922.179 477.74
   LOCATION L0003423     VOLUME   475866.007 3752930.767 477.89
   LOCATION L0003424     VOLUME   475866.211 3752939.354 477.93
   LOCATION L0003425     VOLUME   475866.415 3752947.942 477.97
   LOCATION L0003426     VOLUME   475866.619 3752956.530 478.00
   LOCATION L0003427     VOLUME   475866.822 3752965.117 478.00
   LOCATION L0003428     VOLUME   475867.026 3752973.705 478.00
   LOCATION L0003429     VOLUME   475867.230 3752982.292 478.00
   LOCATION L0003430     VOLUME   475867.434 3752990.880 478.00
   LOCATION L0003431     VOLUME   475867.638 3752999.467 478.00
   LOCATION L0003432     VOLUME   475867.842 3753008.055 478.00
   LOCATION L0003433     VOLUME   475868.046 3753016.643 478.00
   LOCATION L0003434     VOLUME   475868.249 3753025.230 478.00
** END OF LINE VOLUME SOURCE ID = SLINE7
** ----------------------------------------------------------------------
** LINE SOURCE REPRESENTED BY ADJACENT VOLUME SOURCES
** LINE VOLUME SOURCE ID = SLINE8
** DESCRSRC 50% OUTBOUND
** PREFIX
** LENGTH OF SIDE = 8.59
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** CONFIGURATION = ADJACENT
** EMISSION RATE = 1.718E-06
** VERTICAL DIMENSION = 6.99
** SZINIT = 3.25
** NODES = 3
** 475865.179, 3752791.853, 476.00, 3.49, 4.00
** 475867.870, 3753013.306, 478.00, 3.49, 4.00
** 475706.153, 3753010.884, 478.00, 3.49, 4.00
** ------------------------------------------------------------------
   LOCATION L0003480     VOLUME   475865.231 3752796.148 476.00
   LOCATION L0003481     VOLUME   475865.336 3752804.737 476.00
   LOCATION L0003482     VOLUME   475865.440 3752813.327 476.23
   LOCATION L0003483     VOLUME   475865.544 3752821.916 476.51
   LOCATION L0003484     VOLUME   475865.649 3752830.505 476.80
   LOCATION L0003485     VOLUME   475865.753 3752839.095 477.00
   LOCATION L0003486     VOLUME   475865.857 3752847.684 477.00
   LOCATION L0003487     VOLUME   475865.962 3752856.273 477.00
   LOCATION L0003488     VOLUME   475866.066 3752864.863 477.00
   LOCATION L0003489     VOLUME   475866.171 3752873.452 477.00
   LOCATION L0003490     VOLUME   475866.275 3752882.042 477.00
   LOCATION L0003491     VOLUME   475866.379 3752890.631 477.00
   LOCATION L0003492     VOLUME   475866.484 3752899.220 477.08
   LOCATION L0003493     VOLUME   475866.588 3752907.810 477.34
   LOCATION L0003494     VOLUME   475866.692 3752916.399 477.59
   LOCATION L0003495     VOLUME   475866.797 3752924.988 477.85
   LOCATION L0003496     VOLUME   475866.901 3752933.578 477.93
   LOCATION L0003497     VOLUME   475867.005 3752942.167 477.96
   LOCATION L0003498     VOLUME   475867.110 3752950.756 477.98
   LOCATION L0003499     VOLUME   475867.214 3752959.346 478.00
   LOCATION L0003500     VOLUME   475867.319 3752967.935 478.00
   LOCATION L0003501     VOLUME   475867.423 3752976.525 478.00
   LOCATION L0003502     VOLUME   475867.527 3752985.114 478.00
   LOCATION L0003503     VOLUME   475867.632 3752993.703 478.00
   LOCATION L0003504     VOLUME   475867.736 3753002.293 478.00
   LOCATION L0003505     VOLUME   475867.840 3753010.882 478.00
   LOCATION L0003506     VOLUME   475861.705 3753013.214 478.00
   LOCATION L0003507     VOLUME   475853.116 3753013.085 478.00
   LOCATION L0003508     VOLUME   475844.527 3753012.956 478.00
   LOCATION L0003509     VOLUME   475835.938 3753012.828 478.00
   LOCATION L0003510     VOLUME   475827.349 3753012.699 478.00
   LOCATION L0003511     VOLUME   475818.759 3753012.571 478.00
   LOCATION L0003512     VOLUME   475810.170 3753012.442 478.00
   LOCATION L0003513     VOLUME   475801.581 3753012.313 478.00
   LOCATION L0003514     VOLUME   475792.992 3753012.185 478.00
   LOCATION L0003515     VOLUME   475784.403 3753012.056 478.00
   LOCATION L0003516     VOLUME   475775.814 3753011.927 478.00
   LOCATION L0003517     VOLUME   475767.225 3753011.799 478.00
   LOCATION L0003518     VOLUME   475758.636 3753011.670 478.00
   LOCATION L0003519     VOLUME   475750.047 3753011.542 478.00
   LOCATION L0003520     VOLUME   475741.458 3753011.413 478.00
   LOCATION L0003521     VOLUME   475732.869 3753011.284 478.00
   LOCATION L0003522     VOLUME   475724.280 3753011.156 478.00
   LOCATION L0003523     VOLUME   475715.691 3753011.027 478.00
   LOCATION L0003524     VOLUME   475707.102 3753010.898 478.00
** END OF LINE VOLUME SOURCE ID = SLINE8
** SOURCE PARAMETERS **
** LINE VOLUME SOURCE ID = SLINE1
   SRCPARAM L0002467     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002468     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002469     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002470     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002471     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002472     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002473     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002474     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002475     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002476     0.00000135      3.49      4.00      3.25
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   SRCPARAM L0002477     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002478     0.00000135      3.49      4.00      3.25
   SRCPARAM L0002479     0.00000135      3.49      4.00      3.25
** ----------------------------------------------------------------------
** LINE VOLUME SOURCE ID = SLINE2
   SRCPARAM L0002480     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002481     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002482     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002483     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002484     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002485     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002486     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002487     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002488     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002489     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002490     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002491     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002492     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002493     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002494     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002495     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002496     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002497     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002498     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002499     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002500     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002501     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002502     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002503     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002504     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002505     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002506     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002507     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002508     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002509     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002510     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002511     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002512     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002513     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002514     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002515     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002516     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002517     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002518     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002519     0.0000002815      3.49      4.00      3.25
   SRCPARAM L0002520     0.0000002815      3.49      4.00      3.25
** ----------------------------------------------------------------------
** LINE VOLUME SOURCE ID = SLINE3
   SRCPARAM L0002592     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002593     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002594     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002595     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002596     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002597     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002598     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002599     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002600     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002601     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002602     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002603     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002604     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002605     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002606     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002607     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002608     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002609     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002610     0.00000001548      3.49      4.00      3.25
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   SRCPARAM L0002611     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002612     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002613     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002614     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002615     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002616     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002617     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002618     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002619     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002620     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002621     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002622     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002623     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002624     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002625     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002626     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002627     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002628     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002629     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002630     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002631     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002632     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002633     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002634     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002635     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002636     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002637     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002638     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002639     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002640     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002641     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002642     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002643     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002644     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002645     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002646     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002647     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002648     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002649     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002650     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002651     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002652     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002653     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002654     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002655     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002656     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002657     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002658     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002659     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002660     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002661     0.00000001548      3.49      4.00      3.25
   SRCPARAM L0002662     0.00000001548      3.49      4.00      3.25
** ------------------------------------------------------------------
** LINE VOLUME SOURCE ID = SLINE6
   SRCPARAM L0002734     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002735     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002736     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002737     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002738     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002739     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002740     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002741     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002742     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002743     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002744     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002745     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002746     0.00000003096      3.49      4.00      3.25
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   SRCPARAM L0002747     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002748     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002749     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002750     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002751     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002752     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002753     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002754     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002755     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002756     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002757     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002758     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002759     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002760     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002761     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002762     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002763     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002764     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002765     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002766     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002767     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002768     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002769     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002770     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002771     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002772     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002773     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002774     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002775     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002776     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002777     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002778     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002779     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002780     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002781     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002782     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002783     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002784     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002785     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002786     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002787     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002788     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002789     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002790     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002791     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002792     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002793     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002794     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002795     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002796     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002797     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002798     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002799     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002800     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002801     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002802     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002803     0.00000003096      3.49      4.00      3.25
   SRCPARAM L0002804     0.00000003096      3.49      4.00      3.25
** ------------------------------------------------------------------
** LINE VOLUME SOURCE ID = SLINE4
   SRCPARAM L0002929     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0002930     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0002931     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0002932     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0002933     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0002934     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0002935     0.00000002702      3.49      4.00      3.25
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SRCPARAM	L0002936	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002937	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002938	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002939	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002940	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002941	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002942	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002943	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002944	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002945	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002946	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002947	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002948	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002949	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002950	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002951	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002952	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002953	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002954	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002955	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002956	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002957	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002958	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002959	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002960	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002961	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002962	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002963	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002964	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002965	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002966	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002967	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002968	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002969	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002970	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002971	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002972	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002973	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002974	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002975	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002976	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002977	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002978	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002979	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002980	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002981	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002982	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002983	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002984	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002985	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002986	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002987	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002988	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002989	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002990	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002991	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002992	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002993	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002994	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002995	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002996	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002997	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002998	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0002999	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0003000	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0003001	0.00000002702	3.49	4.00	3.25
SRCPARAM	L0003002	0.00000002702	3.49	4.00	3.25

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   SRCPARAM L0003003     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003004     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003005     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003006     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003007     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003008     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003009     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003010     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003011     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003012     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003013     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003014     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003015     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003016     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003017     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003018     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003019     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003020     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003021     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003022     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003023     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003024     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003025     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003026     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003027     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003028     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003029     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003030     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003031     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003032     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003033     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003034     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003035     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003036     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003037     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003038     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003039     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003040     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003041     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003042     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003043     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003044     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003045     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003046     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003047     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003048     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003049     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003050     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003051     0.00000002702      3.49      4.00      3.25
   SRCPARAM L0003052     0.00000002702      3.49      4.00      3.25
** ------------------------------------------------------------------
** LINE VOLUME SOURCE ID = SLINE5
   SRCPARAM L0003176     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003177     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003178     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003179     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003180     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003181     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003182     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003183     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003184     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003185     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003186     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003187     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003188     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003189     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003190     0.00000003455      3.49      4.00      3.25
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                                                  11411 HRA
SRCPARAM L0003191     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003192     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003193     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003194     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003195     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003196     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003197     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003198     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003199     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003200     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003201     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003202     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003203     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003204     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003205     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003206     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003207     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003208     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003209     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003210     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003211     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003212     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003213     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003214     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003215     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003216     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003217     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003218     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003219     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003220     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003221     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003222     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003223     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003224     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003225     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003226     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003227     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003228     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003229     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003230     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003231     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003232     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003233     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003234     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003235     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003236     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003237     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003238     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003239     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003240     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003241     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003242     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003243     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003244     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003245     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003246     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003247     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003248     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003249     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003250     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003251     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003252     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003253     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003254     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003255     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003256     0.00000003455      3.49      4.00      3.25
SRCPARAM L0003257     0.00000003455      3.49      4.00      3.25
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   SRCPARAM L0003258     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003259     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003260     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003261     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003262     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003263     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003264     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003265     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003266     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003267     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003268     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003269     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003270     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003271     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003272     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003273     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003274     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003275     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003276     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003277     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003278     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003279     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003280     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003281     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003282     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003283     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003284     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003285     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003286     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003287     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003288     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003289     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003290     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003291     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003292     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003293     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003294     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003295     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003296     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003297     0.00000003455      3.49      4.00      3.25
   SRCPARAM L0003298     0.00000003455      3.49      4.00      3.25
** ------------------------------------------------------------------
** LINE VOLUME SOURCE ID = SLINE7
   SRCPARAM L0003367     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003368     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003369     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003370     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003371     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003372     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003373     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003374     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003375     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003376     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003377     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003378     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003379     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003380     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003381     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003382     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003383     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003384     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003385     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003386     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003387     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003388     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003389     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003390     0.000000007716      3.49      4.00      3.25
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   SRCPARAM L0003391     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003392     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003393     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003394     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003395     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003396     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003397     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003398     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003399     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003400     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003401     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003402     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003403     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003404     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003405     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003406     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003407     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003408     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003409     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003410     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003411     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003412     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003413     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003414     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003415     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003416     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003417     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003418     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003419     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003420     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003421     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003422     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003423     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003424     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003425     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003426     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003427     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003428     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003429     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003430     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003431     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003432     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003433     0.000000007716      3.49      4.00      3.25
   SRCPARAM L0003434     0.000000007716      3.49      4.00      3.25
** ------------------------------------------------------------------
** LINE VOLUME SOURCE ID = SLINE8
   SRCPARAM L0003480     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003481     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003482     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003483     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003484     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003485     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003486     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003487     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003488     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003489     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003490     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003491     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003492     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003493     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003494     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003495     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003496     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003497     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003498     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003499     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003500     0.00000003818      3.49      4.00      3.25
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   SRCPARAM L0003501     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003502     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003503     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003504     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003505     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003506     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003507     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003508     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003509     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003510     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003511     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003512     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003513     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003514     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003515     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003516     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003517     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003518     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003519     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003520     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003521     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003522     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003523     0.00000003818      3.49      4.00      3.25
   SRCPARAM L0003524     0.00000003818      3.49      4.00      3.25
** ------------------------------------------------------------------
   URBANSRC ALL
   SRCGROUP ALL
SO FINISHED
**
**********************************
** AERMOD RECEPTOR PATHWAY
**********************************
**
**
RE STARTING
   INCLUDED "11411 HRA.ROU"
RE FINISHED
**
**********************************
** AERMOD METEOROLOGY PATHWAY
**********************************
**
**
ME STARTING
   SURFFILE PERRISADJU\PERI_V9_ADJU\PERI_V9.SFC
   PROFFILE PERRISADJU\PERI_V9_ADJU\PERI_V9.PFL
   SURFDATA 3171 2010
   UAIRDATA 3190 2010
   SITEDATA 99999 2010
   PROFBASE 442.0 METERS
ME FINISHED
**
**********************************
** AERMOD OUTPUT PATHWAY
**********************************
**
**
OU STARTING
** AUTO-GENERATED PLOTFILES
   PLOTFILE   ANNUAL ALL "11411 HRA.AD\AN00GALL.PLT" 31
   SUMMFILE "11411 HRA.SUM"
OU FINISHED


  *** Message Summary For AERMOD Model Setup ***

  --------- Summary of Total Messages --------
```

```
 A Total of           0 Fatal Error Message(s)
 A Total of           2 Warning Message(s)
 A Total of           0 Informational Message(s)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 ME W186    1323       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used          0.50
 ME W187    1323       MEOPEN: ADJ_U* Option for Low Winds used in AERMET

 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************

♀ *** AERMOD - VERSION 16216r ***   *** C:\LAKES\AERMOD VIEW\11411 HRA\11411 HRA.ISC                        ***
    05/24/18
 *** AERMET - VERSION  16216 ***   ***                                                                   ***
   17:41:25

   PAGE   1
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses URBAN Dispersion Algorithm for the SBL for   556 Source(s),
   for Total of    1 Urban Area(s):
   Urban Population =   2189641.0 ;  Urban Roughness Length =  1.000 m

 **Model Uses Regulatory DEFAULT Options:
         1. Stack-tip Downwash.
         2. Model Accounts for ELEVated Terrain Effects.
         3. Use Calms Processing Routine.
         4. Use Missing Data Processing Routine.
         5. No Exponential Decay.
         6. Urban Roughness Length of 1.0 Meter Assumed.

 **Other Options Specified:
         ADJ_U*   - Use ADJ_U* BETA option for SBL in AERMET
         CCVR_Sub - Meteorological data includes CCVR substitutions
         TEMP_Sub - Meteorological data includes TEMP substitutions

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  DPM

 **Model Calculates ANNUAL Averages Only

 **This Run Includes:    556 Source(s);       1 Source Group(s); and      25 Receptor(s)

                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:    556 VOLUME source(s)
                 and:      0 AREA type source(s)
```

```
                and:      0 LINE source(s)
                and:      0 OPENPIT source(s)
                and:      0 BUOYANT LINE source(s) with      0 line(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  16216

 **Output Options Selected:
         Model Outputs Tables of ANNUAL Averages by Receptor
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =   442.00 ;  Decay Coef. =    0.000     ;  Rot. Angle
=     0.0
                  Emission Units = GRAMS/SEC                           ;  Emission Rate Unit Factor =
0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      3.7 MB of RAM.

 **Detailed Error/Message File:   11411 HRA.ERR

 **File for Summary of Results:   11411 HRA.SUM

♀ *** AERMOD - VERSION 16216r ***   *** C:\LAKES\AERMOD VIEW\11411 HRA\11411 HRA.ISC                        ***
    05/24/18
 *** AERMET - VERSION  16216 ***   ***                                                                   ***
   17:41:25

   PAGE   2
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*


                                          *** VOLUME SOURCE DATA ***

              NUMBER EMISSION RATE                    BASE    RELEASE    INIT.    INIT.   URBAN  EMISSION RATE
   SOURCE      PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY       SZ     SOURCE  SCALAR VARY
     ID        CATS.               (METERS) (METERS) (METERS) (METERS) (METERS) (METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - -

 L0002467         0   0.13500E-05  476010.6 3752799.0   476.8     3.49     4.00     3.25     YES
 L0002468         0   0.13500E-05  476010.7 3752790.4   476.6     3.49     4.00     3.25     YES
 L0002469         0   0.13500E-05  476010.8 3752781.8   476.4     3.49     4.00     3.25     YES
 L0002470         0   0.13500E-05  476010.9 3752773.2   476.3     3.49     4.00     3.25     YES
 L0002471         0   0.13500E-05  476011.0 3752764.7   476.2     3.49     4.00     3.25     YES
 L0002472         0   0.13500E-05  476011.1 3752756.1   476.1     3.49     4.00     3.25     YES
 L0002473         0   0.13500E-05  476011.2 3752747.5   476.0     3.49     4.00     3.25     YES
 L0002474         0   0.13500E-05  476011.3 3752738.9   476.0     3.49     4.00     3.25     YES
 L0002475         0   0.13500E-05  476011.4 3752730.3   476.0     3.49     4.00     3.25     YES
 L0002476         0   0.13500E-05  476011.5 3752721.7   476.0     3.49     4.00     3.25     YES
 L0002477         0   0.13500E-05  476011.6 3752713.1   476.0     3.49     4.00     3.25     YES
 L0002478         0   0.13500E-05  476011.7 3752704.5   476.0     3.49     4.00     3.25     YES
 L0002479         0   0.13500E-05  476011.8 3752695.9   476.0     3.49     4.00     3.25     YES
 L0002480         0   0.28150E-06  475876.1 3752797.3   476.0     3.49     4.00     3.25     YES
 L0002481         0   0.28150E-06  475884.7 3752797.6   476.0     3.49     4.00     3.25     YES
 L0002482         0   0.28150E-06  475892.1 3752801.8   476.0     3.49     4.00     3.25     YES
 L0002483         0   0.28150E-06  475899.5 3752806.1   476.0     3.49     4.00     3.25     YES
 L0002484         0   0.28150E-06  475907.5 3752808.4   476.3     3.49     4.00     3.25     YES
 L0002485         0   0.28150E-06  475916.1 3752808.4   476.6     3.49     4.00     3.25     YES
 L0002486         0   0.28150E-06  475924.7 3752808.4   476.8     3.49     4.00     3.25     YES
```

L0002487	0	0.28150E-06	475933.2	3752808.4	476.9	3.49	4.00	3.25	YES
L0002488	0	0.28150E-06	475941.8	3752808.4	476.6	3.49	4.00	3.25	YES
L0002489	0	0.28150E-06	475950.4	3752808.4	476.4	3.49	4.00	3.25	YES
L0002490	0	0.28150E-06	475959.0	3752808.4	476.1	3.49	4.00	3.25	YES
L0002491	0	0.28150E-06	475967.6	3752808.4	476.3	3.49	4.00	3.25	YES
L0002492	0	0.28150E-06	475976.2	3752808.4	476.6	3.49	4.00	3.25	YES
L0002493	0	0.28150E-06	475984.8	3752808.4	476.9	3.49	4.00	3.25	YES
L0002494	0	0.28150E-06	475993.4	3752808.4	477.0	3.49	4.00	3.25	YES
L0002495	0	0.28150E-06	476002.0	3752808.4	477.0	3.49	4.00	3.25	YES
L0002496	0	0.28150E-06	476010.6	3752808.4	477.0	3.49	4.00	3.25	YES
L0002497	0	0.28150E-06	476019.1	3752808.4	477.0	3.49	4.00	3.25	YES
L0002498	0	0.28150E-06	476027.7	3752808.4	476.8	3.49	4.00	3.25	YES
L0002499	0	0.28150E-06	476032.1	3752804.1	476.5	3.49	4.00	3.25	YES
L0002500	0	0.28150E-06	476032.3	3752795.6	476.4	3.49	4.00	3.25	YES
L0002501	0	0.28150E-06	476032.4	3752787.0	476.2	3.49	4.00	3.25	YES
L0002502	0	0.28150E-06	476032.5	3752778.4	476.0	3.49	4.00	3.25	YES
L0002503	0	0.28150E-06	476032.7	3752769.8	476.0	3.49	4.00	3.25	YES
L0002504	0	0.28150E-06	476032.8	3752761.2	476.0	3.49	4.00	3.25	YES
L0002505	0	0.28150E-06	476032.9	3752752.6	476.0	3.49	4.00	3.25	YES
L0002506	0	0.28150E-06	476033.1	3752744.0	476.0	3.49	4.00	3.25	YES

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*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0002507	0	0.28150E-06	476033.2	3752735.4	476.0	3.49	4.00	3.25	YES	
L0002508	0	0.28150E-06	476033.4	3752726.8	476.0	3.49	4.00	3.25	YES	
L0002509	0	0.28150E-06	476033.5	3752718.3	476.0	3.49	4.00	3.25	YES	
L0002510	0	0.28150E-06	476033.6	3752709.7	476.0	3.49	4.00	3.25	YES	
L0002511	0	0.28150E-06	476033.8	3752701.1	476.0	3.49	4.00	3.25	YES	
L0002512	0	0.28150E-06	476033.9	3752692.5	476.0	3.49	4.00	3.25	YES	
L0002513	0	0.28150E-06	476034.0	3752683.9	476.0	3.49	4.00	3.25	YES	
L0002514	0	0.28150E-06	476034.2	3752675.3	476.0	3.49	4.00	3.25	YES	
L0002515	0	0.28150E-06	476034.3	3752666.7	476.0	3.49	4.00	3.25	YES	
L0002516	0	0.28150E-06	476034.4	3752658.1	476.0	3.49	4.00	3.25	YES	
L0002517	0	0.28150E-06	476034.6	3752649.5	475.9	3.49	4.00	3.25	YES	
L0002518	0	0.28150E-06	476034.7	3752641.0	475.7	3.49	4.00	3.25	YES	
L0002519	0	0.28150E-06	476034.9	3752632.4	475.6	3.49	4.00	3.25	YES	
L0002520	0	0.28150E-06	476035.0	3752623.8	475.4	3.49	4.00	3.25	YES	
L0002592	0	0.15480E-07	476642.5	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002593	0	0.15480E-07	476633.9	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002594	0	0.15480E-07	476625.3	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002595	0	0.15480E-07	476616.7	3752615.8	475.1	3.49	4.00	3.25	YES	
L0002596	0	0.15480E-07	476608.2	3752615.8	475.4	3.49	4.00	3.25	YES	
L0002597	0	0.15480E-07	476599.6	3752615.8	475.7	3.49	4.00	3.25	YES	
L0002598	0	0.15480E-07	476591.0	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002599	0	0.15480E-07	476582.4	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002600	0	0.15480E-07	476573.8	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002601	0	0.15480E-07	476565.2	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002602	0	0.15480E-07	476556.6	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002603	0	0.15480E-07	476548.0	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002604	0	0.15480E-07	476539.4	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002605	0	0.15480E-07	476530.8	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002606	0	0.15480E-07	476522.3	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002607	0	0.15480E-07	476513.7	3752615.8	476.0	3.49	4.00	3.25	YES	

L0002608	0	0.15480E-07	476505.1	3752615.8	476.0	3.49	4.00	3.25	YES
L0002609	0	0.15480E-07	476496.5	3752615.8	475.9	3.49	4.00	3.25	YES
L0002610	0	0.15480E-07	476487.9	3752615.8	475.6	3.49	4.00	3.25	YES
L0002611	0	0.15480E-07	476479.3	3752615.8	475.3	3.49	4.00	3.25	YES
L0002612	0	0.15480E-07	476470.7	3752615.8	475.0	3.49	4.00	3.25	YES
L0002613	0	0.15480E-07	476462.1	3752615.8	475.0	3.49	4.00	3.25	YES
L0002614	0	0.15480E-07	476453.5	3752615.8	475.0	3.49	4.00	3.25	YES
L0002615	0	0.15480E-07	476444.9	3752615.8	475.0	3.49	4.00	3.25	YES
L0002616	0	0.15480E-07	476436.4	3752615.8	475.1	3.49	4.00	3.25	YES
L0002617	0	0.15480E-07	476427.8	3752615.8	475.3	3.49	4.00	3.25	YES

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0002618	0	0.15480E-07	476419.2	3752615.8	475.4	3.49	4.00	3.25	YES	
L0002619	0	0.15480E-07	476410.6	3752615.8	475.6	3.49	4.00	3.25	YES	
L0002620	0	0.15480E-07	476402.0	3752615.8	475.7	3.49	4.00	3.25	YES	
L0002621	0	0.15480E-07	476393.4	3752615.8	475.8	3.49	4.00	3.25	YES	
L0002622	0	0.15480E-07	476384.8	3752615.8	475.9	3.49	4.00	3.25	YES	
L0002623	0	0.15480E-07	476376.2	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002624	0	0.15480E-07	476367.6	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002625	0	0.15480E-07	476359.0	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002626	0	0.15480E-07	476350.5	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002627	0	0.15480E-07	476341.9	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002628	0	0.15480E-07	476333.3	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002629	0	0.15480E-07	476324.7	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002630	0	0.15480E-07	476316.1	3752615.8	475.9	3.49	4.00	3.25	YES	
L0002631	0	0.15480E-07	476307.5	3752615.8	475.6	3.49	4.00	3.25	YES	
L0002632	0	0.15480E-07	476298.9	3752615.8	475.3	3.49	4.00	3.25	YES	
L0002633	0	0.15480E-07	476290.3	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002634	0	0.15480E-07	476281.7	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002635	0	0.15480E-07	476273.1	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002636	0	0.15480E-07	476264.6	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002637	0	0.15480E-07	476256.0	3752615.8	475.1	3.49	4.00	3.25	YES	
L0002638	0	0.15480E-07	476247.4	3752615.8	475.3	3.49	4.00	3.25	YES	
L0002639	0	0.15480E-07	476238.8	3752615.8	475.4	3.49	4.00	3.25	YES	
L0002640	0	0.15480E-07	476230.2	3752615.8	475.6	3.49	4.00	3.25	YES	
L0002641	0	0.15480E-07	476221.6	3752615.8	475.7	3.49	4.00	3.25	YES	
L0002642	0	0.15480E-07	476213.0	3752615.8	475.8	3.49	4.00	3.25	YES	
L0002643	0	0.15480E-07	476204.4	3752615.8	475.9	3.49	4.00	3.25	YES	
L0002644	0	0.15480E-07	476195.8	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002645	0	0.15480E-07	476187.2	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002646	0	0.15480E-07	476178.7	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002647	0	0.15480E-07	476170.1	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002648	0	0.15480E-07	476161.5	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002649	0	0.15480E-07	476152.9	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002650	0	0.15480E-07	476144.3	3752615.8	476.0	3.49	4.00	3.25	YES	
L0002651	0	0.15480E-07	476135.7	3752615.8	475.9	3.49	4.00	3.25	YES	
L0002652	0	0.15480E-07	476127.1	3752615.8	475.7	3.49	4.00	3.25	YES	
L0002653	0	0.15480E-07	476118.5	3752615.8	475.6	3.49	4.00	3.25	YES	
L0002654	0	0.15480E-07	476109.9	3752615.8	475.4	3.49	4.00	3.25	YES	
L0002655	0	0.15480E-07	476101.3	3752615.8	475.3	3.49	4.00	3.25	YES	
L0002656	0	0.15480E-07	476092.8	3752615.8	475.2	3.49	4.00	3.25	YES	
L0002657	0	0.15480E-07	476084.2	3752615.8	475.1	3.49	4.00	3.25	YES	

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0002658	0	0.15480E-07	476075.6	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002659	0	0.15480E-07	476067.0	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002660	0	0.15480E-07	476058.4	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002661	0	0.15480E-07	476049.8	3752615.8	475.0	3.49	4.00	3.25	YES	
L0002662	0	0.15480E-07	476041.2	3752615.8	475.2	3.49	4.00	3.25	YES	
L0002734	0	0.30960E-07	476648.8	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002735	0	0.30960E-07	476640.2	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002736	0	0.30960E-07	476631.6	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002737	0	0.30960E-07	476623.0	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002738	0	0.30960E-07	476614.4	3752607.4	475.2	3.49	4.00	3.25	YES	
L0002739	0	0.30960E-07	476605.8	3752607.4	475.5	3.49	4.00	3.25	YES	
L0002740	0	0.30960E-07	476597.3	3752607.4	475.8	3.49	4.00	3.25	YES	
L0002741	0	0.30960E-07	476588.7	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002742	0	0.30960E-07	476580.1	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002743	0	0.30960E-07	476571.5	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002744	0	0.30960E-07	476562.9	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002745	0	0.30960E-07	476554.3	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002746	0	0.30960E-07	476545.7	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002747	0	0.30960E-07	476537.1	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002748	0	0.30960E-07	476528.5	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002749	0	0.30960E-07	476519.9	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002750	0	0.30960E-07	476511.4	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002751	0	0.30960E-07	476502.8	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002752	0	0.30960E-07	476494.2	3752607.4	475.8	3.49	4.00	3.25	YES	
L0002753	0	0.30960E-07	476485.6	3752607.4	475.5	3.49	4.00	3.25	YES	
L0002754	0	0.30960E-07	476477.0	3752607.4	475.2	3.49	4.00	3.25	YES	
L0002755	0	0.30960E-07	476468.4	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002756	0	0.30960E-07	476459.8	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002757	0	0.30960E-07	476451.2	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002758	0	0.30960E-07	476442.6	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002759	0	0.30960E-07	476434.0	3752607.4	475.1	3.49	4.00	3.25	YES	
L0002760	0	0.30960E-07	476425.5	3752607.4	475.2	3.49	4.00	3.25	YES	
L0002761	0	0.30960E-07	476416.9	3752607.4	475.3	3.49	4.00	3.25	YES	
L0002762	0	0.30960E-07	476408.3	3752607.4	475.4	3.49	4.00	3.25	YES	
L0002763	0	0.30960E-07	476399.7	3752607.4	475.6	3.49	4.00	3.25	YES	
L0002764	0	0.30960E-07	476391.1	3752607.4	475.8	3.49	4.00	3.25	YES	
L0002765	0	0.30960E-07	476382.5	3752607.4	475.9	3.49	4.00	3.25	YES	
L0002766	0	0.30960E-07	476373.9	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002767	0	0.30960E-07	476365.3	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002768	0	0.30960E-07	476356.7	3752607.4	476.0	3.49	4.00	3.25	YES	

*** VOLUME SOURCE DATA ***

11411 HRA

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0002769	0	0.30960E-07	476348.1	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002770	0	0.30960E-07	476339.6	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002771	0	0.30960E-07	476331.0	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002772	0	0.30960E-07	476322.4	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002773	0	0.30960E-07	476313.8	3752607.4	475.8	3.49	4.00	3.25	YES	
L0002774	0	0.30960E-07	476305.2	3752607.4	475.5	3.49	4.00	3.25	YES	
L0002775	0	0.30960E-07	476296.6	3752607.4	475.2	3.49	4.00	3.25	YES	
L0002776	0	0.30960E-07	476288.0	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002777	0	0.30960E-07	476279.4	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002778	0	0.30960E-07	476270.8	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002779	0	0.30960E-07	476262.2	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002780	0	0.30960E-07	476253.7	3752607.4	475.1	3.49	4.00	3.25	YES	
L0002781	0	0.30960E-07	476245.1	3752607.4	475.2	3.49	4.00	3.25	YES	
L0002782	0	0.30960E-07	476236.5	3752607.4	475.3	3.49	4.00	3.25	YES	
L0002783	0	0.30960E-07	476227.9	3752607.4	475.4	3.49	4.00	3.25	YES	
L0002784	0	0.30960E-07	476219.3	3752607.4	475.6	3.49	4.00	3.25	YES	
L0002785	0	0.30960E-07	476210.7	3752607.4	475.8	3.49	4.00	3.25	YES	
L0002786	0	0.30960E-07	476202.1	3752607.4	475.9	3.49	4.00	3.25	YES	
L0002787	0	0.30960E-07	476193.5	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002788	0	0.30960E-07	476184.9	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002789	0	0.30960E-07	476176.3	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002790	0	0.30960E-07	476167.8	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002791	0	0.30960E-07	476159.2	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002792	0	0.30960E-07	476150.6	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002793	0	0.30960E-07	476142.0	3752607.4	476.0	3.49	4.00	3.25	YES	
L0002794	0	0.30960E-07	476133.4	3752607.4	475.9	3.49	4.00	3.25	YES	
L0002795	0	0.30960E-07	476124.8	3752607.4	475.8	3.49	4.00	3.25	YES	
L0002796	0	0.30960E-07	476116.2	3752607.4	475.7	3.49	4.00	3.25	YES	
L0002797	0	0.30960E-07	476107.6	3752607.4	475.6	3.49	4.00	3.25	YES	
L0002798	0	0.30960E-07	476099.0	3752607.4	475.4	3.49	4.00	3.25	YES	
L0002799	0	0.30960E-07	476090.4	3752607.4	475.2	3.49	4.00	3.25	YES	
L0002800	0	0.30960E-07	476081.9	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002801	0	0.30960E-07	476073.3	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002802	0	0.30960E-07	476064.7	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002803	0	0.30960E-07	476056.1	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002804	0	0.30960E-07	476047.5	3752607.4	475.0	3.49	4.00	3.25	YES	
L0002929	0	0.27020E-07	475379.6	3752217.5	472.0	3.49	4.00	3.25	YES	
L0002930	0	0.27020E-07	475388.2	3752217.5	472.0	3.49	4.00	3.25	YES	
L0002931	0	0.27020E-07	475396.8	3752217.6	472.0	3.49	4.00	3.25	YES	
L0002932	0	0.27020E-07	475405.4	3752217.6	472.0	3.49	4.00	3.25	YES	

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0002933	0	0.27020E-07	475414.0	3752217.7	472.0	3.49	4.00	3.25	YES	
L0002934	0	0.27020E-07	475422.6	3752217.7	472.0	3.49	4.00	3.25	YES	
L0002935	0	0.27020E-07	475431.2	3752217.8	472.0	3.49	4.00	3.25	YES	

L0002936	0	0.27020E-07	475439.8	3752217.8	472.0	3.49	4.00	3.25	YES
L0002937	0	0.27020E-07	475448.4	3752217.8	472.0	3.49	4.00	3.25	YES
L0002938	0	0.27020E-07	475457.0	3752217.9	472.0	3.49	4.00	3.25	YES
L0002939	0	0.27020E-07	475465.5	3752217.9	472.0	3.49	4.00	3.25	YES
L0002940	0	0.27020E-07	475474.1	3752218.0	472.0	3.49	4.00	3.25	YES
L0002941	0	0.27020E-07	475482.7	3752218.0	472.0	3.49	4.00	3.25	YES
L0002942	0	0.27020E-07	475491.3	3752218.1	472.0	3.49	4.00	3.25	YES
L0002943	0	0.27020E-07	475499.9	3752218.1	472.0	3.49	4.00	3.25	YES
L0002944	0	0.27020E-07	475508.5	3752218.2	472.0	3.49	4.00	3.25	YES
L0002945	0	0.27020E-07	475517.1	3752218.2	472.0	3.49	4.00	3.25	YES
L0002946	0	0.27020E-07	475525.7	3752218.3	472.0	3.49	4.00	3.25	YES
L0002947	0	0.27020E-07	475534.3	3752218.3	472.0	3.49	4.00	3.25	YES
L0002948	0	0.27020E-07	475542.9	3752218.3	472.0	3.49	4.00	3.25	YES
L0002949	0	0.27020E-07	475551.4	3752218.4	472.0	3.49	4.00	3.25	YES
L0002950	0	0.27020E-07	475560.0	3752218.4	472.0	3.49	4.00	3.25	YES
L0002951	0	0.27020E-07	475568.6	3752218.5	472.0	3.49	4.00	3.25	YES
L0002952	0	0.27020E-07	475577.2	3752218.5	472.0	3.49	4.00	3.25	YES
L0002953	0	0.27020E-07	475585.8	3752218.6	472.0	3.49	4.00	3.25	YES
L0002954	0	0.27020E-07	475594.4	3752218.6	472.0	3.49	4.00	3.25	YES
L0002955	0	0.27020E-07	475603.0	3752218.7	472.0	3.49	4.00	3.25	YES
L0002956	0	0.27020E-07	475611.6	3752218.7	472.0	3.49	4.00	3.25	YES
L0002957	0	0.27020E-07	475620.2	3752218.7	472.0	3.49	4.00	3.25	YES
L0002958	0	0.27020E-07	475628.8	3752218.8	472.0	3.49	4.00	3.25	YES
L0002959	0	0.27020E-07	475637.3	3752218.8	472.0	3.49	4.00	3.25	YES
L0002960	0	0.27020E-07	475645.9	3752218.9	472.0	3.49	4.00	3.25	YES
L0002961	0	0.27020E-07	475654.5	3752218.9	472.0	3.49	4.00	3.25	YES
L0002962	0	0.27020E-07	475663.1	3752219.0	472.0	3.49	4.00	3.25	YES
L0002963	0	0.27020E-07	475671.7	3752219.0	472.0	3.49	4.00	3.25	YES
L0002964	0	0.27020E-07	475680.3	3752219.1	472.0	3.49	4.00	3.25	YES
L0002965	0	0.27020E-07	475688.9	3752219.1	472.0	3.49	4.00	3.25	YES
L0002966	0	0.27020E-07	475697.5	3752219.2	472.0	3.49	4.00	3.25	YES
L0002967	0	0.27020E-07	475706.1	3752219.2	472.0	3.49	4.00	3.25	YES
L0002968	0	0.27020E-07	475714.7	3752219.2	472.0	3.49	4.00	3.25	YES
L0002969	0	0.27020E-07	475723.2	3752219.3	472.0	3.49	4.00	3.25	YES
L0002970	0	0.27020E-07	475731.8	3752219.3	472.0	3.49	4.00	3.25	YES
L0002971	0	0.27020E-07	475740.4	3752219.4	472.0	3.49	4.00	3.25	YES
L0002972	0	0.27020E-07	475749.0	3752219.4	472.0	3.49	4.00	3.25	YES

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0002973	0	0.27020E-07	475757.6	3752219.5	472.0	3.49	4.00	3.25	YES	
L0002974	0	0.27020E-07	475766.2	3752219.5	472.0	3.49	4.00	3.25	YES	
L0002975	0	0.27020E-07	475774.8	3752219.6	472.0	3.49	4.00	3.25	YES	
L0002976	0	0.27020E-07	475783.4	3752219.6	472.0	3.49	4.00	3.25	YES	
L0002977	0	0.27020E-07	475792.0	3752219.7	472.0	3.49	4.00	3.25	YES	
L0002978	0	0.27020E-07	475800.6	3752219.7	472.0	3.49	4.00	3.25	YES	
L0002979	0	0.27020E-07	475809.1	3752219.7	472.0	3.49	4.00	3.25	YES	
L0002980	0	0.27020E-07	475817.7	3752219.8	472.0	3.49	4.00	3.25	YES	
L0002981	0	0.27020E-07	475826.3	3752219.8	472.0	3.49	4.00	3.25	YES	
L0002982	0	0.27020E-07	475834.9	3752219.9	472.0	3.49	4.00	3.25	YES	
L0002983	0	0.27020E-07	475843.5	3752219.9	472.0	3.49	4.00	3.25	YES	
L0002984	0	0.27020E-07	475852.1	3752220.0	472.0	3.49	4.00	3.25	YES	
L0002985	0	0.27020E-07	475860.7	3752220.0	472.0	3.49	4.00	3.25	YES	

L0002986	0	0.27020E-07	475865.2	3752224.0	472.0	3.49	4.00	3.25	YES
L0002987	0	0.27020E-07	475865.0	3752232.6	472.0	3.49	4.00	3.25	YES
L0002988	0	0.27020E-07	475864.9	3752241.2	472.2	3.49	4.00	3.25	YES
L0002989	0	0.27020E-07	475864.7	3752249.8	472.4	3.49	4.00	3.25	YES
L0002990	0	0.27020E-07	475864.6	3752258.4	472.7	3.49	4.00	3.25	YES
L0002991	0	0.27020E-07	475864.4	3752267.0	473.0	3.49	4.00	3.25	YES
L0002992	0	0.27020E-07	475864.3	3752275.6	473.0	3.49	4.00	3.25	YES
L0002993	0	0.27020E-07	475864.1	3752284.2	473.0	3.49	4.00	3.25	YES
L0002994	0	0.27020E-07	475863.9	3752292.7	473.0	3.49	4.00	3.25	YES
L0002995	0	0.27020E-07	475863.8	3752301.3	473.0	3.49	4.00	3.25	YES
L0002996	0	0.27020E-07	475863.7	3752309.9	473.0	3.49	4.00	3.25	YES
L0002997	0	0.27020E-07	475863.8	3752318.5	473.0	3.49	4.00	3.25	YES
L0002998	0	0.27020E-07	475863.8	3752327.1	473.0	3.49	4.00	3.25	YES
L0002999	0	0.27020E-07	475863.8	3752335.7	473.0	3.49	4.00	3.25	YES
L0003000	0	0.27020E-07	475863.8	3752344.3	473.0	3.49	4.00	3.25	YES
L0003001	0	0.27020E-07	475863.9	3752352.9	473.0	3.49	4.00	3.25	YES
L0003002	0	0.27020E-07	475863.9	3752361.5	473.0	3.49	4.00	3.25	YES
L0003003	0	0.27020E-07	475863.9	3752370.1	473.1	3.49	4.00	3.25	YES
L0003004	0	0.27020E-07	475864.0	3752378.6	473.1	3.49	4.00	3.25	YES
L0003005	0	0.27020E-07	475864.0	3752387.2	473.2	3.49	4.00	3.25	YES
L0003006	0	0.27020E-07	475864.0	3752395.8	473.4	3.49	4.00	3.25	YES
L0003007	0	0.27020E-07	475864.0	3752404.4	473.7	3.49	4.00	3.25	YES
L0003008	0	0.27020E-07	475864.1	3752413.0	473.9	3.49	4.00	3.25	YES
L0003009	0	0.27020E-07	475864.1	3752421.6	474.0	3.49	4.00	3.25	YES
L0003010	0	0.27020E-07	475864.1	3752430.2	474.0	3.49	4.00	3.25	YES
L0003011	0	0.27020E-07	475864.1	3752438.8	474.0	3.49	4.00	3.25	YES
L0003012	0	0.27020E-07	475864.2	3752447.4	474.0	3.49	4.00	3.25	YES

♀ *** AERMOD - VERSION 16216r *** *** C:\LAKES\AERMOD VIEW\11411 HRA\11411 HRA.ISC *** *** 05/24/18

*** AERMET - VERSION 16216 *** *** *** 17:41:25

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*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0003013	0	0.27020E-07	475864.2	3752456.0	474.0	3.49	4.00	3.25	YES	
L0003014	0	0.27020E-07	475864.2	3752464.5	474.0	3.49	4.00	3.25	YES	
L0003015	0	0.27020E-07	475864.3	3752473.1	474.0	3.49	4.00	3.25	YES	
L0003016	0	0.27020E-07	475864.3	3752481.7	474.0	3.49	4.00	3.25	YES	
L0003017	0	0.27020E-07	475864.3	3752490.3	474.0	3.49	4.00	3.25	YES	
L0003018	0	0.27020E-07	475864.3	3752498.9	474.0	3.49	4.00	3.25	YES	
L0003019	0	0.27020E-07	475864.4	3752507.5	474.0	3.49	4.00	3.25	YES	
L0003020	0	0.27020E-07	475864.4	3752516.1	474.3	3.49	4.00	3.25	YES	
L0003021	0	0.27020E-07	475864.4	3752524.7	474.6	3.49	4.00	3.25	YES	
L0003022	0	0.27020E-07	475864.4	3752533.3	474.9	3.49	4.00	3.25	YES	
L0003023	0	0.27020E-07	475864.5	3752541.9	475.0	3.49	4.00	3.25	YES	
L0003024	0	0.27020E-07	475864.5	3752550.4	475.0	3.49	4.00	3.25	YES	
L0003025	0	0.27020E-07	475864.5	3752559.0	475.0	3.49	4.00	3.25	YES	
L0003026	0	0.27020E-07	475864.5	3752567.6	475.0	3.49	4.00	3.25	YES	
L0003027	0	0.27020E-07	475864.6	3752576.2	475.0	3.49	4.00	3.25	YES	
L0003028	0	0.27020E-07	475864.6	3752584.8	475.0	3.49	4.00	3.25	YES	
L0003029	0	0.27020E-07	475864.6	3752593.4	475.0	3.49	4.00	3.25	YES	
L0003030	0	0.27020E-07	475864.7	3752602.0	475.0	3.49	4.00	3.25	YES	
L0003031	0	0.27020E-07	475864.7	3752610.6	475.0	3.49	4.00	3.25	YES	
L0003032	0	0.27020E-07	475864.7	3752619.2	475.0	3.49	4.00	3.25	YES	
L0003033	0	0.27020E-07	475864.7	3752627.8	475.0	3.49	4.00	3.25	YES	
L0003034	0	0.27020E-07	475864.8	3752636.3	475.0	3.49	4.00	3.25	YES	
L0003035	0	0.27020E-07	475864.8	3752644.9	475.0	3.49	4.00	3.25	YES	

L0003036	0	0.27020E-07	475864.8	3752653.5	475.0	3.49	4.00	3.25	YES
L0003037	0	0.27020E-07	475864.8	3752662.1	475.2	3.49	4.00	3.25	YES
L0003038	0	0.27020E-07	475864.9	3752670.7	475.5	3.49	4.00	3.25	YES
L0003039	0	0.27020E-07	475864.9	3752679.3	475.8	3.49	4.00	3.25	YES
L0003040	0	0.27020E-07	475864.9	3752687.9	476.0	3.49	4.00	3.25	YES
L0003041	0	0.27020E-07	475865.0	3752696.5	476.0	3.49	4.00	3.25	YES
L0003042	0	0.27020E-07	475865.0	3752705.1	476.0	3.49	4.00	3.25	YES
L0003043	0	0.27020E-07	475865.0	3752713.7	476.0	3.49	4.00	3.25	YES
L0003044	0	0.27020E-07	475865.0	3752722.2	476.0	3.49	4.00	3.25	YES
L0003045	0	0.27020E-07	475865.1	3752730.8	476.0	3.49	4.00	3.25	YES
L0003046	0	0.27020E-07	475865.1	3752739.4	476.0	3.49	4.00	3.25	YES
L0003047	0	0.27020E-07	475865.1	3752748.0	476.0	3.49	4.00	3.25	YES
L0003048	0	0.27020E-07	475865.1	3752756.6	476.0	3.49	4.00	3.25	YES
L0003049	0	0.27020E-07	475865.2	3752765.2	476.0	3.49	4.00	3.25	YES
L0003050	0	0.27020E-07	475865.2	3752773.8	476.0	3.49	4.00	3.25	YES
L0003051	0	0.27020E-07	475865.2	3752782.4	476.0	3.49	4.00	3.25	YES
L0003052	0	0.27020E-07	475865.2	3752791.0	476.0	3.49	4.00	3.25	YES

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0003176	0	0.34550E-07	475379.6	3752217.5	472.0	3.49	4.00	3.25	YES	
L0003177	0	0.34550E-07	475388.2	3752217.5	472.0	3.49	4.00	3.25	YES	
L0003178	0	0.34550E-07	475396.8	3752217.6	472.0	3.49	4.00	3.25	YES	
L0003179	0	0.34550E-07	475405.4	3752217.6	472.0	3.49	4.00	3.25	YES	
L0003180	0	0.34550E-07	475414.0	3752217.7	472.0	3.49	4.00	3.25	YES	
L0003181	0	0.34550E-07	475422.6	3752217.7	472.0	3.49	4.00	3.25	YES	
L0003182	0	0.34550E-07	475431.2	3752217.8	472.0	3.49	4.00	3.25	YES	
L0003183	0	0.34550E-07	475439.8	3752217.8	472.0	3.49	4.00	3.25	YES	
L0003184	0	0.34550E-07	475448.4	3752217.8	472.0	3.49	4.00	3.25	YES	
L0003185	0	0.34550E-07	475457.0	3752217.9	472.0	3.49	4.00	3.25	YES	
L0003186	0	0.34550E-07	475465.5	3752217.9	472.0	3.49	4.00	3.25	YES	
L0003187	0	0.34550E-07	475474.1	3752218.0	472.0	3.49	4.00	3.25	YES	
L0003188	0	0.34550E-07	475482.7	3752218.0	472.0	3.49	4.00	3.25	YES	
L0003189	0	0.34550E-07	475491.3	3752218.1	472.0	3.49	4.00	3.25	YES	
L0003190	0	0.34550E-07	475499.9	3752218.1	472.0	3.49	4.00	3.25	YES	
L0003191	0	0.34550E-07	475508.5	3752218.2	472.0	3.49	4.00	3.25	YES	
L0003192	0	0.34550E-07	475517.1	3752218.2	472.0	3.49	4.00	3.25	YES	
L0003193	0	0.34550E-07	475525.7	3752218.3	472.0	3.49	4.00	3.25	YES	
L0003194	0	0.34550E-07	475534.3	3752218.3	472.0	3.49	4.00	3.25	YES	
L0003195	0	0.34550E-07	475542.9	3752218.3	472.0	3.49	4.00	3.25	YES	
L0003196	0	0.34550E-07	475551.4	3752218.4	472.0	3.49	4.00	3.25	YES	
L0003197	0	0.34550E-07	475560.0	3752218.4	472.0	3.49	4.00	3.25	YES	
L0003198	0	0.34550E-07	475568.6	3752218.5	472.0	3.49	4.00	3.25	YES	
L0003199	0	0.34550E-07	475577.2	3752218.5	472.0	3.49	4.00	3.25	YES	
L0003200	0	0.34550E-07	475585.8	3752218.6	472.0	3.49	4.00	3.25	YES	
L0003201	0	0.34550E-07	475594.4	3752218.6	472.0	3.49	4.00	3.25	YES	
L0003202	0	0.34550E-07	475603.0	3752218.7	472.0	3.49	4.00	3.25	YES	
L0003203	0	0.34550E-07	475611.6	3752218.7	472.0	3.49	4.00	3.25	YES	
L0003204	0	0.34550E-07	475620.2	3752218.7	472.0	3.49	4.00	3.25	YES	
L0003205	0	0.34550E-07	475628.8	3752218.8	472.0	3.49	4.00	3.25	YES	
L0003206	0	0.34550E-07	475637.3	3752218.8	472.0	3.49	4.00	3.25	YES	
L0003207	0	0.34550E-07	475645.9	3752218.9	472.0	3.49	4.00	3.25	YES	
L0003208	0	0.34550E-07	475654.5	3752218.9	472.0	3.49	4.00	3.25	YES	

L0003209	0	0.34550E-07	475663.1	3752219.0	472.0	3.49	4.00	3.25	YES
L0003210	0	0.34550E-07	475671.7	3752219.0	472.0	3.49	4.00	3.25	YES
L0003211	0	0.34550E-07	475680.3	3752219.1	472.0	3.49	4.00	3.25	YES
L0003212	0	0.34550E-07	475688.9	3752219.1	472.0	3.49	4.00	3.25	YES
L0003213	0	0.34550E-07	475697.5	3752219.2	472.0	3.49	4.00	3.25	YES
L0003214	0	0.34550E-07	475706.1	3752219.2	472.0	3.49	4.00	3.25	YES
L0003215	0	0.34550E-07	475714.7	3752219.2	472.0	3.49	4.00	3.25	YES

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0003216	0	0.34550E-07	475723.2	3752219.3	472.0	3.49	4.00	3.25	YES	
L0003217	0	0.34550E-07	475731.8	3752219.3	472.0	3.49	4.00	3.25	YES	
L0003218	0	0.34550E-07	475740.4	3752219.4	472.0	3.49	4.00	3.25	YES	
L0003219	0	0.34550E-07	475749.0	3752219.4	472.0	3.49	4.00	3.25	YES	
L0003220	0	0.34550E-07	475757.6	3752219.5	472.0	3.49	4.00	3.25	YES	
L0003221	0	0.34550E-07	475766.2	3752219.5	472.0	3.49	4.00	3.25	YES	
L0003222	0	0.34550E-07	475774.8	3752219.6	472.0	3.49	4.00	3.25	YES	
L0003223	0	0.34550E-07	475783.4	3752219.6	472.0	3.49	4.00	3.25	YES	
L0003224	0	0.34550E-07	475792.0	3752219.7	472.0	3.49	4.00	3.25	YES	
L0003225	0	0.34550E-07	475800.6	3752219.7	472.0	3.49	4.00	3.25	YES	
L0003226	0	0.34550E-07	475809.1	3752219.7	472.0	3.49	4.00	3.25	YES	
L0003227	0	0.34550E-07	475817.7	3752219.8	472.0	3.49	4.00	3.25	YES	
L0003228	0	0.34550E-07	475826.3	3752219.8	472.0	3.49	4.00	3.25	YES	
L0003229	0	0.34550E-07	475834.9	3752219.9	472.0	3.49	4.00	3.25	YES	
L0003230	0	0.34550E-07	475843.5	3752219.9	472.0	3.49	4.00	3.25	YES	
L0003231	0	0.34550E-07	475852.1	3752220.0	472.0	3.49	4.00	3.25	YES	
L0003232	0	0.34550E-07	475860.7	3752220.0	472.0	3.49	4.00	3.25	YES	
L0003233	0	0.34550E-07	475865.2	3752224.0	472.0	3.49	4.00	3.25	YES	
L0003234	0	0.34550E-07	475865.0	3752232.6	472.0	3.49	4.00	3.25	YES	
L0003235	0	0.34550E-07	475864.9	3752241.2	472.2	3.49	4.00	3.25	YES	
L0003236	0	0.34550E-07	475864.7	3752249.8	472.4	3.49	4.00	3.25	YES	
L0003237	0	0.34550E-07	475864.6	3752258.4	472.7	3.49	4.00	3.25	YES	
L0003238	0	0.34550E-07	475864.4	3752267.0	473.0	3.49	4.00	3.25	YES	
L0003239	0	0.34550E-07	475864.3	3752275.6	473.0	3.49	4.00	3.25	YES	
L0003240	0	0.34550E-07	475864.1	3752284.2	473.0	3.49	4.00	3.25	YES	
L0003241	0	0.34550E-07	475863.9	3752292.7	473.0	3.49	4.00	3.25	YES	
L0003242	0	0.34550E-07	475863.8	3752301.3	473.0	3.49	4.00	3.25	YES	
L0003243	0	0.34550E-07	475863.7	3752309.9	473.0	3.49	4.00	3.25	YES	
L0003244	0	0.34550E-07	475863.8	3752318.5	473.0	3.49	4.00	3.25	YES	
L0003245	0	0.34550E-07	475863.8	3752327.1	473.0	3.49	4.00	3.25	YES	
L0003246	0	0.34550E-07	475863.9	3752335.7	473.0	3.49	4.00	3.25	YES	
L0003247	0	0.34550E-07	475863.9	3752344.3	473.0	3.49	4.00	3.25	YES	
L0003248	0	0.34550E-07	475863.9	3752352.9	473.0	3.49	4.00	3.25	YES	
L0003249	0	0.34550E-07	475864.0	3752361.5	473.0	3.49	4.00	3.25	YES	
L0003250	0	0.34550E-07	475864.0	3752370.1	473.1	3.49	4.00	3.25	YES	
L0003251	0	0.34550E-07	475864.0	3752378.6	473.1	3.49	4.00	3.25	YES	
L0003252	0	0.34550E-07	475864.1	3752387.2	473.2	3.49	4.00	3.25	YES	
L0003253	0	0.34550E-07	475864.1	3752395.8	473.4	3.49	4.00	3.25	YES	
L0003254	0	0.34550E-07	475864.1	3752404.4	473.7	3.49	4.00	3.25	YES	
L0003255	0	0.34550E-07	475864.2	3752413.0	473.9	3.49	4.00	3.25	YES	

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0003256	0	0.34550E-07	475864.2	3752421.6	474.0	3.49	4.00	3.25	YES	
L0003257	0	0.34550E-07	475864.2	3752430.2	474.0	3.49	4.00	3.25	YES	
L0003258	0	0.34550E-07	475864.3	3752438.8	474.0	3.49	4.00	3.25	YES	
L0003259	0	0.34550E-07	475864.3	3752447.4	474.0	3.49	4.00	3.25	YES	
L0003260	0	0.34550E-07	475864.4	3752456.0	474.0	3.49	4.00	3.25	YES	
L0003261	0	0.34550E-07	475864.4	3752464.5	474.0	3.49	4.00	3.25	YES	
L0003262	0	0.34550E-07	475864.4	3752473.1	474.0	3.49	4.00	3.25	YES	
L0003263	0	0.34550E-07	475864.5	3752481.7	474.0	3.49	4.00	3.25	YES	
L0003264	0	0.34550E-07	475864.5	3752490.3	474.0	3.49	4.00	3.25	YES	
L0003265	0	0.34550E-07	475864.5	3752498.9	474.0	3.49	4.00	3.25	YES	
L0003266	0	0.34550E-07	475864.6	3752507.5	474.0	3.49	4.00	3.25	YES	
L0003267	0	0.34550E-07	475864.6	3752516.1	474.3	3.49	4.00	3.25	YES	
L0003268	0	0.34550E-07	475864.6	3752524.7	474.6	3.49	4.00	3.25	YES	
L0003269	0	0.34550E-07	475864.7	3752533.3	474.9	3.49	4.00	3.25	YES	
L0003270	0	0.34550E-07	475864.7	3752541.9	475.0	3.49	4.00	3.25	YES	
L0003271	0	0.34550E-07	475864.7	3752550.4	475.0	3.49	4.00	3.25	YES	
L0003272	0	0.34550E-07	475864.8	3752559.0	475.0	3.49	4.00	3.25	YES	
L0003273	0	0.34550E-07	475864.8	3752567.6	475.0	3.49	4.00	3.25	YES	
L0003274	0	0.34550E-07	475864.8	3752576.2	475.0	3.49	4.00	3.25	YES	
L0003275	0	0.34550E-07	475864.9	3752584.8	475.0	3.49	4.00	3.25	YES	
L0003276	0	0.34550E-07	475864.9	3752593.4	475.0	3.49	4.00	3.25	YES	
L0003277	0	0.34550E-07	475865.0	3752602.0	475.0	3.49	4.00	3.25	YES	
L0003278	0	0.34550E-07	475866.9	3752608.6	475.0	3.49	4.00	3.25	YES	
L0003279	0	0.34550E-07	475875.5	3752608.6	475.0	3.49	4.00	3.25	YES	
L0003280	0	0.34550E-07	475884.1	3752608.5	475.0	3.49	4.00	3.25	YES	
L0003281	0	0.34550E-07	475892.7	3752608.5	475.0	3.49	4.00	3.25	YES	
L0003282	0	0.34550E-07	475901.3	3752608.5	475.0	3.49	4.00	3.25	YES	
L0003283	0	0.34550E-07	475909.9	3752608.4	475.0	3.49	4.00	3.25	YES	
L0003284	0	0.34550E-07	475918.5	3752608.4	475.0	3.49	4.00	3.25	YES	
L0003285	0	0.34550E-07	475927.1	3752608.4	475.0	3.49	4.00	3.25	YES	
L0003286	0	0.34550E-07	475935.7	3752608.3	475.0	3.49	4.00	3.25	YES	
L0003287	0	0.34550E-07	475944.2	3752608.3	475.0	3.49	4.00	3.25	YES	
L0003288	0	0.34550E-07	475952.8	3752608.2	475.0	3.49	4.00	3.25	YES	
L0003289	0	0.34550E-07	475961.4	3752608.2	475.0	3.49	4.00	3.25	YES	
L0003290	0	0.34550E-07	475970.0	3752608.2	475.1	3.49	4.00	3.25	YES	
L0003291	0	0.34550E-07	475978.6	3752608.1	475.2	3.49	4.00	3.25	YES	
L0003292	0	0.34550E-07	475987.2	3752608.1	475.4	3.49	4.00	3.25	YES	
L0003293	0	0.34550E-07	475995.8	3752608.1	475.4	3.49	4.00	3.25	YES	
L0003294	0	0.34550E-07	476004.4	3752608.0	475.4	3.49	4.00	3.25	YES	
L0003295	0	0.34550E-07	476013.0	3752608.0	475.4	3.49	4.00	3.25	YES	

*** VOLUME SOURCE DATA ***

SOURCE	NUMBER PART.	EMISSION RATE (GRAMS/SEC)	X	Y	BASE ELEV.	RELEASE HEIGHT	INIT. SY	INIT. SZ	URBAN SOURCE	EMISSION RATE SCALAR VARY

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SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0003296	0	0.34550E-07	476021.6	3752608.0	475.4	3.49	4.00	3.25	YES	
L0003297	0	0.34550E-07	476030.1	3752607.9	475.2	3.49	4.00	3.25	YES	
L0003298	0	0.34550E-07	476038.7	3752607.9	475.1	3.49	4.00	3.25	YES	
L0003367	0	0.77160E-08	476031.7	3752615.9	475.4	3.49	4.00	3.25	YES	
L0003368	0	0.77160E-08	476023.1	3752616.0	475.6	3.49	4.00	3.25	YES	
L0003369	0	0.77160E-08	476014.6	3752616.1	475.7	3.49	4.00	3.25	YES	
L0003370	0	0.77160E-08	476006.0	3752616.2	475.7	3.49	4.00	3.25	YES	
L0003371	0	0.77160E-08	475997.4	3752616.2	475.7	3.49	4.00	3.25	YES	
L0003372	0	0.77160E-08	475988.8	3752616.3	475.6	3.49	4.00	3.25	YES	
L0003373	0	0.77160E-08	475980.2	3752616.4	475.4	3.49	4.00	3.25	YES	
L0003374	0	0.77160E-08	475971.6	3752616.5	475.3	3.49	4.00	3.25	YES	
L0003375	0	0.77160E-08	475963.0	3752616.6	475.1	3.49	4.00	3.25	YES	
L0003376	0	0.77160E-08	475954.4	3752616.6	475.0	3.49	4.00	3.25	YES	
L0003377	0	0.77160E-08	475945.8	3752616.7	475.0	3.49	4.00	3.25	YES	
L0003378	0	0.77160E-08	475937.2	3752616.8	475.0	3.49	4.00	3.25	YES	
L0003379	0	0.77160E-08	475928.7	3752616.9	475.0	3.49	4.00	3.25	YES	
L0003380	0	0.77160E-08	475920.1	3752616.9	475.0	3.49	4.00	3.25	YES	
L0003381	0	0.77160E-08	475911.5	3752617.0	475.0	3.49	4.00	3.25	YES	
L0003382	0	0.77160E-08	475902.9	3752617.1	475.0	3.49	4.00	3.25	YES	
L0003383	0	0.77160E-08	475894.3	3752617.2	475.0	3.49	4.00	3.25	YES	
L0003384	0	0.77160E-08	475885.7	3752617.3	475.0	3.49	4.00	3.25	YES	
L0003385	0	0.77160E-08	475877.1	3752617.3	475.0	3.49	4.00	3.25	YES	
L0003386	0	0.77160E-08	475868.5	3752617.4	475.0	3.49	4.00	3.25	YES	
L0003387	0	0.77160E-08	475864.1	3752621.5	475.0	3.49	4.00	3.25	YES	
L0003388	0	0.77160E-08	475864.1	3752630.1	475.0	3.49	4.00	3.25	YES	
L0003389	0	0.77160E-08	475864.2	3752638.7	475.0	3.49	4.00	3.25	YES	
L0003390	0	0.77160E-08	475864.2	3752647.3	475.0	3.49	4.00	3.25	YES	
L0003391	0	0.77160E-08	475864.3	3752655.9	475.0	3.49	4.00	3.25	YES	
L0003392	0	0.77160E-08	475864.4	3752664.5	475.3	3.49	4.00	3.25	YES	
L0003393	0	0.77160E-08	475864.4	3752673.1	475.6	3.49	4.00	3.25	YES	
L0003394	0	0.77160E-08	475864.5	3752681.7	475.8	3.49	4.00	3.25	YES	
L0003395	0	0.77160E-08	475864.6	3752690.3	476.0	3.49	4.00	3.25	YES	
L0003396	0	0.77160E-08	475864.6	3752698.8	476.0	3.49	4.00	3.25	YES	
L0003397	0	0.77160E-08	475864.7	3752707.4	476.0	3.49	4.00	3.25	YES	
L0003398	0	0.77160E-08	475864.7	3752716.0	476.0	3.49	4.00	3.25	YES	
L0003399	0	0.77160E-08	475864.8	3752724.6	476.0	3.49	4.00	3.25	YES	
L0003400	0	0.77160E-08	475864.9	3752733.2	476.0	3.49	4.00	3.25	YES	
L0003401	0	0.77160E-08	475864.9	3752741.8	476.0	3.49	4.00	3.25	YES	
L0003402	0	0.77160E-08	475865.0	3752750.4	476.0	3.49	4.00	3.25	YES	
L0003403	0	0.77160E-08	475865.0	3752759.0	476.0	3.49	4.00	3.25	YES	

♀ *** AERMOD - VERSION 16216r *** *** C:\LAKES\AERMOD VIEW\11411 HRA\11411 HRA.ISC *** ***
05/24/18
*** AERMET - VERSION 16216 *** *** ***
17:41:25

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*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0003404	0	0.77160E-08	475865.1	3752767.6	476.0	3.49	4.00	3.25	YES	
L0003405	0	0.77160E-08	475865.2	3752776.2	476.0	3.49	4.00	3.25	YES	
L0003406	0	0.77160E-08	475865.2	3752784.7	476.0	3.49	4.00	3.25	YES	
L0003407	0	0.77160E-08	475865.3	3752793.3	476.0	3.49	4.00	3.25	YES	
L0003408	0	0.77160E-08	475865.3	3752801.9	476.0	3.49	4.00	3.25	YES	
L0003409	0	0.77160E-08	475865.4	3752810.5	476.1	3.49	4.00	3.25	YES	

L0003410	0	0.77160E-08	475865.4	3752819.1	476.4	3.49	4.00	3.25	YES
L0003411	0	0.77160E-08	475865.4	3752827.7	476.7	3.49	4.00	3.25	YES
L0003412	0	0.77160E-08	475865.4	3752836.3	477.0	3.49	4.00	3.25	YES
L0003413	0	0.77160E-08	475865.4	3752844.9	477.0	3.49	4.00	3.25	YES
L0003414	0	0.77160E-08	475865.4	3752853.5	477.0	3.49	4.00	3.25	YES
L0003415	0	0.77160E-08	475865.4	3752862.1	477.0	3.49	4.00	3.25	YES
L0003416	0	0.77160E-08	475865.4	3752870.6	477.0	3.49	4.00	3.25	YES
L0003417	0	0.77160E-08	475865.4	3752879.2	477.0	3.49	4.00	3.25	YES
L0003418	0	0.77160E-08	475865.4	3752887.8	477.0	3.49	4.00	3.25	YES
L0003419	0	0.77160E-08	475865.4	3752896.4	477.0	3.49	4.00	3.25	YES
L0003420	0	0.77160E-08	475865.4	3752905.0	477.2	3.49	4.00	3.25	YES
L0003421	0	0.77160E-08	475865.6	3752913.6	477.5	3.49	4.00	3.25	YES
L0003422	0	0.77160E-08	475865.8	3752922.2	477.7	3.49	4.00	3.25	YES
L0003423	0	0.77160E-08	475866.0	3752930.8	477.9	3.49	4.00	3.25	YES
L0003424	0	0.77160E-08	475866.2	3752939.4	477.9	3.49	4.00	3.25	YES
L0003425	0	0.77160E-08	475866.4	3752947.9	478.0	3.49	4.00	3.25	YES
L0003426	0	0.77160E-08	475866.6	3752956.5	478.0	3.49	4.00	3.25	YES
L0003427	0	0.77160E-08	475866.8	3752965.1	478.0	3.49	4.00	3.25	YES
L0003428	0	0.77160E-08	475867.0	3752973.7	478.0	3.49	4.00	3.25	YES
L0003429	0	0.77160E-08	475867.2	3752982.3	478.0	3.49	4.00	3.25	YES
L0003430	0	0.77160E-08	475867.4	3752990.9	478.0	3.49	4.00	3.25	YES
L0003431	0	0.77160E-08	475867.6	3752999.5	478.0	3.49	4.00	3.25	YES
L0003432	0	0.77160E-08	475867.8	3753008.1	478.0	3.49	4.00	3.25	YES
L0003433	0	0.77160E-08	475868.0	3753016.6	478.0	3.49	4.00	3.25	YES
L0003434	0	0.77160E-08	475868.2	3753025.2	478.0	3.49	4.00	3.25	YES
L0003480	0	0.38180E-07	475865.2	3752796.1	476.0	3.49	4.00	3.25	YES
L0003481	0	0.38180E-07	475865.3	3752804.7	476.0	3.49	4.00	3.25	YES
L0003482	0	0.38180E-07	475865.4	3752813.3	476.2	3.49	4.00	3.25	YES
L0003483	0	0.38180E-07	475865.5	3752821.9	476.5	3.49	4.00	3.25	YES
L0003484	0	0.38180E-07	475865.6	3752830.5	476.8	3.49	4.00	3.25	YES
L0003485	0	0.38180E-07	475865.8	3752839.1	477.0	3.49	4.00	3.25	YES
L0003486	0	0.38180E-07	475865.9	3752847.7	477.0	3.49	4.00	3.25	YES
L0003487	0	0.38180E-07	475866.0	3752856.3	477.0	3.49	4.00	3.25	YES
L0003488	0	0.38180E-07	475866.1	3752864.9	477.0	3.49	4.00	3.25	YES

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0003489	0	0.38180E-07	475866.2	3752873.5	477.0	3.49	4.00	3.25	YES	
L0003490	0	0.38180E-07	475866.3	3752882.0	477.0	3.49	4.00	3.25	YES	
L0003491	0	0.38180E-07	475866.4	3752890.6	477.0	3.49	4.00	3.25	YES	
L0003492	0	0.38180E-07	475866.5	3752899.2	477.1	3.49	4.00	3.25	YES	
L0003493	0	0.38180E-07	475866.6	3752907.8	477.3	3.49	4.00	3.25	YES	
L0003494	0	0.38180E-07	475866.7	3752916.4	477.6	3.49	4.00	3.25	YES	
L0003495	0	0.38180E-07	475866.8	3752925.0	477.9	3.49	4.00	3.25	YES	
L0003496	0	0.38180E-07	475866.9	3752933.6	477.9	3.49	4.00	3.25	YES	
L0003497	0	0.38180E-07	475867.0	3752942.2	478.0	3.49	4.00	3.25	YES	
L0003498	0	0.38180E-07	475867.1	3752950.8	478.0	3.49	4.00	3.25	YES	
L0003499	0	0.38180E-07	475867.2	3752959.3	478.0	3.49	4.00	3.25	YES	
L0003500	0	0.38180E-07	475867.3	3752967.9	478.0	3.49	4.00	3.25	YES	
L0003501	0	0.38180E-07	475867.4	3752976.5	478.0	3.49	4.00	3.25	YES	
L0003502	0	0.38180E-07	475867.5	3752985.1	478.0	3.49	4.00	3.25	YES	
L0003503	0	0.38180E-07	475867.6	3752993.7	478.0	3.49	4.00	3.25	YES	
L0003504	0	0.38180E-07	475867.7	3753002.3	478.0	3.49	4.00	3.25	YES	

L0003505	0	0.38180E-07	475867.8	3753010.9	478.0	3.49	4.00	3.25	YES
L0003506	0	0.38180E-07	475861.7	3753013.2	478.0	3.49	4.00	3.25	YES
L0003507	0	0.38180E-07	475853.1	3753013.1	478.0	3.49	4.00	3.25	YES
L0003508	0	0.38180E-07	475844.5	3753013.0	478.0	3.49	4.00	3.25	YES
L0003509	0	0.38180E-07	475835.9	3753012.8	478.0	3.49	4.00	3.25	YES
L0003510	0	0.38180E-07	475827.3	3753012.7	478.0	3.49	4.00	3.25	YES
L0003511	0	0.38180E-07	475818.8	3753012.6	478.0	3.49	4.00	3.25	YES
L0003512	0	0.38180E-07	475810.2	3753012.4	478.0	3.49	4.00	3.25	YES
L0003513	0	0.38180E-07	475801.6	3753012.3	478.0	3.49	4.00	3.25	YES
L0003514	0	0.38180E-07	475793.0	3753012.2	478.0	3.49	4.00	3.25	YES
L0003515	0	0.38180E-07	475784.4	3753012.1	478.0	3.49	4.00	3.25	YES
L0003516	0	0.38180E-07	475775.8	3753011.9	478.0	3.49	4.00	3.25	YES
L0003517	0	0.38180E-07	475767.2	3753011.8	478.0	3.49	4.00	3.25	YES
L0003518	0	0.38180E-07	475758.6	3753011.7	478.0	3.49	4.00	3.25	YES
L0003519	0	0.38180E-07	475750.0	3753011.5	478.0	3.49	4.00	3.25	YES
L0003520	0	0.38180E-07	475741.5	3753011.4	478.0	3.49	4.00	3.25	YES
L0003521	0	0.38180E-07	475732.9	3753011.3	478.0	3.49	4.00	3.25	YES
L0003522	0	0.38180E-07	475724.3	3753011.2	478.0	3.49	4.00	3.25	YES
L0003523	0	0.38180E-07	475715.7	3753011.0	478.0	3.49	4.00	3.25	YES
L0003524	0	0.38180E-07	475707.1	3753010.9	478.0	3.49	4.00	3.25	YES

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs
ALL	L0002467 , L0002468 , L0002469 , L0002470 , L0002471 , L0002472 , L0002473 , L0002474 ,
	L0002475 , L0002476 , L0002477 , L0002478 , L0002479 , L0002480 , L0002481 , L0002482 ,
	L0002483 , L0002484 , L0002485 , L0002486 , L0002487 , L0002488 , L0002489 , L0002490 ,
	L0002491 , L0002492 , L0002493 , L0002494 , L0002495 , L0002496 , L0002497 , L0002498 ,
	L0002499 , L0002500 , L0002501 , L0002502 , L0002503 , L0002504 , L0002505 , L0002506 ,
	L0002507 , L0002508 , L0002509 , L0002510 , L0002511 , L0002512 , L0002513 , L0002514 ,
	L0002515 , L0002516 , L0002517 , L0002518 , L0002519 , L0002520 , L0002592 , L0002593 ,
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	L0002602 , L0002603 , L0002604 , L0002605 , L0002606 , L0002607 , L0002608 , L0002609 ,
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L0002761 , L0002762 , L0002763 , L0002764 , L0002765 , L0002766 , L0002767 , L0002768 ,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs

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L0002777 , L0002778 , L0002779 , L0002780 , L0002781 , L0002782 , L0002783 , L0002784 ,

L0002785 , L0002786 , L0002787 , L0002788 , L0002789 , L0002790 , L0002791 , L0002792 ,

L0002793 , L0002794 , L0002795 , L0002796 , L0002797 , L0002798 , L0002799 , L0002800 ,

L0002801 , L0002802 , L0002803 , L0002804 , L0002929 , L0002930 , L0002931 , L0002932 ,

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L0003013 , L0003014 , L0003015 , L0003016 , L0003017 , L0003018 , L0003019 , L0003020 ,

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L0003045 , L0003046 , L0003047 , L0003048 , L0003049 , L0003050 , L0003051 , L0003052 ,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs

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L0003184 , L0003185 , L0003186 , L0003187 , L0003188 , L0003189 , L0003190 , L0003191 ,

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L0003396 , L0003397 , L0003398 , L0003399 , L0003400 , L0003401 , L0003402 , L0003403 ,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs

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L0003420 , L0003421 , L0003422 , L0003423 , L0003424 , L0003425 , L0003426 , L0003427 ,

L0003428 , L0003429 , L0003430 , L0003431 , L0003432 , L0003433 , L0003434 , L0003480 ,

L0003481 , L0003482 , L0003483 , L0003484 , L0003485 , L0003486 , L0003487 , L0003488 ,

L0003489 , L0003490 , L0003491 , L0003492 , L0003493 , L0003494 , L0003495 , L0003496 ,

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L0003513 , L0003514 , L0003515 , L0003516 , L0003517 , L0003518 , L0003519 , L0003520 ,

L0003521 , L0003522 , L0003523 , L0003524 ,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

URBAN ID	URBAN POP	SOURCE IDs
	2189641.	L0002467 , L0002468 , L0002469 , L0002470 , L0002471 , L0002472 , L0002473 , L0002474 ,
		L0002475 , L0002476 , L0002477 , L0002478 , L0002479 , L0002480 , L0002481 , L0002482 ,
		L0002483 , L0002484 , L0002485 , L0002486 , L0002487 , L0002488 , L0002489 , L0002490 ,
		L0002491 , L0002492 , L0002493 , L0002494 , L0002495 , L0002496 , L0002497 , L0002498 ,
		L0002499 , L0002500 , L0002501 , L0002502 , L0002503 , L0002504 , L0002505 , L0002506 ,
		L0002507 , L0002508 , L0002509 , L0002510 , L0002511 , L0002512 , L0002513 , L0002514 ,
		L0002515 , L0002516 , L0002517 , L0002518 , L0002519 , L0002520 , L0002592 , L0002593 ,
		L0002594 , L0002595 , L0002596 , L0002597 , L0002598 , L0002599 , L0002600 , L0002601 ,
		L0002602 , L0002603 , L0002604 , L0002605 , L0002606 , L0002607 , L0002608 , L0002609 ,
		L0002610 , L0002611 , L0002612 , L0002613 , L0002614 , L0002615 , L0002616 , L0002617 ,
		L0002618 , L0002619 , L0002620 , L0002621 , L0002622 , L0002623 , L0002624 , L0002625 ,
		L0002626 , L0002627 , L0002628 , L0002629 , L0002630 , L0002631 , L0002632 ,

L0002633 ,

L0002634 , L0002635 , L0002636 , L0002637 , L0002638 , L0002639 , L0002640 , L0002641 ,

L0002642 , L0002643 , L0002644 , L0002645 , L0002646 , L0002647 , L0002648 , L0002649 ,

L0002650 , L0002651 , L0002652 , L0002653 , L0002654 , L0002655 , L0002656 , L0002657 ,

L0002658 , L0002659 , L0002660 , L0002661 , L0002662 , L0002734 , L0002735 , L0002736 ,

L0002737 , L0002738 , L0002739 , L0002740 , L0002741 , L0002742 , L0002743 , L0002744 ,

L0002745 , L0002746 , L0002747 , L0002748 , L0002749 , L0002750 , L0002751 , L0002752 ,

L0002753 , L0002754 , L0002755 , L0002756 , L0002757 , L0002758 , L0002759 , L0002760 ,

L0002761 , L0002762 , L0002763 , L0002764 , L0002765 , L0002766 , L0002767 , L0002768 ,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

URBAN ID	URBAN POP	SOURCE IDs

L0002769 , L0002770 , L0002771 , L0002772 , L0002773 , L0002774 , L0002775 , L0002776 ,

L0002777 , L0002778 , L0002779 , L0002780 , L0002781 , L0002782 , L0002783 , L0002784 ,

L0002785 , L0002786 , L0002787 , L0002788 , L0002789 , L0002790 , L0002791 , L0002792 ,

L0002793 , L0002794 , L0002795 , L0002796 , L0002797 , L0002798 , L0002799 , L0002800 ,

L0002801 , L0002802 , L0002803 , L0002804 , L0002929 , L0002930 , L0002931 , L0002932 ,

L0002933 , L0002934 , L0002935 , L0002936 , L0002937 , L0002938 , L0002939 , L0002940 ,

L0002941 , L0002942 , L0002943 , L0002944 , L0002945 , L0002946 , L0002947 , L0002948 ,

L0002949 , L0002950 , L0002951 , L0002952 , L0002953 , L0002954 , L0002955 , L0002956 ,

L0002957 , L0002958 , L0002959 , L0002960 , L0002961 , L0002962 , L0002963 , L0002964 ,

L0002965 , L0002966 , L0002967 , L0002968 , L0002969 , L0002970 , L0002971 , L0002972 ,

L0002973 , L0002974 , L0002975 , L0002976 , L0002977 , L0002978 , L0002979 , L0002980 ,

L0002981 , L0002982 , L0002983 , L0002984 , L0002985 , L0002986 , L0002987 , L0002988 ,

L0002989 , L0002990 , L0002991 , L0002992 , L0002993 , L0002994 , L0002995 , L0002996 ,

L0002997 , L0002998 , L0002999 , L0003000 , L0003001 , L0003002 , L0003003 , L0003004 ,

L0003005 , L0003006 , L0003007 , L0003008 , L0003009 , L0003010 , L0003011 , L0003012 ,

L0003013 , L0003014 , L0003015 , L0003016 , L0003017 , L0003018 , L0003019 , L0003020 ,

L0003021 , L0003022 , L0003023 , L0003024 , L0003025 , L0003026 , L0003027 , L0003028 ,

L0003029 , L0003030 , L0003031 , L0003032 , L0003033 , L0003034 , L0003035 , L0003036 ,

L0003037 , L0003038 , L0003039 , L0003040 , L0003041 , L0003042 , L0003043 , L0003044 ,

L0003045 , L0003046 , L0003047 , L0003048 , L0003049 , L0003050 , L0003051 , L0003052 ,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

URBAN ID	URBAN POP	SOURCE IDs

L0003176 , L0003177 , L0003178 , L0003179 , L0003180 , L0003181 , L0003182 , L0003183 ,

L0003184 , L0003185 , L0003186 , L0003187 , L0003188 , L0003189 , L0003190 , L0003191 ,

L0003192 , L0003193 , L0003194 , L0003195 , L0003196 , L0003197 , L0003198 , L0003199 ,

L0003200 , L0003201 , L0003202 , L0003203 , L0003204 , L0003205 , L0003206 , L0003207 ,

L0003208 , L0003209 , L0003210 , L0003211 , L0003212 , L0003213 , L0003214 , L0003215 ,

L0003216 , L0003217 , L0003218 , L0003219 , L0003220 , L0003221 , L0003222 , L0003223 ,

L0003224 , L0003225 , L0003226 , L0003227 , L0003228 , L0003229 , L0003230 , L0003231 ,

L0003232 , L0003233 , L0003234 , L0003235 , L0003236 , L0003237 , L0003238 ,
L0003239 ,

L0003240 , L0003241 , L0003242 , L0003243 , L0003244 , L0003245 , L0003246 ,
L0003247 ,

L0003248 , L0003249 , L0003250 , L0003251 , L0003252 , L0003253 , L0003254 ,
L0003255 ,

L0003256 , L0003257 , L0003258 , L0003259 , L0003260 , L0003261 , L0003262 ,
L0003263 ,

L0003264 , L0003265 , L0003266 , L0003267 , L0003268 , L0003269 , L0003270 ,
L0003271 ,

L0003272 , L0003273 , L0003274 , L0003275 , L0003276 , L0003277 , L0003278 ,
L0003279 ,

L0003280 , L0003281 , L0003282 , L0003283 , L0003284 , L0003285 , L0003286 ,
L0003287 ,

L0003288 , L0003289 , L0003290 , L0003291 , L0003292 , L0003293 , L0003294 ,
L0003295 ,

L0003296 , L0003297 , L0003298 , L0003367 , L0003368 , L0003369 , L0003370 ,
L0003371 ,

L0003372 , L0003373 , L0003374 , L0003375 , L0003376 , L0003377 , L0003378 ,
L0003379 ,

L0003380 , L0003381 , L0003382 , L0003383 , L0003384 , L0003385 , L0003386 ,
L0003387 ,

L0003388 , L0003389 , L0003390 , L0003391 , L0003392 , L0003393 , L0003394 ,
L0003395 ,

L0003396 , L0003397 , L0003398 , L0003399 , L0003400 , L0003401 , L0003402 ,
L0003403 ,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

URBAN ID	URBAN POP	SOURCE IDs

L0003404 , L0003405 , L0003406 , L0003407 , L0003408 , L0003409 , L0003410 ,
L0003411 ,

L0003412 , L0003413 , L0003414 , L0003415 , L0003416 , L0003417 , L0003418 ,
L0003419 ,

L0003420 , L0003421 , L0003422 , L0003423 , L0003424 , L0003425 , L0003426 ,
L0003427 ,

L0003428 , L0003429 , L0003430 , L0003431 , L0003432 , L0003433 , L0003434 ,
L0003480 ,

L0003481 , L0003482 , L0003483 , L0003484 , L0003485 , L0003486 , L0003487 ,

```
L0003488    ,

             L0003489    , L0003490    , L0003491    , L0003492    , L0003493    , L0003494    , L0003495    ,
L0003496    ,

             L0003497    , L0003498    , L0003499    , L0003500    , L0003501    , L0003502    , L0003503    ,
L0003504    ,

             L0003505    , L0003506    , L0003507    , L0003508    , L0003509    , L0003510    , L0003511    ,
L0003512    ,

             L0003513    , L0003514    , L0003515    , L0003516    , L0003517    , L0003518    , L0003519    ,
L0003520    ,

             L0003521    , L0003522    , L0003523    , L0003524    ,
```


*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

```
     ( 475305.7, 3752441.1,     473.2,     473.2,       0.0);        ( 475356.1, 3755568.4,     505.1,     939.0,
     0.0);
     ( 472704.4, 3752072.6,     493.2,     498.0,       0.0);        ( 478401.9, 3751276.6,     467.0,     467.0,
     0.0);
     ( 476088.3, 3752782.9,     476.2,     476.2,       0.0);        ( 476088.5, 3752715.6,     476.0,     476.0,
     0.0);
     ( 476090.2, 3752663.4,     475.7,     475.7,       0.0);        ( 475836.1, 3752721.8,     476.0,     476.0,
     0.0);
     ( 475836.3, 3752756.5,     476.0,     476.0,       0.0);        ( 475837.4, 3752781.2,     476.0,     476.0,
     0.0);
     ( 475825.6, 3752658.5,     475.5,     475.5,       0.0);        ( 475826.0, 3752628.4,     475.0,     475.0,
     0.0);
     ( 475824.7, 3752587.6,     475.0,     475.0,       0.0);        ( 475823.0, 3752553.9,     475.0,     475.0,
     0.0);
     ( 475918.1, 3752573.2,     475.0,     475.0,       0.0);        ( 476100.4, 3752546.0,     475.2,     475.2,
     0.0);
     ( 476093.3, 3753061.7,     479.0,     479.0,       0.0);        ( 476122.1, 3753059.0,     479.0,     479.0,
     0.0);
     ( 476280.5, 3753038.2,     479.0,     479.0,       0.0);        ( 476165.7, 3753060.1,     479.0,     479.0,
     0.0);
     ( 476193.3, 3753059.5,     479.0,     479.0,       0.0);        ( 475733.9, 3753078.7,     478.0,     478.0,
     0.0);
     ( 475830.6, 3753074.3,     478.0,     478.0,       0.0);        ( 475821.9, 3753036.2,     478.0,     478.0,
     0.0);
     ( 476365.6, 3753041.8,     478.8,     478.8,       0.0);
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1
1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1
```

11411 HRA

```
1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1
1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1
1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1
1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1
1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1
1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

```
♀ *** AERMOD - VERSION 16216r ***   *** C:\LAKES\AERMOD VIEW\11411 HRA\11411 HRA.ISC                          ***
    05/24/18
 *** AERMET - VERSION  16216 ***   ***                                                                      ***
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   PAGE  26
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

                                *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

   Surface file:   PERRISADJU\PERI_V9_ADJU\PERI_V9.SFC                                          Met Version:
16216
   Profile file:   PERRISADJU\PERI_V9_ADJU\PERI_V9.PFL
   Surface format: FREE

   Profile format: FREE

   Surface station no.:     3171                 Upper air station no.:     3190
                  Name: UNKNOWN                                Name: UNKNOWN
                  Year:   2010                                 Year:   2010

 First 24 hours of scalar data
 YR MO DY JDY HR     H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN ALBEDO  REF WS   WD     HT  REF TA
  HT
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -
 10 01 01   1 01   -7.9  0.125 -9.000 -9.000 -999.  106.     21.2  0.19   0.61   1.00    1.30  335.    9.1  282.5
 5.5
 10 01 01   1 02   -3.9  0.088 -9.000 -9.000 -999.   62.     15.1  0.19   0.61   1.00    0.90  142.    9.1  280.9
 5.5
 10 01 01   1 03   -3.9  0.088 -9.000 -9.000 -999.   62.     15.1  0.19   0.61   1.00    0.90  324.    9.1  280.4
 5.5
 10 01 01   1 04   -1.3  0.064 -9.000 -9.000 -999.   39.     18.3  0.19   0.61   1.00    0.40  294.    9.1  278.8
 5.5
 10 01 01   1 05   -3.9  0.088 -9.000 -9.000 -999.   62.     15.0  0.19   0.61   1.00    0.90  205.    9.1  278.1
 5.5
 10 01 01   1 06   -1.3  0.065 -9.000 -9.000 -999.   39.     18.3  0.19   0.61   1.00    0.40    3.    9.1  277.0
 5.5
 10 01 01   1 07   -8.0  0.125 -9.000 -9.000 -999.  106.     21.0  0.19   0.61   1.00    1.30   99.    9.1  277.0
 5.5
 10 01 01   1 08   -3.3  0.086 -9.000 -9.000 -999.   61.     16.8  0.19   0.61   0.54    0.90  319.    9.1  278.8
 5.5
 10 01 01   1 09   20.1  0.128  0.307  0.010   49.  110.     -9.0  0.19   0.61   0.33    0.90  239.    9.1  284.2
 5.5
 10 01 01   1 10   56.7  0.087  0.560  0.010  107.   62.     -1.0  0.19   0.61   0.26    0.40  188.    9.1  289.2
```

```
 5.5
 10 01 01   1 11   81.5  0.323  0.867  0.008  277.  441.    -35.9  0.19   0.61   0.23    2.70  310.    9.1  290.9
 5.5
 10 01 01   1 12   97.1  0.281  1.058  0.008  421.  357.    -19.7  0.19   0.61   0.22    2.20  357.    9.1  293.1
 5.5
 10 01 01   1 13   92.2  0.279  1.117  0.008  523.  354.    -20.4  0.19   0.61   0.22    2.20  356.    9.1  293.8
 5.5
 10 01 01   1 14   77.6  0.275  1.102  0.008  595.  347.    -23.2  0.19   0.61   0.23    2.20   50.    9.1  294.2
 5.5
 10 01 01   1 15   54.9  0.230  1.006  0.008  640.  266.    -19.2  0.19   0.61   0.27    1.80   53.    9.1  293.8
 5.5
 10 01 01   1 16   12.3  0.206  0.613  0.008  648.  225.    -61.5  0.19   0.61   0.36    1.80   11.    9.1  292.5
 5.5
 10 01 01   1 17   -3.6  0.087 -9.000 -9.000 -999.   71.     15.6  0.19   0.61   0.64    0.90  351.    9.1  290.4
 5.5
 10 01 01   1 18   -3.8  0.087 -9.000 -9.000 -999.   62.     15.2  0.19   0.61   1.00    0.90  186.    9.1  287.5
 5.5
 10 01 01   1 19   -3.8  0.087 -9.000 -9.000 -999.   62.     15.2  0.19   0.61   1.00    0.90  275.    9.1  285.9
 5.5
 10 01 01   1 20   -1.2  0.064 -9.000 -9.000 -999.   39.     18.1  0.19   0.61   1.00    0.40  181.    9.1  285.4
 5.5
 10 01 01   1 21   -7.8  0.125 -9.000 -9.000 -999.  106.     21.3  0.19   0.61   1.00    1.30  318.    9.1  284.9
 5.5
 10 01 01   1 22   -3.8  0.088 -9.000 -9.000 -999.   62.     15.1  0.19   0.61   1.00    0.90  196.    9.1  283.1
 5.5
 10 01 01   1 23   -3.8  0.088 -9.000 -9.000 -999.   62.     15.1  0.19   0.61   1.00    0.90  330.    9.1  281.4
 5.5
 10 01 01   1 24   -7.9  0.125 -9.000 -9.000 -999.  106.     21.2  0.19   0.61   1.00    1.30  332.    9.1  280.9
 5.5


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 10 01 01 01    5.5 0 -999.  -99.00   282.6   99.0  -99.00  -99.00
 10 01 01 01    9.1 1  335.    1.30  -999.0   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
♀ *** AERMOD - VERSION 16216r ***   *** C:\LAKES\AERMOD VIEW\11411 HRA\11411 HRA.ISC                        ***
    05/24/18
 *** AERMET - VERSION  16216 ***   ***                                                                    ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5 YEARS FOR SOURCE GROUP: ALL
 ***
                                  INCLUDING SOURCE(S):     L0002467    , L0002468    , L0002469    , L0002470    ,
L0002471    ,
                L0002472    , L0002473    , L0002474    , L0002475    , L0002476    , L0002477    , L0002478    ,
L0002479    ,
                L0002480    , L0002481    , L0002482    , L0002483    , L0002484    , L0002485    , L0002486    ,
L0002487    ,
                L0002488    , L0002489    , L0002490    , L0002491    , L0002492    , L0002493    , L0002494    ,
. . .       ,

                                          *** DISCRETE CARTESIAN RECEPTOR POINTS ***

                                    ** CONC OF DPM      IN MICROGRAMS/M**3                          **

       X-COORD (M)   Y-COORD (M)        CONC                      X-COORD (M)   Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - -
        475305.71    3752441.09        0.00013                     475356.07    3755568.45        0.00002

        472704.43    3752072.64        0.00001                     478401.87    3751276.61        0.00001
```

476088.27	3752782.86	0.00303	476088.54	3752715.57	0.00336
476090.16	3752663.36	0.00275	475836.07	3752721.76	0.00134
475836.34	3752756.49	0.00147	475837.41	3752781.25	0.00161
475825.57	3752658.51	0.00106	475826.02	3752628.39	0.00103
475824.70	3752587.62	0.00097	475822.95	3752553.87	0.00089
475918.06	3752573.16	0.00135	476100.40	3752545.98	0.00113
476093.34	3753061.72	0.00040	476122.11	3753058.98	0.00038
476280.46	3753038.16	0.00027	476165.67	3753060.08	0.00034
476193.34	3753059.53	0.00032	475733.93	3753078.66	0.00035
475830.56	3753074.34	0.00046	475821.92	3753036.24	0.00073
476365.61	3753041.78	0.00021			

♀ *** AERMOD - VERSION 16216r *** *** C:\LAKES\AERMOD VIEW\11411 HRA\11411 HRA.ISC *** *** 05/24/18
*** AERMET - VERSION 16216 *** *** *** 17:41:25

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF DPM IN MICROGRAMS/M**3 **

NETWORK GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE GRID-ID
ALL	1ST HIGHEST VALUE IS	0.00336 AT	476088.54,	3752715.57,	475.99,	475.99,	0.00)	DC
	2ND HIGHEST VALUE IS	0.00303 AT	476088.27,	3752782.86,	476.21,	476.21,	0.00)	DC
	3RD HIGHEST VALUE IS	0.00275 AT	476090.16,	3752663.36,	475.65,	475.65,	0.00)	DC
	4TH HIGHEST VALUE IS	0.00161 AT	475837.41,	3752781.25,	476.01,	476.01,	0.00)	DC
	5TH HIGHEST VALUE IS	0.00147 AT	475836.34,	3752756.49,	476.00,	476.00,	0.00)	DC
	6TH HIGHEST VALUE IS	0.00135 AT	475918.06,	3752573.16,	475.00,	475.00,	0.00)	DC
	7TH HIGHEST VALUE IS	0.00134 AT	475836.07,	3752721.76,	476.00,	476.00,	0.00)	DC
	8TH HIGHEST VALUE IS	0.00113 AT	476100.40,	3752545.98,	475.22,	475.22,	0.00)	DC
	9TH HIGHEST VALUE IS	0.00106 AT	475825.57,	3752658.51,	475.51,	475.51,	0.00)	DC
	10TH HIGHEST VALUE IS	0.00103 AT	475826.02,	3752628.39,	475.03,	475.03,	0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART

```
                    DP = DISCPOLR
♀ *** AERMOD - VERSION 16216r ***   *** C:\LAKES\AERMOD VIEW\11411 HRA\11411 HRA.ISC                    ***
   05/24/18
 *** AERMET - VERSION  16216 ***   ***                                                                ***
  17:41:25

  PAGE  29
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            4 Warning Message(s)
 A Total of         2028 Informational Message(s)

 A Total of        43824 Hours Were Processed

 A Total of          978 Calm Hours Identified

 A Total of         1050 Missing Hours Identified (  2.40 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 ME W186    1323       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used           0.50
 ME W187    1323       MEOPEN: ADJ_U* Option for Low Winds used in AERMET
 MX W450   17521       CHKDAT: Record Out of Sequence in Meteorological File at:      14010101
 MX W450   17521       CHKDAT: Record Out of Sequence in Meteorological File at:    2 year gap

    ***********************************
    *** AERMOD Finishes Successfully ***
    ***********************************
```

APPENDIX 2.2:

RISK CALCULATIONS

Table 1
Quantification of Carcinogenic Risks and Noncarcinogenic Risks
Resident 30-Year Exposure Scenario

Source Number*	Source	Mass GLC		Weight Fraction	Contaminant	Carcinogenic Risk				Noncarcinogenic Hazards/ Toxicological Endpoints**									
						URF	CPF	DOSE	RISK	REL	RfD	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
		(ug/m^3)	(mg/m^3)			(ug/m^3)$^{-1}$	(mg/kg/day)$^{-1}$	(mg/kg-day)		(ug/m^3)	(mg/kg/day)								
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)
1	Diesel	4.60E-04	4.60E-07	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	2.0E-07	2.4E-07	5.0E+00	1.4E-03	9.2E-05							
	TOTAL								2.39E-07 0.24			9.2E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

** Key to Toxicological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g. teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	350
exposure duration (years)	30
inhalation rate (L/kg-day))	461
inhalation absorption factor	1
averaging time (years)	70
fraction of time at home	1
age sensitivity factor (age third trimester to 2 ye	10
age sensitivity factor (ages 2 to 16 years old)	3
weighted age sensitivity factor	2.6

Table 2
Quantification of Carcinogenic Risks and Noncarcinogenic Risks
25-Year Worker Exposure Scenario

	Source	Mass GLC		Weight Fraction	Contaminant	Carcinogenic Risk				Noncarcinogenic Hazards/ Toxicological Endpoints**									
						URF	CPF	DOSE	RISK	REL	RfD	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
		(ug/m^3)	(mg/m^3)			($ug/m^3)^{-1}$	$(mg/kg/day)^{-1}$	(mg/kg-day)		(ug/m^3)	(mg/kg/day)								
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)
1	Diesel Particulates	3.36E-03	3.36E-06	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	6.2E-07	2.3E-07	5.0E+00	1.4E-03	6.7E-04							
	TOTAL								2.3E-07			6.7E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
									0.23										

** Key to Toxicological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g. teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	250
exposure duration (years)	25
inhalation rate (L/kg-day))	271
inhalation absorption factor	1
averaging time (years)	70

AVERAGE EMISSION FACTOR
SCAQMD 2020

Speed	LHD1	MHD	HHD
0	0.33522	0.13293	0.01988
5	0.0468	0.05903	0.04096
25	0.01570	0.04105	0.02327

Speed	Weighted Average Emissions
0	**0.12132**
5	**0.04603**
25	**0.02494**

Emission Rates - 2020 Emission Factors

Truck Emission Rates						
Source	Trucks Per Day	VMT [a] (miles/day)	Truck Emission Rate [b] (grams/mile)	Truck Emission Rate [b] (grams/idle-hour)	Daily Truck Emissions [c] (grams/day)	Modeled Emission Rates (g/second)
On-Site Idling	50			0.1213	1.52	1.755E-05
On-Site Travel	100	21.65	0.0460		1.00	1.154E-05
Off-Site Travel 20% Inbound on Brodiea Av.	10	3.81	0.0249		0.09	1.099E-06
Off-Site Travel 40% Outbound on Brodiea Av.	20	7.62	0.0249		0.19	2.198E-06
Off-Site Travel 35% Inbound Dwy 1	18	11.61	0.0249		0.29	3.350E-06
Off-Site Travel 45% Inbound Dwy 3	23	14.72	0.0249		0.37	4.250E-06
Off-Site Travel 10% Outbound Dwy 3	5	1.82	0.0249		0.05	5.247E-07
Off-Site Travel 50% Outbound Dwy 1	25	5.95	0.0249		0.15	1.718E-06

ECOLOGICAL SCIENCES, inc.

General Habitat Assessment

±8.78-acre Centerpointe Industrial Center Site

APN: 297-170-029

Site Location:
City of Moreno Valley, Riverside County
Riverside East 7.5-minute USGS Quadrangle Map
Township 3 South, Range 4 West, Section 13

Prepared for:
Brett Anderson / Senior Development Manager
Newcastle Partners, Inc.
4740 Green River Road, #118
Corona, CA 92880

Prepared by:
Scott Cameron
Ecological Sciences, Inc.
24307 Magic Mountain Parkway #538
Valencia, CA 91355
805.921.0583
scameron@ecosciencesinc.com

Total Area Surveyed:
±8.78 acres

Survey Conducted by:
Scott Cameron

Survey Conducted On:
January 10, 2018

Report Date:
May 17, 2018

ECOLOGICAL SCIENCES, inc.

May 17, 2018

Brett Anderson / Senior Development Manager
Newcastle Partners, Inc.
4740 Green River Road, #118
Corona, CA 92880

SUBJECT: ***Results of a General Habitat Assessment; ±8.78-acre Site, APN 297-170-029, City of Moreno Valley, Riverside County, California***

Dear Brett:

This letter report presents findings of a field survey conducted to generally evaluate the suitability of a ±8.78-acre site to support sensitive biological resources pursuant to the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Emphasis of the survey was placed on the presence/absence of habitat potentially suitable for the special-status ***burrowing owl*** (*Athene cunicularia*-BUOW). In addition, a ***MSHCP Consistency Analysis*** was also conducted in support of the environmental review process.

Introduction

The subject site is located in the City of Moreno Valley, Riverside County, California (***Plate 1***). Specifically, the site is located east of Frederick Street and north of Brodiaea Avenue. The site occurs on the "Riverside East" USGS quadrangle map, Township 4 South, Range 3 West, Section 13 (***Plate 2***). Projects proposed in the area that contain potentially suitable habitat to support sensitive biological resources must also demonstrate to reviewing agencies [e.g., U.S. Fish and Wildlife Service (FWS), U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife/Game (CDFW/CDFG), and/or County of Riverside (County)] that potential project-related impacts to sensitive biological resources are adequately addressed and mitigated pursuant to the California Environmental Quality Act (CEQA) and other environmental regulations as part of project approval.

The subject parcel is not located within a MSHCP criteria area. However, the site is located within an area requiring a habitat assessment for the BUOW under Section 6.3.2 and Narrow Endemic Plant Species (NEPS) under Section 6.1.3. If suitable habitat is present for any of these species, focused surveys are required. Due to the inherent limitations of unseasonal or habitat-based data, definitive conclusions regarding the actual presence or absence of the selected sensitive biological resources cannot necessarily be made in this evaluation. Accordingly, this report is intended to provide the applicant with general information relative to the occurrence potential of the selected sensitive biological resources primarily based on the nature of habitat present.

Selected MSHCP Species and Objectives Overview

The ***burrowing owl (BUOW)*** is a small ground-dwelling owl with white eyebrows, yellow eyes, and long legs. The owl's head, back, and wings are sand-colored, with white barring on the breast and belly. Male BUOW are larger and lighter than females. The BUOW ranges across most of western North America from 200 feet below sea level to 9,000 feet above sea level (CBOC 2000). Although the BUOW is migratory throughout much of its range, in central and southern California, owls are predominantly non-

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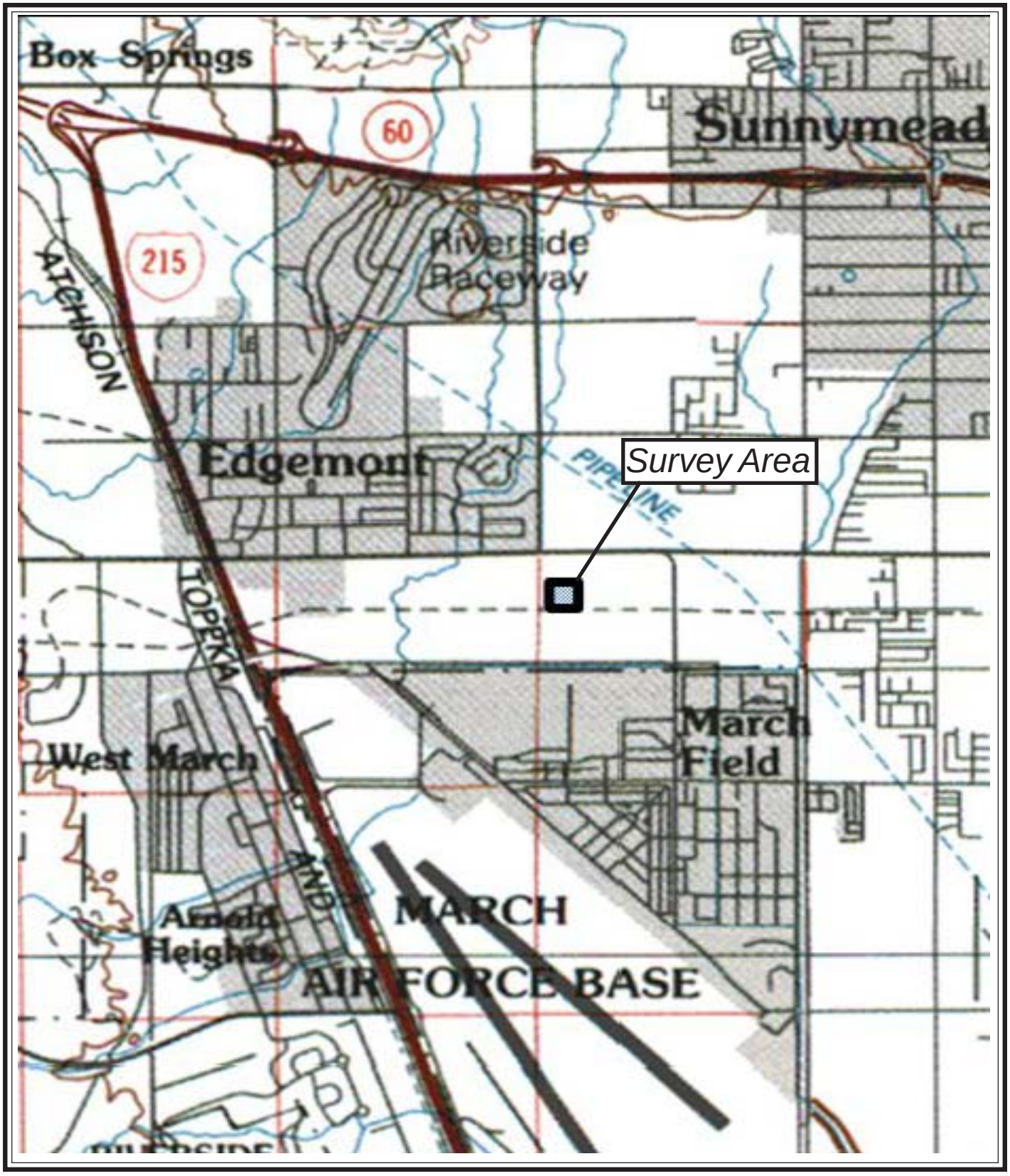

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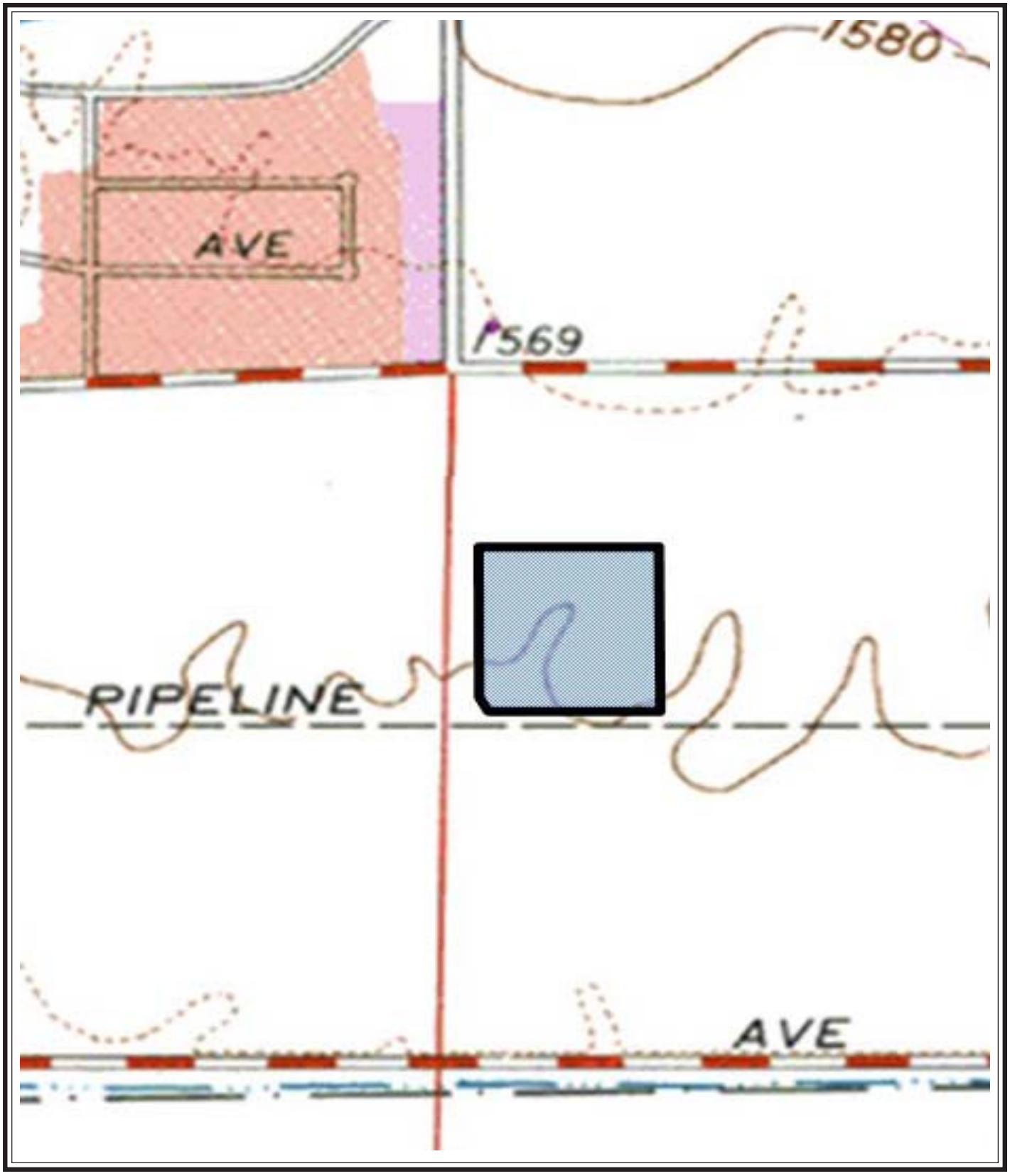
plate **1**

Regional Site Location

8.78-acre Site



= Study Area Boundary

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plate **2**

USGS Topographic Vicinity Map

8.78-acre Site

migratory (CBOC 2000). In coastal southern California, they occur in annual and perennial grasslands, agricultural areas, and coastal dunes. Habitat characteristics also include deserts and arid scrublands that contain low-growing vegetation (Zarn 1974). It is a resident in the open areas of the lowlands over much of the southern California region (Garrett and Dunn 1981). BUOW have also been observed utilizing roadway ditches, airports, vacant lots in residential/commercial areas, abandoned buildings, and irrigation ditches/flood control channels. It is believed that burrowing owls require open areas supporting sparsely vegetated habitat on gently rolling or level terrain. The BUOW generally prefers moderately to heavily grazed grasslands for nesting and roosting and avoids cultivated fields.

The BUOW also requires an abundance of active small mammal burrows as a critical habitat feature for roosting and nesting cover. The availability of numerous small mammal burrows [e.g., ground squirrel (*Spermophilus beecheyi*] is a major factor in determining whether an area with apparently suitable habitat will support burrowing owls (Coulombe 1971 in Volume II-B, Species Accounts, MSHCP 2003). The mammal burrows are modified and enlarged as needed. BUOW are also capable of digging their own burrows, and do so over a limited portion of their range. One burrow is typically selected for use as the nest, however, satellite burrows are usually found within the immediate vicinity of the nest burrow within the defended territory of the owl (Volume II-B, Species Accounts, MSHCP 2003). BUOW may utilize multiple burrows/sites throughout the year (e.g., small seasonal migrations). Burrowing owls rarely use areas unoccupied by colonies of burrowing mammals (Zarn 1974). While burrows are the essential component of burrowing owl habitat (CDFG 1995), the BUOW is also known to use artificial burrows under certain circumstances such as abandoned concrete structures and debris piles. They are commonly seen perching on fence posts or on mounds outside their burrows.

The BUOW is a crepuscular (dawn and dusk) hunter with a prey base primarily consisting of invertebrates and small vertebrates. Nesting season generally occurs between February 1 and August 30 (CDFG 1994). Actual breeding occurs between March through August, with a peak activity in April and May. Eggs are laid between March and May depending upon regional location. Incubation lasts 3-4 weeks, and after hatching, the chicks remain in the nest for 2-3 weeks. Fledging (development of flight feathers) occurs about four weeks after emergence from the burrow, so young are capable of sustained flight by about 6 weeks of age. BUOW adults feed the young for another 6-8 weeks after emergence, and the young are able to catch their own prey by about the ninth week. By mid September, the young molt into adult plumage and disperse.

Threats to the BUOW include conversion of grassland to agriculture, habitat destruction, predators, collisions with vehicles, and pesticides/poisoning of ground squirrels (Grinnell and Miller 1944, Zarn 1974, Remsen 1978 in Volume II-B, Species Accounts, MSHCP 2003).

BUOW Regulatory Summary

The BUOW is considered a MSHCP Group 3 species, California Species of Special Concern, Federal Species of Concern, Partners in Flight Priority Bird Species, and FWS Species of Management Concern. Although this special-status species is not protected by state or federal endangered species acts, the BUOW is protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711) and CDFG Code sections 3503, 3503.5, and 3800. These sections prohibit take, possession, or destruction of birds, their nests or eggs. If it were later determined that active nests would be lost as a result of site-preparation, it would be in conflict with these regulations, as well as MSHCP species-specific objectives, and could also be considered a significant impact under CEQA.

MSHCP Burrowing Owl Survey Methodology

Step I of the MSHCP Burrowing Owl Survey Instructions is the ***Habitat Assessment***. The first step in the habitat assessment process is to walk the property to identify the presence of burrowing owl habitat on the project site. If habitat is found on the site, then walk a 150-meter (approximately 500 feet) buffer zone around the project boundary. If permission to access the buffer cannot be obtained, visually inspect any

adjacent habitat areas with binoculars. If burrowing owl habitat occurs on-site, then Step II is required and 30-day preconstruction surveys will also be required; **(i)** habitat was determined to be present on the project site during the habitat assessment in the form of "several marginally suitable burrows associated with California ground squirrels"; **(ii)** was the 150-meter buffer surveyed?

Step II, ***Part A (Focused Burrow Surveys)*** requires a systematic survey for burrows including burrowing owl sign be conducted by walking through suitable habitat over the entire survey area (i.e. the project site and within 150 meters). Pedestrian survey transects need to be spaced to allow 100% visual coverage of the ground surface. The location of all suitable burrowing owl habitat, potential owl burrows, burrowing owl sign, and any owls observed should be recorded and mapped. If the survey area contains natural or man-made structures that could potentially support burrowing owls, or owls are observed during the burrow surveys, the systematic surveys should continue as prescribed in Step II, Part B (Focused Burrowing Owl Surveys). If no potential burrows are detected, no further surveys are required.

A written report including photographs of the project site, location of burrowing owl habitat surveyed, location of transects, and burrow survey methods should be prepared. If the report indicates further surveys are not required, then the report should state the reason(s) why further focused burrowing owl surveys are not necessary. Absence of burrowing owl sign cannot be used to confirm absence of the species if the focused burrow survey (Step II, Part A) is conducted within five days of rain; (**i)** Include an exhibit that depicts the burrowing owl habitat surveyed (include acreage), 150-meter buffer area, location of survey transects, and the location of the potential burrows; **(ii)** include weather information proving that it did not rain within five days before the focused burrow survey; **(iii)** include several photos of potential burrows located on the site; **(iv)** are the burrows on the site suitable for burrowing owl? If yes, then four focused breeding season surveys will be required. Breeding season is March 1 through August 31. If focused surveys are required based on your analysis please complete the surveys as soon as possible; **(v)** however, if the burrows on the site are not suitable to support burrowing owls, then proper justification must be provided for not completing focused surveys.

All project sites containing burrows or suitable habitat (based on Step I/Habitat Assessment) whether owls were found or not, require ***pre-construction surveys*** that shall be conducted within 30 days prior to ground disturbance to avoid direct take of burrowing owls (MSHCP Species-Specific Objective 6). If ground-disturbing activities are delayed or suspended for more than 30 days after the survey, the site should be resurveyed for owls if suitable habitat is present.

Additional MSHCP and other Conservation Objectives

Although the site is located outside a MSCHP criteria area, it must also be reviewed for constency with additional MSHCP Objectives such as ***Section 6.1.2-Riparian/Riverine Areas and Vernal Pools***. The MSHCP (Survey, Mapping, and Documentation Requirements) define Riparian/Riverine Areas, Vernal Pools, and Fairy Shrimp habitat as follows: ***(1) Riparian/Riverine Areas-*** lands which contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year; ***(2) Vernal pools*** are seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. The determination that an area exhibits vernal pool characteristics, and the definition of the watershed supporting vernal pool hydrology, must be made on a case-by-case basis. Such determinations should consider the length of the time the area exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soils, and drainage characteristics, uses to which it has been

subjected, and weather and hydrologic records; and ***(3) Fairy Shrimp-***for Riverside, vernal pool and Santa Rosa fairy shrimp, mapping of stock ponds, ephemeral pools and other features shall also be undertaken as determined appropriate by a qualified biologist.

Vegetation Mapping (Section 6.3.1)
Individual project-level vegetation mapping may be required for (1) public and private projects within the Plan Area determined to be subject to the Protection of Species Associated with Riparian/Riverine and Vernal Pools policies, (2) public and private projects within the NEPSSA and subject to NEPS policies, and (3) as part of the local CEQA review process for individual public and private projects.

Methodology

Review of Existing Information

Existing documentation pertinent to the distribution and habitat requirements of the burrowing owl and other potentially occurring MSHCP elements was reviewed and analyzed. This included a review of: (1) the California Natural Diversity Data Base (CNDDB 2018) for the "Riverside East" USGS 7.5-minute quadrangle map; (2) Final MSHCP (2003), and (3) other literature pertaining to habitat requirements of the BUOW and selected MSHCP objectives.

Burrowing Owl Habitat Assessment / General MSHCP Consistency Analysis

Ecological Sciences conducted a habitat assessment on January 10, 2018. The survey was conducted using meandering transects across the site. In addition, a general MSHCP consistency analysis (e.g., NEPS habitat assessment) was conducted during the survey. To the extent possible, the project site was surveyed such that 100 percent visual coverage was achieved. Important indicators of BUOW habitat noted during the survey included the presence/absence of small mammal burrows, percentage of vegetative cover, on-site and surrounding land use, potential burrow sites with good horizontal visibility, and soil conditions. The NEPS evaluation included soils types, vegetative components, geographic location, and current land uses. Weather conditions during the January 2018 survey were characterized as partly cloudy to overcast, wind speeds of 1-3 mph, with air temperatures of 57-59 °F.

Existing Site Conditions

The site is generally characterized as a vacant parcel that has been exposed to recent and long-standing forms of disturbances such as discing, scraping, and agriculture. Historically, the site appears to have been entirely disced based on review of historic Google maps since at least 1994, and has been exposed to other forms of anthropogenic disturbances such as adjacent development projects (roads, infrastructure, commercial buildings, etc.). Debris such as soil and gravel piles is present. Landscaping is present along the western property boundary. Existing infrastructure includes culverts and curb/gutter. Surrounding land use includes commercial and residential development. ***Plate 3*** illustrates site features. ***Plates 4a-4b*** photographically illustrate existing site conditions.

Vegetation

Dominant vegetation present on site includes short-podded mustard (*Hirschfeldia incana*), Russian thistle (*Salsola tragus*), pigweed (*Amaranthus* sp.), Mediterranean grass (*Schismus barbatus*), and slender oat (*Avena barbata*).

Soil Conservation Map Review

Based on review of the Natural Resources Conservation Service (NRCS 2018) website, the site is mapped at Monserate sandy loam (MmB). Both gravel and cobbles are mixed in the substrate.

= Study Area
= Routinely disced ruderal vegetation

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plate **3**

Site Features Schematic

View to west

View to north

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plate **4a**

Site Photographs

8.78-acre Site

View to south

View to east

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May 2018

plate **4b**

Site Photographs

8.78-acre Site

Results / Conclusions

No direct ***burrowing owl*** observations or sign (pellets, fecal material, or prey remains) were incidentally recorded during the January 2018 BUOW habitat assessment. No focused BUOW surveys were conducted as part of this assessment. Birds observed generally included those species that are accustomed to nearby human presence such as American crow (*Corvus brachyrhynchos*) and mourning dove (*Zenaida macroura*). Marginally suitable burrows associated with California ground squirrels were recorded that could potentially be utilized by BUOW. As such, some potential does exist for BUOW presence. Accordingly, focused and/or preconstruction surveys conducted prior to development would be required per MSHCP guidelines to determine current presence/absence on the site.

Additional MSHCP objectives reviewed for consistency during the survey included ***Section 6.1.2-Riparian/Riverine Areas and Vernal Pools***. Vernal pools are depressions in areas where a hard underground layer prevents rainwater from draining downward into the subsoils. When rain fills the pools in the winter and spring, the water collects and remains in the depressions. In the springtime the water gradually evaporates away, until the pools become completely dry in the summer and fall (CDFW 2013). Vernal pools tend to have an impermeable layer that results in ponded water. The soil texture (the amount of sand, silt, and clay particles) typically contains higher amounts of fine silts and clays that lower percolation rates. Pools that retain water for a sufficient length of time will develop hydric soils. Hydric soils form when the soil is saturated from flooding for extended periods of time and anaerobic conditions (lacking oxygen or air) develop. None of these features are present on site. In addition, no habitat is present for Narrow Endemic Plant Species under Section 6.1.3.

Although no native habitat types are present, and no listed species (currently protected by state or federal endangered species acts) are expected to occur due to absence of suitable habitat, the potential presence of certain special-status species (e.g., burrowing owl) may impose some degree of constraint to development depending upon the nature of both direct and indirect impacts on these resources (if present), as well as on the particular species and seasonal timing of construction activities. During permitting procedures, measures to avoid or further reduce project-related impacts to potentially occurring sensitive biological resources may be necessary pursuant to MSHCP guidelines.

If the proposed project demonstrates MSHCP consistency, then the MSHCP provides full mitigation under CEQA, National Environmental Policy Act, California Endangered Species Act, and Federal Endangered Species Act for impacts to the species and habitats covered by the MSHCP pursuant to agreements with USFWS, CDFW, and/or any other appropriate participating regulatory agencies (MSHCP 2003).

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I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological survey, and that the facts, statements, and information presented herein are true and correct to the best of my knowledge and belief.

Sincerely,

Ecological Sciences, Inc.

Scott D. Cameron
Principal Biologist

References

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Attachment E-3

BIOLOGICAL REPORT SUMMARY SHEET

(Submit two copies to the County)

Applicant Name: Newcastle Partners
Assessor's Parcel Number (APN): 297-170-029
APN cont. :
Site Location: Section: 13 **Township:** 3 South **Range:** 4 West
Site Address:
Related Case Number(s): **PDB Number:**

General Habitat Assessment for	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
	Arroyo Southwestern Toad	Yes	No	(N/A)
X	Blueline Stream(s)	Yes	(No)	N/A
	Coachella Valley Fringed-Toed Lizard	Yes	No	(N/A)
	Coastal California Gnatcatcher	Yes	No	(N/A)
X	Coastal Sage Scrub	Yes	(No)	N/A
	Delhi Sands Flower-Loving Fly	Yes	No	(N/A)
	Desert Pupfish	Yes	No	(N/A)
	Desert Slender Salamander	Yes	No	(N/A)
	Desert Tortoise	Yes	No	(N/A)
	Flat-Tailed Horned Lizard	Yes	No	(N/A)
	Least Bell's Vireo	Yes	No	(N/A)
X	Oak Woodlands	Yes	(No)	N/A
	Quino Checkerspot Butterfly	Yes	No	(N/A)
	Riverside Fairy Shrimp	Yes	No	(N/A)
	Santa Ana River Woolystar	Yes	No	(N/A)
	San Bernardino Kangaroo Rat	Yes	No	(N/A)
	Slender Horned Spineflower	Yes	No	(N/A)
	Stephen's Kangaroo Rat	Yes	No	(N/A)
X	Vernal Pools	Yes	(No)	N/A
X	Wetlands	Yes	(No)	N/A

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
X	Other Burrowing Owl Habitat	(Yes)	No	N/A
X	Other 6.1.3 Habitat	Yes	(No)	N/A
	Other 6.1.2 Habitat	Yes	(No)	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened or candidate species by either State, or Federal regulations, or for Riverside County as listed by the California Department of Fish and Game Natural Diversity Data Base (NDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report.

Ecological Sciences, Inc. May 17, 2018

Signature and Company Name — Report Date

10(a) Permit Number (if applicable) — Permit Expiration Date

County Use Only

Received by: _____ **Date:** _____

PD-B# _____

Attachment E-4

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit Two Copies)

Case Number: _____ **Lot/Parcel No.** _____ **EA Number**_____

Wildlife & Vegetation

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

(Check the level of impact the applies to the following questions)

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?
Participation in the MSHCP Required

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?

c) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U. S. Wildlife Service?

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

e) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U. S. Fish and Wildlife Service?

f) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Source: CGP Fig. VI.36-VI.40

Findings of Fact:
>No BUOW or sign observed on site during Habitat Assessments conducted in January and May 2018
>No selected narrow endemic plant habitat present on site
>No riparian/riverine/vernal pools present on site or habitat associated with 6.1.2 species due to presence of potentially suitable habitat

Proposed Mitigation: >MSHCP focused BUOW and/or preconstruction surveys prior to development

Monitoring Recommended: >None recommended unless BUOW present during construction

ECOLOGICAL SCIENCES, inc.

Focused Burrowing Owl Surveys

±8.78-acre Centerpointe Industrial Center Site

APN: 297-170-029

Site Location:
City of Moreno Valley, Riverside County
Riverside East 7.5-minute USGS Quadrangle Map
Township 3 South, Range 4 West, Section 13

Prepared for:

David Ornelas
T&B Planning, Inc.
3665 Ruffin Road, Ste. 208
San Diego, CA 92123

Prepared by:
Scott Cameron
Ecological Sciences, Inc.
24307 Magic Mountain Parkway #538
Valencia, CA 91355
805.921.0583
scameron@ecosciencesinc.com

Total Area Surveyed:
±8.78 acres

Survey Conducted by:
Scott Cameron

Survey Conducted On:
April 6-9, 2018

Report Date:
May 21, 2018

ECOLOGICAL SCIENCES

May 21, 2018

David Ornelas
T&B Planning, Inc.
3665 Ruffin Road, Ste. 208
San Diego, CA 92123

SUBJECT: ***Results of Focused Burrowing Owl Surveys; ±8.78-acre Site; APN: 297-170-029; Riverside County, California***

Dear David:

This letter report presents findings of focused ***burrowing owl*** (*Athene cunicularia*-BUOW) surveys pursuant to the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Section 6.3.2.

Introduction

The subject site is located in the City of Moreno Valley, Riverside County, California (***Plate 1***). Specifically, the site is located east of Frederick Street and north of Brodiaea Avenue. The site occurs on the "Riverside East" USGS quadrangle map, Township 4 South, Range 3 West, Section 13 (***Plate 2***). Projects proposed in the area that contain potentially suitable habitat to support sensitive biological resources must also demonstrate to reviewing agencies [e.g., U.S. Fish and Wildlife Service (FWS), California Department of Fish and Wildlife/Game (CDFW/CDFG), and/or County of Riverside (County)] that potential project-related impacts to sensitive biological resources are adequately addressed and mitigated pursuant to the California Environmental Quality Act (CEQA) and other environmental regulations as part of project approval.

The subject parcel is not located within a MSHCP criteria area. However, the site is located within an area (Reche Canyon/Badlands Area Plan) requiring habitat assessments for BUOW (Section 6.3.2-Additional Survey Needs and Procedures). This report is intended to provide the applicant and reviewing regulatory agencies with general and specific information necessary for planning and permitting decisions concerning the proposed project relative to the occurrence potential of selected sensitive biological resources primarily based on the nature of habitat present and results of focused surveys.

Selected MSHCP Species and Objectives Overview

The ***burrowing owl (BUOW)*** is a small ground-dwelling owl with white eyebrows, yellow eyes, and long legs. The owl's head, back, and wings are sand-colored, with white barring on the breast and belly. Male BUOW are larger and lighter than females. The BUOW ranges across most of western North America from 200 feet below sea level to 9,000 feet above sea level (CBOC 2000). Although the BUOW is migratory throughout much of its range, in central and southern California, owls are predominantly non-migratory (CBOC 2000). In coastal southern California, they occur in annual and perennial grasslands, agricultural areas, and coastal dunes. Habitat characteristics also include deserts and arid scrublands that contain low-growing vegetation (Zarn 1974). It is a resident in the open areas of the lowlands over much of the southern California region (Garrett and Dunn 1981). BUOW have also been observed utilizing roadway ditches, airports, vacant lots in residential/commercial areas, abandoned buildings, and

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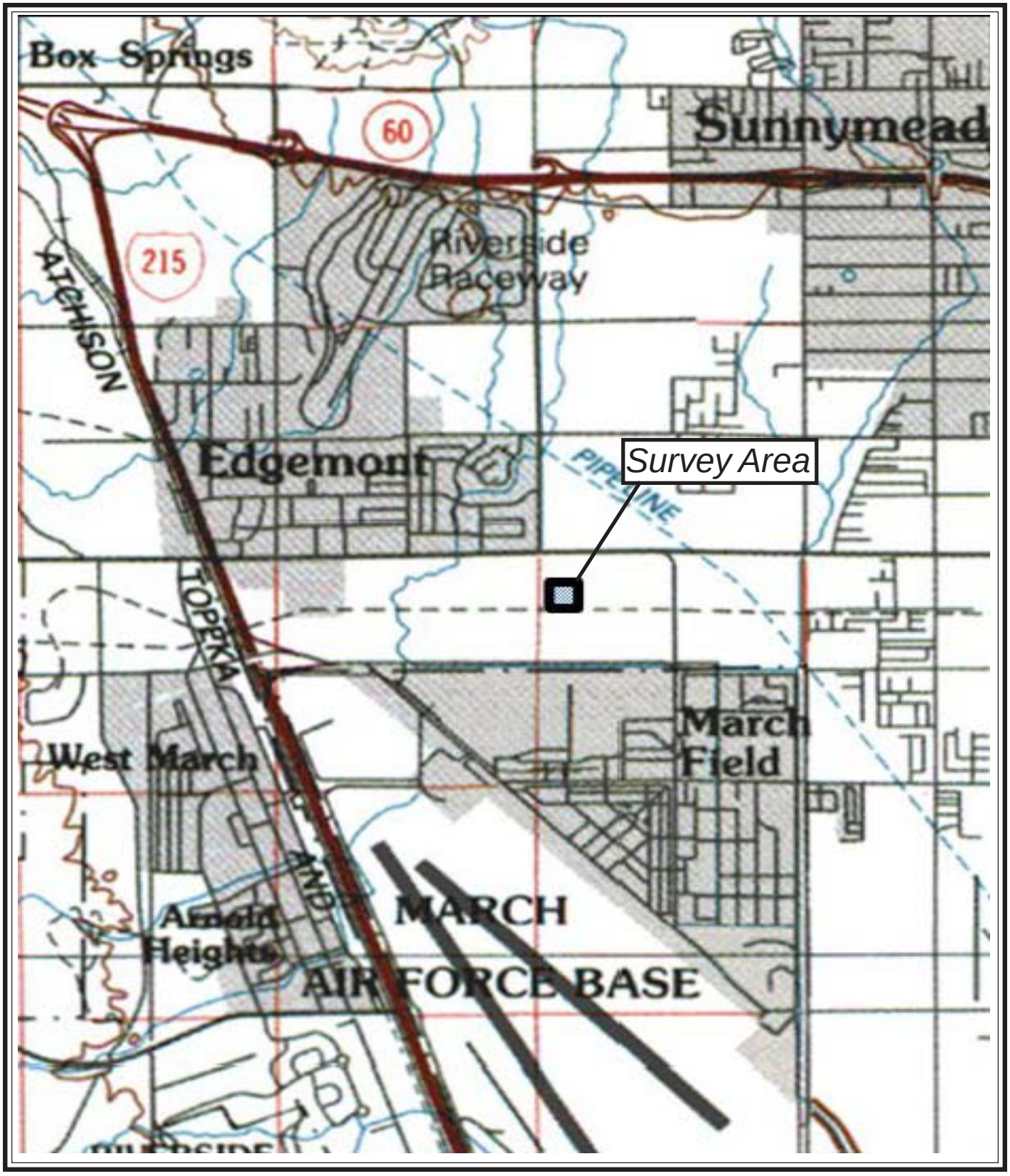
Fax: 805.921.0683 ♦ Cell: 805.415.9595 ♦ email: scameron@ecosciencesinc.com



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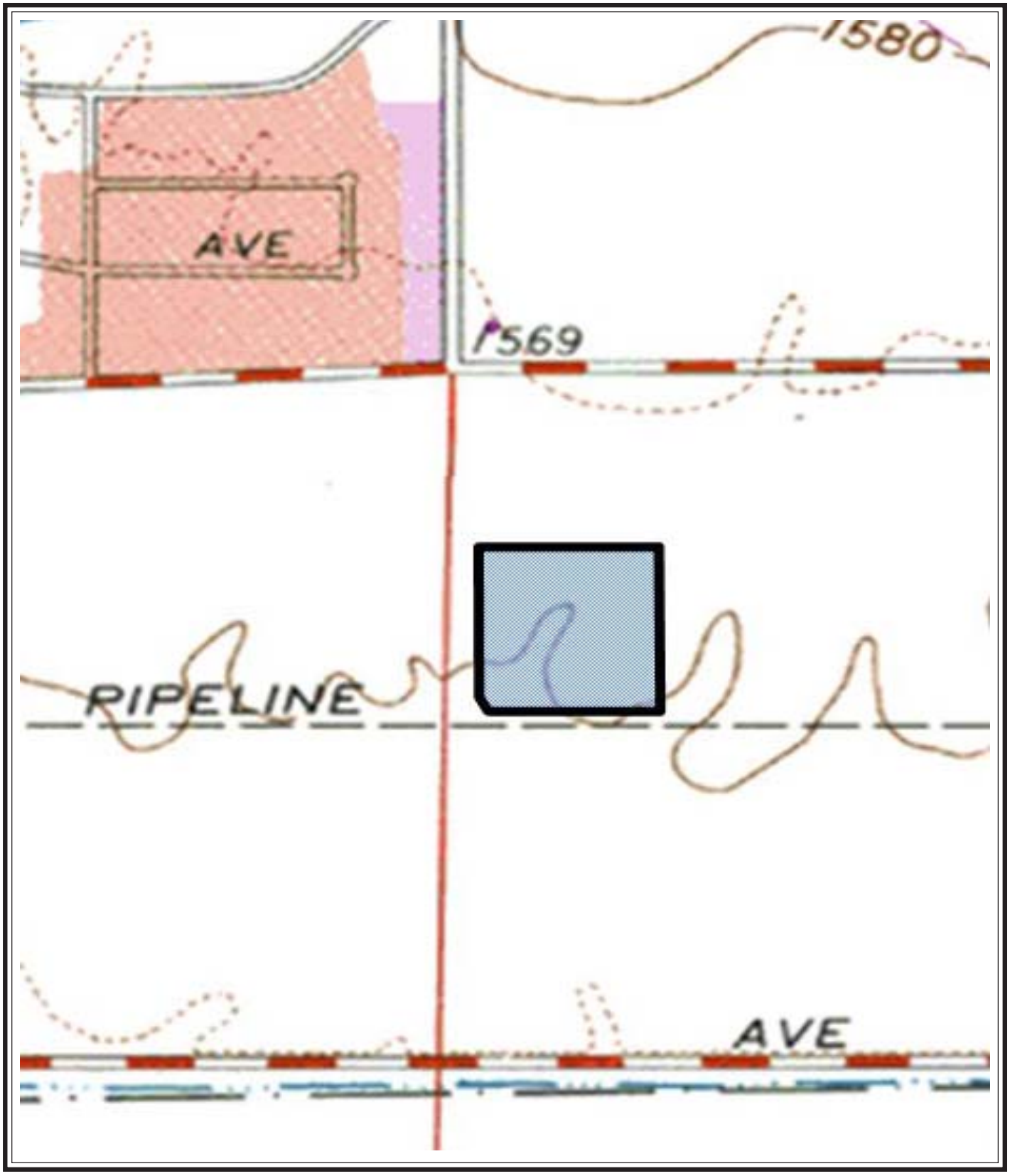
May 2018

plate **1**

Regional Site Location

8.78-acre Site



= Study Area Boundary

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May 2018

plate **2**

USGS Topographic Vicinity Map

8.78-acre Site

irrigation ditches/flood control channels. It is believed that burrowing owls require open areas supporting sparsely vegetated habitat on gently rolling or level terrain. The BUOW generally prefers moderately to heavily grazed grasslands for nesting and roosting and avoids cultivated fields.

The BUOW also requires an abundance of active small mammal burrows as a critical habitat feature for roosting and nesting cover. The availability of numerous small mammal burrows [e.g., ground squirrel (*Spermophilus beecheyi*] is a major factor in determining whether an area with apparently suitable habitat will support burrowing owls (Coulombe 1971 in Volume II-B, Species Accounts, MSHCP 2003). The mammal burrows are modified and enlarged as needed. BUOW are also capable of digging their own burrows, and do so over a limited portion of their range. One burrow is typically selected for use as the nest, however, satellite burrows are usually found within the immediate vicinity of the nest burrow within the defended territory of the owl (Volume II-B, Species Accounts, MSHCP 2003). BUOW may utilize multiple burrows/sites throughout the year (e.g., small seasonal migrations). Burrowing owls rarely use areas unoccupied by colonies of burrowing mammals (Zarn 1974). While burrows are the essential component of burrowing owl habitat (CDFG 1995), the BUOW is also known to use artificial burrows under certain circumstances such as abandoned concrete structures and debris piles. They are commonly seen perching on fence posts or on mounds outside their burrows.

The BUOW is a crepuscular (dawn and dusk) hunter with a prey base primarily consisting of invertebrates and small vertebrates. Nesting season generally occurs between February 1 and August 30 (CDFG 1994). Actual breeding occurs between March through August, with a peak activity in April and May. Eggs are laid between March and May depending upon regional location. Incubation lasts 3-4 weeks, and after hatching, the chicks remain in the nest for 2-3 weeks. Fledging (development of flight feathers) occurs about four weeks after emergence from the burrow, so young are capable of sustained flight by about 6 weeks of age. BUOW adults feed the young for another 6-8 weeks after emergence, and the young are able to catch their own prey by about the ninth week. By mid September, the young molt into adult plumage and disperse.

Threats to the BUOW include conversion of grassland to agriculture, habitat destruction, predators, collisions with vehicles, and pesticides/poisoning of ground squirrels (Grinnell and Miller 1944, Zarn 1974, Remsen 1978 in Volume II-B, Species Accounts, MSHCP 2003).

BUOW Regulatory Summary

The BUOW is considered a MSHCP Group 3 species, California Species of Special Concern, Federal Species of Concern, Partners in Flight Priority Bird Species, and FWS Species of Management Concern. Although this special-status species is not protected by state or federal endangered species acts, the BUOW is protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711) and CDFG Code sections 3503, 3503.5, and 3800. These sections prohibit take, possession, or destruction of birds, their nests or eggs. If it were later determined that active nests would be lost as a result of site-preparation, it would be in conflict with these regulations, as well as MSHCP species-specific objectives, and could also be considered a significant impact under CEQA.

MSHCP Burrowing Owl Survey Methodology

Step I of the MSHCP Burrowing Owl Survey Instructions is the ***Habitat Assessment***. The first step in the habitat assessment process is to walk the property to identify the presence of burrowing owl habitat on the project site. If habitat is found on the site, then walk a 150-meter (approximately 500 feet) buffer zone around the project boundary. If permission to access the buffer cannot be obtained, visually inspect any adjacent habitat areas with binoculars. If burrowing owl habitat occurs on-site, then Step II is required and 30-day preconstruction surveys will also be required; **(i)** habitat was determined to be present on the project site during the habitat assessment in the form of "several marginally suitable burrows associated with California ground squirrels"; **(ii)** was the 150-meter buffer surveyed?

Step II, ***Part A (Focused Burrow Surveys)*** requires a systematic survey for burrows including burrowing owl sign be conducted by walking through suitable habitat over the entire survey area (i.e. the project site and within 150 meters). Pedestrian survey transects need to be spaced to allow 100% visual coverage of the ground surface. The location of all suitable burrowing owl habitat, potential owl burrows, burrowing owl sign, and any owls observed should be recorded and mapped. If the survey area contains natural or man-made structures that could potentially support burrowing owls, or owls are observed during the burrow surveys, the systematic surveys should continue as prescribed in Step II, Part B (Focused Burrowing Owl Surveys). If no potential burrows are detected, no further surveys are required.

A written report including photographs of the project site, location of burrowing owl habitat surveyed, location of transects, and burrow survey methods should be prepared. If the report indicates further surveys are not required, then the report should state the reason(s) why further focused burrowing owl surveys are not necessary. Absence of burrowing owl sign cannot be used to confirm absence of the species if the focused burrow survey (Step II, Part A) is conducted within five days of rain; (**i)** Include an exhibit that depicts the burrowing owl habitat surveyed (include acreage), 150-meter buffer area, location of survey transects, and the location of the potential burrows; **(ii)** include weather information proving that it did not rain within five days before the focused burrow survey; **(iii)** include several photos of potential burrows located on the site; **(iv)** are the burrows on the site suitable for burrowing owl? If yes, then four focused breeding season surveys will be required. Breeding season is March 1 through August 31. If focused surveys are required based on your analysis please complete the surveys as soon as possible; **(v)** however, if the burrows on the site are not suitable to support burrowing owls, then proper justification must be provided for not completing focused surveys.

All project sites containing burrows or suitable habitat (based on Step I/Habitat Assessment) whether owls were found or not, require ***pre-construction surveys*** that shall be conducted within 30 days prior to ground disturbance to avoid direct take of burrowing owls (MSHCP Species-Specific Objective 6). If ground-disturbing activities are delayed or suspended for more than 30 days after the survey, the site should be resurveyed for owls if suitable habitat is present.

Methodology

Review of Existing Information

Existing documentation pertinent to the distribution and habitat requirements of the burrowing owl and other potentially occurring MSHCP elements was reviewed and analyzed. This included a review of: (1) the California Natural Diversity Data Base (CNDDB 2018) for the "Riverside East" USGS 7.5-minute quadrangle map; (2) Final MSHCP (2003), and (3) other literature pertaining to habitat requirements of the BUOW.

Focused BUOW Surveys

A systematic survey for burrows and breeding season BUOW surveys were conducted due to the presence of potentially suitable habitat. Focused surveys were conducted in accordance with current MSHCP guidelines (detailed above). Accordingly, a series of 4 surveys were conducted (one hour before sunrise to two hours after sunrise and two hours before sunset to one hour after sunset). Surveys were conducted April 6-9, 2018.

Pursuant to survey protocol, surveyors initially used binoculars to scan all suitable habitat/potential refugia prior to the start of pedestrian surveys. Habitat characteristics noted during the surveys included the presence of small mammal burrows, percentage of vegetative cover, on-site and surrounding land use, potential burrow sites with good horizontal visibility, and soil conditions. Weather data were recorded using a digital thermocouple and digital anemometer, and by visual estimation of cloud cover and general weather characteristics. Site photographs were taken using a Nikon digital camera. Following the initial site scan, a systematic survey for burrows, burrowing owls, and owl sign was conducted by

= Study Area
= Routinely disced ruderal vegetation

ECOLOGICAL SCIENCES, Inc.

May 2018

plate **3**

Site Features Schematic

View to west

View to north

ECOLOGICAL SCIENCES Inc.

May 2018

plate **4a**

Site Photographs

8.78-acre Site

View to south

View to east

ECOLOGICAL SCIENCES Inc.

May 2018

plate **4b**

Site Photographs

8.78-acre Site

walking through suitable habitat over the entire survey area (i.e. the project site and at least visually with binoculars within 150 meters off site). To the extent possible, pedestrian survey transects were spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines was no more than 30 meters (±100 feet) and were reduced to account for differences in terrain, vegetation density, and ground surface visibility (where necessary). Potentially suitable burrows were examined for sign of BUOW use such as the presence of owl pellets, prey remains, or feathers at potential burrow entrances. Burrows were inspected with the aid of a mirror to better view burrow interiors. Weather conditions during the April 2018 surveys included clear and partly cloudy skies, winds between 1-9 mph, and ambient air temperatures of 69-85°F.

Existing Site Conditions

The site is generally characterized as a vacant parcel that has been exposed to recent and long-standing forms of disturbances such as discing, scraping, and agriculture. Historically, the site appears to have been entirely disced based on review of historic Google maps since at least 1994, and has been exposed to other forms of anthropogenic disturbances such as adjacent development projects (roads, infrastructure, commercial buildings, etc.). Debris such as soil and gravel piles is present. Landscaping is present along the western property boundary. Existing infrastructure includes culverts and curb/gutter. Surrounding land use includes commercial and residential development. ***Plate 3*** illustrates site features. ***Plates 4a-4b*** photographically illustrate existing site conditions.

Vegetation

Dominant vegetation present on site includes short-podded mustard (*Hirschfeldia incana*), Russian thistle (*Salsola tragus*), pigweed (*Amaranthus* sp.), Mediterranean grass (*Schismus barbatus*), and slender oat (*Avena barbata*).

2018 Focused BUOW Survey Results (6.3.2)

No direct BUOW observations or sign (feathers, pellets, fecal material, prey remains, etc.) were recorded during the April 2018 focused BUOW survey. Birds observed included common raven (*Corvus corax*), American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), rock pigeon (*Columba livia*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*).

Multiple potential nesting refugia (e.g., small mammal burrows) are present on site. However, none of the burrows/refugia inspected during the 2018 focused survey were determined to be currently occupied or recently used by BUOW based on the lack of owl observations and absence of sign around burrow entrances. Surveys of the site and scanning adjacent areas during peak BUOW activity times did not reveal any indication that this species was currently present or utilizing the site for foraging purposes. Nonetheless, potential nesting and foraging habitat for BUOW is present on and adjacent to the site and the subject site could be occupied by BUOW at anytime of the year. Due the presence of suitable BUOW habitat and the potential for this taxon to occur, preconstruction surveys pursuant to MSHCP guidelines would also be required prior to any development activities. If BUOW were recorded during any subsequent site surveys, their presence would impose some degree of constraint (e.g., compliance with MSHCP, CDFW, MBTA) to development depending upon the nature and extent of potential impacts [e.g., number of BUOW pair(s)] and the seasonal timing of proposed construction activities. If it were later determined that active nests would be lost as a result of site-preparation, it would be in conflict with MSHCP species-specific conservation objectives.

ϕ

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological survey, and that the facts, statements, and information presented herein are true and correct to the best of my knowledge and belief.

Sincerely,

Ecological Sciences, Inc.

Scott D. Cameron
Principal Biologist

References

California Burrowing Owl Consortium. 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. April 1993. 12 pp.

California Burrowing Owl Consortium and The Santa Cruz Predatory Bird Research Group. [online]. Burrowing Owl Consortium Survey Protocol. Available: www2.ucsc.edu/~scpbrg. (2000) May.

California Department of Fish and Game. 1995. Staff Report on Burrowing Owl Mitigation. C. F. Raysbrook Interim Director. October 17, 1995. 7 pp.

California, State of. 1989. *Fish and Game Code*.

California Natural Diversity Data Base (CNDDB). 2018. Computer Reports for the "Riverside East" USGS 7.5-minute quadrangle map.

County of Riverside. 2003. Final Western Riverside County Multiple Species Habitat Conservation Plan. June. Review of information from RCIP website.

Zarn, M. 1974. Burrowing owl. U.S. Department of Interior, Bureau of Land Management. Technical Note T-N 250. Denver, Colorado. 25 pp. in California Department of Fish and Game (1995), Staff Report on Burrowing Owl Mitigation. C. F. Raysbrook Interim Director. October 17, 1995. 7 pp.

Attachment E-3

BIOLOGICAL REPORT SUMMARY SHEET

(Submit two copies to the County)

Applicant Name: Newcastle Partners
Assessor's Parcel Number (APN): 297-170-029
APN cont. :
Site Location: Section: 13 **Township:** 3 South **Range:** 4 West
Site Address:
Related Case Number(s): **PDB Number:**

General Habitat Assessment for	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
	Arroyo Southwestern Toad	Yes	No	N/A
	Blueline Stream(s)	Yes	No	N/A
	Coachella Valley Fringed-Toed Lizard	Yes	No	N/A
	Coastal California Gnatcatcher	Yes	No	N/A
	Coastal Sage Scrub	Yes	No	N/A
	Delhi Sands Flower-Loving Fly	Yes	No	N/A
	Desert Pupfish	Yes	No	N/A
	Desert Slender Salamander	Yes	No	N/A
	Desert Tortoise	Yes	No	N/A
	Flat-Tailed Horned Lizard	Yes	No	N/A
	Least Bell's Vireo	Yes	No	N/A
	Oak Woodlands	Yes	No	N/A
	Quino Checkerspot Butterfly	Yes	No	N/A
	Riverside Fairy Shrimp	Yes	No	N/A
	Santa Ana River Woolystar	Yes	No	N/A
	San Bernardino Kangaroo Rat	Yes	No	N/A
	Slender Horned Spineflower	Yes	No	N/A
	Stephen's Kangaroo Rat	Yes	No	N/A
	Vernal Pools	Yes	No	N/A
	Wetlands	Yes	No	N/A

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
X	Other Burrowing Owl Habitat	(Yes)	No	N/A
X	Other Burrowing Owl	Yes	(No)	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened or candidate species by either State, or Federal regulations, or for Riverside County as listed by the California Department of Fish and Game Natural Diversity Data Base (NDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report.

Ecological Sciences, Inc. May 21, 2018

Signature and Company Name — Report Date

10(a) Permit Number (if applicable) — Permit Expiration Date

County Use Only

Received by: _____ **Date:** _____

PD-B# _____

Attachment E-4

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit Two Copies)

Case Number: _____ **Lot/Parcel No.** _____ **EA Number**_____

Wildlife & Vegetation

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

(Check the level of impact the applies to the following questions)

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?
Participation in the MSHCP Required

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?

c) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U. S. Wildlife Service?

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

e) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U. S. Fish and Wildlife Service?

f) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Source: CGP Fig. VI.36-VI.40

Findings of Fact: >No BUOW or sign observed on site during focused surveys conducted in April 2018

Proposed Mitigation: >MSHCP focused BUOW and/or preconstruction surveys prior to development

Monitoring Recommended: >None recommended unless BUOW present during construction

PHASE I CULTURAL RESOURCES SURVEY FOR THE CENTERPOINTE PROJECT

CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE

APN 297-170-029

Prepared for:

T&B Planning, Inc.
17542 East 17th Street, Suite 100
Tustin, California 92780

Prepared by:

Brian F. Smith and Associates, Inc.
14010 Poway Road, Suite A
Poway, California 92064

February 12, 2018; Revised May 30, 2018

Archaeological Database Information

Author(s):	Andrew J. Garrison and Brian F. Smith
Prepared by:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064 (858) 484-0915
Report Date:	February 12, 2018; Revised May 30, 2018
Report Title:	Phase I Cultural Resources Survey for the Centerpointe Project, City of Moreno Valley, County of Riverside
Prepared for:	T&B Planning, Inc. 17542 East 17th Street, Suite 100 Tustin, California 92780
Assessor's Parcel Numbers:	APN 297-170-029
USGS Quadrangle:	*Riverside East, California* (7.5 minute)
Study Area:	8.78 acres
Key Words:	Cultural resources survey; city of Moreno Valley; negative survey; no mitigation measures recommended.

Table of Contents

Section **Page**

Appendices

Appendix A – Qualifications of Key Personnel
Appendix B – Archaeological Records Search Results*
Appendix C – NAHC Sacred Lands File Search Results*
**Deleted for public review and bound separately in the Confidential Appendix*

List of Figures

List of Plates

List of Tables

1.0 MANAGEMENT SUMMARY/ABSTRACT

The following report describes the results of a Phase I cultural resources assessment conducted by Brian F. Smith and Associates, Inc. (BFSA) for the Centerpointe Project. The survey covered an 8.78-acre property located northeast of the intersection of Frederick Street and Brodiaea Avenue, within the city of Moreno Valley in Riverside County, California. Specifically, this project is located within Section 13 of the USGS 7.5-minute *Riverside East, California* topographic quadrangle (Township 3 South, Range 4 West, San Bernardino Base and Meridian). The property encompasses the entirety of Assessor's Parcel Number (APN) APN 297-170-029 and lies north of March Air Reserve Base. The project proposes to develop an approximately 203,712-square-foot industrial warehouse/logistics building with approximately 5,000 square feet of office space and 27 single load dock doors positioned on the eastern side. Additional project improvements include approximately 31 truck trailer parking stalls and an underground stormwater detention basin, along with associated public parking, landscaping, and infrastructure. In compliance with the California Environmental Quality Act (CEQA) and City of Moreno Valley environmental policies, BFSA conducted the assessment to locate and record any cultural resources present within the project.

The cultural resources investigation of the subject property also included a records search performed by BFSA at the Eastern Information Center (EIC) at the University of California at Riverside (UCR) on February 2, 2018 in order to assess previous archaeological studies and identify any previously recorded cultural resources within the project boundaries or in the immediate vicinity. Results of the records search from the EIC indicate that 114 cultural resource properties, all historic, have been recorded within a one-mile radius of the project. None of these properties include the current project. Additionally, the records search indicated that 36 cultural resource studies have been conducted within a one-mile radius of the project, none of which include the current Area of Potential Effect (APE).

BFSA requested a review of the Sacred Lands File (SLF) from the Native American Heritage Commission (NAHC) on January 29, 2018 to determine if any recorded Native American sacred sites or locations of religious or ceremonial importance are present within one mile of the project. All correspondence is provided in Appendix C.

The cultural resources survey of the property was conducted on January 29, 2018. Survey conditions were generally good and ground visibility was good to excellent. Much of the property has been disturbed by historic agricultural use, vegetation clearing, disking, grading, and development of the surrounding area. No prehistoric or historic cultural resources were identified during the survey. Because no cultural resources were identified, monitoring of grading is not recommended as a condition of approval for the project.

A copy of this report will be permanently filed with the EIC at UCR. All notes, photographs, and other materials related to this project will be curated at the archaeological laboratory of BFSA in Poway, California.

2.0 INTRODUCTION

In response to a request by T&B Planning, Inc., BFSA conducted a cultural resources assessment of the Centerpointe Project. The cultural resources survey and evaluation program for the project were conducted in order to comply with CEQA and City of Moreno Valley environmental policies. The project is located in an area of low archaeological sensitivity, as suggested by known site density and predictive modeling.

The project is an 8.78-acre property located in Moreno Valley, Riverside County, California (Figure 2.0–1). The project encompasses the entirety of APN 297-170-029 and is located north of March Air Reserve Base, northeast of the intersection of Frederick Street and Brodiaea Avenue, within Section 13 of the USGS 7.5-minute *Riverside East, California* topographic quadrangle (Township 3 South, Range 4 West, San Bernardino Base and Meridian) (Figure 2.0–2). The project proposes to develop an approximately 203.712-square-foot industrial warehouse/logistics building with approximately 5,000 square feet of office space and 27 single load dock doors positioned on the eastern side. Additional project improvements include approximately 31 truck trailer parking stalls and an underground stormwater detention basin, along with associated public parking, landscaping, and infrastructure (Figure 2.0–3).

Principal Investigator Brian F. Smith and Project Archaeologist Andrew J. Garrison directed the Phase I archaeological survey program. Senior field archaeologist Clarence Hoff conducted the field survey. The technical report was prepared by Andrew Garrison and Brian Smith. Caitlin Foote conducted technical editing and report production and Kris Reinicke created the report graphics. Qualifications of key personnel are provided in Appendix A.

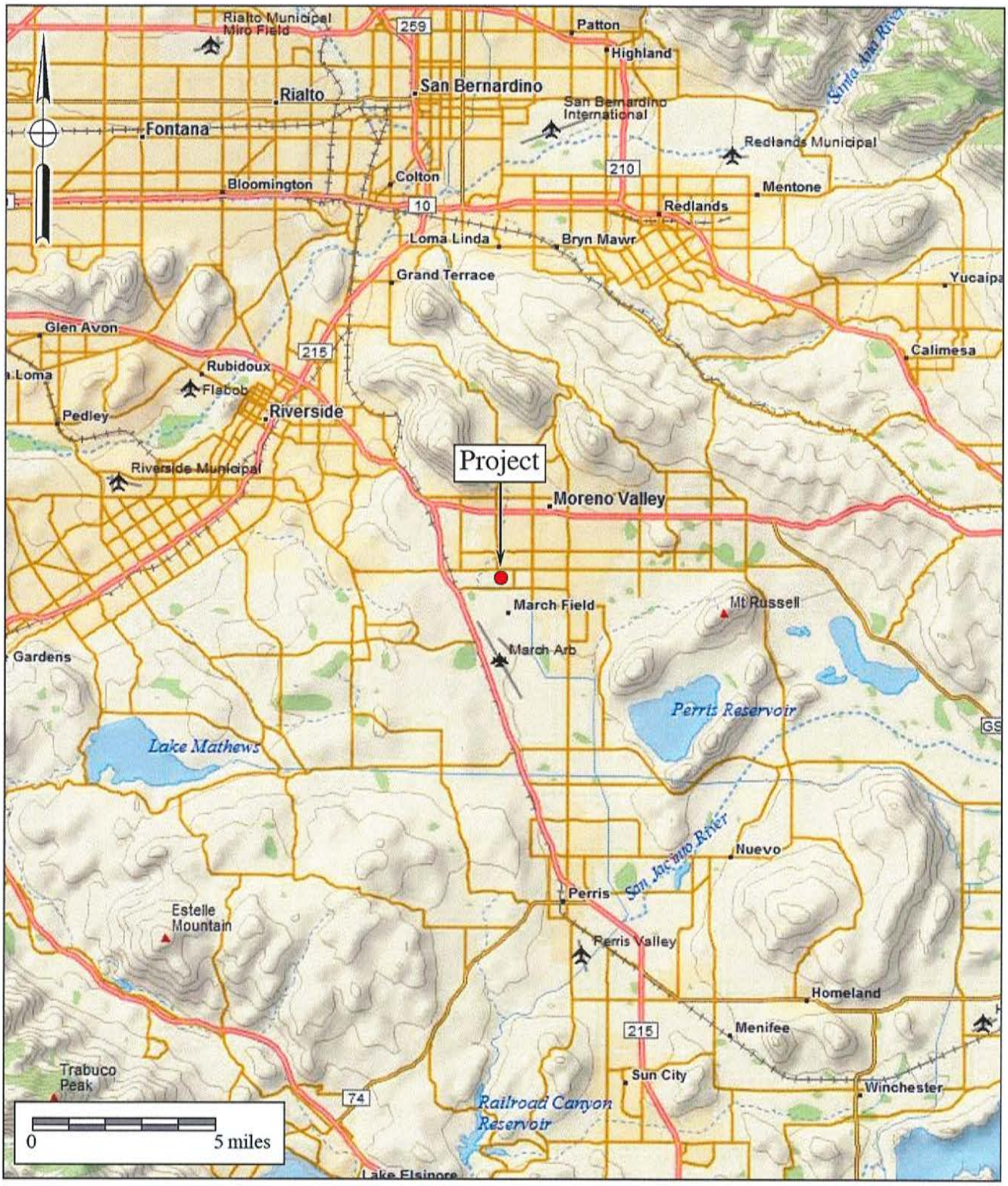

Figure 2.0–1

General Location Map

The Centerpointe Project

DeLorme (1:250,000)

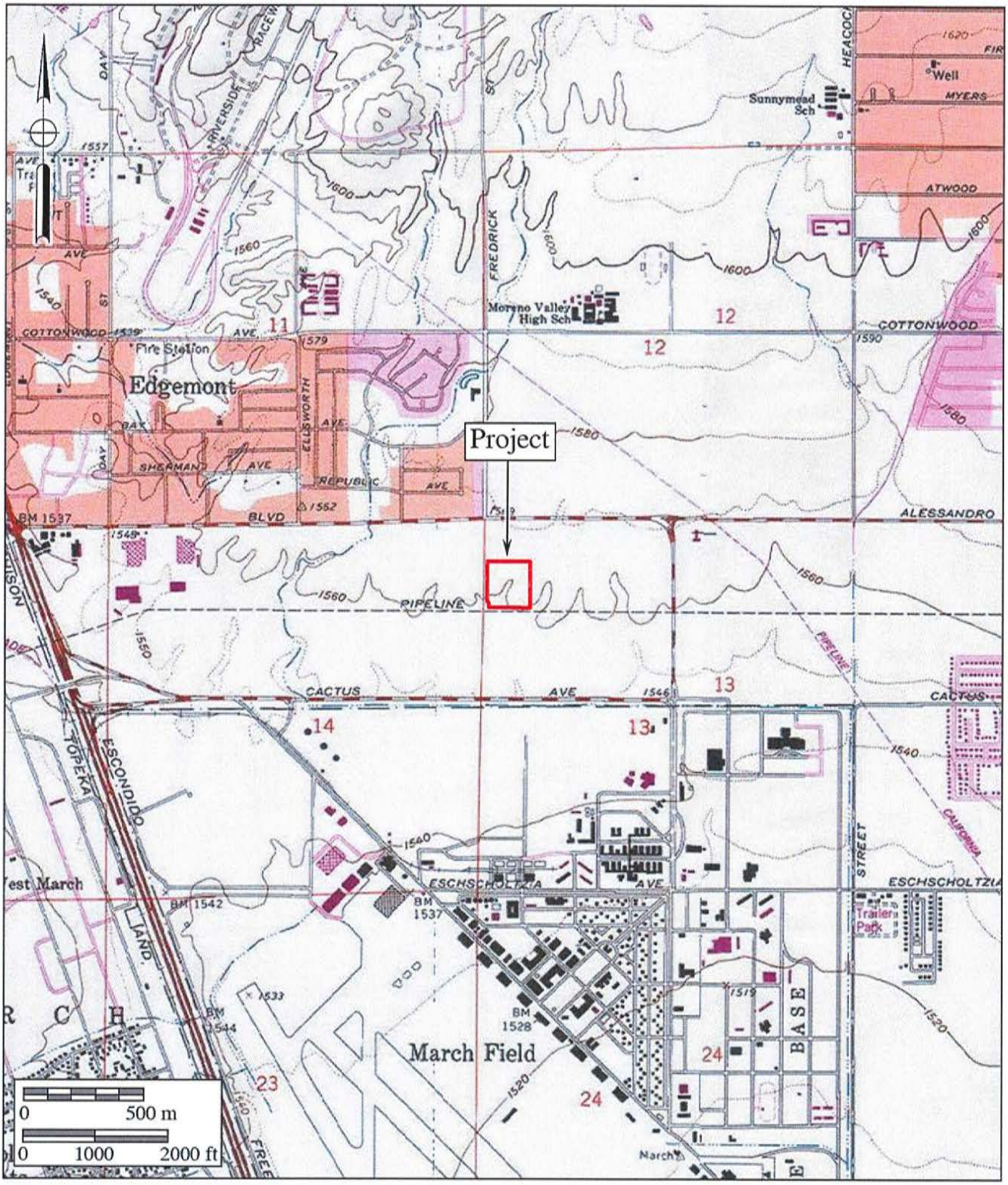

Figure 2.0–2

Project Location Map

The Centerpointe Project

USGS *Riverside East* and *Sunnymead* Quadrangles (7.5-minute series)

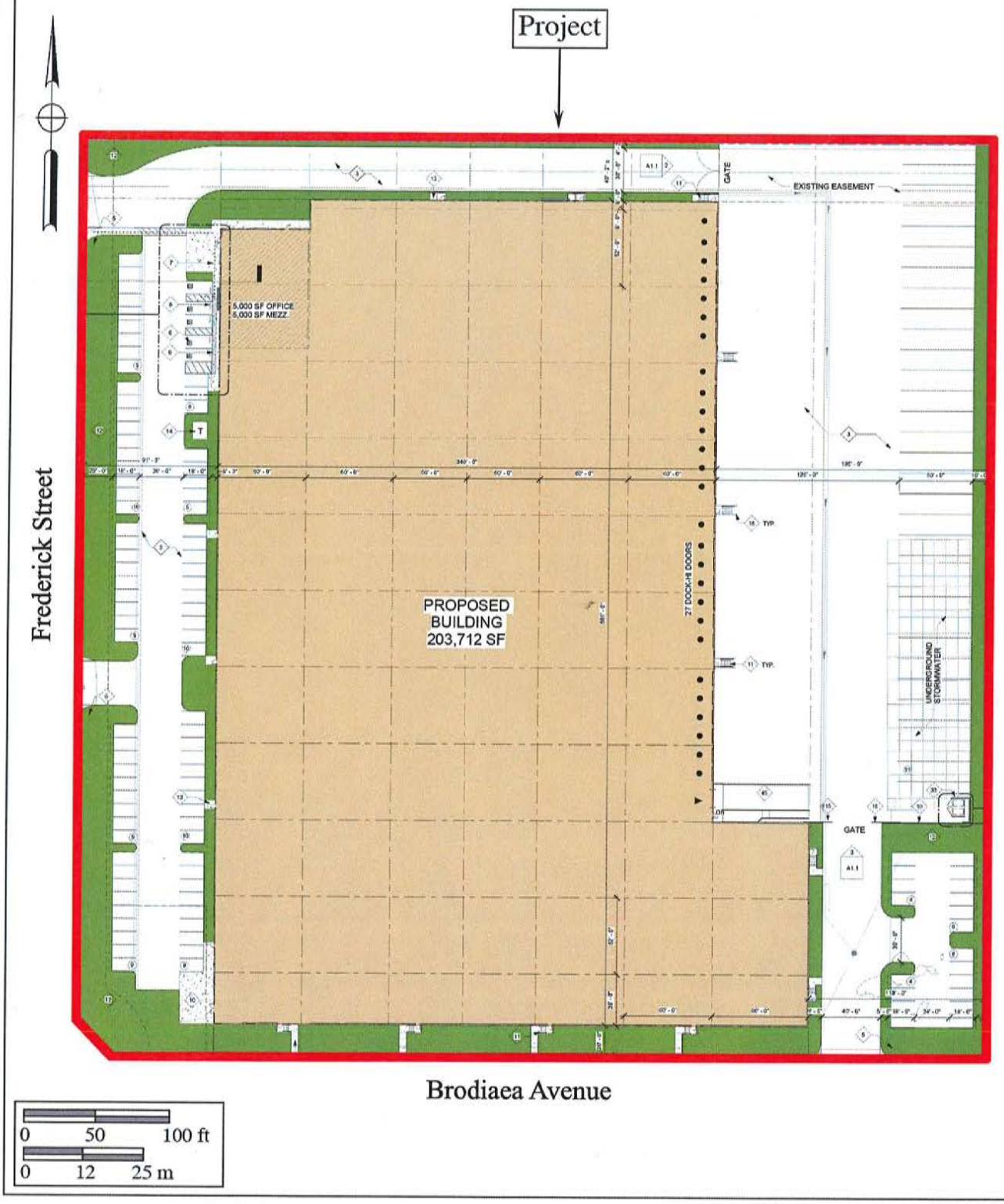

Figure 2.0–3

Project Development Map

The Centerpointe Project

3.0 PROJECT SETTING

The project setting includes the natural physical, geological, and biological contexts of the proposed project, as well as the cultural setting of prehistoric and historic human activities in the general area. The following sections discuss both the environmental and cultural settings at the subject property, the relationship between the two, and the relevance of that relationship to the project.

3.1 Environmental Setting

Riverside County lies in the Peninsular Range Geologic Province of southern California. The range, which lies in a northwest to southeast trend through the county, extends some 1,000 miles from the Raymond-Malibu Fault Zone in western Los Angeles County to the southern tip of Baja California. The subject property is northwest of the Perris Reservoir in the Moreno Valley, southeast of the Box Springs Mountains. The project area is relatively flat, with an elevation of approximately 1,560 feet above mean sea level (AMSL). The entire project has been disked and disturbed by past agricultural activities and appears to have been previously graded. The vegetation is dominated by newly growing non-native weeds and grasses, approximately two to six inches in height. A row of shrubs and pine trees have been planted on the western boundary of the project.

3.2 Cultural Setting

Paleo Indian, Archaic Period Milling Stone Horizon, and the Late Prehistoric Takic groups are the three general cultural periods represented in Riverside County. The following discussion of the cultural history of Riverside County references the San Dieguito Complex, Encinitas Tradition, Milling Stone Horizon, La Jolla Complex, Pauma Complex, and San Luis Rey Complex, since these culture sequences have been used to describe archaeological manifestations in the region. The Late Prehistoric component present in the Riverside County area was represented by the Cahuilla, Gabrielino, and Luiseño Indians.

Absolute chronological information, where possible, will be incorporated into this discussion to examine the effectiveness of continuing to interchangeably use these terms. Reference will be made to the geological framework that divides the culture chronology of the area into four segments: the late Pleistocene (20,000 to 10,000 YBP [years before the present]), the early Holocene (10,000 to 6,650 YBP), the middle Holocene (6,650 to 3,350 YBP), and the late Holocene (3,350 to 200 YBP).

3.2.1 Paleo Indian Period (Late Pleistocene: 11,500 to circa 9,000 YBP)

The Paleo Indian Period is associated with the terminus of the late Pleistocene (12,000 to 10,000 YBP). The environment during the late Pleistocene was cool and moist, which allowed for glaciation in the mountains and the formation of deep, pluvial lakes in the deserts and basin

lands (Moratto 1984). However, by the terminus of the late Pleistocene, the climate became warmer, which caused the glaciers to melt, sea levels to rise, greater coastal erosion, large lakes to recede and evaporate, extinction of Pleistocene megafauna, and major vegetation changes (Moratto 1984; Martin 1967, 1973; Fagan 1991). The coastal shoreline at 10,000 YBP, depending upon the particular area of the coast, was near the 30-meter isobath, or two to six kilometers further west than its present location (Masters 1983).

Paleo Indians were likely attracted to multiple habitat types, including mountains, marshlands, estuaries, and lakeshores. These people likely subsisted using a more generalized hunting, gathering, and collecting adaptation utilizing a variety of resources including birds, mollusks, and both large and small mammals (Erlandson and Colten 1991; Moratto 1984; Moss and Erlandson 1995).

3.2.2 Archaic Period (Early and Middle Holocene: circa 9,000 to 1,300 YBP)

Between 9,000 and 8,000 YBP, a widespread complex was established in the southern California region, primarily along the coast (Warren and True 1961). This complex is locally known as the La Jolla Complex (Rogers 1939; Moriarty 1966), which is regionally associated with the Encinitas Tradition (Warren 1968) and shares cultural components with the widespread Milling Stone Horizon (Wallace 1955). The coastal expression of this complex appeared in the southern California coastal areas and focused upon coastal resources and the development of deeply stratified shell middens that were primarily located around bays and lagoons. The older sites associated with this expression are located at Topanga Canyon, Newport Bay, Agua Hedionda Lagoon, and some of the Channel Islands. Radiocarbon dates from sites attributed to this complex span a period of over 7,000 years in this region, beginning over 9,000 YBP.

The Encinitas Tradition is best recognized for its pattern of large coastal sites characterized by shell middens, grinding tools that are closely associated with the marine resources of the area, cobble-based tools, and flexed human burials (Shumway et al. 1961; Smith and Moriarty 1985). While ground stone tools and scrapers are the most recognized tool types, coastal Encinitas Tradition sites also contain numerous utilized flakes, which may have been used to pry open shellfish. Artifact assemblages at coastal sites indicate a subsistence pattern focused upon shellfish collection and nearshore fishing. This suggests an incipient maritime adaptation with regional similarities to more northern sites of the same period (Koerper et al. 1986). Other artifacts associated with Encinitas Tradition sites include stone bowls, doughnut stones, discoidals, stone balls, and stone, bone, and shell beads.

The coastal lagoons in southern California supported large Milling Stone Horizon populations circa 6,000 YBP, as is shown by numerous radiocarbon dates from the many sites adjacent to the lagoons. The ensuing millennia were not stable environmentally, and by 3,000 YBP, many of the coastal sites in central San Diego County had been abandoned (Gallegos 1987, 1992). The abandonment of the area is usually attributed to the sedimentation of coastal lagoons and the resulting deterioration of fish and mollusk habitat, which is a well-documented situation

at Batiquitos Lagoon (Miller 1966; Gallegos 1987). Over a two-thousand-year period at Batiquitos Lagoon, dominant mollusk species occurring in archaeological middens shift from deep-water mollusks (*Argopecten* sp.) to species tolerant of tidal flat conditions (*Chione* sp.), indicating water depth and temperature changes (Miller 1966; Gallegos 1987).

This situation likely occurred for other small drainages (Buena Vista, Agua Hedionda, San Marcos, and Escondido creeks) along the central San Diego coast where low flow rates did not produce sufficient discharge to flush the lagoons they fed (Buena Vista, Agua Hedionda, Batiquitos, and San Elijo lagoons) (Byrd 1998). Drainages along the northern and southern San Diego coastline were larger and flushed the coastal hydrological features they fed, keeping them open to the ocean and allowing for continued human exploitation (Byrd 1998). Peñasquitos Lagoon exhibits dates as late as 2,355 YBP (Smith and Moriarty 1985) and San Diego Bay showed continuous occupation until the close of the Milling Stone Horizon (Gallegos and Kyle 1988). Additionally, data from several drainages in Camp Pendleton indicate a continued occupation of shell midden sites until the close of the period, indicating that coastal sites were not entirely abandoned during this time (Byrd 1998).

By 5,000 YBP, an inland expression of the La Jolla Complex is evident in the archaeological record, exhibiting influences from the Campbell Tradition from the north. These inland Milling Stone Horizon sites have been termed "Pauma Complex" (True 1958; Warren et al. 1961; Meighan 1954). By definition, Pauma Complex sites share a predominance of grinding implements (manos and metates), lack mollusk remains, have greater tool variety (including atlatl dart points, quarry-based tools, and crescentics), and seem to express a more sedentary lifestyle with a subsistence economy based upon the use of a broad variety of terrestrial resources. Although originally viewed as a separate culture from the coastal La Jolla Complex (True 1980), it appears that these inland sites may be part of a subsistence and settlement system utilized by the coastal peoples. Evidence from the 4S Project in inland San Diego County suggests that these inland sites may represent seasonal components within an annual subsistence round by La Jolla Complex populations (Raven-Jennings et al. 1996). Including both coastal and inland sites of this time period in discussions of the Encinitas Tradition, therefore, provides a more complete appraisal of the settlement and subsistence system exhibited by this cultural complex.

More recent work by Sutton has identified a more localized complex known as the Greven Knoll Complex. The Greven Knoll Complex is a redefined northern inland expression of the Encinitas Tradition first put forth by Mark Sutton and Jill Gardener (2010). Sutton and Gardner (2010:25) state that "[t]he early millingstone archaeological record in the northern portion of the interior southern California was not formally named but was often referred to as 'Inland Millingstone,' 'Encinitas,' or even 'Topanga.'" Therefore, they proposed that all expressions of the inland Milling Stone in southern California north of San Diego County be grouped together in the Greven Knoll Complex.

The Greven Knoll Complex, as postulated by Sutton and Gardener (2010), is broken into

three phases and obtained its name from the type-site Greven Knoll located in Yucaipa, California. Presently, the Greven Knoll Site is part of the Yukaipa't Site (SBR-1000) and was combined with the adjacent Simpson Site. Excavations at Greven Knoll recovered manos, metates, projectile points, discoidal cogged stones, and a flexed inhumation with a possible cremation (Kowta 1969:39). It is believed that the Greven Knoll Site was occupied between 5,000 and 3,500 YBP. The Simpson Site contained mortars, pestles, side-notched points, and stone and shell beads. Based upon the data recovered at these sites, Kowta (1969:39) suggested that "coastal Milling Stone Complexes extended to and interdigitated with the desert Pinto Basin Complex in the vicinity of the Cajon Pass."

Phase I of the Greven Knoll Complex is generally dominated by the presence of manos and metates, core tools, hammerstones, large dart points, flexed inhumations, and occasional cremations. Mortars and pestles are absent from this early phase, and the subsistence economy emphasized hunting. Sutton and Gardener (2010:26) propose that the similarity of the material culture of Greven Knoll Phase I and that found in the Mojave Desert at Pinto Period sites indicates that the Greven Knoll Complex was influenced by neighbors to the north at that time. Accordingly, Sutton and Gardener (2010) believe that Greven Knoll Phase I may have appeared as early as 9,400 YBP and lasted until about 4,000 YBP.

Greven Knoll Phase II is associated with a period between 4,000 and 3,000 YBP. Artifacts common to Greven Knoll Phase II include manos and metates, Elko points, core tools, and discoidals. Pestles and mortars are present; however, they are only represented in small numbers. Finally, there is an emphasis upon hunting and gathering for subsistence (Sutton and Gardner 2010:8).

Greven Knoll Phase III includes manos, metates, Elko points, scraper planes, choppers, hammerstones, and discoidals. Again, small numbers of mortars and pestles are present. Greven Knoll Phase III spans from approximately 3,000 to 1,000 YBP and shows a reliance upon seeds and yucca. Hunting is still important, but bones seem to have been processed to obtain bone grease more often in this later phase (Sutton and Gardner 2010:8).

The shifts in food processing technologies during each of these phases indicate a change in subsistence strategies; although people were still hunting for large game, plant-based foods eventually became the primary dietary resource (Sutton 2011a). Sutton's (2011b) argument posits that the development of mortars and pestles during the middle Holocene can be attributed to the year-round exploitation of acorns as a main dietary provision. Additionally, the warmer and drier climate may have been responsible for groups from the east moving toward coastal populations, which is archaeologically represented by the interchange of coastal and eastern cultural traits (Sutton 2011a).

3.2.3 Late Prehistoric Period (Late Holocene: 1,300 YBP to 1790)

Many Luiseño hold the world view that as a population they were created in southern California; however, archaeological and anthropological data proposes a scientific perspective.

Archaeological and anthropological evidence suggests that at approximately 1,350 YBP, Takic-speaking groups from the Great Basin region moved into Riverside County, marking the transition to the Late Prehistoric Period. An analysis of the Takic expansion by Sutton (2009) indicates that inland southern California was occupied by "proto-Yuman" populations before 1,000 YBP. The comprehensive, multi-phase model offered by Sutton (2009) employs linguistic, ethnographic, archaeological, and biological data to solidify a reasonable argument for population replacement of Takic groups to the north by Penutians (Laylander 1985). As a result, it is believed that Takic expansion occurred starting around 3,500 YBP moving toward southern California, with the Gabrielino language diffusing south into neighboring Yuman (Hokan) groups around 1,500 to 1,000 YBP, possibly resulting in the Luiseño dialect.

Based upon Sutton's model, the final Takic expansion would not have occurred until about 1,000 YBP, resulting in Vanyume, Serrano, Cahuilla, and Cupeño dialects. The model suggests that the Luiseño did not simply replace Hokan speakers, but were rather a northern San Diego County/southern Riverside County Yuman population who adopted the Takic language. This period is characterized by higher population densities and elaborations in social, political, and technological systems. Economic systems diversified and intensified during this period with the continued elaboration of trade networks, the use of shell-bead currency, and the appearance of more labor-intensive, yet effective, technological innovations. Technological developments during this period included the introduction of the bow and arrow between A.D. 400 and 600 and the introduction of ceramics. Atlatl darts were replaced by smaller arrow darts, including Cottonwood series points. Other hallmarks of the Late Prehistoric Period include extensive trade networks as far-reaching as the Colorado River Basin and cremation of the dead.

3.2.4 Protohistoric Period (Late Holocene: 1790 to Present)

Ethnohistoric and ethnographic evidence indicates that three Takic-speaking groups occupied portions of Riverside County: the Cahuilla, the Gabrielino, and the Luiseño. The geographic boundaries between these groups in pre- and proto-historic times are difficult to place, but the project is located well within the borders of ethnographic Luiseño territory. This group was a seasonal hunting and gathering people with cultural elements that were very distinct from Archaic Period peoples. These distinctions include cremation of the dead, the use of the bow and arrow, and exploitation of the acorn as a main food staple (Moratto 1984). Along the coast, the Luiseño made use of available marine resources by fishing and collecting mollusks for food. Seasonally available terrestrial resources, including acorns and game, were also sources of nourishment for Luiseño groups. Elaborate kinship and clan systems between the Luiseño and other groups facilitated a wide-reaching trade network that included trade of Obsidian Butte obsidian and other resources from the eastern deserts, as well as steatite from the Channel Islands.

According to Charles Handley (1967), the primary settlements of Late Prehistoric Luiseño Indians in the San Jacinto Plain were represented by Ivah and Soboba near Soboba

Springs, Jusipah near the town of San Jacinto, Ararah in Webster's Canyon en route to Idyllwild, Pahsitha near Big Springs Ranch southeast of Hemet, and Corova in Castillo Canyon. These locations share features such as the availability of food and water resources. Features of this land use include petroglyphs and pictographs, as well as widespread milling, which is evident in bedrock and portable implements. Groups in the vicinity of the project, neighboring the Luiseño, include the Cahuilla and the Gabrielino. Ethnographic data for the three groups is presented below.

Luiseño

When contacted by the Spanish in the sixteenth century, the Luiseño occupied a territory bounded on the west by the Pacific Ocean, on the east by the Peninsular Ranges mountains at San Jacinto (including Palomar Mountain to the south and Santiago Peak to the north), on the south by Agua Hedionda Lagoon, and on the north by Aliso Creek in present-day San Juan Capistrano. The Luiseño were a Takic-speaking people more closely related linguistically and ethnographically to the Cahuilla, Gabrielino, and Cupeño to the north and east rather than the Kumeyaay who occupied territory to the south. The Luiseño differed from their neighboring Takic speakers in having an extensive proliferation of social statuses, a system of ruling families that provided ethnic cohesion within the territory, a distinct worldview that stemmed from the use of *datura* (a hallucinogen), and an elaborate religion that included the creation of sacred sand paintings depicting the deity *Chingichngish* (Bean and Shipek 1978; Kroeber 1976).

Subsistence and Settlement

The Luiseño occupied sedentary villages most often located in sheltered areas in valley bottoms, along streams, or along coastal strands near mountain ranges. Villages were located near water sources to facilitate acorn leaching and in areas that offered thermal and defensive protection. Villages were composed of areas that were publicly and privately (by family) owned. Publicly owned areas included trails, temporary campsites, hunting areas, and quarry sites. Inland groups had fishing and gathering sites along the coast that were used intensively from January to March when inland food resources were scarce. During October and November, most of the village would relocate to mountain oak groves to harvest acorns. The Luiseño remained at village sites for the remainder of the year, where food resources were within a day's travel (Bean and Shipek 1978; Kroeber 1976).

The most important food source for the Luiseño was the acorn, six different species of which were used (*Quercus californica, Quercus agrifolia, Quercus chrysolepis, Quercus dumosa, Quercus engelmannii,* and *Quercus wislizenii*). Seeds, particularly of grasses, composites, and mints, were also heavily exploited. Seed-bearing species were encouraged through controlled burns, which were conducted at least every third year. A variety of other stems, leaves, shoots, bulbs, roots, and fruits were also collected. Hunting augmented this vegetal diet. Animal species taken included deer, rabbit, hare, woodrat, ground squirrel,

antelope, quail, duck, freshwater fish from mountain streams, marine mammals, and other sea creatures such as fish, crustaceans, and mollusks (particularly abalone, or *Haliotis* sp.). In addition, a variety of snakes, small birds, and rodents were eaten (Bean and Shipek 1978; Kroeber 1976).

Social Organization

Social groups within the Luiseño nation consisted of patrilinear families or clans, which were politically and economically autonomous. Several clans comprised a religious party, or *nota*, which was headed by a chief who organized ceremonies and controlled economics and warfare. The chief had assistants who specialized in particular aspects of ceremonial or environmental knowledge and who, with the chief, were part of a religion-based social group with special access to supernatural power, particularly that of *Chingichngish*. The positions of chief and assistants were hereditary, and the complexity and multiplicity of these specialists' roles likely increased in coastal and larger inland villages (Bean and Shipek 1978; Kroeber 1976; Strong 1929).

Marriages were arranged by the parents, often made to forge alliances between lineages. Useful alliances included those between groups of differing ecological niches and those that resulted in territorial expansion. Residence was patrilocal (Bean and Shipek 1978; Kroeber 1976). Women were primarily responsible for plant gathering, and men principally hunted, although at times, particularly during acorn and marine mollusk harvests, there was no division of labor. Elderly women cared for children and elderly men participated in rituals, ceremonies, and political affairs. They were also responsible for manufacturing hunting and ritual implements. Children were taught subsistence skills at the earliest age possible (Bean and Shipek 1978; Kroeber 1976).

Material Culture

House structures were conical, partially subterranean, and thatched with reeds, brush, or bark. Ramadas were rectangular, protected workplaces for domestic chores such as cooking. Ceremonial sweathouses were important in purification rituals; these were round and partially subterranean thatched structures covered with a layer of mud. Another ceremonial structure was the *wámkis* (located in the center of the village, serving as the place of rituals), where sand paintings and other rituals associated with the *Chingichngish* religious group were performed (Bean and Shipek 1978; Kroeber 1976).

Clothing was minimal; women wore a cedar-bark and netted twine double apron and men wore a waist cord. In cold weather, cloaks or robes of rabbit fur, deerskin, or sea otter fur were worn by both sexes. Footwear included deerskin moccasins and sandals fashioned from yucca fibers. Adornments included bead necklaces and pendants made of bone, clay, stone, shell, bear claw, mica, deer hooves, and abalone shell. Men wore ear and nose piercings made from cane or bone, which were sometimes decorated with beads. Other adornments were commonly

decorated with semiprecious stones including quartz, topaz, garnet, opal, opalite, agate, and jasper (Bean and Shipek 1978; Kroeber 1976).

Hunting implements included the bow and arrow. Arrows were tipped with either a carved, fire-hardened wooden tip or a lithic point, usually fashioned from locally available metavolcanic material or quartz. Throwing sticks fashioned from wood were used in hunting small game, while deer head decoys were used during deer hunts. Coastal groups fashioned dugout canoes for nearshore fishing and harvested fish with seines, nets, traps, and hooks made of bone or abalone shell (Bean and Shipek 1978; Kroeber 1976).

The Luiseño had a well-developed basket industry. Baskets were used in resource gathering, food preparation, storage, and food serving. Ceramic containers were shaped by paddle and anvil and fired in shallow, open pits to be used for food storage, cooking, and serving. Other utensils included wood implements, steatite bowls, and ground stone manos, metates, mortars, and pestles (Bean and Shipek 1978; Kroeber 1976). Additional tools such as knives, scrapers, choppers, awls, and drills were also used. Shamanistic items include soapstone or clay smoking pipes and crystals made of quartz or tourmaline (Bean and Shipek 1978; Kroeber 1976).

Cahuilla

At the time of Spanish contact in the sixteenth century, the Cahuilla occupied territory that included the San Bernardino Mountains, Orocopia Mountain, and the Chocolate Mountains to the west, Salton Sea and Borrego Springs to the south, Palomar Mountain and Lake Mathews to the west, and the Santa Ana River to the north. The Cahuilla are a Takic-speaking people closely related to their Gabrielino and Luiseño neighbors, although relations with the Gabrielino were more intense than with the Luiseño. They differ from the Luiseño and Gabrielino in that their religion is more similar to the Mohave tribes of the eastern deserts than the *Chingichngish* religious group of the Luiseño and Gabrielino. The following is a summary of ethnographic data regarding this group (Bean 1978; Kroeber 1976).

Subsistence and Settlement

Cahuilla villages were typically permanent and located on low terraces within canyons in proximity to water sources. These locations proved to be rich in food resources and also afforded protection from prevailing winds. Villages had areas that were publicly owned and areas that were privately owned by clans, families, or individuals. Each village was associated with a particular lineage and series of sacred sites that included unique petroglyphs and pictographs. Villages were occupied throughout the year; however, during a several-week period in the fall, most of the village members relocated to mountain oak groves to take part in acorn harvesting (Bean 1978; Kroeber 1976).

The Cahuilla's use of plant resources is well documented. Plant foods harvested by the Cahuilla included valley oak acorns and single-leaf pinyon pine nuts. Other important plant

species included bean and screw mesquite, agave, Mohave yucca, cacti, palm, chia, quail brush, yellowray goldfield, goosefoot, manzanita, catsclaw, desert lily, mariposa lily, and a number of other species such as grass seed. A number of agricultural domesticates were acquired from the Colorado River tribes including corn, bean, squash, and melon grown in limited amounts. Animal species taken included deer, bighorn sheep, pronghorn antelope, rabbit, hare, rat, quail, dove, duck, roadrunner, and a variety of rodents, reptiles, fish, and insects (Bean 1978; Kroeber 1976).

Social Organization

The Cahuilla was not a political nation, but rather a cultural nationality with a common language. Two non-political, non-territorial patrimoieties were recognized, the Wildcats (túktem) and the Coyotes (?ístam). Lineage and kinship were memorized at a young age among the Cahuilla, providing a backdrop for political relationships. Clans were composed of three to 10 lineages; each lineage owned a village site and specific resource areas. Lineages within a clan cooperated in subsistence activities, defense, and rituals (Bean 1978; Kroeber 1976).

A system of ceremonial hierarchy operated within each lineage. The hierarchy included the lineage leader, who was responsible for leading subsistence activities, guarding the sacred bundle, and negotiating with other lineage leaders in matters concerning land use, boundary disputes, marriage arrangements, trade, warfare, and ceremonies. The ceremonial assistant to the lineage leader was responsible for organizing ceremonies. A ceremonial singer possessed and performed songs at rituals and trained assistant singers. The shaman cured illnesses through supernatural powers, controlled natural phenomena, and was the guardian of ceremonies, keeping evil spirits away. The diviner was responsible for finding lost objects, telling future events, and locating game and other food resources. Doctors were usually older women who cured various ailments and illnesses with their knowledge of medicinal herbs. Finally, certain Cahuilla specialized as traders, who ranged as far west as Santa Catalina and as far east as the Gila River (Bean 1978; Kroeber 1976).

Marriages were arranged by parents from opposite moieties. When a child was born, an alliance formed between the families, which included frequent reciprocal exchanges. The Cahuilla kinship system extended to relatives within five generations. Important economic decisions, primarily the distribution of goods, operated within this kinship system (Bean 1978; Kroeber 1976).

Material Culture

Cahuilla houses were dome-shaped or rectangular, thatched structures. The home of the lineage leader was the largest, located near the ceremonial house with the best access to water. Other structures within the village included the men's sweathouse and granaries (Bean 1978; Kroeber 1976).

Cahuilla clothing, like other groups in the area, was minimal. Men typically wore a

loincloth and sandals; women wore skirts made from mesquite bark, animal skin, or tules. Babies wore mesquite bark diapers. Rabbit skin cloaks were worn in cold weather (Bean 1978; Kroeber 1976).

Hunting implements included the bow and arrow, throwing sticks, and clubs. Grinding tools used in food processing included manos, metates, and wooden mortars. The Cahuilla were known to use long, wood, grinding implements to process mesquite beans; the mortar was typically a hollowed wooden log buried in the ground. Other tools included steatite arrow shaft straighteners (Bean 1978; Kroeber 1976).

Baskets were made from rush, deer grass, and skunkbrush. Different species and leaves were chosen for different colors in the basket design. Coiled-ware baskets were either flat (for plates, trays, or winnowing), bowl-shaped (for food serving), deep, inverted, and cone-shaped (for transporting), or rounded and flat-bottomed for storing utensils and personal items (Bean 1978; Kroeber 1976).

Cahuilla pottery was made from a thin, red-colored ceramic ware that was often painted and incised. Four basic vessel types are known for the Cahuilla: small-mouthed jars, cooking pots, bowls, and dishes. Additionally, smoking pipes and flutes were fashioned from ceramic (Bean 1978; Kroeber 1976).

Gabrielino

The territory of the Gabrielino at the time of Spanish contact covers much of present-day Los Angeles and Orange counties. The southern extent of this culture area is bounded by Aliso Creek, the eastern extent is located east of present-day San Bernardino along the Santa Ana River, the northern extent includes the San Fernando Valley, and the western extent includes portions of the Santa Monica Mountains. The Gabrielino also occupied several Channel Islands including Santa Barbara Island, Santa Catalina Island, San Nicholas Island, and San Clemente Island. Because of their access to certain resources, including a steatite source from Santa Catalina Island, this group was among the wealthiest and most populous aboriginal groups in all of southern California. Trade of materials and resources controlled by the Gabrielino extended as far north as the San Joaquin Valley, as far east as the Colorado River, and as far south as Baja California (Bean and Smith 1978; Kroeber 1976).

Subsistence and Settlement

The Gabrielino lived in permanent villages and smaller resource-gathering camps occupied at various times of the year depending upon the seasonality of the resource. Larger villages were comprised of several families or clans, while smaller, seasonal camps typically housed smaller family units. The coastal area between San Pedro and Topanga Canyon was the location of primary subsistence villages, while secondary sites were located near inland sage stands, oak groves, and pine forests. Permanent villages were located along rivers and streams and in sheltered areas along the coast. As previously mentioned, the Channel Islands were also

the locations of relatively large settlements (Bean and Smith 1978; Kroeber 1976).

Resources procured along the coast and on the islands were primarily marine in nature and included tuna, swordfish, ray and shark, California sea lion, Stellar sea lion, harbor seal, northern elephant seal, sea otter, dolphin and porpoise, various waterfowl species, numerous fish species, purple sea urchin, and mollusks, such as rock scallop, California mussel, and limpet. Inland resources included oak acorn, pine nut, Mohave yucca, cacti, sage, grass nut, deer, rabbit, hare, rodent, quail, duck, and a variety of reptiles such as western pond turtle and numerous snake species (Bean and Smith 1978; Kroeber 1976).

Social Organization

The social structure of the Gabrielino is little known; however, there appears to have been at least three social classes: 1) the elite, which included the rich, chiefs, and their immediate family; 2) a middle class, which included people of relatively high economic status or long-established lineages; and 3) a class of people that included most other individuals in the society. Villages were politically autonomous units comprised of several lineages. During times of the year when certain seasonal resources were available, the village would divide into lineage groups and move out to exploit them, returning to the village between forays (Bean and Smith 1978; Kroeber 1976).

Each lineage had its own leader, with the village chief coming from the dominant lineage. Several villages might be allied under a paramount chief. Chiefly positions were of an ascribed status, most often passed to the eldest son. Chiefly duties included providing village cohesion, leading warfare and peace negotiations with other groups, collecting tribute from the village(s) under his jurisdiction, and arbitrating disputes within the village(s). The status of the chief was legitimized by his safekeeping of the sacred bundle, a representation of the link between the material and spiritual realms and the embodiment of power (Bean and Smith 1978; Kroeber 1976).

Shamans were leaders in the spirit realm. The duties of the shaman included conducting healing and curing ceremonies, guarding the sacred bundle, locating lost items, identifying and collecting poisons for arrows, and making rain (Bean and Smith 1978; Kroeber 1976).

Marriages were made between individuals of equal social status and, in the case of powerful lineages, marriages were arranged to establish political ties between the lineages (Bean and Smith 1978; Kroeber 1976).

Men conducted the majority of the heavy labor, hunting, fishing, and trading with other groups. Women's duties included gathering and preparing plant and animal resources, and making baskets, pots, and clothing (Bean and Smith 1978; Kroeber 1976).

Material Culture

Gabrielino houses were domed, circular structures made of thatched vegetation. Houses varied in size and could house from one to several families. Sweathouses (semicircular, earth-

covered buildings) were public structures used in male social ceremonies. Other structures included menstrual huts and a ceremonial structure called a *yuvar*, an open-air structure built near the chief's house (Bean and Smith 1978; Kroeber 1976).

Clothing was minimal; men and children most often went naked, while women wore deerskin or bark aprons. In cold weather, deerskin, rabbit fur, or bird skin (with feathers intact) cloaks were worn. Island and coastal groups used sea otter fur for cloaks. In areas of rough terrain, yucca fiber sandals were worn. Women often used red ochre on their faces and skin for adornment or protection from the sun. Adornment items included feathers, fur, shells, and beads (Bean and Smith 1978; Kroeber 1976).

Hunting implements included wooden clubs, sinew-backed bows, slings, and throwing clubs. Maritime implements included rafts, harpoons, spears, hook and line, and nets. A variety of other tools included deer scapulae saws, bone and shell needles, bone awls, scrapers, bone or shell flakers, wedges, stone knives and drills, metates, mullers, manos, shell spoons, bark platters, and wooden paddles and bowls. Baskets were made from rush, deer grass, and skunkbush. Baskets were fashioned for hoppers, plates, trays, and winnowers for leaching, straining, and gathering. Baskets were also used for storing, preparing, and serving food, and for keeping personal and ceremonial items (Bean and Smith 1978; Kroeber 1976).

The Gabrielino had exclusive access to soapstone, or steatite, procured from Santa Catalina Island quarries. This highly prized material was used for making pipes, animal carvings, ritual objects, ornaments, and cooking utensils. The Gabrielino profited well from trading steatite since it was valued so much by groups throughout southern California (Bean and Smith 1978; Kroeber 1976).

3.2.5 Ethnohistoric Period (1769 to Present)

European exploration along the California coast began in 1542 with the landing of Juan Rodriguez Cabrillo and his men at San Diego Bay. Sixty years after the Cabrillo expeditions, an expedition under Sebastian Viscaíno made an extensive and thorough exploration of the Pacific coast. Although the voyage did not extend beyond the northern limits of the Cabrillo track, Viscaíno had the most lasting effect on the nomenclature of the coast. Many of the names he gave to various locations have survived, whereas practically every one of the names given by Cabrillo has faded from use. For instance, Cabrillo gave the name "San Miguel" to the first port he stopped at in what is now the United States; 60 years later, Viscaíno changed it to "San Diego" (Rolle 1969). The early European voyages observed Native Americans living in villages along the coast but did not make any substantial, long-lasting impact. At the time of contact, the Luiseño population was estimated to have ranged from 4,000 to as many as 10,000 individuals (Bean and Shipek 1978; Kroeber 1976).

3.2.6 Historic Period

The historic background of the project area began with the Spanish colonization of Alta California. The first Spanish colonizing expedition reached southern California in 1769 with the intention of converting and civilizing the indigenous populations, as well as expanding the knowledge of and access to new resources in the region (Brigandi 1998). In the late eighteenth century, the San Gabriel (Los Angeles County), San Juan Capistrano (Orange County), and San Luis Rey (San Diego County) missions began colonizing southern California and gradually expanded their use of the interior valley (into what is now western Riverside County) for raising grain and cattle to support the missions (Riverside County n.d.). The San Gabriel Mission claimed lands in what is now Jurupa, Riverside, San Jacinto, and the San Gorgonio Pass, while the San Luis Rey Mission claimed land in what is now Lake Elsinore, Temecula, and Murrieta (American Local History Network: Riverside County, California 1998). The indigenous groups who occupied these lands were recruited by missionaries, converted, and put to work in the missions (Pourade 1964). Throughout this period, the Native American populations were decimated by introduced diseases, a drastic shift in diet resulting in poor nutrition, and social conflicts due to the introduction of an entirely new social order (Cook 1976).

In the mid- to late 1770s, Juan Bautista de Anza passed through much of Riverside County while searching for an overland route from Sonora, Mexico to San Gabriel and Los Angeles, describing fertile valleys, lakes, and sub-desert areas (American Local History Network: Riverside County, California 1998; Riverside County n.d.). In 1797, Father Presidente Lausen, Father Norberto de Santiago, and Corporal Pedro Lisalde led an expedition from Mission San Juan Capistrano through southwestern Riverside County in search of a new mission site before constructing Mission San Luis Rey in northern San Diego County (Brigandi 1998). While no missions were ever built in what would become Riverside County (American Local History Network: Riverside County, California 1998), many mission outposts, or *asistencias*, were established in the early years of the nineteenth century to extend the missions' influence to the backcountry (Brigandi 1998). Two outposts located in Riverside County include San Jacinto and Temecula.

Mexico gained independence in 1822 and desecularized the missions in 1832, signifying the end of the Mission Period (Brigandi 1998; Riverside County n.d.). By this time, the missions owned some of the best and most fertile land in southern California. In order for California to develop, the land would have to be made productive enough to turn a profit (Brigandi 1998). The new government began distributing the vast mission holdings to wealthy and politically connected Mexican citizens. The "grants" were called "ranchos," of which Jurupa, El Rincon, La Sierra, El Sobrante de San Jacinto, La Laguna (Lake Elsinore), Santa Rosa, Temecula, Pauba, San Jacinto Nuevo y Potrero, and San Jacinto Viejo were located in present-day Riverside County. Many of these ranchos have lent their names to modern-day locales (American Local History Network: Riverside County, California 1998). The first grant in present-day Riverside County, Rancho Jurupa, was given to Juan Bandini in 1838. These ranchos were all located in

the valley environments typical of western Riverside County.

The treatment of Native Americans grew worse during the Rancho Period. Most of the Native Americans were forced off of their land or put to work on the now privately-owned ranchos, most often as slave labor. In light of the brutal ranchos, the degree to which Native Americans had become dependent upon the mission system is evident when, in 1838, a group of Native Americans from the San Luis Rey Mission petitioned government officials in San Diego to relieve suffering at the hands of the rancheros:

> We have suffered incalculable losses, for some of which we are in part to be blamed for because many of us have abandoned the Mission … We plead and beseech you … to grant us a Rev. Father for this place. We have been accustomed to the Rev. Fathers and to their manner of managing the duties. We labored under their intelligent directions, and we were obedient to the Fathers according to the regulations, because we considered it as good for us. (Brigandi 1998:21)

Native American culture had been disrupted to the point where they could no longer rely upon prehistoric subsistence and social patterns. Not only does this illustrate how dependent the Native Americans had become upon the missionaries, but it also indicates a marked contrast in the way the Spanish treated the Native Americans compared to the Mexican and United States ranchers. Spanish colonialism (missions) is based upon utilizing human resources while integrating them into their society. The Mexican and American ranchers did not accept Native Americans into their social order and used them specifically for the extraction of labor, resources, and profit. Rather than being incorporated, they were either subjugated or exterminated (Cook 1976).

In 1846, war erupted between Mexico and the United States. In 1848, with the signing of the Treaty of Guadalupe Hidalgo, the region was annexed as a territory of the United States, leading to California became a state in 1850. These events generated a steady flow of settlers into the area, including gold miners, entrepreneurs, health-seekers, speculators, politicians, adventurers, seekers of religious freedom, and individuals desiring to create utopian colonies.

In early 1852, the Native Americans of southern Riverside County, including the Luiseño and the Cahuilla, thought they had signed a treaty resulting in their ownership of all lands from Temecula to Aguanga east to the desert, including the San Jacinto Valley and the San Gorgonio Pass. The Temecula Treaty also included food and clothing provisions for the Native Americans. However, Congress never ratified the treaties, and the promise of one large reservation was rescinded (Brigandi 1998).

With the completion of the transcontinental railroad in 1869, land speculators, developers, and colonists began to invest in southern California. The first colony in what was to become Riverside County was Riverside itself. Judge John Wesley North, an abolitionist from

Tennessee, brought a group of associates and co-investors out to southern California and founded Riverside on part of the Jurupa Rancho. A few years after, the navel orange was planted and found to be such a success that it quickly became the agricultural staple of the region (American Local History Network: Riverside County, California 1998).

By the late 1880s and early 1890s, there was growing discontent between Riverside and San Bernardino, its neighbor 10 miles to the north, due to differences in opinion concerning religion, morality, the Civil War, politics, and fierce competition to attract settlers. After a series of instances in which charges were claimed about unfair use of tax monies to the benefit of the city of only San Bernardino, several people from Riverside decided to investigate the possibility of a new county. In May 1893, voters living within portions of San Bernardino County (to the north) and San Diego County (to the south) approved the formation of Riverside County. Early business opportunities were linked to the agriculture industry, but commerce, construction, manufacturing, transportation, and tourism also provided a healthy local economy. By the time of Riverside County's formation, Riverside had grown to become the wealthiest city per capita in the country due to the successful cultivation of the navel orange (American Local History Network: Riverside County, California 1998; Riverside County n.d.).

3.3 Applicable Regulations

Resource importance is assigned to districts, sites, buildings, structures, and objects that possess exceptional value or quality illustrating or interpreting the heritage of Riverside County in history, architecture, archaeology, engineering, and culture. A number of criteria are used in demonstrating resource importance. Specifically, criteria outlined in CEQA provide the guidance for making such a determination. The following sections detail the CEQA criteria that a resource must meet in order to be determined important.

3.3.1 California Environmental Quality Act

According to CEQA (§15064.5a), the term "historical resource" includes the following:

1) A resource listed in or determined to be eligible by the State Historical Resources Commission for listing in the California Register of Historical Resources (Pub. Res. Code SS5024.1, Title 14 CCR. Section 4850 et seq.).
2) A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code, or identified as significant in an historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
3) Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural,

engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code SS5024.1, Title 14, Section 4852) including the following:

a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
b) Is associated with the lives of persons important in our past;
c) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
d) Has yielded, or may be likely to yield, information important in prehistory or history.

4) The fact that a resource is not listed in, or determined eligible for listing in, the California Register of Historical Resources, not included in a local register of historical resources (pursuant to Section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in Section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code Section 5020.1(j) or 5024.1.

According to CEQA (§15064.5b), a project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. CEQA defines a substantial adverse change as:

1) Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.
2) The significance of an historical resource is materially impaired when a project:

a) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register of Historical Resources;

b) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant;

c) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

Section 15064.5(c) of CEQA applies to effects on archaeological sites and contains the following additional provisions regarding archaeological sites:

1. When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource, as defined in subsection (a).
2. If a lead agency determines that the archaeological site is an historical resource, it shall refer to the provisions of Section 21084.1 of the Public Resources Code, Section 15126.4 of the guidelines, and the limits contained in Section 21083.2 of the Public Resources Code do not apply.
3. If an archaeological site does not meet the criteria defined in subsection (a), but does meet the definition of a unique archaeological resource in Section 21803.2 of the Public Resources Code, the site shall be treated in accordance with the provisions of Section 21083.2. The time and cost limitations described in Public Resources Code Section 21083.2 (c-f) do not apply to surveys and site evaluation activities intended to determine whether the project location contains unique archaeological resources.
4. If an archaeological resource is neither a unique archaeological nor historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or Environmental Impact Report, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process.

Section 15064.5 (d) & (e) contain additional provisions regarding human remains. Regarding Native American human remains, paragraph (d) provides:

(d) When an initial study identifies the existence of, or the probable likelihood of, Native American human remains within the project, a lead agency shall work with the appropriate Native Americans as identified by the NAHC, as provided in Public Resources Code SS5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials with the appropriate Native Americans as identified by the NAHC. Action implementing such an agreement is exempt from:

1) The general prohibition on disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery (Health and Safety Code Section 7050.5)
2) The requirement of CEQA and the Coastal Act.

3.4 Research Design

The primary goal of the research design is to attempt to understand the way in which humans have used the land and resources within the project area through time, as well as to aid in the determination of resource significance. For the current project, the study area under investigation is the western portion of Riverside County and the southwestern section of the city of Moreno Valley. The scope of work for the archaeological program conducted for the Centerpointe Project included the survey of an 8.78-acre area. Given the area involved in this Phase I survey, the research design for this project was limited and general in nature. Since the main objective of the investigation was to identify the presence of and potential impacts to cultural resources, the goal here is not necessarily to answer wide-reaching theories regarding the development of early southern California, but to investigate the role and importance of the identified resources. Nevertheless, the assessment of the significance of a resource must take into consideration a variety of characteristics, as well as the ability of the resource to address regional research topics and issues.

Although survey-level investigations are limited in terms of the amount of information available, several specific research questions were developed that could be used to guide the initial investigations of any observed cultural resources. The following research questions take into account the small size and location of the project area discussed above.

Research Questions

- Can located cultural resources be situated with a specific time period, population, or individual?
- Do the types of located cultural resources allow a site activity/function to be determined from a preliminary investigation? What are the site activities? What is the site function? What resources were exploited?
- How do the located sites compare to others reported from different surveys conducted

in the area?

- How do the located sites fit existing models of settlement and subsistence for valley environments of the region?

Data Needs

At the survey level, the principle research objective is a generalized investigation of changing settlement patterns in both the prehistoric and historic periods within the study area. The overall goal is to understand settlement and resource procurement patterns of the project area occupants. Therefore, adequate information on site function, context, and chronology from an archaeological perspective is essential for the investigation. The fieldwork and archival research was undertaken with these primary research goals in mind:

1) To identify cultural resources occurring within the project area;
2) To determine, if possible, site type and function, context of the deposit, and chronological placement of each cultural resource identified;
3) To place each cultural resource identified within a regional perspective; and
4) To provide recommendations for the treatment of each of the cultural resources identified.

4.0 METHODOLOGY

The cultural resources assessment conducted for the Centerpointe Project consisted of a reconnaissance-level survey of the property by a qualified archaeologist and an institutional records search. This archaeological study conformed to City of Moreno Valley environmental guidelines, and the statutory requirements of CEQA were followed in evaluating potential impacts.

4.1 Field Methodology

The cultural resources survey of the project was conducted on January 29, 2018. The survey of the entire 8.78-acre property was an intensive pedestrian reconnaissance consisting of a series of parallel transects spaced at approximately five-meter intervals, which covered all areas of the project. The project is comprised of a generally rectangular APE. Ground visibility was good to excellent and only limited at times due to non-native weeds and grasses. The entire property was accessible and no constraints were encountered. Digital photographs were taken to document project conditions during the survey (see Section 5.2).

4.2 Records Search

The records search conducted at the EIC at UCR on February 6, 2018 was reviewed for an area of one mile surrounding the project in order to determine the presence of any previously recorded cultural resources. Results of the records search are provided in Appendix B and discussed in Section 5.1. During the EIC records search, a standard review of the National Register of Historic Places and the Office of Historic Preservation Historic Property Directory was completed. Land patent records held by the Bureau of Land Management (BLM) and accessible through the BLM General Land Office (GLO) website were also reviewed for pertinent project information. In addition, the BFSA research library and historic aerial photographs were also consulted for any relevant historical information.

4.3 Report Preparation and Recordation

This report contains information regarding previous studies, statutory requirements for the project, and a brief description of the setting, research methods employed, overall results, and recommendations. The report includes all appropriate illustrations and tabular information needed to make a complete and comprehensive presentation of these activities, including the methodologies employed and the personnel involved. A copy of this report will be placed at the EIC at UCR. Any newly recorded sites or sites requiring updated information will be recorded on the appropriate Department of Parks and Recreation (DPR) forms, which will be filed with the EIC.

4.4 Native American Consultation

BFSA requested a review of the SLF at the NAHC on January 29, 2018 to determine if any recorded Native American sacred sites or locations of religious or ceremonial importance are present within one mile of the project. Original correspondence may be found in Appendix C.

5.0 REPORT OF FINDINGS

5.1 Results of the Institutional Records Searches

A records search was conducted by BFSA at the EIC at UCR on February 6, 2018. The EIC records search indicates that there are 114 cultural resources present within a one-mile radius of the project. None of the recorded cultural resources are located within the project boundary. The resources identified by the EIC during the records search mainly consist of structures associated with the historic World War II (WWII)-era March Air Reserve Base, including the National Register March Field Historic District, buildings and a stone drainage canal that contribute to the district, non-contributing ancillary buildings and historic March Village medical campus buildings, and the former main entrance/security checkpoint to the military base. The only resources within one mile of the APE not associated with the March Field/Air Reserve area are six historic Alessandro & Day Property buildings (Table 5.1–1).

Table 5.1–1
Cultural Resources Located Within a One-Mile Radius
of the Centerpointe Project

Site	Description
P-33-009191	March Field Historic District
P-33-009200, P-33-009202, P-33-009203, P-33-009204, P-33-009205, P-33-009206, P-33-009207, P-33-009208, P-33-009211, P-33-009212, P-33-009213, P-33-009214, P-33-009215, P-33-009216, P-33-009217, P-33-009218, P-33-009222, P-33-009223, P-33-009224, P-33-009225, P-33-009226, P-33-009229, P-33-009230, P-33-009231, P-33-009232, P-33-009233, P-33-009236, P-33-009237, P-33-009238, P-33-009241, P-33-009243, P-33-009245, P-33-009246, P-33-009264, P-33-009277, P-33-009279, P-33-009280, P-33-009281, P-33-009284, P-33-009286, P-33-009287, P-33-009288, P-33-009289, P-33-009290, P-33-009291, P-33-009292, P-33-009293, P-33-009294, P-33-009295, P-33-009296, P-33-009297, P-33-009298, P-33-009299, P-33-009300, P-33-009301, P-33-009302, P-33-009303, P-33-009304, P-33-009305, P-33-009306, P-33-009307, P-33-009308, P-33-009309, P-33-009310, P-33-009311, P-33-009312, P-33-009313, P-33-009314, P-33-009315,	Historic March Air Reserve Base WWII-era military buildings (March Field Historic District contributing buildings)

Site	Description
P-33-009321, P-33-009323, P-33-009324, P-33-009325, P-33-009326, P-33-009327, P-33-009328, P-33-009329, P-33-009330, P-33-009331, P-33-009332, P-33-009333, P-33-009334, P-33-009335, P-33-009419, P-33-009421, P-33-009422, P-33-009423, P-33-009424, P-33-009425, P-33-009426, P-33-009427, P-33-009428, P-33-009429, P-33-009430, P-33-009431, P-33-009432, P-33-009436, P-33-009437, P-33-009440, P-33-009441, and P-33-009443	
P-33-009444	Historic March Air Reserve Base WWII-era stone drainage canal (March Field Historic District contributing structure)
P-33-017971 and P-33-017972	Historic March Air Reserve Base ancillary building
P-33-018039	Historic former March Air Reserve Base main entrance/security checkpoint
P-33-017968	Historic March Village medical campus WPA canal
P-33-017969	Historic March Village medical campus ancillary building
P-33-020326, P-33-020327, P-33-020328, P-33-020329, P-33-020330, and P-33-020331	Historic Alessandro & Day Property buildings

The records search also indicated that there have been 36 cultural resource studies conducted within a one-mile radius of the project. None of the previously conducted studies include any portion of the current APE.

For the current project, the following historic sources were reviewed at the EIC:

- The National Register of Historic Places Index
- The Office of Historic Preservation, Archaeological Determinations of Eligibility
- The Office of Historic Preservation, Directory of Properties in the Historic Property Data File
- The 15' USGS *Riverside* topographic map (1897 and 1947)
- The 15' USGS *Perris* topographic map (1942)
- The 30' USGS *Elsinore* topographic map (1901)

These additional sources did not identify any cultural resources within the APE. The complete records search results are provided in Appendix B.

An in-house assessment of historic aerial photographs show the property has historically been used for agriculture since at least 1966. The aerial photographs, as well as the historic USGS maps reviewed at the EIC, indicate that no structures have ever been located on the APE. The BLM GLO records indicate that a patent (BLM serial number CACAAA 082784) was issued to William B. Bourn on September 20, 1870 under the authority of April 24, 1820: Sale-Cash Entry (3 Stat. 566). Under the patent, Bourn acquired 10,500.6 acres spanning across Township 3 South, Range 4 West, San Bernardino Base and Meridian.

BFSA requested a review of the SLF at the NAHC on January 29, 2018 to determine if any recorded Native American sacred sites or locations of religious or ceremonial importance are present within one mile of the project. Original correspondence may be found in Appendix C.

Based on the records search results, the APE possesses a low sensitivity for cultural resources. No prehistoric resource sites have been recorded within one mile of the project, and the majority of nearby resources are associated with March Air Reserve Base. Further, the APE does not contain bedrock outcrops, natural sources of water, or other landforms that are typically associated with prehistoric use areas. Given the valley setting and lack of exposed bedrock outcrops or water sources for the property, predictive modeling would suggest that if prehistoric sites are present within the project, they will likely be isolated artifacts, artifact scatters, or specialized resource processing loci that would have developed as a result of prehistoric resource extraction practices. In addition, no buildings were ever located on the property, and as a result, any historic sites are likely to be surface deposits resulting from rural refuse dumping practices.

5.2 Results of the Field Survey

The cultural resources survey took place on January 29, 2018. The survey was directed by Principal Investigator Brian F. Smith and conducted by senior field archaeologist Clarence Hoff. The survey of the property was an intensive reconnaissance consisting of a series of parallel survey transects spaced at approximately five-meter intervals, which covered all areas of the project. The project is comprised of a generally rectangular APE that has historically been used for agriculture. Ground visibility was generally good to excellent and only limited at times due to vegetation. The entire property was accessible and no constraints were encountered. Photographs were taken to document project conditions at the time of the survey (Plates 5.2–1 and 5.2–2).

The pedestrian survey indicated that the entirety of the project had been disturbed by historic agricultural use, vegetation clearing, disking, grading, and the development of the surrounding area. The vegetation on the property mainly consists of two- to six-inch-high non-native weeds and grasses. In addition, a row of shrubs and pine trees was noted on the western boundary of the subject property along Frederick Street. Other disturbances or alterations to the property include a storm drain culvert with riprap in the southwest corner and a dirt entry road in the southeast corner. A commercial building has recently been constructed on the adjacent parcel to the east and piles of building material, possibly left over from neighboring construction, were identified in the southeast quarter of the APE. In addition, concrete and bits of gravel were located

throughout the property.

The survey did not result in the identification of any cultural resources within the APE. The potential for buried or masked cultural deposits within the project is considered low based upon the research results, lack of identified resources on this property, and previous impacts to the property.

Plate 5.2–1: Overview of the project, facing north.

Plate 5.2–2: Overview of the project, facing east.

6.0 RECOMMENDATIONS

The cultural resources study for the Centerpointe Project was negative for the presence of archaeological sites. The EIC records search showed that while 114 cultural resource sites have been recorded within a one-mile radius of the project, no resources have ever been recorded within the current APE. Furthermore, 36 cultural resource studies have been conducted within one mile of the project. None of the previously conducted studies include any portion of the current APE. Property research indicates the APE has historically been used for agriculture and does not contain bedrock outcrops, natural sources of water, or other landforms that are typically associated with prehistoric use areas. In addition, the archaeological field survey did not identify any historic or prehistoric resources. Therefore, as a result of the research findings, the documented land use of the property, and the current survey, it is unlikely that any cultural resources exist within the project.

Given that no archaeological sites, features, or artifacts have been identified within the project, no potential impacts to cultural resources are associated with the proposed development of the project. The archaeological study was completed in accordance with the City of Moreno Valley environmental policies and CEQA significance evaluation criteria. Based upon the absence of any cultural resources within the APE, site-specific mitigation measures will not be required for this project. Further, as a result of previous ground-disturbing activities and the absence of recorded cultural resources within the project boundaries, there is little potential for cultural resources to be present or disturbed by the proposed development. No further archaeological study is recommended as a condition of permit approval based upon the records search and the results of the field survey.

7.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this archaeological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

May 30, 2018

Brian F. Smith
Principal Investigator

Date

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APPENDIX A

Qualifications of Key Personnel

Brian F. Smith, MA

Owner, Principal Investigator

Brian F. Smith and Associates, Inc.
14010 Poway Road • Suite A •
Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: bsmith@bfsa-ca.com

Education

Master of Arts, History, University of San Diego, California	1982
Bachelor of Arts, History, and Anthropology, University of San Diego, California	1975

Professional Memberships

Society for California Archaeology

Experience

Principal Investigator — 1977–Present
Brian F. Smith and Associates, Inc. — Poway, California

Brian F. Smith is the owner and principal historical and archaeological consultant for Brian F. Smith and Associates. Over the past 32 years, he has conducted over 2,500 cultural resource studies in California, Arizona, Nevada, Montana, and Texas. These studies include every possible aspect of archaeology from literature searches and large-scale surveys to intensive data recovery excavations. Reports prepared by Mr. Smith have been submitted to all facets of local, state, and federal review agencies, including the US Army Crops of Engineers, the Bureau of Land Management, the Bureau of Reclamation, the Department of Defense, and the Department of Homeland Security. In addition, Mr. Smith has conducted studies for utility companies (Sempra Energy) and state highway departments (CalTrans).

Professional Accomplishments

These selected major professional accomplishments represent research efforts that have added significantly to the body of knowledge concerning the prehistoric life ways of cultures once present in the Southern California area and historic settlement since the late 18th century. Mr. Smith has been principal investigator on the following select projects, except where noted.

Downtown San Diego Mitigation and Monitoring Reporting Programs: Large numbers of downtown San Diego mitigation and monitoring projects submitted to the Centre City Development Corporation, some of which included Strata (2008), Hotel Indigo (2008), Lofts at 707 10th Avenue Project (2007), Breeza (2007), Bayside at the Embarcadero (2007), Aria (2007), Icon (2007), Vantage Pointe (2007), Aperture (2007), Sapphire Tower (2007), Lofts at 655 Sixth Avenue (2007), Metrowork (2007), The Legend (2006), The Mark (2006), Smart Corner (2006), Lofts at 677 7th Avenue (2005), Aloft on Cortez Hill (2005), Front and

Beech Apartments (2003), Bella Via Condominiums (2003), Acqua Vista Residential Tower (2003), Northblock Lofts (2003), Westin Park Place Hotel (2001), Parkloft Apartment Complex (2001), Renaissance Park (2001), and Laurel Bay Apartments (2001).

Archaeology at the Padres Ballpark: Involved the analysis of historic resources within a seven-block area of the "East Village" area of San Diego, where occupation spanned a period from the 1870s to the 1940s. Over a period of two years, BFSA recovered over 200,000 artifacts and hundreds of pounds of metal, construction debris, unidentified broken glass, and wood. Collectively, the Ballpark Project and the other downtown mitigation and monitoring projects represent the largest historical archaeological program anywhere in the country in the past decade (2000-2007).

4S Ranch Archaeological and Historical Cultural Resources Study: Data recovery program consisted of the excavation of over 2,000 square meters of archaeological deposits that produced over one million artifacts, containing primarily prehistoric materials. The archaeological program at 4S Ranch is the largest archaeological study ever undertaken in the San Diego County area and has produced data that has exceeded expectations regarding the resolution of long-standing research questions and regional prehistoric settlement patterns.

Charles H. Brown Site: Attracted international attention to the discovery of evidence of the antiquity of man in North America. Site located in Mission Valley, in the city of San Diego.

Del Mar Man Site: Study of the now famous Early Man Site in Del Mar, California, for the San Diego Science Foundation and the San Diego Museum of Man, under the direction of Dr. Spencer Rogers and Dr. James R. Moriarty.

Old Town State Park Projects: Consulting Historical Archaeologist. Projects completed in the Old Town State Park involved development of individual lots for commercial enterprises. The projects completed in Old Town include Archaeological and Historical Site Assessment for the Great Wall Cafe (1992), Archaeological Study for the Old Town Commercial Project (1991), and Cultural Resources Site Survey at the Old San Diego Inn (1988).

Site W-20, Del Mar, California: A two-year-long investigation of a major prehistoric site in the Del Mar area of the city of San Diego. This research effort documented the earliest practice of religious/ceremonial activities in San Diego County (circa 6,000 years ago), facilitated the projection of major non-material aspects of the La Jolla Complex, and revealed the pattern of civilization at this site over a continuous period of 5,000 years. The report for the investigation included over 600 pages, with nearly 500,000 words of text, illustrations, maps, and photographs documenting this major study.

City of San Diego Reclaimed Water Distribution System: A cultural resource study of nearly 400 miles of pipeline in the city and county of San Diego.

Master Environmental Assessment Project, City of Poway: Conducted for the City of Poway to produce a complete inventory of all recorded historic and prehistoric properties within the city. The information was used in conjunction with the City's General Plan Update to produce a map matrix of the city showing areas of high, moderate, and low potential for the presence of cultural resources. The effort also included the development of the City's Cultural Resource Guidelines, which were adopted as City policy.

Draft of the City of Carlsbad Historical and Archaeological Guidelines: Contracted by the City of Carlsbad to produce the draft of the City's historical and archaeological guidelines for use by the Planning Department of the City.

The Mid-Bayfront Project for the City of Chula Vista: Involved a large expanse of undeveloped agricultural land situated between the railroad and San Diego Bay in the northwestern portion of the city. The study included the analysis of some potentially historic features and numerous prehistoric sites.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Audie Murphy Ranch, Riverside County, California: Project manager/director of the investigation of 1,113.4 acres and 43 sites, both prehistoric and historic—included project coordination; direction of field crews; evaluation of sites for significance based on County of Riverside and CEQA guidelines; assessment of cupule, pictograph, and rock shelter sites, co-authoring of cultural resources project report. February-September 2002.

Cultural Resources Evaluation of Sites Within the Proposed Development of the Otay Ranch Village 13 Project, San Diego County, California: Project manager/director of the investigation of 1,947 acres and 76 sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of San Diego and CEQA guidelines; co-authoring of cultural resources project report. May-November 2002.

Cultural Resources Survey for the Remote Video Surveillance Project, El Centro Sector, Imperial County: Project manager/director for a survey of 29 individual sites near the U.S./Mexico Border for proposed video surveillance camera locations associated with the San Diego Border barrier Project—project coordination and budgeting; direction of field crews; site identification and recordation; assessment of potential impacts to cultural resources; meeting and coordinating with U.S. Army Corps of Engineers, U.S. Border Patrol, and other government agencies involved; co-authoring of cultural resources project report. January, February, and July 2002.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee West GPA, Riverside County, California: Project manager/director of the investigation of nine sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of Riverside and CEQA guidelines; historic research; co-authoring of cultural resources project report. January-March 2002.

Mitigation of An Archaic Cultural Resource for the Eastlake III Woods Project for the City of Chula Vista, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program including collection of material for specialized faunal and botanical analyses; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; co-authoring of cultural resources project report, in prep. September 2001-March 2002.

Cultural Resources Survey and Test of Sites Within the Proposed French Valley Specific Plan/EIR, Riverside County, California: Project manager/director of the investigation of two prehistoric and three historic sites—included project coordination and budgeting; survey of project area; Native American consultation; direction of field crews; assessment of sites for significance based on CEQA guidelines; cultural resources project report in prep. July-August 2000.

Cultural Resources Survey and Test of Sites Within the Proposed Lawson Valley Project, San Diego County, California: Project manager/director of the investigation of 28 prehistoric and two historic sites—included project coordination; direction of field crews; assessment of sites for significance based on CEQA guidelines; cultural resources project report in prep. July-August 2000.

Cultural Resource Survey and Geotechnical Monitoring for the Mohyi Residence Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; field survey; assessment of parcel for potentially buried cultural deposits; monitoring of geotechnichal borings; authoring of cultural resources project report. Brian F. Smith and Associates, San Diego, California. June 2000.

Enhanced Cultural Resource Survey and Evaluation for the Prewitt/Schmucker/Cavadias Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; direction of field crews; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. June 2000.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee Ranch, Riverside County, California: Project manager/director of the investigation of one prehistoric and five historic sites—included project coordination and budgeting; direction of field crews; feature recordation; historic structure assessments; assessment of sites for significance based on CEQA guidelines; historic research; co-authoring of cultural resources project report. February-June 2000.

Salvage Mitigation of a Portion of the San Diego Presidio Identified During Water Pipe Construction for the City of San Diego, California: Project archaeologist/director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Tyrian 3 Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Lamont 5 Project, Pacific Beach, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Reiss Residence Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. March-April 2000.

Salvage Mitigation of a Portion of Site SDM-W-95 (CA-SDI-211) for the Poinsettia Shores Santalina Development Project and Caltrans, Carlsbad, California: Project achaeologist/ director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. December 1999-January 2000.

Survey and Testing of Two Prehistoric Cultural Resources for the Airway Truck Parking Project, Otay Mesa, California: Project archaeologist/director—included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; authoring of cultural resources project report, in prep. December 1999-January 2000.

Cultural Resources Phase I and II Investigations for the Tin Can Hill Segment of the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for a survey and testing of a prehistoric quarry site along the border—NRHP eligibility assessment; project coordination and budgeting; direction of field crews; feature recordation; meeting and coordinating with U.S. Army Corps of Engineers; co-authoring of cultural resources project report. December 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Westview High School Project for the City of San Diego, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program including collection of material for specialized faunal and botanical analyses; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; co-authoring of cultural resources project report, in prep. October 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Otay Ranch SPA-One West Project for the City of Chula Vista, California: Project archaeologist/director—included direction of field crews; development of data recovery program; management of artifact collections cataloging and curation; assessment of

site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report, in prep. September 1999-January 2000.

Monitoring of Grading for the Herschel Place Project, La Jolla, California: Project archaeologist/ monitor—included monitoring of grading activities associated with the development of a single-dwelling parcel. September 1999.

Survey and Testing of a Historic Resource for the Osterkamp Development Project, Valley Center, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program; budget development; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Testing of a Prehistoric Cultural Resource for the Proposed College Boulevard Alignment Project, Carlsbad, California: Project manager/director —included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report, in prep. July-August 1999.

Survey and Evaluation of Cultural Resources for the Palomar Christian Conference Center Project, Palomar Mountain, California: Project archaeologist—included direction of field crews; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Evaluation of Cultural Resources at the Village 2 High School Site, Otay Ranch, City of Chula Vista, California: Project manager/director —management of artifact collections cataloging and curation; assessment of site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report. July 1999.

Cultural Resources Phase I, II, and III Investigations for the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for the survey, testing, and mitigation of sites along border—supervision of multiple field crews, NRHP eligibility assessments, Native American consultation, contribution to Environmental Assessment document, lithic and marine shell analysis, authoring of cultural resources project report. August 1997-January 2000.

Phase I, II, and II Investigations for the Scripps Poway Parkway East Project, Poway California: Project archaeologist/project director—included recordation and assessment of multicomponent prehistoric and historic sites; direction of Phase II and III investigations; direction of laboratory analyses including prehistoric and historic collections; curation of collections; data synthesis; coauthorship of final cultural resources report. February 1994; March-September 1994; September-December 1995.

Archaeological Evaluation of Cultural Resources Within the Proposed Corridor for the San Elijo Water Reclamation System Project, San Elijo, California: Project manager/director —test excavations; direction of artifact identification and analysis; graphics production; coauthorship of final cultural resources report. December 1994-July 1995.

Evaluation of Cultural Resources for the Environmental Impact Report for the Rose Canyon Trunk Sewer Project, San Diego, California: Project manager/Director —direction of test excavations; identification and analysis of prehistoric and historic artifact collections; data synthesis; co-authorship of final cultural resources report, San Diego, California. June 1991-March 1992.

Reports/Papers

Author, coauthor, or contributor to over 2,500 cultural resources management publications, a selection of which are presented below.

2015 An Archaeological/Historical Study for the Safari Highlands Ranch Project, City of Escondido, County of San Diego.

2015 A Phase I and II Cultural Resources Assessment for the Decker Parcels II Project, Planning Case No. 36962, Riverside County, California.

2015 A Phase I and II Cultural Resources Assessment for the Decker Parcels I Project, Planning Case No. 36950, Riverside County, California.

2015 Cultural Resource Data Recovery and Mitigation Monitoring Program for Site SDI-10,237 Locus F, Everly Subdivision Project, El Cajon, California.

2015 Phase I Cultural Resource Survey for the Woodward Street Senior Housing Project, City of San Marcos, California (APN 218-120-31).

2015 An Updated Cultural Resource Survey for the Box Springs Project (TR 33410), APNs 255-230-010, 255-240-005, 255-240-006, and Portions of 257-180-004, 257-180-005, and 257-180-006.

2015 A Phase I and II Cultural Resource Report for the Lake Ranch Project, TR 36730, Riverside County, California.

2015 A Phase II Cultural Resource Assessment for the Munro Valley Solar Project, Inyo County, California.

2014 Cultural Resources Monitoring Report for the Diamond Valley Solar Project, Community of Winchester, County of Riverside.

2014 National Historic Preservation Act Section 106 Compliance for the Proposed Saddleback Estates Project, Riverside County, California.

2014 A Phase II Cultural Resource Evaluation Report for RIV-8137 at the Toscana Project, TR 36593, Riverside County, California.

2014 Cultural Resources Study for the Estates at Del Mar Project, City of Del Mar, San Diego, California (TTM 14-001).

2014 Cultural Resources Study for the Aliso Canyon Major Subdivision Project, Rancho Santa Fe, San Diego County, California.

2014 Cultural Resources Due Diligence Assessment of the Ocean Colony Project, City of Encinitas.

2014 A Phase I and Phase II Cultural Resource Assessment for the Citrus Heights II Project, TTM 36475, Riverside County, California.

2013 A Phase I Cultural Resource Assessment for the Modular Logistics Center, Moreno Valley, Riverside County, California.

2013 A Phase I Cultural Resources Survey of the Ivey Ranch Project, Thousand Palms, Riverside County, California.

2013 Cultural Resources Report for the Emerald Acres Project, Riverside County, California.

2013 A Cultural Resources Records Search and Review for the Pala Del Norte Conservation Bank Project, San Diego County, California.

2013 An Updated Phase I Cultural Resources Assessment for Tentative Tract Maps 36484 and 36485, Audie Murphy Ranch, City of Menifee, County of Riverside.

2013 El Centro Town Center Industrial Development Project (EDA Grant No. 07-01-06386); Result of Cultural Resource Monitoring.

2013 Cultural Resources Survey Report for the Renda Residence Project, 9521 La Jolla Farms Road, La Jolla, California.

2013 A Phase I Cultural Resource Study for the Ballpark Village Project, San Diego, California.

2013 Archaeological Monitoring and Mitigation Program, San Clemente Senior Housing Project, 2350 South El Camino Real, City of San Clemente, Orange County, California (CUP No. 06-065; APN-060-032-04).

2012 Mitigation Monitoring Report for the Los Peñasquitos Recycled Water Pipeline.

2012 Cultural Resources Report for Menifee Heights (Tract 32277).

2012 A Phase I Cultural Resource Study for the Altman Residence at 9696 La Jolla Farms Road, La Jolla, California 92037.

2012 Mission Ranch Project (TM 5290-1/MUP P87-036W3): Results of Cultural Resources Monitoring During Mass Grading.

2012 A Phase I Cultural Resource Study for the Payan Property Project, San Diego, California.

2012 Phase I Archaeological Survey of the Rieger Residence, 13707 Durango Drive, Del Mar, California 92014, APN 300-369-49.

2011 Mission Ranch Project (TM 5290-1/MUP P87-036W3): Results of Cultural Resources Monitoring During Mass Grading.

2011 Mitigation Monitoring Report for the 1887 Viking Way Project, La Jolla, California.

2011 Cultural Resource Monitoring Report for the Sewer Group 714 Project.

2011 Results of Archaeological Monitoring at the 10th Avenue Parking Lot Project, City of San Diego, California (APNs 534-194-02 and 03).

2011 Archaeological Survey of the Pelberg Residence for a Bulletin 560 Permit Application; 8335 Camino Del Oro; La Jolla, California 92037 APN 346-162-01-00 .

2011 A Cultural Resources Survey Update and Evaluation for the Robertson Ranch West Project and an Evaluation of National Register Eligibility of Archaeological sites for Sites for Section 106 Review (NHPA).

2011 Mitigation Monitoring Report for the 43rd and Logan Project.

2011 Mitigation Monitoring Report for the Sewer Group 682 M Project, City of San Diego Project #174116.

2011 A Phase I Cultural Resource Study for the Nooren Residence Project, 8001 Calle de la Plata, La Jolla, California, Project No. 226965.

2011 A Phase I Cultural Resource Study for the Keating Residence Project, 9633 La Jolla Farms Road, La Jolla, California 92037.

2010 Mitigation Monitoring Report for the 15th & Island Project, City of San Diego; APNs 535-365-01, 535-365-02 and 535-392-05 through 535-392-07.

2010 Archaeological Resource Report Form: Mitigation Monitoring of the Sewer and Water Group 772 Project, San Diego, California, W.O. Nos. 187861 and 178351.

2010 Pottery Canyon Site Archaeological Evaluation Project, City of San Diego, California, Contract No. H105126.

2010 Archaeological Resource Report Form: Mitigation Monitoring of the Racetrack View Drive Project, San Diego, California; Project No. 163216.

2010 A Historical Evaluation of Structures on the Butterfield Trails Property.

2010 Historic Archaeological Significance Evaluation of 1761 Haydn Drive, Encinitas, California (APN 260-276-07-00).

2010 Results of Archaeological Monitoring of the Heller/Nguyen Project, TPM 06-01, Poway, California.

2010 Cultural Resource Survey and Evaluation Program for the Sunday Drive Parcel Project, San Diego County, California, APN 189-281-14.

2010 Archaeological Resource Report Form: Mitigation Monitoring of the Emergency Garnet Avenue Storm Drain Replacement Project, San Diego, California, Project No. B10062

2010 An Archaeological Study for the 1912 Spindrift Drive Project

2009 Cultural Resource Assessment of the North Ocean Beach Gateway Project City of San Diego #64A-003A; Project #154116.

2009 Archaeological Constraints Study of the Morgan Valley Wind Assessment Project, Lake County, California.

2008 Results of an Archaeological Review of the Helen Park Lane 3.1-acre Property (APN 314-561-31), Poway, California.

2008 Archaeological Letter Report for a Phase I Archaeological Assessment of the Valley Park Condominium Project, Ramona, California; APN 282-262-75-00.

2007 Archaeology at the Ballpark. Brian F. Smith and Associates, San Diego, California. Submitted to the Centre City Development Corporation.

2007 Result of an Archaeological Survey for the Villages at Promenade Project (APNs 115-180-007-3,115-180-049-1, 115-180-042-4, 115-180-047-9) in the City of Corona, Riverside County.

2007 Monitoring Results for the Capping of Site CA-SDI-6038/SDM-W-5517 within the Katzer Jamul Center Project; P00-017.

2006 Archaeological Assessment for The Johnson Project (APN 322-011-10), Poway, California.

2005 Results of Archaeological Monitoring at the El Camino Del Teatro Accelerated Sewer Replacement Project (Bid No. K041364; WO # 177741; CIP # 46-610.6.

2005 Results of Archaeological Monitoring at the Baltazar Draper Avenue Project (Project No. 15857; APN: 351-040-09).

2004 TM 5325 ER #03-14-043 Cultural Resources.

2004 An Archaeological Survey and an Evaluation of Cultural Resources at the Salt Creek Project. Report on file at Brian F. Smith and Associates.

2003 An Archaeological Assessment for the Hidden Meadows Project, San Diego County, TM 5174, Log No. 99-08-033. Report on file at Brian F. Smith and Associates.

2003 An Archaeological Survey for the Manchester Estates Project, Coastal Development Permit #02-009, Encinitas, California. Report on file at Brian F. Smith and Associates.

2003 Archaeological Investigations at the Manchester Estates Project, Coastal Development Permit #02-009, Encinitas, California. Report on file at Brian F. Smith and Associates.

2003 Archaeological Monitoring of Geological Testing Cores at the Pacific Beach Christian Church Project. Report on file at Brian F. Smith and Associates.

2003 San Juan Creek Drilling Archaeological Monitoring. Report on file at Brian F. Smith and Associates.

2003 Evaluation of Archaeological Resources Within the Spring Canyon Biological Mitigation Area, Otay Mesa, San Diego County, California. Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for the Otay Ranch Village 13 Project (et al.). Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for the Audie Murphy Ranch Project (et al.). Brian F. Smith and Associates, San Diego, California.

2002 Results of an Archaeological Survey for the Remote Video Surveillance Project, El Centro Sector, Imperial County, California. Brian F. Smith and Associates, San Diego, California.

2002 A Cultural Resources Survey and Evaluation for the Proposed Robertson Ranch Project, City of Carlsbad. Brian F. Smith and Associates, San Diego, California.

2002 Archaeological Mitigation of Impacts to Prehistoric Site SDI-7976 for the Eastlake III Woods Project, Chula Vista, California. Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for Tract No. 29777, Menifee West GPA Project, Perris Valley, Riverside County. Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for Tract No. 29835, Menifee West GPA Project, Perris Valley, Riverside County. Brian F. Smith and Associates, San Diego, California.

2001 An Archaeological Survey and Evaluation of a Cultural Resource for the Moore Property, Poway. Brian F. Smith and Associates, San Diego, California.

2001 An Archaeological Report for the Mitigation, Monitoring, and Reporting Program at the Water and Sewer Group Job 530A, Old Town San Diego. Brian F. Smith and Associates, San Diego, California.

2001 A Cultural Resources Impact Survey for the High Desert Water District Recharge Site 6 Project, Yucca Valley. Brian F. Smith and Associates, San Diego, California.

2001 Archaeological Mitigation of Impacts to Prehistoric Site SDI-13,864 at the Otay Ranch SPA-One West Project. Brian F. Smith and Associates, San Diego, California.

2001 A Cultural Resources Survey and Site Evaluations at the Stewart Subdivision Project, Moreno Valley, County of San Diego. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological/Historical Study for the French Valley Specific Plan/EIR, French Valley, County of Riverside. Brian F. Smith and Associates, San Diego, California.

2000 Results of an Archaeological Survey and the Evaluation of Cultural Resources at The TPM#24003–Lawson Valley Project. Brian F. Smith and Associates, San Diego, California.

2000 Archaeological Mitigation of Impacts to Prehistoric Site SDI-5326 at the Westview High School Project for the Poway Unified School District. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological/Historical Study for the Menifee Ranch Project. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological Survey and Evaluation of Cultural Resources for the Bernardo Mountain Project, Escondido, California. Brian F. Smith and Associates, San Diego, California.

2000 A Cultural Resources Impact Survey for the Nextel Black Mountain Road Project, San Diego, California. Brian F. Smith and Associates, San Diego, California.

2000 A Cultural Resources Impact Survey for the Rancho Vista Project, 740 Hilltop Drive, Chula Vista, California. Brian F. Smith and Associates, San Diego, California.

2000 A Cultural Resources Impact Survey for the Poway Creek Project, Poway, California. Brian F. Smith and Associates, San Diego, California.

2000 Cultural Resource Survey and Geotechnical Monitoring for the Mohyi Residence Project. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Prewitt/Schmucker/ Cavadias Project. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Lamont 5 Project. Brian F. Smith and Associates, San Diego, California.

2000 Salvage Excavations at Site SDM-W-95 (CA-SDI-211) for the Poinsettia Shores Santalina Development Project, Carlsbad, California. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Reiss Residence Project, La Jolla, California. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Tyrian 3 Project, La Jolla, California. Brian F. Smith and Associates, San Diego, California.

2000 A Report for an Archaeological Evaluation of Cultural Resources at the Otay Ranch Village Two SPA, Chula Vista, California. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological Evaluation of Cultural Resources for the Airway Truck Parking Project, Otay Mesa, County of San Diego. Brian F. Smith and Associates, San Diego, California.

2000 Results of an Archaeological Survey and Evaluation of a Resource for the Tin Can Hill Segment of the Immigration and Naturalization and Immigration Service Border Road, Fence, and Lighting Project, San Diego County, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey of the Home Creek Village Project, 4600 Block of Home Avenue, San Diego, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey for the Sgobassi Lot Split, San Diego County, California. Brian F. Smith and Associates, San Diego, California.

1999 An Evaluation of Cultural Resources at the Otay Ranch Village 11 Project. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological/Historical Survey and Evaluation of a Cultural Resource for The Osterkamp Development Project, Valley Center, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey and Evaluation of Cultural Resources for the Palomar Christian Conference Center Project, Palomar Mountain, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey and Evaluation of a Cultural Resource for the Proposed College Boulevard Alignment Project. Brian F. Smith and Associates, San Diego, California.

1999 Results of an Archaeological Evaluation for the Anthony's Pizza Acquisition Project in Ocean Beach, City of San Diego (with L. Pierson and B. Smith). Brian F. Smith and Associates, San Diego, California.

1996 An Archaeological Testing Program for the Scripps Poway Parkway East Project. Brian F. Smith and Associates, San Diego, California.

1995 Results of a Cultural Resources Study for the 4S Ranch. Brian F. Smith and Associates, San Diego, California.

1995 Results of an Archaeological Evaluation of Cultural Resources Within the Proposed Corridor for the San Elijo Water Reclamation System. Brian F. Smith and Associates, San Diego, California.

1994 Results of the Cultural Resources Mitigation Programs at Sites SDI-11,044/H and SDI-12,038 at the Salt Creek Ranch Project . Brian F. Smith and Associates, San Diego, California.

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1992 Results of an Archaeological Survey and the Evaluation of Cultural Resources at the Ely Lot Split Project. Brian F. Smith and Associates, San Diego, California.

1991 The Results of an Archaeological Study for the Walton Development Group Project. Brian F. Smith and Associates, San Diego, California.

Andrew J. Garrison, M.A., RPA

Senior Project Archaeologist

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Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: agarrison@bfsa-ca.com

Education

Master of Arts, Public History, University of California, Riverside	2009
Bachelor of Science, Anthropology, University of California, Riverside	2005
Bachelor of Arts, History, University of California, Riverside	2005

Professional Memberships

Register of Professional Archaeologists
Society for California Archaeology
Society for American Archaeology
California Council for the Promotion of History
Society of Primitive Technology
Lithic Studies Society
California Preservation Foundation
Pacific Coast Archaeological Society

Experience

Senior Project Archaeologist — June 2017–Present
Brian F. Smith and Associates, Inc. — Poway, California

Project management of all phases of archaeological investigations for local, state, and federal agencies including National Register of Historic Places (NRHP) and California Environmental Quality Act (CEQA) level projects interacting with clients, sub-consultants, and lead agencies. Supervise and perform fieldwork including archaeological survey, monitoring, site testing, comprehensive site records checks, and historic building assessments. Perform and oversee technological analysis of prehistoric lithic assemblages. Author or co-author cultural resource management reports submitted to private clients and lead agencies.

Senior Archaeologist and GIS Specialist — 2009–2017
Scientific Resource Surveys, Inc. — Orange, California

Served as Project Archaeologist or Principal Investigator on multiple projects, including archaeological monitoring, cultural resource surveys, test excavations, and historic building assessments. Directed projects from start to finish, including budget and personnel hours proposals, field and laboratory direction, report writing, technical editing, Native American consultation, and final report submittal. Oversaw all GIS projects including data collection, spatial analysis, and map creation.

Preservation Researcher — 2009
City of Riverside Modernism Survey — Riverside, California

Completed DPR Primary, District, and Building, Structure and Object Forms for five sites for a grant-funded project to survey designated modern architectural resources within the City of Riverside.

Information Officer — 2005, 2008–2009
Eastern Information Center (EIC), University of California, Riverside — Riverside, California

Processed and catalogued restricted and unrestricted archaeological and historical site record forms. Conducted research projects and records searches for government agencies and private cultural resource firms.

Reports/Papers

2017 A Phase I Cultural Resources Assessment for the Marbella Villa Project, City of Desert Hot Springs, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 Phase I Cultural Resources Survey for TTM 37109, City of Jurupa Valley, County of Riverside. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Survey for the Jefferson & Ivy Project, City of Murrieta, California. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Assessment for the Nuevo Dollar General Store Project, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resource Study for the Westmont Project, Encinitas, California. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Assessment for the Winchester Dollar General Store Project, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 Phase I Cultural Resource Assessment for TTM 31810 (42.42 acres) Predico Properties Olive Grove Project. Scientific Resource Surveys, Inc.

2016 John Wayne Airport Jet Fuel Pipeline and Tank Farm Archaeological Monitoring Plan. Scientific Resource Surveys, Inc. On file at the County of Orange, California.

2016 Phase I Cultural Resources Assessment: All Star Super Storage City of Menifee Project, 2015-156. Scientific Resource Surveys, Inc. On file at the Eastern Information Center, University of California, Riverside.

2016 Historic Resource Assessment for 220 South Batavia Street, Orange, CA 92868 Assessor's Parcel Number 041-064-4. Scientific Resource Surveys, Inc. Submitted to the City of Orange as part of Mills Act application.

2015 Historic Resource Report: 807-813 Harvard Boulevard, Los Angeles. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2015 Exploring a Traditional Rock Cairn: Test Excavation at CA-SDI-13/RBLI-26: The Rincon Indian Reservation, San Diego County, California. Scientific Resource Surveys, Inc.

2015 Class III Scientific Resource Surveys, Inc. Survey for The Lynx Cat Granite Quarry and Water Valley Road Widening Project County of San Bernardino, California, Near the Community of Hinkley. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2014 Archaeological Phase I: Cultural Resource Survey of the South West Quadrant of Fairview Park, Costa Mesa. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2014 Archaeological Monitoring Results: The New Los Angeles Federal Courthouse. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2012 Bolsa Chica Archaeological Project Volume 7, Technological Analysis of Stone Tools, Lithic Technology at Bolsa Chica: Reduction Maintenance and Experimentation. Scientific Resource Surveys, Inc.

2010 Phase II Cultural Resources Report Site CA=RIV-2160 PM No. 35164. Scientific Resource Surveys, Inc. On file at the Eastern Information Center, University of California, Riverside.

2009 Riverside Modernism Context Survey, contributing author. Available online at the City of Riverside.

Presentations

2017 "Repair and Replace: Lithic Production Behavior as Indicated by the Debitage Assemblage from CA-MRP-283 the Hackney Site." Presented at the Society for California Archaeology Annual Meeting, Fish Camp, California.

2016 "Bones, Stones, and Shell at Bolsa Chica: A Ceremonial Relationship?" Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2016 "Markers of Time: Exploring Transitions in the Bolsa Chica Assemblage." Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2016 "Dating Duress: Understanding Prehistoric Climate Change at Bolsa Chica." Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2015 "Successive Cultural Phasing Of Prehistoric Northern Orange County, California." Presented at the Society for California Archaeology Annual Meeting, Redding, California.

2015 "Southern California Cogged Stone Replication: Experimentation and Results." Presented at the Society for California Archaeology Annual Meeting, Redding, California.

2015 "Prehistoric House Keeping: Lithic Analysis of an Intermediate Horizon House Pit." Presented at the Society for California Archaeology Annual Meeting, Redding, California.

2015 "Pits and Privies: The Use and Disposal of Artifacts from Historic Los Angeles." Presented at the Society for California Archaeology Annual Meeting, Redding, California.

2015 "Grooving in the Past: A Demonstration of the Manufacturing of OGR beads and a look at Past SRS, Inc. Replicative Studies." Demonstration of experimental manufacturing techniques at the January meeting of The Pacific Coast Archaeological Society, Irvine, California.

2014 "From Artifact to Replication: Examining *Olivella* Grooved Bead Manufacturing." Presented at the Society for California Archaeology Annual Meeting, Visalia, California.

2014 "New Discoveries from an Old Collection: Comparing Recently Identified OGR Beads to Those Previously Analyzed from the Encino Village Site." Presented at the Society for California Archaeology Annual Meeting, Visalia, California.

2012 Bolsa Chica Archaeology: Part Seven: Culture and Chronology. Lithic demonstration of experimental manufacturing techniques at the April meeting of The Pacific Coast Archaeological Society, Irvine, California.

2012 "Expedient Flaked Tools from Bolsa Chica: Exploring the Lithic Technological Organization." Presented at the Society for California Archaeology Annual Meeting, San Diego, California.

2012 "Utilitarian and Ceremonial Ground Stone Production at Bolsa Chica Identified Through Production Tools." Presented at the Society for California Archaeology Annual Meeting, San Diego, California.

2012 "Connecting Production Industries at Bolsa Chica: Lithic Reduction and Bead Manufacturing." Presented at the Society for California Archaeology Annual Meeting, San Diego, California.

2011 Bolsa Chica Archaeology: Part Four: Mesa Production Industries. Co-presenter at the April meeting of The Pacific Coast Archaeological Society, Irvine, California.

2011 "Hammerstones from Bolsa Chica and Their Relationship towards Site Interpretation." Presented at the Society for California Archaeology Annual Meeting, Rohnert Park, California.

2011 "Exploring Bipolar Reduction at Bolsa Chica: Debitage Analysis and Replication." Presented at the Society for California Archaeology Annual Meeting, Rohnert Park, California.

APPENDIX B

Archaeological Records Search Results

(Deleted for Public Review; Bound Separately)

APPENDIX C

NAHC Sacred Lands File Search Results

(Deleted for Public Review; Bound Separately)

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

30 January 2018

Ms. Tracy Zinn
T&B Planning, Inc.
17542 East 17th Street, Suite 100
Tustin, California 92780

Subject: Paleontological Resource and Monitoring Assessment, Centerpointe Warehouse Project, City of Moreno Valley, Riverside County, California

Dear Ms. Zinn:

Site Location: A paleontological resource assessment has been completed for the Centerpointe warehouse project located north of March Field Air Force Base and northwest of the Perris Reservoir in the City of Moreno Valley, Riverside County, California (Attachments 1 and 2). The 8.78-acre project site is bounded on the south by Brodiaea Avenue and on the west by Frederick Street and is located approximately midway between Alessandro Boulevard and Cactus Avenue. The project site and land to the immediate north are currently fallow agricultural land. On the U. S. Geological Survey 7.5-minute, 1:24,000-scale Riverside East, California topographic quadrangle map, the subject property is located in the northwest quarter of the northwest quarter of Section 13, Township 3 South, Range 4 West, San Bernardino Base and Meridian. The proposed project involves construction of a slab-on-grade warehouse building, truck parking areas, associated infrastructure, and an underground stormwater detention basin.

Geology: Published geologic reports and maps of the project area and immediate surrounding areas include those of D. M. Morton and B. Cox, 2001a (Geologic map of the Riverside East 7.5' quadrangle, Riverside County, California), and D. M. Morton and J. C. Matti, 2001b (Preliminary geologic map of the Sunnymead 7.5' quadrangle, Riverside County, California). The maps indicate that the project site is underlain by lower Pleistocene (approximately 1.8 million to perhaps 200,000 to 300,000 year old) very old alluvial fan deposits ($Qvof_a$, shown in light brown on Attachment 3). A geotechnical report prepared for a nearby project (R. G. Trazo and J. A. Seminara, 2014) identified alluvial sediments to a depth of 30 feet below ground level, but did not comment on the age of the sediments (*i.e.*, whether or not they were Holocene ["modern"] in age or older, being early to late Pleistocene). The age of the sediments is important in determining if they should be accorded a low paleontological sensitivity (Holocene) or a medium or high paleontological sensitivity (Pleistocene).

Paleontological Sensitivity: Previous paleontological sensitivity maps generated by the Riverside County Land Information System ranked the Moreno Valley area as having a "High Potential/Sensitivity (High B)," which was "based on [the presence of] geologic formations or mappable rock units that contain[ed] fossilized body elements, and trace fossils such as tracks, nests, and eggs. These fossils occur on or below the surface." The category "High B" indicates that fossils are likely to be encountered at or below four feet of depth, and could be impacted during excavation by construction activities. The terminology previously used for a "High B" paleontological sensitivity has since been changed (2017) and is now referred to as "Medium" sensitivity (Attachment 4). Alluvial fan sediments with a Medium resource potential or Medium resource sensitivity to yield nonrenewable paleontological resources (*i.e.*, fossils) are shown in amber tint on Attachment 4.

Records Search Results: Based on a paleontological literature review and a collections and records search conducted by the Geological Sciences Division of the San Bernardino County Museum in Redlands, California for a nearby project site (Moreno Valley Logistics Center; E. G. Scott, March 12, 2015, attached), older Pleistocene alluvial fan deposits ($Qvof_a$ on Attachment 3) have a high potential to contain significant nonrenewable paleontological resources (*i.e.*, fossils), and were thus assigned a "high paleontological resource sensitivity" by Scott (2015). Similar older Pleistocene sediments throughout the lowland (valley) areas of western Riverside County and the Inland Empire have been reported to yield significant fossils of extinct terrestrial mammals from the last Ice Age (see references in Scott, 2015), such as mammoths, mastodons, giant ground sloths, dire wolves, short-faced bears, saber-toothed cats, large and small horses, camels, and bison. A collections and records search report solicited from the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County (LACM) for the nearby Brodiaea Avenue and Heacock Street Warehouse project site (S. A. McLeod, 2017, attached) also did not identify any known fossil localities within the boundaries of that project, nor within a one-mile radius. The closest recorded fossil locality cited by McLeod (2017) is LACM loc. 4540, which yielded fossil horse remains (*Equus* sp.) from a location more than eight miles to the east in the San Timoteo Badlands, east of the city of Moreno Valley. The San Timoteo Badlands have yielded a considerable number of Tertiary vertebrate and plant fossils. However, the closest recorded fossil locality may be that reported by R. E. Reynolds (2004) from a location several miles northeast of the current project site. The only fossil recovered there was a limb bone of an unidentified species of *Bison*.

Recommendations: Because of the Medium paleontological sensitivity (previously High B) assigned to the lower Pleistocene older alluvial fan deposits across the site ($Qvof_a$ on Attachment 3), full-time paleontological monitoring of mass grading and excavation (utility trenching, etc.) activities greater than four feet in depth in areas so mapped should be required in order to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources. The age of these sediments is more important in determining the need for paleontological monitoring than the possible depth of their current burial.

However, we are unaware of the depth that earthmoving activities, including utility trenching and footing excavations, will reach at the project site. We assume that the building structure will be slab on grade, and thus may not require extensive removals, depending on the geotechnical conclusions and requirements for the project. Excavation of the retention basin in the southeast

corner of the job site will certainly need to be monitored paleontologically. The mitigation program should be consistent with the provisions of the California Environmental Quality Act (CEQA), regulations currently implemented by the City of Moreno Valley (as the lead agency for the project), the County of Riverside, and the proposed guidelines of the Society of Vertebrate Paleontology (see page 5, following).

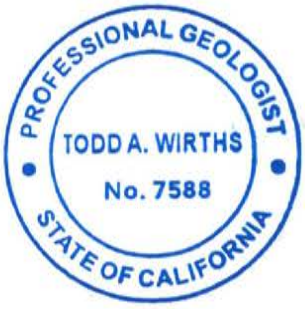
If you have any questions concerning this evaluation, please feel free to contact us at our Poway address. Thank you for the opportunity to have provided paleontological services for this project.

Sincerely,

George L. Kennedy, Ph.D.
Senior Paleontologist

Todd Wirths, M.S.
California Professional Geologist No. 7588

Attachments: Index maps, geologic map, paleontological sensitivity map, and LACM and SBCM records search reports



References:

McLeod, S. A. 2017. Paleontological resources records search for the proposed Brodiaea Avenue & Heacock Street Warehouse project, BFSA Project # 17-166, in Moreno Valley, Riverside County, project area. Unpublished paleontological records search report prepared for Brian F. Smith and Associates, Inc., Poway by the Section of Vertebrate Paleontology, Natural History Museum of Los Angeles County, Los Angeles. (Copy attached.)

Morton, D. M., and Cox, B. 2001a. Geologic map of the Riverside East 7.5' quadrangle, Riverside County, California: U. S. Geological Survey Open-File Report 01-452, scale 1:24,000.

Morton, D. M., and Matti, J. C. 2001b. Preliminary geologic map of the Sunnymead 7.5' quadrangle, Riverside County, California: U. S. Geological Survey Open-File Report 01-450, scale 1:24,000.

Reynolds, R. E. 2004. Paleontological resource investigation, Moreno Highlands fault investigation. *In* unpublished geologic report prepared by Leighton & Associates, 2004, Preliminary fault investigation, Tentative Tract Map No. 32501, Moreno Highlands, City of Moreno Valley, Project No. 111061-1031.

Scott, E. G. 2015. Paleontology literature and records review, Moreno Valley Logistics Center, City of Moreno Valley, Riverside County, California. Unpublished paleontological records search report prepared for Brian F. Smith and Associates, Inc., Poway by the Division of Geological Sciences, San Bernardino County Museum, Redlands. (Copy attached.)

Trazo, R. G., and Seminara, J. A. 2014. Geotechnical investigation, proposed Moreno Valley Logistics Center, SWC Krameria Avenue and Indian Street, Moreno Valley, California. Unpublished geotechnical report prepared for ProLogis, Ontario, California, by Southern California Geotechnical, Inc., Yorba Linda, California.

Paleontological Mitigation Program

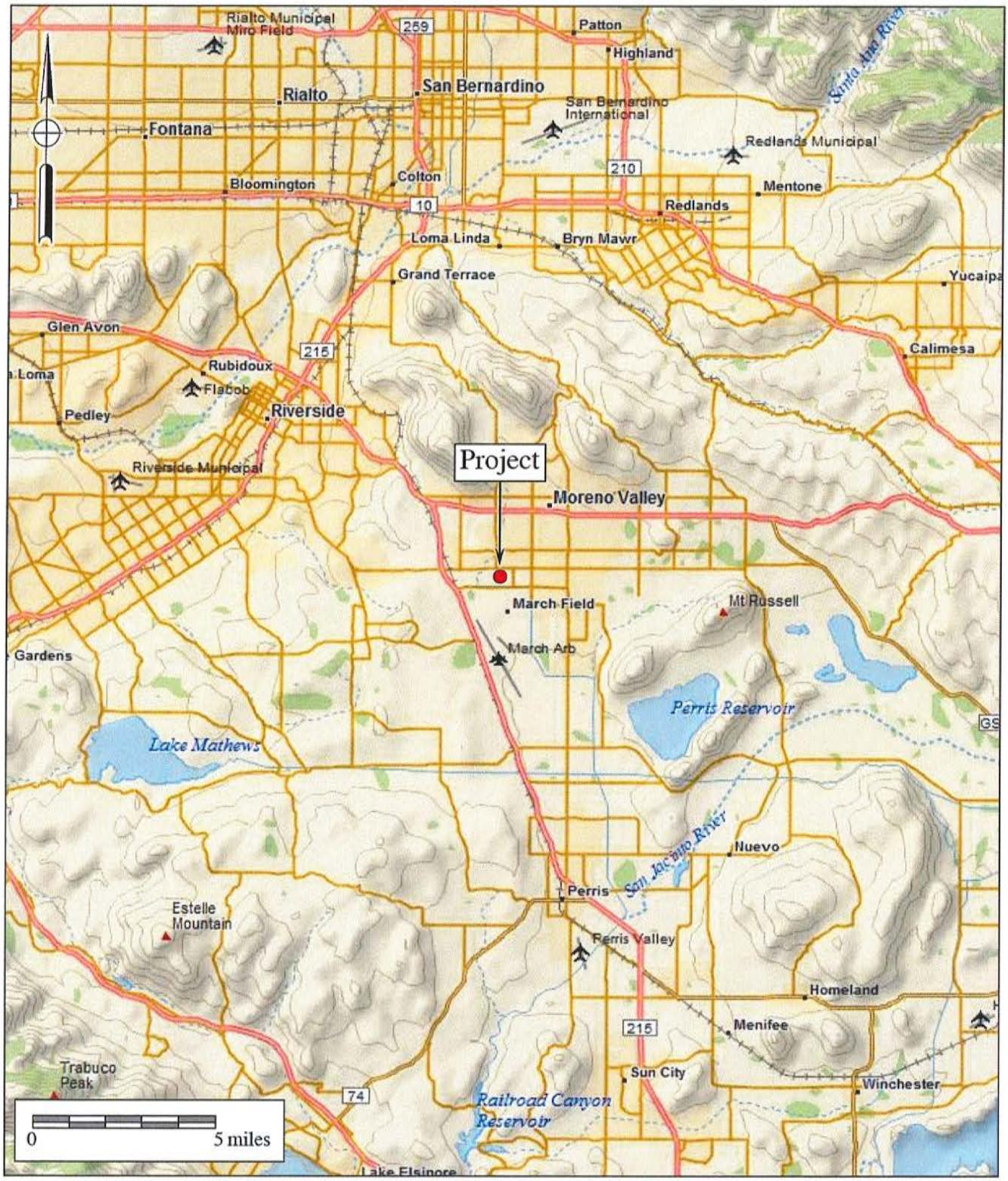
Centerpointe Warehouse Project

1. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources by a qualified paleontologist or paleontological monitor. Full-time monitoring will be conducted in areas of grading or excavation in undisturbed, very old alluvial fan sediments ($Qvof_a$ on Attachment 3) at depths greater than four feet. Paleontological monitors will be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow for the removal of abundant or large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or if present, are determined upon exposure and examination by qualified paleontological personnel to have a low potential to contain or yield fossil resources.

2. Preparation of recovered specimens to a point of identification and permanent preservation, including screen washing sediments to recover small invertebrates and vertebrates, if necessary. Preparation of individual vertebrate fossils is often more time-consuming than for accumulations of invertebrate fossils.

3. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (*e.g.*, the Western Science Center Museum, 2345 Searl Parkway, Hemet, California 92543). The paleontological program should include a written repository agreement prior to the initiation of mitigation activities.

4. Preparation of a final monitoring and mitigation report of findings and significance, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location. The report, when submitted to the appropriate lead agency (City of Moreno Valley), will signify satisfactory completion of the project program to mitigate impacts to any paleontological resources.

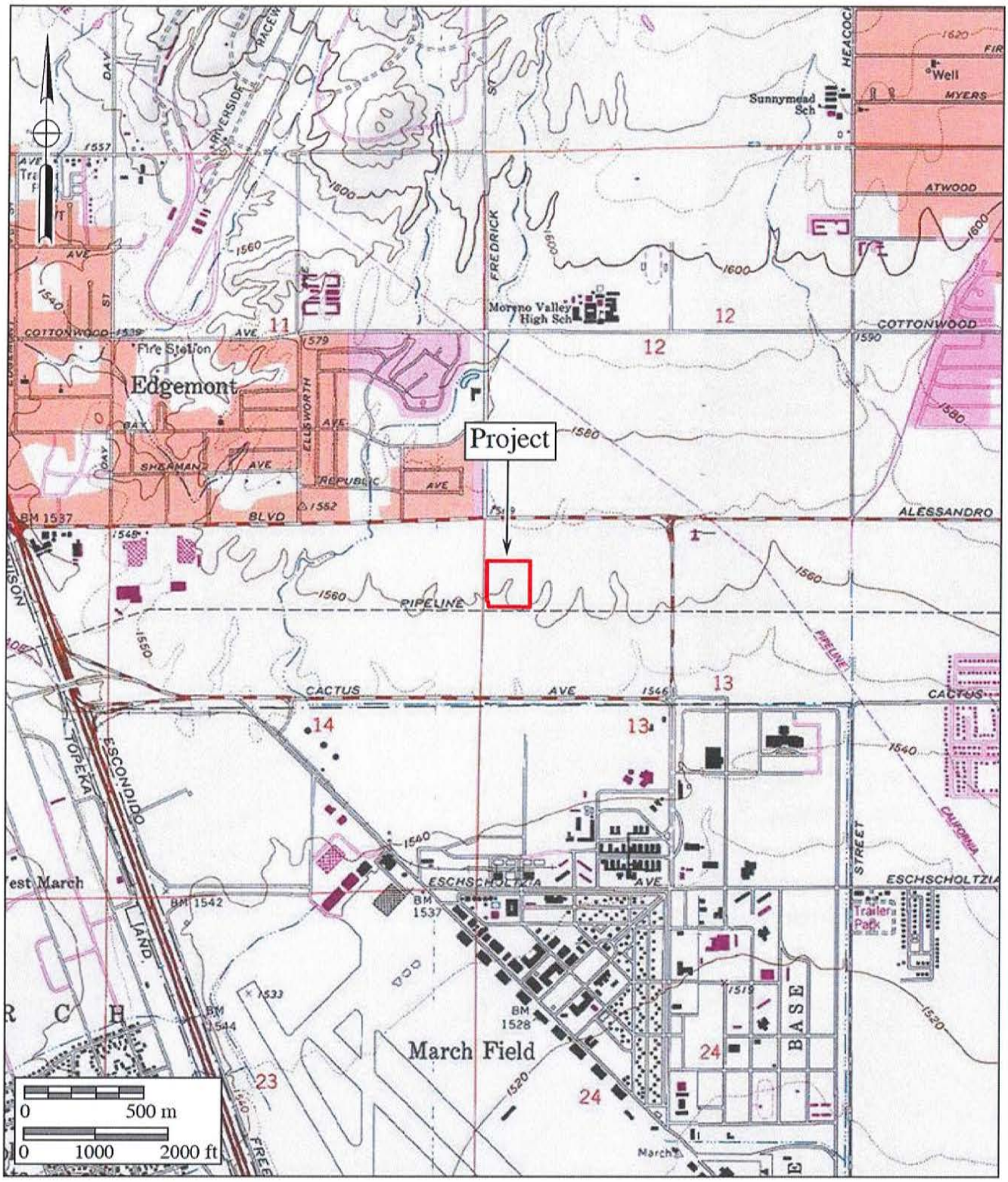


Attachment 1

General Location Map

The Centerpointe Project

DeLorme (1:250,000)

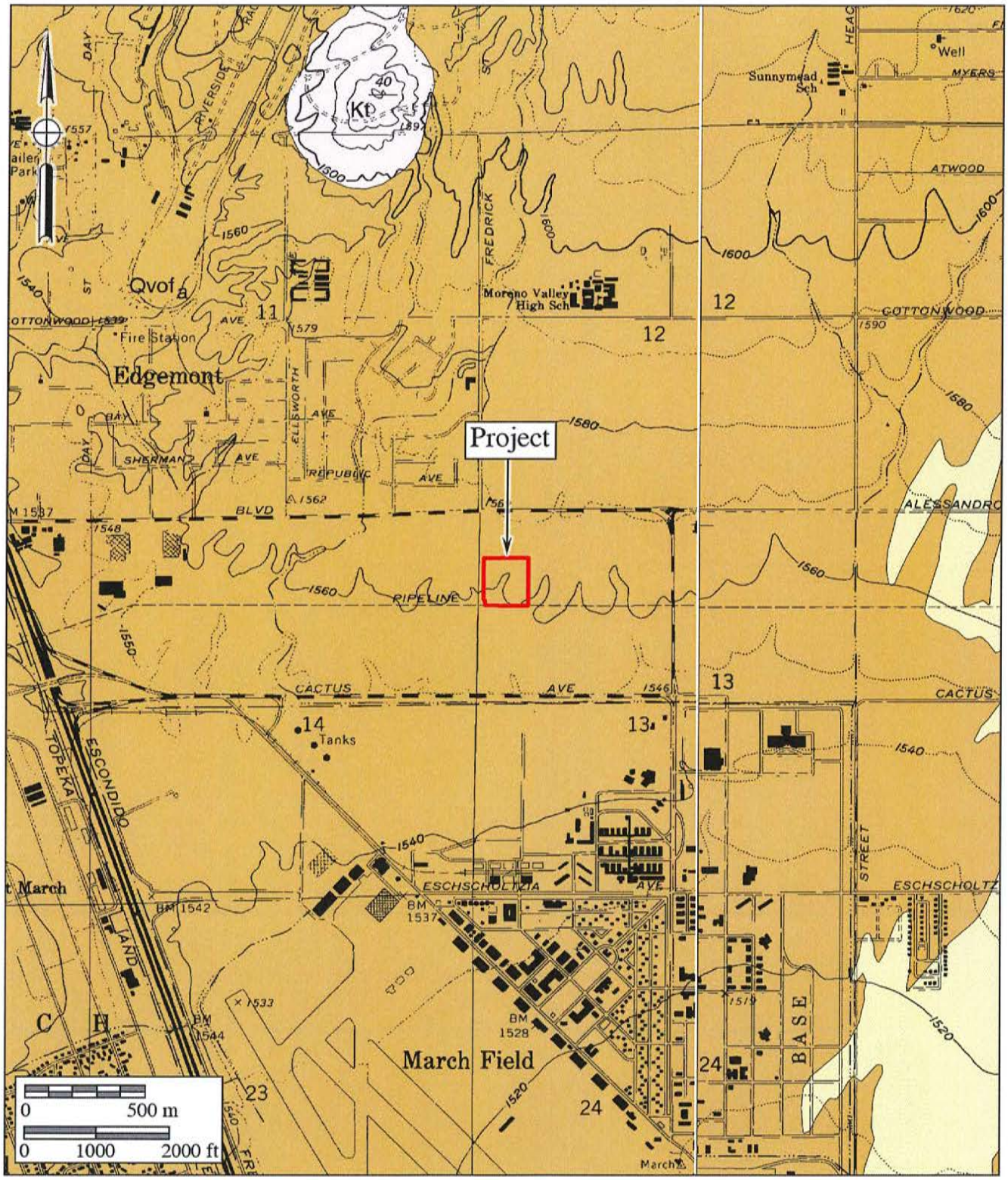


Attachment 2

Project Location Map

The Centerpointe Project

USGS *Riverside East* and *Sunnymead* Quadrangles (7.5-minute series)

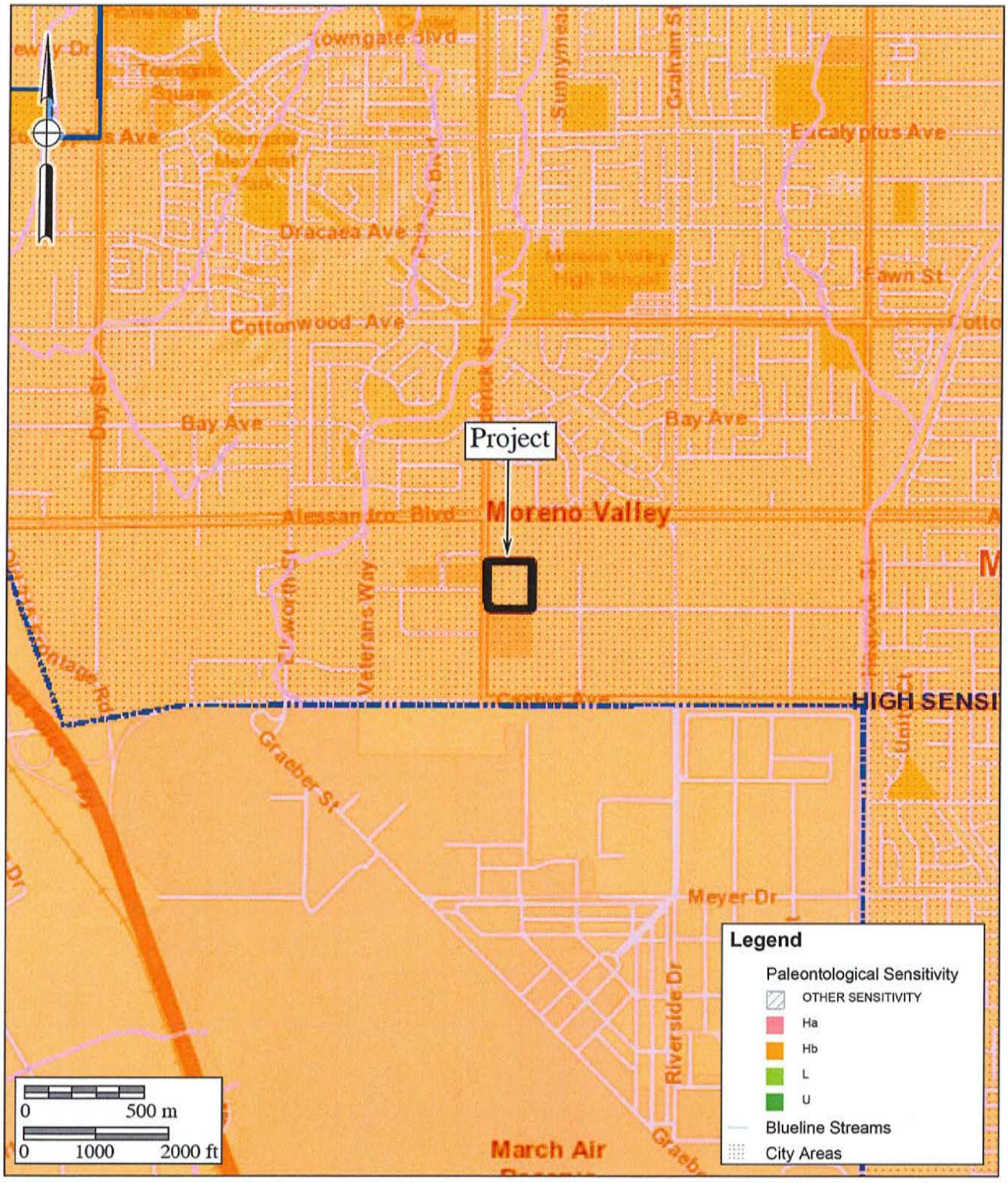


Attachment 3

Geologic Map

The Centerpointe Project

USGS *Riverside East* and *Sunnymead* Quadrangles (7.5-minute series)



Attachment 4

Paleontological Sensitivity Map

The Centerpointe Project

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

14 September 2017

Brian F. Smith & Associates, Inc.
14010 Poway Road, Suite A
Poway, CA 92064

Attn: George L. Kennedy, Ph.D., Senior Paleontologist

re: Paleontological Resources Records Search for the proposed Brodiaea Avenue & Heacock Street Warehouse Project, BFSA Project # 17-166, in Moreno Valley, Riverside County, project area

Dear Dr. Kennedy:

I have thoroughly searched our paleontology collection records for the locality and specimen data for the proposed Brodiaea Avenue & Heacock Street Warehouse Project, BFSA Project # 17-166, in Moreno Valley, Riverside County, project area as outlined on the portion of the Sunnymead USGS topographic quadrangle map that you sent to me via e-mail on 31 August 2017. We do not have any vertebrate fossil localities that lie directly within the proposed project area boundaries, but we do have localities farther afield from sedimentary deposits similar to those that may occur subsurface in the proposed project area.

Surface deposits in the entire proposed project area consist of younger Quaternary Alluvium, derived as alluvial fan deposits from the more elevated terrain to the north. These sedimentary deposits typically do not contain significant vertebrate fossils, at least in the uppermost layers, but they may be underlain by finer-grained older Quaternary deposits that do contain significant vertebrate fossils. Our closest vertebrate fossil locality from somewhat similar deposits is LACM 4540, from the gravel pits just west of Jack Rabbit Trail east-southeast of the proposed project area on the eastern side of the San Jacinto Valley, that produced a specimen of fossil horse, *Equus*.

Shallow excavations in younger Quaternary Alluvium in the proposed project area are unlikely to uncover significant vertebrate fossil remains. Deeper excavations in the proposed project area that extend down into older Quaternary deposits, however, may well encounter significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice

2024 Orange Tree Lane, Redlands, California 92374 | Phone: 909.798.8608
www.SBCounty.

SAN BERNARDINO COUNTY

Museum

Leonard X. Hernand
Interim Museum Direc

12 March 2015

Brian F. Smith and Associates
attn: George L. Kennedy, Ph.D., Senior Paleontologist
14010 Poway Road, Suite A
Poway, CA 92064

re: **PALEONTOLOGY LITERATURE AND RECORDS REVIEW, MORENO VALLEY LOGISTICS CENTER, CITY OF MORENO VALLEY, RIVERSIDE COUNTY, CALIFORNIA**

Dear Dr. Kennedy,

The Division of Geological Sciences of the San Bernardino County Museum (SBCM) has completed a literature review and records search for the above-named project in the City of Moreno Valley, Riverside County, California. Specifically, the proposed study area is located in the southwestern quadrant of section 30, Township 3 South, Range 3 West, San Bernardino Base and Meridian, as seen on the Perris, California and the Sunnymead, California 7.5' United States Geological Survey topographic quadrangle maps (1967 editions, photorevised 1973 and 1980, respectively).

Previous mapping of the proposed property (Rogers, 1965; Morton and Matti, 2001; Morton, 2003) indicates that the study area is situated entirely upon surface exposures of early Pleistocene alluvial fan deposits (= unit **$Qvof_a$**). These Pleistocene fan deposits may have high paleontologic sensitivity, depending upon their lithology. Pleistocene alluvium elsewhere throughout Riverside County and the Inland Empire has repeatedly been reported to yield significant fossils of extinct animals from the Ice Age (Jefferson, 1991; Reynolds, 1991; Anderson and others, 2002; Scott and Cox, 2008; Springer and others, 2009, 2010; Scott, 2010). Fossils recovered from these Pleistocene sediments represent extinct taxa including mammoths, mastodons, ground sloths, dire wolves, sabre-toothed cats, large and small horses, large and small camels, and bison (Jefferson, 1991; Reynolds, 1991; Scott and Cox, 2008; Springer and others, 2009, 2010; Scott, 2010), as well as plant macro- and microfossils (Anderson and others, 2002). If not previously disturbed by development, and depending upon the lithology exhibited, these sediments have high potential to contain significant nonrenewable paleontologic resources.

For this review, I conducted a search of the Regional Paleontologic Locality Inventory (RPLI) at the SBCM. The results of this search indicate that no previously-recorded fossil resource

localities from Pleistocene older alluvium are present within the boundaries of the proposed development property, nor from at least within one mile in any direction.

Recommendations

The results of the literature review and the search of the RPLI at the SBCM demonstrate that the proposed study area is situated upon Pleistocene older alluvial deposits that, if not previously disturbed by development and depending upon their lithology, have high potential to contain paleontologic resources. Excavation in this older alluvium therefore has high potential to impact paleontologic resources. A qualified vertebrate paleontologist must develop a program to mitigate impacts to nonrenewable paleontologic resources. This mitigation program must be consistent with the provisions of the California Environmental Quality Act (Scott and Springer, 2003), as well as with regulations currently implemented by the County of Riverside. This program should include, but not be limited to:

1. Monitoring of excavation in areas identified as likely to contain paleontologic resources by a qualified paleontologic monitor. Areas requiring monitoring include all previously-undisturbed Pleistocene older alluvial sediments present, at the surface or at depth, within the boundaries of the property. Paleontologic monitors should be equipped to salvage fossils as they are unearthed, to avoid construction delays, and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Monitoring may be reduced or eliminated if the potentially-fossiliferous units described herein are determined upon exposure and examination by qualified paleontologic personnel to have low potential to contain fossil resources.

2. Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Preparation and stabilization of all recovered fossils are essential in order to fully mitigate adverse impacts to the resources (Scott and others, 2004).

3. Identification and curation of specimens into an established, accredited museum repository with permanent retrievable paleontologic storage. These procedures are also essential steps in effective paleontologic mitigation (Scott and others, 2004) and CEQA compliance (Scott and Springer, 2003). The paleontologist must have a written repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontologic resources is not complete until such curation into an established, accredited museum repository has been fully completed and documented.

4. Preparation of a report of findings with an appended itemized inventory of specimens. The report and inventory, when submitted to the appropriate Lead Agency along with confirmation of the curation of recovered specimens into an established, accredited museum

repository, would signify completion of the program to mitigate impacts to paleontologic resources.

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Please do not hesitate to contact us with any further questions you may have.

Sincerely,

Eric Scott, Curator of Paleontology
Division of Geological Sciences
San Bernardino County Museum

Updated Geotechnical Engineering Investigation

Proposed Industrial Warehouse Development
NWC of Frederick Street and Brodiaea Avenue
Moreno Valley, California

Newcastle Partners
4740 Green River Road, Suite 118
Corona, California 92880

Attn.: Mr. Brett Anderson

Project Number 20083-17
December 19, 2017

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(562) 799-9469 Fax (562) 799-9459

December 19, 2017 Project Number 20083-17

Newcastle Partners
4740 Green River Road, Suite 118
Corona, California 92880

Attn.: Mr. Brett Anderson

RE: **Updated Geotechnical Engineering Investigation** - Proposed Industrial Warehouse Development - Located at the Northwest Corner of Frederick Street and Brodiaea Avenue, in the City of Moreno Valley, California

Dear Mr. Anderson:

Pursuant to your request, this firm has performed a Geotechnical Engineering Investigation for the above referenced project in accordance to our signed proposal dated November 22, 2017. The purpose of this investigation is to evaluate the subsurface conditions of the subject site and to provide recommendations for the proposed industrial warehouse development.

The scope of work included the following: 1) site reconnaissance; 2) subsurface geotechnical exploration and sampling; 3) laboratory testing; 4) engineering analysis of field and laboratory data; 5) and preparation of a geotechnical engineering report. It is the opinion of this firm that the proposed development is feasible from a geotechnical standpoint provided that the recommendations presented in this report are followed in the design and construction of the project.

1.0 Project Description

It is proposed to construct an industrial warehouse development consisting of a concrete tilt-up building totaling 203,285 square feet as shown on the attached Site Plan. The proposed building will be supported by a conventional slab-on-grade foundation system with perimeter-spread footings and isolated interior footings. Other improvements will consist of concrete and/or asphalt pavement and hardscape. It is assumed that the proposed grading for the development will include minor cut and fill procedures. Final building plans shall be reviewed by this firm prior to submittal for city approval to determine the need for any additional study and revised recommendations pertinent to the proposed development, if necessary.

2.0 Site Description

The 8.94-acre property is located at the northeast corner of Frederick Street and Brodiaea Avenue, in the City of Moreno Valley. The generally square-shaped parcel is relatively level with topography descending gradually from north to south on the order of a few feet. The site is currently an undeveloped land covered with a low growth of vegetation cover consisting of natural grasses and weeds.

3.0 Site Exploration

Our field investigation consisted of the placement of two (2) subsurface exploratory borings by a truck-mounted drill rig to a depth of 20 and 50 feet and nine (9) subsurface exploratory trenches to depths ranging between 5 and 15 feet below current ground elevations. All explorations were visually classified and logged by a field engineer with locations of the subsurface explorations shown on the attached Site Plan. The exploratory borings and trenches revealed the existing earth materials to consist of a fill and natural soil. A detailed description of the subsurface conditions is listed on the excavation logs in Appendix A.

Fill: A surficial fill and/or disturbed top soil classifying as brown clayey SAND was encountered to a depth of 1 to 2½ feet. These soils were noted to be loose and damp.

Natural: An undisturbed alluvium soil classifying as a brown, clayey SAND was encountered directly beneath the fill and observed to be dense to very dense and damp to moist. Deeper soils consisted of silty sands and sandy silts which were noted to be very dense and stiff and damp to moist.

The overall engineering characteristics of the earth material were relatively uniform with each excavation. Groundwater was encountered at the depth of 30 feet below ground surface and no caving occurred.

4.0 Laboratory Tests

Relatively undisturbed samples of the subsurface soils were obtained to perform laboratory testing and analysis for direct shear, consolidation tests, and to determine in-place moisture/densities. These relatively undisturbed ring samples were obtained by driving a thin-walled steel sampler lined with one inch long brass rings with an inside diameter of 2.42 inches into the undisturbed soils.

Standard penetration tests were obtained by driving an unlined steel sampler with an inside diameter of 1.5 inches into the soils. This standard penetrometer sampler was driven a total of eighteen inches with blow counts tallied every six inches. Blow count data is given on the Boring Logs in Appendix A.

Bulk bag samples were obtained in the upper soils for expansion index tests and maximum density tests. All test results are included in Appendix B, unless otherwise noted.

4.1 **Field moisture content** (ASTM: D 2216) and the dry density of the ring samples were determined in the laboratory. This data is listed on the logs of explorations.

4.2 **Sieve analyses** (ASTM: D 422) and the percent by weight of soil finer than the No. 200 sieve (ASTM: 1140) were performed on selected soil samples. These results are shown later within the body of this report.

4.3 **Maximum density tests** (ASTM: D-1557) were performed on typical samples of the upper soils. Results of these tests are shown on Table I.

4.4 **Expansion index tests** (ASTM: D 4829) were performed on remolded samples of the upper soils. Results of these tests are provided on Table II.

4.5 **Atterberg Limits** (ASTM: D 4318) consisting of liquid limit, plastic limit and plasticity index were performed on representative soil samples. Results are shown on Table III.

4.6 **Corrosion tests** consisting of sulfate, pH, resistivity and chloride analysis to determine potential corrosive effects of soils on concrete and underground utilities. Test results are provided on Table IV.

4.7 **R-Value test** per California Test Method 301 was performed on a representative sample, which may be anticipated to be near subgrade to determine pavement design. Result provided within pavement section design section of report.

4.8 **Direct Shear tests** (ASTM: D 3080) were performed on undisturbed and disturbed samples of the subsurface soils. The test is performed under saturated conditions at loads of 1,000 lbs./sq.ft., 2,000 lbs./sq.ft., and 3,000 lbs./sq.ft. with results shown on Plates A and B.

4.9 **Consolidation tests** (ASTM: D-2435) were performed on undisturbed samples to determine the differential and total settlement which may be anticipated based upon the proposed loads. Water was added to the samples at a surcharge of one KSF and the settlement curves are plotted on Plates C and D.

5.0 Infiltration Characteristics

Infiltration tests within the site were performed to provide preliminary infiltration rates for the purpose of planning and design of an on-site water disposal system. The infiltration tests consisted of the double ring infiltration test per ASTM Method D 3385. Based upon the results of our testing, the soils encountered in the planned on-site drainage disposal system area exhibit the following infiltration rates. The field infiltration rate is listed below for two exploratory trenches at a depth of 5 and 10 feet measured from existing ground surface with our calculations given in Appendix C. .

Test No.	Depth	Infiltration Rate
T-1	5'	0.22 in/hr
T-2	10'	0.12 in/hr

The correction factors CF_t, CF_v and CF_s are given below based on soils in the upper 10 feet from our field tests.

a) $CF_t = R_f = 1.0$ for our double ring infiltration test holes.

b) $CF_v = 1.0$ based on uniform soils encountered in two trenches for infiltration tests.

c) $CF_s = 3.0$ for long-term siltation, plugging and maintenance. The subsurface soils are likely to have some plugging and regular maintenance of storm water discharge devices is required.

Based upon the results of our testing, the subsurface soils encountered in the proposed on-site drainage disposal system to a depth of 10 feet shall utilize a design infiltration rate of 0.05 in/hr in the upper 10 feet below existing grade. These fine grained soils have a very low permeability for use in a disposal system. All systems must meet the latest city and/or county specifications and California Regional Water Quality Control Board (CRWQCB) requirements.

All systems must meet the latest city and/or county specifications and California Regional Water Quality Control Board (CRWQCB) requirements. Foundations shall be set back a minimum distance of 10 feet from the drainage disposal system and the bottom of footing shall be a minimum of 10 feet from the expected zone of saturation. The boundary of the zone of saturation may be assumed to project downward from the top of the permeable portion of the disposal system at an inclination of 1 to 1 or flatter, as determined by the soils engineer.

6.0 Seismicity Evaluation

There are no known active or potentially active faults trending toward or through the site. The proposed development lies outside of any Alquist Priolo Special Studies Zone and the potential for damage due to direct fault rupture is considered very remote. The site is located in an area of high regional seismicity and the San Jacinto fault is located about 8 kilometers from the site. Ground shaking originating from earthquakes along other active faults in the region is expected to induce lower horizontal accelerations due to smaller anticipated earthquakes and/or greater distances to other faults.

The seismic design of the project has been updated to the latest 2010 ASCE 7-10 (with July 2013 errata) standards and the mapped seismic ground motions were provided by using the Java based program available from the United States Geological Survey (USGS) website: http://geohazards.usgs.gov/designmaps/us/application.php. The earthquake design parameters are listed below.

Seismic Design Parameters

Site Location	Latitude	33.915°
	Longitude	-117.225°
Site Class		D
Risk Category		I/II/III
Maximum Spectral Response Acceleration	S_S	1.566g
	S_1	0.678g
Adjusted Maximum Acceleration	S_{MS}	1.566g
	S_{M1}	1.017g
Design Spectral Response Acceleration Parameters	S_{DS}	1.044g
	S_{D1}	0.678g

7.0 Liquefaction Evaluation

The site is expected to experience ground shaking and earthquake activity that is typical of Southern California area. It is during severe ground shaking that loose, granular soils below the groundwater table can liquefy. A review of the exploratory boring log and the laboratory test results on selected soil samples obtained indicate the following soil classifications, field blowcounts and amounts of fines passing through the No. 200 sieve.

Field Blowcount and Gradation Data

Location	Classification	Blowcounts (blows/ft)	Relative Density	% Passing No. 200 Sieve
B-1 @ 5'	SC	45	Very Dense	36
B-1 @ 10'	SM	54	Very Dense	21
B-1 @ 15'	ML	47	Very Stiff	51
B-1 @ 20'	SM	42	Very Stiff	12
B-1 @ 25'	ML	37	Very Dense	52
B-1 @ 30'	SM	32	Dense	17
B-1 @ 35'	SM	41	Dense	27
B-1 @ 40'	SW	38	Dense	5
B-1 @ 45'	SM	61	Very Dense	30
B-1 @ 50'	SM	57	Very Dense	14

Our analysis indicates the potential for liquefaction at this site is considered to be very low due to stiff and dense subsurface soils with a groundwater depth of 30 feet. Thus, the design of the proposed construction in conformance with the latest Building Code provisions for earthquake design is expected to provide mitigation of ground shaking hazards that are typical to Southern California.

8.0 Conclusions and Recommendations

Based upon our evaluations, the proposed development is acceptable from a geotechnical engineering standpoint. By following the recommendations and guidelines set forth in our report, the structures will be safe from excessive settlements under the anticipated design loadings and conditions. The proposed development shall meet all requirements of the City Building Ordinance and will not impose any adverse effect on existing adjacent structures.

The following recommendations are based upon geotechnical conditions encountered in our field investigation and laboratory data. Therefore, these surface and subsurface conditions could vary across the site. Variations in these conditions may not become evident until the commencement of grading operations and any unusual conditions which may be encountered in the course of the project development may require the need for additional study and revised recommendations.

It is recommended that site inspections be performed by a representative of this firm during all grading and construction of the development to verify the findings and recommendations documented in this report. The following sections present a discussion of geotechnical related requirements for specific design recommendations of different aspects of the project.

8.1 Site Grading Recommendations

Any vegetation and or demolition debris shall be removed and hauled from proposed grading areas prior to the start of grading operations. Existing vegetation shall not be mixed or disced into the soils. Any removed soils may be reutilized as compacted fill once any deleterious material or oversized materials (in excess of eight inches) is removed. Grading operations shall be performed in accordance with the attached "Specifications for Compacted Fill Operations".

8.1.1 Removal and Recompaction Recommendations

All disturbed soils and/or fill (about 1 to 2½ feet) shall be removed to competent native material, the exposed surface scarified to a depth of 12 inches, brought to within 2% of optimum moisture content and compacted to a minimum of 90% of the laboratory standard (ASTM: D-1557) prior to placement of any additional compacted fill soils, foundations, slabs-on-grade and pavement. Grading shall extend a minimum of five horizontal feet outside the edges of foundations or equidistant to the depth of fill placed, whichever is greater.

It is possible that isolated areas of undiscovered fill not described in this report are present on site. If found, these areas should be treated as discussed earlier. A diligent search shall also be conducted during grading operations in an effort to uncover any underground structures, irrigation or utility lines. If encountered, these structures and lines shall be either removed or properly abandoned prior to the proposed construction.

Any imported fill material should be preferably soil similar to the upper soils encountered at the subject site. All soils shall be approved by this firm prior to importing at the site and will be subjected to additional laboratory testing to assure concurrence with the recommendations stated in this report.

Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase. Adequate drainage away from the structures, pavement and slopes should be provided at all times.

If placement of slabs-on-grade and pavement is not completed immediately upon completion of grading operations, additional testing and grading of the areas may be necessary prior to continuation of construction operations. Likewise, if adverse weather conditions occur which may damage the subgrade soils, additional assessment by the geotechnical engineer as to the suitability of the supporting soils may be needed.

8.1.2 Fill Blanket Recommendations

In areas of transition between the underlying native material and engineered fill, additional overexcavation of the native material consisting of a depth of two feet below proposed foundations is required to mitigate the potential of differential settlement. This fill shall extend a minimum of five horizontal feet or to the depth of vertical overexcavation, whichever is greater, beyond the outside edge of the perimeter foundation.

7.2 Shrinkage and Subsidence

Results of our in-place density tests reveal that the soil shrinkage will be on the order of 5 to 10% due to excavation and recompaction, based upon the assumption that the fill is compacted to 92% of the maximum dry density per ASTM standards. Subsidence should be 0.2 feet due to earthwork operations. The volume change does not include any allowance for vegetation or organic stripping, removal of subsurface improvements or topographic approximations. Although these values are only approximate, they represent our best estimate of lost yardage which will likely occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field testing using the actual equipment and grading techniques should be conducted.

8.3 Temporary Excavations

Temporary unsurcharged excavations in the existing site materials less than 4 feet high may be made at a vertical gradient unless cohesionless soils are encountered. In areas where soils with little or no binder are encountered, where adverse geological conditions are exposed, or where excavations are adjacent to existing structures, shoring, slot-cutting, or flatter excavations may be required. The temporary cut slope gradients given do not preclude local raveling and sloughing. All excavations shall be made in accordance with the requirements of CAL-OSHA and other public agencies having jurisdiction. Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase.

8.4 Foundation Design

All foundations may be designed utilizing the following safe bearing capacities for an embedded depth of 18 inches into approved fill materials with the corresponding widths:

Allowable Safe Bearing Capacity (psf)

Width (ft)	Continuous Foundation	Isolated Foundation
1.5	2000	2500
2.0	2075	2575
4.0	2375	2875
6.0	2500	3000

The bearing value may be increased by 500 psf for each additional foot of depth in excess of the 18-inch minimum depth, up to a maximum of 4,000 psf. A one third increase may be used when considering short-term loading and seismic forces. All continuous foundations shall be reinforced a minimum of one No. 4 bar, top and bottom. Isolated foundations shall be reinforced per the discretion of the project structural engineer. A representative of this firm shall inspect all foundation excavations prior to pouring concrete.

8.5 Settlement Analysis

Resultant pressure curves for the consolidation tests are shown on Plates C and D. Computations utilizing these curves and the recommended safe bearing capacities reveal that the foundations will experience settlements on the order of 3/4 inch and differential settlements of less than 1/4 inch.

8.6 Lateral Resistance

The following values may be utilized in resisting lateral loads imposed on the structure. Requirements of the California Building Code should be adhered to when the coefficient of friction and passive pressures are combined.

Coefficient of Friction – 0.35

Equivalent Passive Fluid Pressure = 200 lbs./cu.ft.

Maximum Passive Pressure = 2,000 lbs./cu.ft.

The passive pressure recommendations are valid only for approved compacted fill soils.

8.7 Retaining Wall Design Parameters

Active earth pressures against retaining wall will be equal to the pressures developed by the following fluid densities. These values are for **granular backfill material** placed behind the walls at various ground slopes above the walls.

Surface Slope of Retained Materials (Horizontal to Vertical)	Equivalent Fluid Density (lb./cu.ft.)
Level	30
5 to 1	35
4 to 1	38
3 to 1	40
2 to 1	45

Any applicable short-term construction surcharges and seismic forces should be added to the referenced lateral pressure values. An equivalent fluid pressure of 45 pcf may be utilized for the restrained wall condition with a level grade behind the wall.

All walls shall be waterproofed as needed and protected from hydrostatic pressure by a reliable permanent subdrain system. The subsurface drainage system shall consist of 4-inch diameter perforated PVC pipe encased with gravel and wrapped with filter fabric. The granular backfill to be utilized immediately adjacent to the walls shall consist of an approved granular soils with a sand equivalency greater than 30. This backfill zone of free draining material shall consist of a wedge beginning a minimum of one horizontal foot from the base of the wall extending upward at an inclination of no less than 3/4 to 1 (horizontal to vertical).

The seismic-induced lateral soil pressure for walls greater than 6 feet shall be computed using a triangular pressure distribution with the maximum value at the top of the wall. The maximum lateral pressure of (20 pcf) H, where H is the height of the retained soils above the wall footing should be utilized in final design of retaining walls. Sliding resistance values and passive fluid pressures given in our referenced report may be increased by 1/3 during short-term wind and seismic loading conditions.

8.8 Slab Design

All concrete slabs-on-grade shall be at least four inches in office and hardscape areas, six inches in warehouse, both reinforced with No. 3 bars at sixteen inch spacing in each direction and positioned in the center of the slab and placed on approved subgrade soils. Additional reinforcement requirements and an increase in thickness of the slabs-on-grade may be necessary based upon soils expansion potential and proposed loading conditions in the structures and should be evaluated further by the project engineers and/or architect. These slabs shall be placed on approved subgrade soils moisture conditioned to 3% above optimum moisture content to a depth of eighteen inches.

A vapor retarder (10-mil minimum thickness) should be utilized in areas which would be sensitive to the infiltration of moisture. This retarder shall meet requirements of ASTM E 96, *Water Vapor Transmission of Materials* and ASTM E 1745, *Standard Specification for Water Vapor Retarders used in Contact with Soil or Granular Fill Under Concrete Slabs.* The vapor retarder shall be installed in accordance with procedures stated in ASTM E 1643, *Standard practice for Installation of Water Vapor Retarders used in Contact with Earth or Granular Fill Under Concrete Slabs.*

The moisture retarder may be placed directly upon approved subgrade soils, although one to two inches of sand beneath the membrane is desirable. The subgrade upon which the retarder is placed shall be smooth and free of rocks, gravel or other protrusions which may damage the retarder. Use of sand above the retarder is under the purview of the structural engineer; if sand is used over the retarder, it should be placed in a dry condition.

8.9 Pavement Section Design

The table below provides a preliminary pavement design based upon an R-Value of 30 for the proposed pavement areas. Final pavement design may need to be based on R-Value testing of the subgrade soils near the conclusion of rough grading to assure that these soils are consistent with those assumed in this preliminary design.

Type of Traffic	Traffic Index	Asphaltic Concrete (in)	Base Material (in)
Automobile Parking Stalls	4.0	3.0	4.0
Light Vehicle Circulation Areas	5.5	3.5	5.5
Heavy Truck Access Areas (GVW < 90,000 lbs.; 5 axle)	7.0	4.0	10.0

All concrete slabs to be utilized for pavement shall be a minimum of six inches in thickness and placed on approved subgrade soils. Client should submit anticipated traffic loadings, when available, so that pavement sections may be reviewed to determine adequacy to support these loads.

Any approved base material shall consist of a Class II aggregate or equivalent and should be compacted to a minimum of 95% relative compaction. All pavement materials shall conform to the requirements set forth by the City of Moreno Valley. The base material and asphaltic concrete should be tested prior to delivery to the site and during placement to determine conformance with the project specifications. A pavement engineer shall designate the specific asphalt mix design to meet the required project specifications.

All pavement areas shall have positive drainage toward an approved outlet from the site. Drain lines behind curbs and/or adjacent to landscape areas should be considered by client and the appropriate design engineers to prevent water from infiltrating beneath pavement. If such infiltration occurs, damage to pavement, curbs and flow lines, especially on sites with expansive soils, may occur during the life of the project.

8.10 Utility Trench and Excavation Backfill

Trenches from installation of utility lines and other excavations may be backfilled with on-site soils or approved imported soils compacted to a minimum of 90% relative compaction. All utility lines shall be properly bedded with clean sand having a sand equivalency rating of 30 (SE > 30) or more. This bedding material shall be thoroughly water jetted around the pipe structure prior to placement of compacted backfill soils.

8.11 Corrosion Design Criteria

Representative samples of the surficial soils, typical of the subgrade soils expected to be encountered within foundation excavations and underground utilities were tested for corrosion potential. The minimum resistivity value obtained for the samples tested is representative of an environment that may be corrosive to metals. The soil pH value was considered mildly acidic and may have a significant effect on soil corrosivity. Consideration should be given to corrosion protection systems for buried metal such as protective coatings, wrappings or the use of PVC where permitted by local building codes.

According to Table 4.3.1, ACI 318 Building Code and Commentary, these contents revealed negligible levels of sulfate exposure. Therefore, a Type II cement according to latest CBC specifications may be utilized for building foundations at this time. Additional sulfate tests shall be performed at the completion of site grading to assure that these soils are consistent with the recommendations stated in this design. Sulfate test results may be found on the attached Table IV.

8.12 Expansive Soil

Since expansive soils were encountered, special attention should be given to the project design and maintenance. The attached *Expansive Soil Guidelines* should be reviewed by the engineers, architects, owner, maintenance personnel and other interested parties and considered during the design of the project and future property maintenance.

9.0 Closure

The recommendations and conclusions contained in this report are based upon the soil conditions uncovered in our test excavations. No warranty of the soil condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected to unfavorable conditions are encountered during construction phase.

It is the responsibility of the owner to ensure that all information within this report is submitted to the Architect and appropriate Engineers for the project. This firm should have the opportunity to review the final plans to verify that all our recommendations are incorporated. This report and all conclusions are subject to the review of the controlling authorities for the project.

A preconstruction conference should be held between the developer, general contractor, grading contractor, city inspector, architect, and soil engineer to clarify any questions relating to the grading operations and subsequent construction. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied within the field.

This geotechnical investigation has been conducted in a manner consistent with the level of care and skill exercised by members of our profession currently practicing under similar conditions in the Southern California area. No other warranty, expressed or implied is made.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker
Project Engineer
R.G.E. 841

Scott D. Spensiero
Project Manager

SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL

Excavation

Any existing low density soils and/or saturated soils shall be removed to competent natural soil under the inspection of the Soils Engineering Firm. After the exposed surface has been cleansed of debris and/or vegetation, it shall be scarified until it is uniform in consistency, brought to the proper moisture content and compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557).

In any area where a transition between fill and native soil or between bedrock and soil are encountered, additional excavation beneath foundations and slabs will be necessary in order to provide uniform support and avoid differential settlement of the structure.

Material For Fill

The on-site soils or approved import soils may be utilized for the compacted fill provided they are free of any deleterious materials and shall not contain any rocks, brick, asphaltic concrete, concrete or other hard materials greater than eight inches in maximum dimensions. Any import soil must be approved by the Soils Engineering firm a minimum of 24 hours prior to importation of site.

Placement of Compacted Fill Soils

The approved fill soils shall be placed in layers not excess of six inches in thickness. Each lift shall be uniform in thickness and thoroughly blended. The fill soils shall be brought to within 2% of the optimum moisture content, unless otherwise specified by the Soils Engineering firm. Each lift shall be compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557) and approved prior to the placement of the next layer of soil. Compaction tests shall be obtained at the discretion of the Soils Engineering firm but to a minimum of one test for every 500 cubic yards placed and/or for every 2 feet of compacted fill placed.

The minimum relative compaction shall be obtained in accordance with accepted methods in the construction industry. The final grade of the structural areas shall be in a dense and smooth condition prior to placement of slabs-on-grade or pavement areas. No fill soils shall be placed, spread or compacted during unfavorable weather conditions. When the grading is interrupted by heavy rains, compaction operations shall not be resumed until approved by the Soils Engineering firm.

Grading Observations

The controlling governmental agencies should be notified prior to commencement of any grading operations. This firm recommends that the grading operations be conducted under the observation of a Soils Engineering firm as deemed necessary. A 24 hour notice must be provided to this firm prior to the time of our initial inspection.

Observation shall include the clearing and grubbing operations to assure that all unsuitable materials have been properly removed; approve the exposed subgrade in areas to receive fill and in areas where excavation has resulted in the desired finished grade and designate areas of overexcavation; and perform field compaction tests to determine relative compaction achieved during fill placement. In addition, all foundation excavations shall be observed by the Soils Engineering firm to confirm that appropriate bearing materials are present at the design grades and recommend any modifications to construct footings.

Expansive Soil Guidelines

The following expansive soil guidelines are provided for your project. The intent of these guidelines is to inform you, the client, of the importance of proper design and maintenance of projects supported on expansive soils. ***You, as the owner or other interested party, should be warned that you have a duty to provide the information contained in the soil report including these guidelines to your design engineers, architects, landscapers and other design parties in order to enable them to provide a design that takes into consideration expansive soils.***

In addition, you should provide the soil report with these guidelines to any property manager, lessee, property purchaser or other interested party that will have or assume the responsibility of maintaining the development in the future.

Expansive soils are fine-grained silts and clays which are subject to swelling and contracting. The amount of this swelling and contracting is subject to the amount of fine-grained clay materials present in the soils and the amount of moisture either introduced or extracted from the soils. Expansive soils are divided into five categories ranging from "very low" to "very high". Expansion indices are assigned to each classification and are included in the laboratory testing section of this report. *If the expansion index of the soils on your site, as stated in this report, is 21 or higher, you have expansive soils.* The classifications of expansive soils are as follows:

Classification of Expansive Soil*

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

When expansive soils are compacted during site grading operations, care is taken to place the materials at or slightly above optimum moisture levels and perform proper compaction operations. Any subsequent excessive wetting and/or drying of expansive soils will cause the soil materials to expand and/or contract. These actions are likely to cause distress of foundations, structures, slabs-on-grade, sidewalks and pavement over the life of the structure. ***It is therefore imperative that even after construction of improvements, the moisture contents are maintained at relatively constant levels, allowing neither excessive wetting or drying of soils.***

Evidence of excessive wetting of expansive soils may be seen in concrete slabs, both interior and exterior. Slabs may lift at construction joints producing a trip hazard or may crack from the pressure of soil expansion. Wet clays in foundation areas may result in lifting of the structure causing difficulty in the opening and closing of doors and windows, as well as cracking in exterior and interior wall surfaces. In extreme wetting of soils to depth, settlement of the structure may eventually result. Excessive wetting of soils in landscape areas adjacent to concrete or asphaltic pavement areas may also result in expansion of soils beneath pavement and resultant distress to the pavement surface.

Excessive drying of expansive soils is initially evidenced by cracking in the surface of the soils due to contraction. Settlement of structures and on-grade slabs may also eventually result along with problems in the operation of doors and windows.

Projects located in areas of expansive clay soils will be subject to more movement and "hairline" cracking of walls and slabs than similar projects situated on non-expansive sandy soils. There are, however, measures that developers and property owners may take to reduce the amount of movement over the life the development. The following guidelines are provided to assist you in both design and maintenance of projects on expansive soils:

- Drainage away from structures and pavement is essential to prevent excessive wetting of expansive soils. Grades to the latest building code should be designed and maintained to allow flow of irrigation and rain water to approved drainage devices or to the street. Any "ponding" of water adjacent to buildings, slabs and pavement after rains is evidence of poor drainage; the installation of drainage devices or regrading of the area may be required to assure proper drainage. Installation of rain gutters is also recommended to control the introduction of moisture next to buildings. Gutters should discharge into a drainage device or onto pavement which drains to roadways.

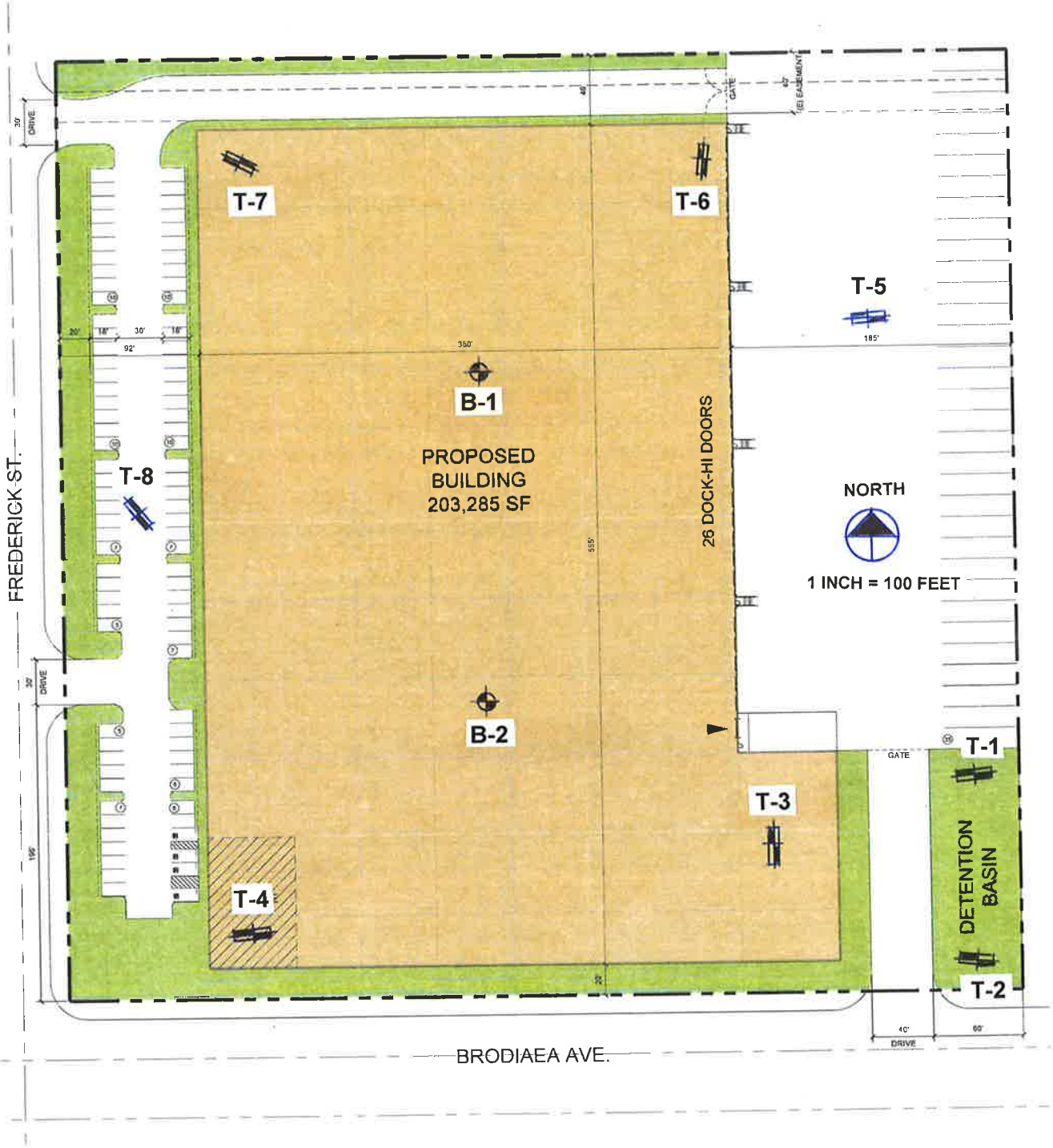
- Irrigation should be strictly controlled around building foundations, slabs and pavement and may need to be adjusted depending upon season. This control is essential to maintain a relatively uniform moisture content in the expansive soils and to prevent swelling and contracting. Over-watering adjacent to improvements may result in damage to those improvements. NorCal Engineering makes no specific recommendations regarding landscape irrigation schedules.

- Planting schemes for landscaping around structures and pavement should be analyzed carefully. Plants (including sod) requiring high amounts of water may result in excessive wetting of soils. Trees and large shrubs may actually extract moisture from the expansive soils, thus causing contraction of the fine-grained soils.

- Thickened edges on exterior slabs will assist in keeping excessive moisture from entering directly beneath the concrete. A six-inch thick or greater deepened edge on slabs may be considered. Underlying interior and exterior slabs with 6 to 12 inches or more of non-expansive soils and providing presaturation of the underlying clayey soils as recommended in the soil report will improve the overall performance of on-grade slabs.

- Increase the amount of steel reinforcing in concrete slabs, foundations and other structures to resist the forces of expansive soils. The precise amount of reinforcing should be determined by the appropriate design engineers and/or architects.

- Recommendations of the soil report should always be followed in the development of the project. Any recommendations regarding presaturation of the upper subgrade soils in slab areas should be performed in the field and verified by the Soil Engineer.



NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

SITE PLAN

PROJECT 20081-17	DATE DECEMBER 2017

List of Appendices
(in order of appearance)

Appendix A - Log of Excavations

- Log of Borings B-1 and B-2
- Log of Trenches T-1 to T-8

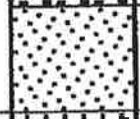
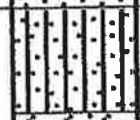
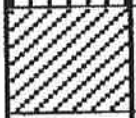
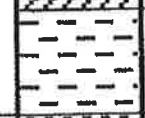
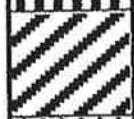
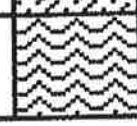
- **Appendix B - Laboratory Tests**
- Table I - Maximum Dry Density
- Table II – Expansion
- Table III – Atterberg Limits
- Table IV – Corrosion

- Plates A and B - Direct Shear
- Plates C and D – Consolidation

Appendix C – Soil Infiltration Study

- Field Data

Appendix A

MAJOR DIVISION			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL, SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINE (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM

KEY:

- Indicates 2.5-inch Inside Diameter. Ring Sample.
- Indicates 2-inch OD Split Spoon Sample (SPT).
- Indicates Shelby Tube Sample.
- Indicates No Recovery.
- Indicates SPT with 140# Hammer 30 in. Drop.
- Indicates Bulk Sample.
- Indicates Small Bag Sample.
- Indicates Non-Standard
- Indicates Core Run.

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace	1 - 5%
Few	5 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5mm) to No. 200 (0.074mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
DAMP	Some perceptible moisture; below optimum
MOIST	No visible water; near optimum moisture content
WET	Visible free water, usually soil is below water table.

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N -VALUE

COHESIONLESS SOILS		COHESIVE SOILS		
Density	N (blows/ft)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	Very Soft	0 to 2	< 250
Loose	4 to 10	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	Very Stiff	15 to 30	2000 - 4000
		Hard	over 30	> 4000

Log of Boring B-1

Newcastle Partners
20083-17

Boring Location: Frederick & Brodiaea, Moreno Valley
Date of Drilling: 12/6/17 | Groundwater Depth: 30'
Drilling Method: Simco 2800HS
Hammer Weight: 140 lbs | Drop: 30"
Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, very dense, damp to moist	X	20/24/21	9.1		3(
5							
		Silty (fine to medium grained) SAND Brown, very dense, moist	X	17/25/29	8.5		2
10							
		Sandy SILT Grey-brown, stiff, moist	X	20/22/25	11.2		5
15							
		Silty (fine to coarse grained) SAND Brown, very dense, moist; with occasional gravel and slightly silty	X	18/20/22	8.6		1
20							
		Sandy SILT Grey-brown, stiff, moist to very moist	X	14/17/20	12.6		5
25							
		Silty (fine to coarse grained) SAND Brown, dense, wet; slightly silty to silty	X	12/15/17	17.4		1
30							
35							

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20083-17

Log of Boring B-1

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: 30'

Drilling Method: Simco 2800HS

Hammer Weight: 140 lbs | Drop: 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
35		Silty (fine to coarse grained) SAND Brown, dense, wet; slightly silty to silty		10/16/25	20.1		2
40		SAND (medium to coarse grained) Yellow-brown, dense, wet		13/17/21	19.3		5
45		Silty (fine to coarse grained) SAND Grey-brown, dense, wet; silty to slightly silty		15/29/32	17.2		3
50		Boring completed at depth of 51.5'		14/25/32	17.5		1
55							
60							
65							
70							

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2

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\20083-17.log Date: 12/14/2017

Newcastle Partners
20083-17

Log of Boring B-2

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Simco 2800HS

Hammer Weight: 140 lbs | Drop: 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, very dense, damp to moist					
5				35/41	8.8	118.2	
		Silty (fine to medium grained) SAND Brown, very dense, damp					
10				30/42	7.7	121.7	
		Sandy SILT Grey-brown, very stiff, moist					
15				30/42	12.6	117.0	
		Silty (fine to coarse grained) SAND Brown, very dense, moist; with occasional gravel; slightly silty					
20		Boring completed at depth of 20'		22/38	10.3	120.3	
25							
30							
35							

GWT not encountered

NorCal Engineering

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Newcastle Partners
20083-17

Log of Trench T-1

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, dense, damp					
5		Trench completed at depth of 5'					
10							
15							
20							
25							
30							
35							

GWT not encountered

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20083-17

Log of Trench T-2

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, dense to very dense, damp					
5		GWT not encountered					
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

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SuperLog CiviliTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\20083-17.log Date: 12/14/2017

Newcastle Partners
20083-17

Log of Trench T-3

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0	FILL Clayey SAND Brown, loose, damp	■		7.0	114.2	
	NATURAL Clayey SAND Brown, dense, damp	▽				
5		■		9.8	121.1	
10	Silty (fine to medium grained) SAND Brown, very dense, damp	■		6.4	122.9	
15	Sandy SILT Grey-brown, stiff, moist	■		12.1	115.5	
	Trench completed at depth of 15'					
20						
25						
30						
35						

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SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\20083-17.log Date: 12/14/2017

Newcastle Partners
20083-17

Log of Trench T-4

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp	■		10.2	115.4	
		NATURAL Clayey SAND Brown, dense, moist					
5		GWT not encountered					
			■		12.5	120.7	
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

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Attachment: Geotechnical Investigation (3273 : Centerpointe Commerce Center)

NorCal Engineering

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20083-17

Log of Trench T-5

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp			5.5	120.3	
		NATURAL Clayey SAND Brown, dense, damp					
5		Trench completed at depth of 5'					
10							
15							
20							
25							
30							
35							

GWT not encountered

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Newcastle Partners
20083-17

Log of Trench T-6

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, dense, damp to moist					
5			■		11.7	117.5	
10		Trench completed at depth of 10'	■		11.1	121.6	
15							
20							
25							
30							
35							

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Newcastle Partners
20083-17

Log of Trench T-7

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp	■		2.7	116.3	
		NATURAL Clayey SAND Brown, dense, damp	■		5.9	121.7	
10		Silty (fine to medium grained) SAND Brown, very dense, damp	■		8.1	119.5	
		Trench completed at depth of 12'					
15							
20							
25							
30							
35							

GWT not encountered

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Attachment: Geotechnical Investigation (3273 : Centerpointe Commerce Center)

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20083-17

Log of Trench T-8

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, dense, damp					
5		Trench completed at depth of 5'					
10							
15							
20							
25							
30							
35							

GWT not encountered

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Appendix B

December 19, 2017 Project Number 20083-17

TABLE I
MAXIMUM DENSITY TESTS

Sample	Classification	Optimum Moisture	Maximum Dry Density (lbs./cu.ft.)
T-3 @ 2'	Clayey SAND	11.0	128.0

TABLE II
EXPANSION INDEX TESTS

Soil Type	Classification	Expansion Index
T-3 @ 2'	Clayey SAND	15

TABLE III
ATTERBERG LIMITS

Sample	Liquid Limit	Plastic Limit	Plasticity Index
B-1 @ 5'	24	19	5
B-1 @ 10'	20	17	3

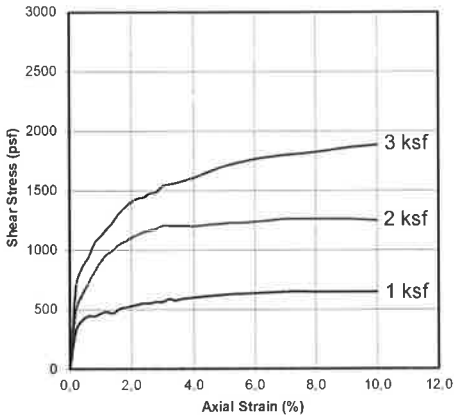
TABLE IV
CORROSION TESTS

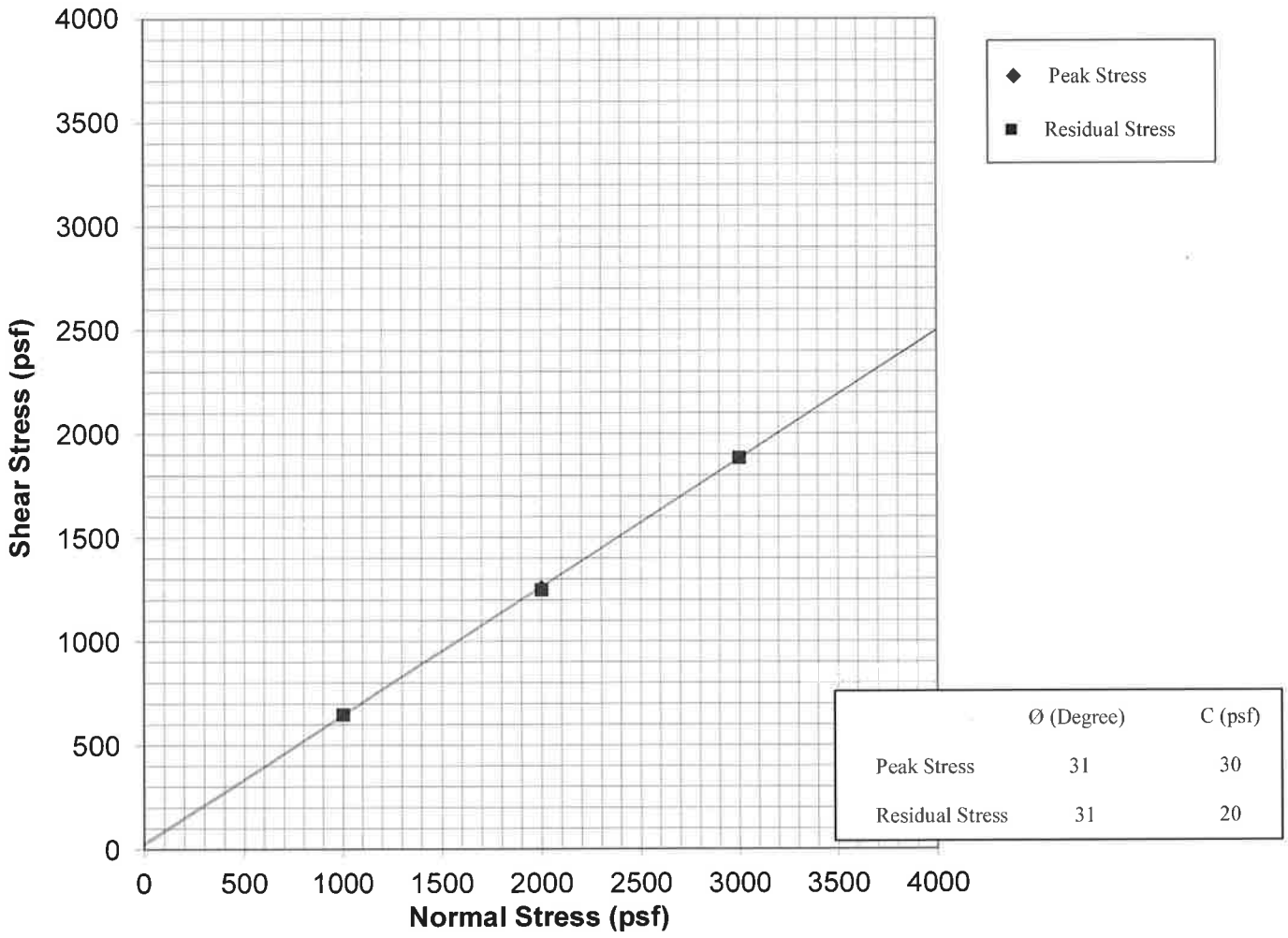
Sample	pH	Electrical Resistivity (ohm-cm)	Sulfate (%)	Chloride (ppm)
T-3 @ 2'	6.8	3,134	0.003	209

ND denotes not detected
% by weight
ppm – mg/kg

Sample No.		T3@2'
Sample Type:		Undisturbed/Saturated
Soil Description:		Clayey Sand

		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	648	1260	1884
Displacement	(in)	0.175	0.175	0.250
Residual Stress	(psf)	648	1248	1884
Displacement	(in.)	0.250	0.250	0.250
In Situ Dry Density	(pcf)	114.2	114.2	114.2
In Situ Water Content	(%)	7.0	7.0	7.0
Saturated Water Content	(%)	17.6	17.6	17.6
Strain Rate	(in/min)	0.020	0.020	0.020





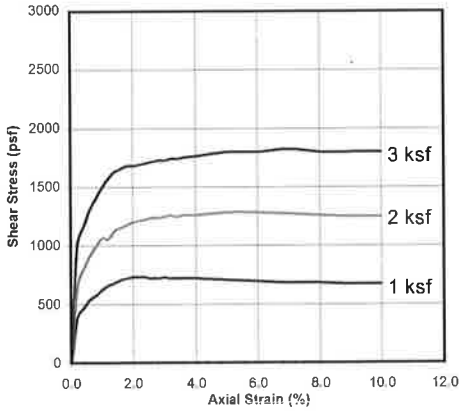
	Ø (Degree)	C (psf)
Peak Stress	31	30
Residual Stress	31	20

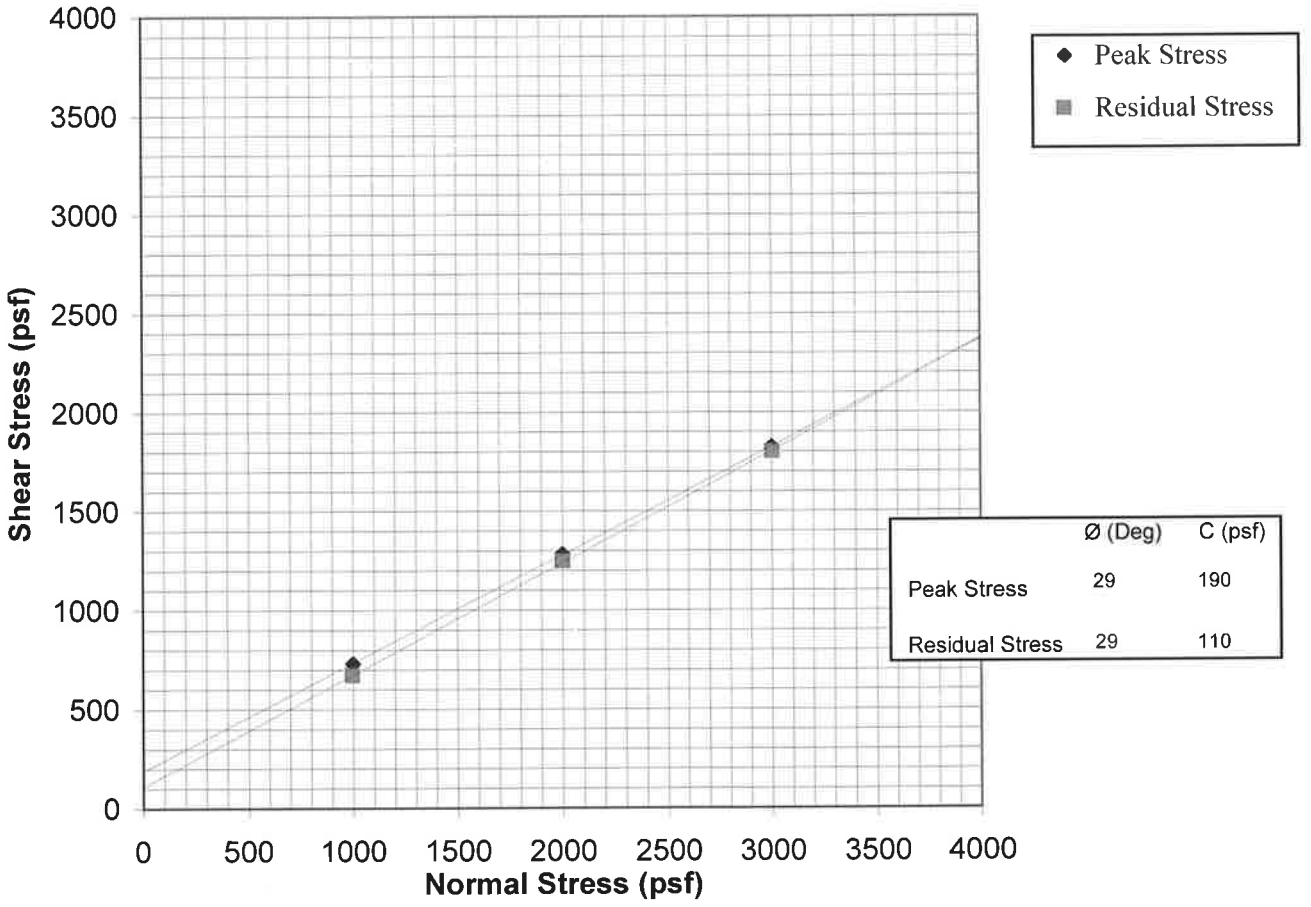
NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS
Newcastle Partners
PROJECT NUMBER: 20083-17 DATE: 12/19/2017

DIRECT SHEAR TEST
ASTM D3080
Plate A

Sample No.	T7@2'	
Sample Type:	Undisturbed-Saturated	
Soil Description:	Clayey Sand	

		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	732	1284	1824
Displacement	(in.)	0.050	0.125	0.175
Residual Stress	(psf)	672	1248	1800
Displacement	(in.)	0.250	0.250	0.250
Initial Dry Density	(pcf)	116.3	116.3	116.3
Initial Water Content	(%)	2.7	2.7	2.7
Strain Rate	(in./min.)	0.020	0.020	0.020





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Newcastle Partners

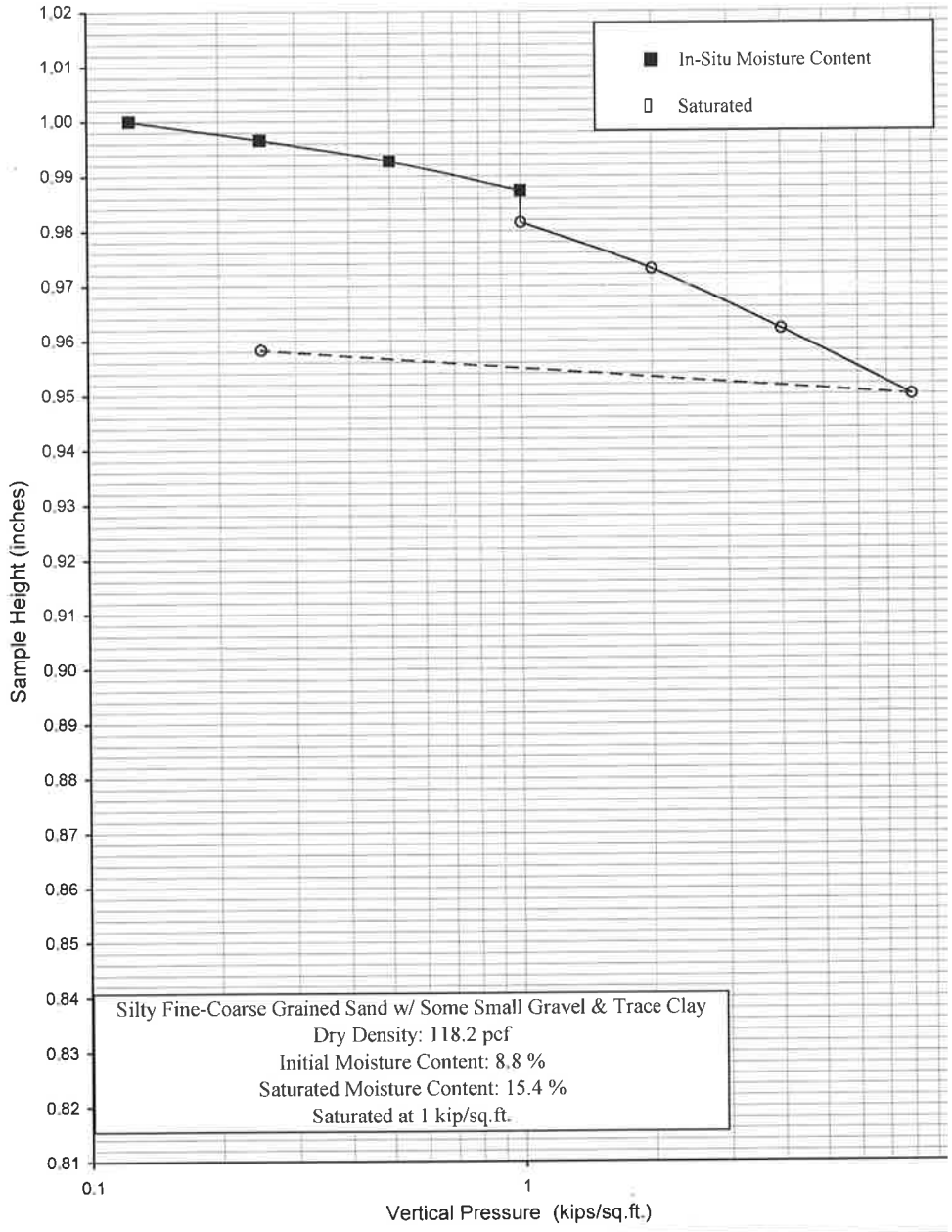
PROJECT NUMBER: 20083-17 DATE: 12/19/2017

DIRECT SHEAR TEST
ASTM D3080
Plate B

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9966	0.3	
0.5	0.9927	0.7	
1	0.9873	1.3	
1	0.9815	1.9	Saturated
2	0.9730	2.7	
4	0.9620	3.8	
8	0.9499	5.0	
0.25	0.9583	4.2	

Date Tested: 12/13/2017
Sample: B2
Depth: 5'

Sample No.	B2	Depth	5'	Date	12/19/2017



NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

Newcastle Partners

PROJECT NUMBER: 20083-17 DATE: 12/19/2017

CONSOLIDATION TEST

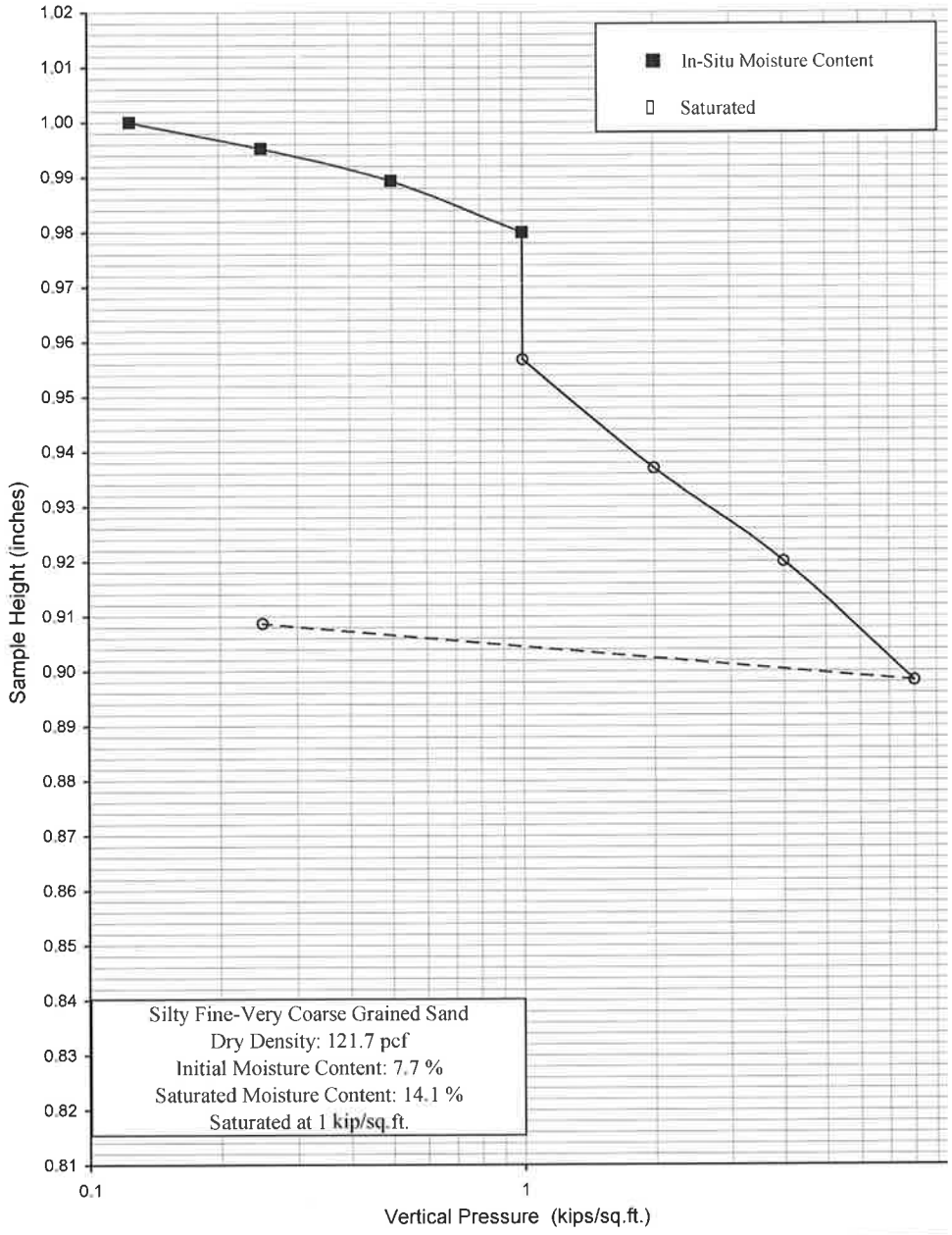
ASTM D2435

Plate C

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9952	0.5	
0.5	0.9893	1.1	
1	0.9799	2.0	
1	0.9568	4.3	Saturated
2	0.9370	6.3	
4	0.9200	8.0	
8	0.8982	10.2	
0.25	0.9087	9.1	

Date Tested: 12/14/2017
Sample: B2
Depth: 10'

Sample No.	B2	Depth	10'	Date	12/19/2017



NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

Newcastle Partners

PROJECT NUMBER: 20083-17 DATE: 12/19/2017

CONSOLIDATION TEST

ASTM D2435

Plate D

Appendix C

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

Project: Newcastle Partners
Project No: 20083-17
Date: 12/5/17
Test No. 1
Depth: 5'
Tested By: J.S.

	TIME (hr/min)	CHANGE TIME (min)	CUMULATIVE TIME (min)	INNER RING READING (cm)	INNER RING CHANGE	INNER RING FLOW (cc)	OUTER RING READING (cm)	OUTER RING CHANGE (cm)	OUTER RING FLOW (cc)	INNER RING INF RATE (cm/hr)	OUTER RING INF RATE (cm/hr)	INNER RING INF RATE (ft/hr)
1	9:04			104.5			47.0					
	9:14	10	10	104.6	0.1		47.3	0.3		1.8	1.8	
2	9:14			104.6			47.3					
	9:24	10	20	105.0	0.4		47.6	0.3		1.8	1.8	
3	9:24			105.0			47.6					
	9:34	10	30	105.1	0.1		47.8	0.2		1.2	1.2	
4	9:34			105.1			47.8					
	9:44	10	40	105.2	0.1		47.9	0.1		0.6	0.5	
5	9:44			105.2			47.9					
	9:54	10	50	105.3	0.1		48.1	0.2		1.2	1.2	
6	9:54			105.3			48.1					
	10:04	10	60	105.3	0.0		48.1	0.0		0.0	0.0	
7	10:04			105.3			48.1					
	10:14	10	70	105.3	0.0		48.1	0.0		0.0	0.0	
8	10:14			105.3			48.1					
	10:24	10	80	105.3	0.0		48.1	0.0		0.0	0.0	
9	10:24			105.3			48.1					
	10:34	10	90	105.3	0.0		48.1	0.0		0.0	0.0	
10	10:34			105.3			48.1					
	10:44	10	100	105.3	0.0		48.1	0.0		0.0	0.0	
11	10:44			105.3			48.1					
	10:54	10	110	105.3	0.0		48.1	0.0		0.0	0.0	
12	10:54			105.3			48.1					
	11:04	10	120	105.3	0.0		48.1	0.0		0.0	0.0	

Average = 0.55 / 0.55

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

Project: Newcastle Partners
Project No: 20083-17
Date: 12/5/17
Test No. 2
Depth: 10'
Tested By: J.S.

	TIME (hr/min)	CHANGE TIME (min)	CUMULATIVE TIME (min)	INNER RING READING (cm)	INNER RING CHANGE	INNER RING FLOW (cc)	OUTER RING READING (cm)	OUTER RING CHANGE (cm)	OUTER RING FLOW (cc)	INNER RING INF RATE (cm/hr)	OUTER RING INF RATE (cm/hr)	INNER RING INF RATI (ft/hr)
1	11:32			106.4			49.6					
	11:42	10	10	106.5	0.1		49.9	0.3		0.6	1.8	
2	11:42			106.5			49.9					
	11:52	10	20	106.5	0.0		50.0	0.1		0.0	0.6	
3	11:52			106.5			50.0					
	12:02	10	30	106.6	0.1		50.0	0.0		0.6	0.0	
4	12:02			106.6			50.0					
	12:12	10	40	106.7	0.1		50.1	0.1		0.6	0.6	
5	12:12			106.7			50.1					
	12:22	10	50	106.7	0.0		50.1	0.0		0.0	0.0	
6	12:22			106.7			50.1					
	12:32	10	60	106.7	0.0		50.1	0.0		0.0	0.0	
7	12:32			106.7			50.1					
	12:42	10	70	106.8	0.1		50.2	0.1		0.6	0.6	
8	12:42			106.8			50.2					
	12:52	10	80	106.8	0.0		50.3	0.1		0.0	0.6	
9	12:52			106.8			50.3					
	1:02	10	90	106.9	0.1		50.4	0.1		0.6	0.6	
10	1:02			106.9			50.4					
	1:12	10	100	106.9	0.0		50.4	0.0		0.0	0.0	
11	1:12			106.9			50.4					
	1:22	10	110	107.0	0.1		50.5	0.1		0.6	0.6	
12	1:22			107.0			50.5					
	1:32	10	120	107.0	0.0		50.5	0.0		0.0	0.0	

Average = 0.3 / 0.4

Centerpointe

GREENHOUSE GAS ANALYSIS

CITY OF MORENO VALLEY

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JUNE 4, 2018

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APPENDIX 3.2: CALEEMOD OPERATIONAL EMISSIONS MODEL OUTPUTS (PASSENGER CARS)

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

(1)	Reference
ARB	California Air Resources Board
AQIA	Air Quality Impact Analysis
CAA	Federal Clean Air Act
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CAT	Climate Action Team
CBSC	California Building Standards Commission
CEC	California Energy Commission
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFC	Chlorofluorocarbons
CFR	Code of Federal Regulations
CH4	Methane
CO	Carbon Monoxide
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
EPA	Environmental Protection Agency
EPS	Emission Performance Standard
GCC	Global Climate Change
GHGA	Greenhouse Gas Analysis
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
LCA	Life-Cycle Analysis
MMs	Mitigation Measures
MMTCO2e	Million Metric Ton of Carbon Dioxide Equivalent
MTCO2e	Metric Ton of Carbon Dioxide Equivalent
N20	Nitrogen Dioxide
NIOSH	National Institute for Occupational Safety and Health
NOx	Oxides of Nitrogen
PFC	Perfluorocarbons
PM10	Particulate Matter 10 microns in diameter or less
PM2.5	Particulate Matter 2.5 microns in diameter or less

PPM	Parts Per Million
Project	Centerpointe
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
UNFCCC	United Nations' Framework Convention on Climate Change
VOC	Volatile Organic Compounds

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EXECUTIVE SUMMARY

GHG Impact #1: The Project would not generate direct or indirect greenhouse gas emission that would result in a significant impact on the environment.

The City of Moreno Valley does not have an adopted threshold of significance for GHG emissions. For CEQA purposes, the City has discretion to select an appropriate significance criterion, based on substantial evidence. The South Coast Air Quality Management District's (SCAQMD)'s adopted numerical threshold of 10,000 metric tons carbon dioxide equivalent ($MTCO_2e$) per year for industrial stationary source emissions is selected as the significance criterion. The SCAQMD-adopted industrial threshold was selected by the City because the proposed Project is analogous to an industrial use much more closely than any other land use such as commercial or residential in terms of its expected operating characteristics. The Project proposes a warehouse and industrial use that will serve mid- stream functions in the goods movement chain between manufacturers and consumers, characteristic of an industrial operation. Further, analysis of the Project's traffic generation in this report is based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017 for warehouse and industrial land use categories. Also, 10,000 $MTCO_2e$ has been used as the significance threshold by many local government lead agencies for logistics projects throughout the SCAG region since the SCAQMD adopted this threshold for its own use. Further, to ensure that the threshold is conservative in its application, although the SCAQMD uses their adopted 10,000 $MTCO_2e$ threshold to determine the significance of stationary source emissions for industrial projects, the 10,000 $MTCO_2e$ threshold used in this CEQA document is applied to all sources of Project-related GHG emissions whether stationary source, mobile source, area source, or other.

Use of this threshold is also consistent with guidance provided in the CAPCOA *CEQA and Climate Change* handbook, as such the City has opted to use a non-zero threshold approach based on Approach 2 of the handbook. Threshold 2.5 (Unit-Based Thresholds Based on Market Capture) establishes a numerical threshold based on capture of approximately 90 percent of emissions from future development. The latest threshold developed by SCAQMD using this method is 10,000 $MTCO_2e$ based on the review of 711 CEQA projects.

The Project will result in approximately 732.18 $MTCO_2e$ per year from construction, area, energy, waste, and water usage. In addition, the Project has the potential to result in an additional 4,782.94 $MTCO_2e$ per year from mobile sources if the assumption is made that all of the vehicle trips to and from the Project are "new" trips resulting from the development of the Project. As shown on Table ES-1, the Project has the potential to generate a total of approximately 5,515.11 $MTCO_2e$ per year. As such, the Project would not exceed the SCAQMD's numeric threshold of 10,000 $MTCO_2e$ if it were applied. Thus, the Project would not have the potential to result in a cumulatively considerable impact with respect to GHG emissions.

TABLE ES-1: PROJECT GREENHOUSE GAS EMISSIONS (ANNUAL)

Emission Source	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2E
Annual construction-related emissions amortized over 30 years	16.96	0.00	0.00	17.01
Area	9.13E-03	2.00E-05	0.00	9.75E-03
Energy	350.433	0.01	3.86E-03	351.90
Mobile Sources (Passenger Cars)	1,895.67	0.04	0.00	1,896.64
Mobile Sources (Trucks)	2,883.01	0.13	0.00	2,886.30
Waste	41.41	2.45	0.00	102.60
Water Usage	210.71	1.55	0.04	260.66
Total CO_2E (All Sources)	**5,515.11**			
Screening Threshold (CO_2E)	**10,000**			
Threshold Exceeded?	**NO**			

GHG Impact #2: The Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

The Project would be consistent with and would not conflict with implementation of the goals and objectives established by Assembly Bill 32 (AB 32) and Senate Bill 32 (SB 32) (or targets established by Executive Orders S-3-05 and B-30-15) as evaluated in Section 3.7 of this report. As such, the Project would result in a less than significant impact with respect to this threshold.

1 INTRODUCTION

This report presents the results of the greenhouse gas analysis (GHGA) prepared by Urban Crossroads, Inc., for the proposed Brodiaea Commerce Center ("Project"). The purpose of this GHGA is to evaluate Project-related construction and operational emissions and determine the level of greenhouse gas (GHG) impacts as a result of constructing and operating the proposed Project.

1.1 SITE LOCATION

The proposed Centerpointe site is located on the northeast corner of Frederick Street and Brodiaea Avenue in the City of Moreno Valley, as shown on Exhibit 1-A. Existing uses in the Project study area include a commercial-designated vacant lot north of the Project site, existing business park/warehouse use to the east, the Riverside County Department of Waste Resources facilities to the south, and existing City of Moreno Valley offices to the west. The closest existing residential homes to the Project site are located approximately 800 feet north of the Project site across Alessandro Boulevard. The March Air Reserve Base/Inland Port Airport (MARB/IPA) runway is located approximately 1.2 miles southwest of the Project site, and Interstate 215 (I-215) is located roughly 1.2 miles west of the Project site.

1.2 PROJECT DESCRIPTION

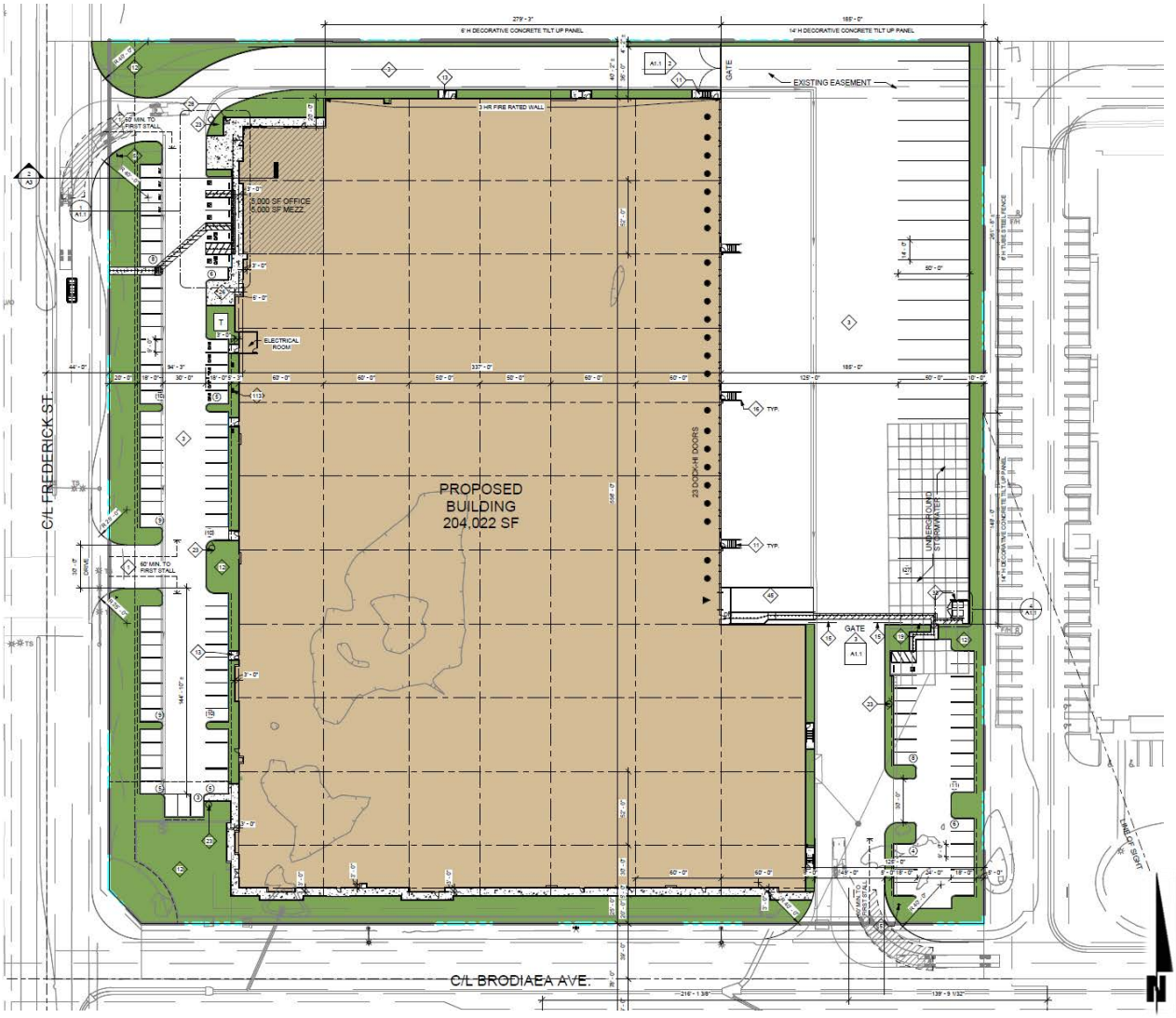
The Project is proposed to consist of up to 163,218 square feet (sf) of warehouse (without cold storage) use (80 percent of the total square footage) and 40,804 sf of general light industrial use (20 percent of the total square footage) for a total of 204,022 sf within a single building, as shown on Exhibit 1-B. The Project is anticipated to have an Opening Year of 2020[1]. At the time this air quality analysis was prepared the future tenants of the proposed Project were unknown. The Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. This air quality analysis is intended to describe air quality level impacts associated with the expected typical warehouse and distribution storage activities at the Project site. At the time of this analysis, no cold storage was planned at the Project site, and therefore is not analyzed in this report.

According to the *Centerpointe Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 486 trip-ends per day (actual vehicles) (1). The Project trip generation includes 100 truck trip-ends per day from the proposed

[1] The Traffic Impact Analysis (TIA) prepared for the Project evaluates an Opening Year of 2023 since the City of Moreno Valley traffic study guidelines require the Opening Year to be a minimum of 5 years from baseline (2018) conditions. Utilizing a 2020 Opening Year for purposes of this AQIA would generate more emissions than if the Project utilized a 2023 Opening Year consistent with the traffic study because as the analysis year increases, vehicle emission factors would decrease as a result of emissions regulations becoming more stringent. Utilizing a 2020 Opening Year for purposes of the GHG herein represents a conservative estimate of emissions compared to if a 2023 Opening Year, consistent with the traffic study, were utilized.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



buildings within the Project site. This air quality study relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

1.3 Regulatory Requirements

The Project would be required to comply with all mandates imposed by the State of California and the South Coast Air Quality Management District aimed at the reduction of air quality emissions. Those that are applicable to the Project and that would assist in the reduction of greenhouse gas emissions are:

- Global Warming Solutions Act of 2006 (AB32) (2)
- Regional GHG Emissions Reduction Targets/Sustainable Communities Strategies (SB 375) (3)
- Pavely Fuel Efficiency Standards (AB1493). Establishes fuel efficiency ratings for new vehicles (4).
- Title 24 California Code of Regulations (California Building Code). Establishes energy efficiency requirements for new construction (5).
- Title 20 California Code of Regulations (Appliance Energy Efficiency Standards). Establishes energy efficiency requirements for appliances (6).
- Title 17 California Code of Regulations (Low Carbon Fuel Standard). Requires carbon content of fuel sold in California to be 10% less by 2020 (7).
- California Water Conservation in Landscaping Act of 2006 (AB1881). Requires local agencies to adopt the Department of Water Resources updated Water Efficient Landscape Ordinance or equivalent by January 1, 2010 to ensure efficient landscapes in new development and reduced water waste in existing landscapes (8).
- Statewide Retail Provider Emissions Performance Standards (SB 1368). Requires energy generators to achieve performance standards for GHG emissions (9).
- Renewable Portfolio Standards (SB 1078). Requires electric corporations to increase the amount of energy obtained from eligible renewable energy resources to 20 percent by 2010 and 33 percent by 2020 (10).

Promulgated regulations that will affect the Project's emissions are accounted for in the Project's GHG calculations provided in this report. In particular, the Pavley Standards, Low Carbon Fuel Standards, and Renewable Portfolio Standards (RPS) will be in effect for the AB 32 target year of 2020, and therefore are accounted for in the Project's emission calculations.

1.4 Construction and Operational-Source Air Pollutant Emissions Mitigation Measures

The Project would not result in any significant impacts during construction and operational activity. Therefore, no mitigation measures are required.

2 CLIMATE CHANGE SETTING

2.1 INTRODUCTION TO GLOBAL CLIMATE CHANGE

Global Climate Change (GCC) is defined as the change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms. GCC is currently one of the most controversial environmental issues in the United States, and much debate exists within the scientific community about whether or not GCC is occurring naturally or as a result of human activity. Some data suggests that GCC has occurred in the past over the course of thousands or millions of years. These historical changes to the earth's climate have occurred naturally without human influence, as in the case of an ice age. However, many scientists believe that the climate shift taking place since the industrial revolution (1900) is occurring at a quicker rate and magnitude than in the past. Scientific evidence suggests that GCC is the result of increased concentrations of greenhouse gases in the earth's atmosphere, including carbon dioxide, methane, nitrous oxide, and fluorinated gases. Many scientists believe that this increased rate of climate change is the result of greenhouse gases resulting from human activity and industrialization over the past 200 years.

An individual project like the proposed Project evaluated in this GHGA cannot generate enough greenhouse gas emissions to affect a discernible change in global climate. However, the proposed Project may participate in the potential for GCC by its incremental contribution of greenhouse gases combined with the cumulative increase of all other sources of greenhouse gases, which when taken together constitute potential influences on GCC. Because these changes may have serious environmental consequences, Section 3.0 will evaluate the potential for the proposed Project to have a significant effect upon the environment as a result of its potential contribution to the greenhouse effect.

2.2 GREENHOUSE GAS EMISSIONS INVENTORIES

Global

Worldwide anthropogenic (human) GHG emissions are tracked by the Intergovernmental Panel on Climate Change for industrialized nations (referred to as Annex I) and developing nations (referred to as Non-Annex I). Human GHG emissions data for Annex I nations are available through 2015. For the Year 2015, the sum of these emissions totaled approximately 28,872,564 Gg $CO2e^2$ (11) (12). The GHG emissions in more recent years may differ from the inventories presented in Table 2-1; however, the data is representative of currently available inventory data.

United States

As noted in Table 2-1, the United States, as a single country, was the number two producer of GHG emissions in 2015. The primary greenhouse gas emitted by human activities in the United States was CO2, representing approximately 83 percent of total greenhouse gas emissions (13).

2 The global emissions are the sum of Annex I and non-Annex I countries, without counting Land-Use, Land-Use Change and Forestry (LULUCF). For countries without 2005 data, the UNFCCC data for the most recent year were used. United Nations Framework Convention on Climate Change, "Annex I Parties – GHG total without LULUCF,"

Carbon dioxide from fossil fuel combustion, the largest source of US greenhouse gas emissions, accounted for approximately 78 percent of the GHG emissions.

TABLE 2-1: TOP GHG PRODUCER COUNTRIES AND THE EUROPEAN UNION [3]

Emitting Countries	GHG Emissions (Gg CO2e)
China	11,895,765
United States	6,586,655
European Union (28 member countries)	4,315,773
India	2,650,954
Russian Federation	2,100,849
Japan	1,322,568
Total	**28,872,564**

State of California

CARB compiles GHG inventories for the State of California. Based upon the 2017 GHG inventory data (i.e., the latest year for which data are available) for the 2000-2015 greenhouse gas emissions inventory, California emitted 440.4 MMTCO2e including emissions resulting from imported electrical power in 2015 (14). Based on the CARB inventory data and GHG inventories compiled by the World Resources Institute, California's total statewide GHG emissions rank second in the United States (Texas is number one) with emissions of 417 MMTCO2e excluding emissions related to imported power (15).

2.3 GLOBAL CLIMATE CHANGE DEFINED

GCC refers to the change in average meteorological conditions on the earth with respect to temperature, wind patterns, precipitation and storms. Global temperatures are regulated by naturally occurring atmospheric gases such as water vapor, CO2 (carbon dioxide), N2O (nitrous oxide), CH4 (methane), hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. These particular gases are important due to their residence time (duration they stay) in the atmosphere, which ranges from 10 years to more than 100 years. These gases allow solar radiation into the earth's atmosphere, but prevent radioactive heat from escaping, thus warming the earth's atmosphere. GCC can occur naturally as it has in the past with the previous ice ages.

Gases that trap heat in the atmosphere are often referred to as greenhouse gases. Greenhouse gases are released into the atmosphere by both natural and anthropogenic (human) activity. Without the natural greenhouse gas effect, the earth's average temperature would be approximately 61° Fahrenheit (F) cooler than it is currently. The cumulative accumulation of these gases in the earth's atmosphere is considered to be the cause for the observed increase in the earth's temperature.

Although California's rate of growth of greenhouse gas emissions is slowing, the state is still a substantial contributor to the U.S. emissions inventory total. In 2004, California is estimated to

[3] Used http://unfccc.int data for Annex I countries. Consulted the CAIT Climate Data Explorer in http://www.wri.org site to reference Non-Annex I countries such as China and India.

have produced 492 million gross metric tons of CO2e greenhouse gas emissions. Despite a population increase of 16 percent between 1990 and 2004, California has significantly slowed the rate of growth of greenhouse gas emissions due to the implementation of energy efficiency programs as well as adoption of strict emission controls (16).

2.4 GREENHOUSE GASES

For the purposes of this analysis, emissions of carbon dioxide, methane, and nitrous oxide were evaluated (see Table 3-4 later in this report) because these gasses are the primary contributors to GCC from development projects. Although there are other substances such as fluorinated gases that also contribute to GCC, these fluorinated gases were not evaluated as their sources are not well-defined and do not contain accepted emissions factors or methodology to accurately calculate these gases.

Water Vapor: Water vapor (H20) is the most abundant, important, and variable greenhouse gas in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered to be a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. A climate feedback is an indirect, or secondary, change, either positive or negative, that occurs within the climate system in response to a forcing mechanism. The feedback loop in which water is involved is critically important to projecting future climate change.

As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to 'hold' more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop will continue is unknown as there are also dynamics that hold the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the earth's surface and heat it up).

There are no human health effects from water vapor itself; however, when some pollutants come in contact with water vapor, they can dissolve and the water vapor can then act as a pollutant-carrying agent. The main source of water vapor is evaporation from the oceans (approximately 85 percent). Other sources include: evaporation from other water bodies, sublimation (change from solid to gas) from sea ice and snow, and transpiration from plant leaves.

Carbon Dioxide: Carbon dioxide (CO2) is an odorless and colorless GHG. Outdoor levels of carbon dioxide are not high enough to result in negative health effects. Carbon dioxide is emitted from natural and manmade sources. Natural sources include: the decomposition of dead organic matter; respiration of bacteria, plants, animals and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include: the burning of coal, oil, natural gas, and

wood. Carbon dioxide is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks (17).

Since the industrial revolution began in the mid-1700s, the sort of human activity that increases GHG emissions has increased dramatically in scale and distribution. Data from the past 50 years suggests a corollary increase in levels and concentrations. As an example, prior to the industrial revolution, CO2 concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of more than 30 percent. Left unchecked, the concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources (18).

Methane: Methane (CH4) is an extremely effective absorber of radiation, though its atmospheric concentration is less than carbon dioxide and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs. No health effects are known to occur from exposure to methane.

Methane has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other anthropocentric sources include fossil-fuel combustion and biomass burning.

Nitrous Oxide: Nitrous oxide (N2O), also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide can cause dizziness, euphoria, and sometimes slight hallucinations. In small doses, it is considered harmless. However, in some cases, heavy and extended use can cause Olney's Lesions (brain damage) (19).

Concentrations of nitrous oxide also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 parts per billion (ppb). Nitrous oxide is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant, i.e., in whipped cream bottles. It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars. Nitrous oxide can be transported into the stratosphere, be deposited on the earth's surface, and be converted to other compounds by chemical reaction

Chlorofluorocarbons: Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C2H6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs are no longer being used; therefore, it is not likely that health effects would be experienced. Nonetheless, in confined indoor locations, working with CFC-113 or other CFCs is thought to result in death by cardiac arrhythmia (heart frequency too high or too low) or asphyxiation.

CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely

successful, so much so that levels of the major CFCs are now remaining steady or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.

Hydrofluorocarbons: Hydrofluorocarbons (HFCs) are synthetic, man-made chemicals that are used as a substitute for CFCs. Out of all the greenhouse gases, they are one of three groups with the highest global warming potential. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF3), HFC-134a (CF3CH2F), and HFC-152a (CH3CHF2). Prior to 1990, the only significant emissions were of HFC-23. HFC-134a emissions are increasing due to its use as a refrigerant. The U.S. EPA estimates that concentrations of HFC-23 and HFC-134a are now about 10 parts per trillion (ppt) each; and that concentrations of HFC-152a are about 1 ppt (20). No health effects are known to result from exposure to HFCs, which are manmade for applications such as automobile air conditioners and refrigerants.

Perfluorocarbons: Perfluorocarbons (PFCs) have stable molecular structures and do not break down through chemical processes in the lower atmosphere. High-energy ultraviolet rays, which occur about 60 kilometers above earth's surface, are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF4) and hexafluoroethane (C2F6). The U.S. EPA estimates that concentrations of CF4 in the atmosphere are over 70 ppt.

No health effects are known to result from exposure to PFCs. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

Sulfur Hexafluoride: Sulfur hexafluoride (SF6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest global warming potential (GWP) of any gas evaluated (23,900). The U.S. EPA indicates that concentrations in the 1990s were about 4 ppt. In high concentrations in confined areas, the gas presents the hazard of suffocation because it displaces the oxygen needed for breathing.

Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Greenhouse gases have varying GWP values; GWP values represent the potential of a gas to trap heat in the atmosphere. Carbon dioxide is utilized as the reference gas for GWP, and thus has a GWP of 1.

The atmospheric lifetime and GWP of selected greenhouse gases are summarized at Table 2-2. As shown in the table below, GWP for the Second Assessment Report (SAR), the Intergovernmental Panel on Climate Change (IPCC)'s scientific and socio-economic assessment on climate change, range from 1 for carbon dioxide to 23,900 for sulfur hexafluoride and GWP for the IPCC's 4th Assessment Report (AR4) range from 1 for carbon dioxide to 22,800 for sulfur hexafluoride.

TABLE 2-2: GLOBAL WARMING POTENTIAL AND ATMOSPHERIC LIFETIME OF SELECT GHGS

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)	
		Second Assessment Report (SAR)	4th Assessment Report (AR4)
Carbon Dioxide	50-200	1	1
Methane	12 ± 3	21	25
Nitrous Oxide	120	310	298
HFC-23	264	11,700	14,800
HFC-134a	14.6	1,300	1,430
HFC-152a	1.5	140	124
Sulfur Hexafluoride (SF6)	3,200	23,900	22,800

Source: Table 2.14 of the IPCC Fourth Assessment Report, 2007

2.5 EFFECTS OF CLIMATE CHANGE IN CALIFORNIA

Public Health

Higher temperatures may increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation could increase from 25 to 35 percent under the lower warming range (3-5.5°F) to 75 to 85 percent under the medium warming range (5.5-8°F). In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances, depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming range scenario (8-10.5°F), there could be up to 100 more days per year with temperatures above 90oF in Los Angeles and 95oF in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures could increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

Water Resources

A vast network of man-made reservoirs and aqueducts captures and transports water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages.

If temperatures continue to increase, more precipitation could fall as rain instead of snow, and the snow that does fall could melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. Under the lower warming range scenario, snowpack losses could be only half as large as those possible if temperatures were to rise to the higher warming range. How much snowpack could be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snowpack could pose challenges to water managers and hamper hydropower generation. It could also adversely affect winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as a month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

The State's water supplies are also at risk from rising sea levels. An influx of saltwater could degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta – a major fresh water supply.

Agriculture

Increased temperatures could cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. First, California farmers could possibly lose as much as 25 percent of the water supply they need. Although higher CO2 levels can stimulate plant production and increase plant water-use efficiency, California's farmers could face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development could change, as could the intensity and frequency of pest and disease outbreaks. Rising temperatures could aggravate O3 pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures could worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts.

In addition, continued global climate change could shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion could occur in many species while range contractions may be less likely in rapidly evolving species with significant populations already established. Should range contractions occur, new or different weed species could fill the emerging gaps. Continued global climate change could alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

Forests and Landscapes

Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of

factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. In contrast, wildfires in northern California could increase by up to 90 percent due to decreased precipitation.

Moreover, continued global climate change has the potential to alter natural ecosystems and biological diversity within the state. For example, alpine and subalpine ecosystems could decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures. The productivity of the state's forests has the potential to decrease as a result of global climate change.

Rising Sea Levels

Rising sea levels, more intense coastal storms, and warmer water temperatures could increasingly threaten the state's coastal regions. Under the higher warming range scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate low-lying coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats. Under the lower warming range scenario, sea level could rise 12-14 inches.

2.6 HUMAN HEALTH EFFECTS

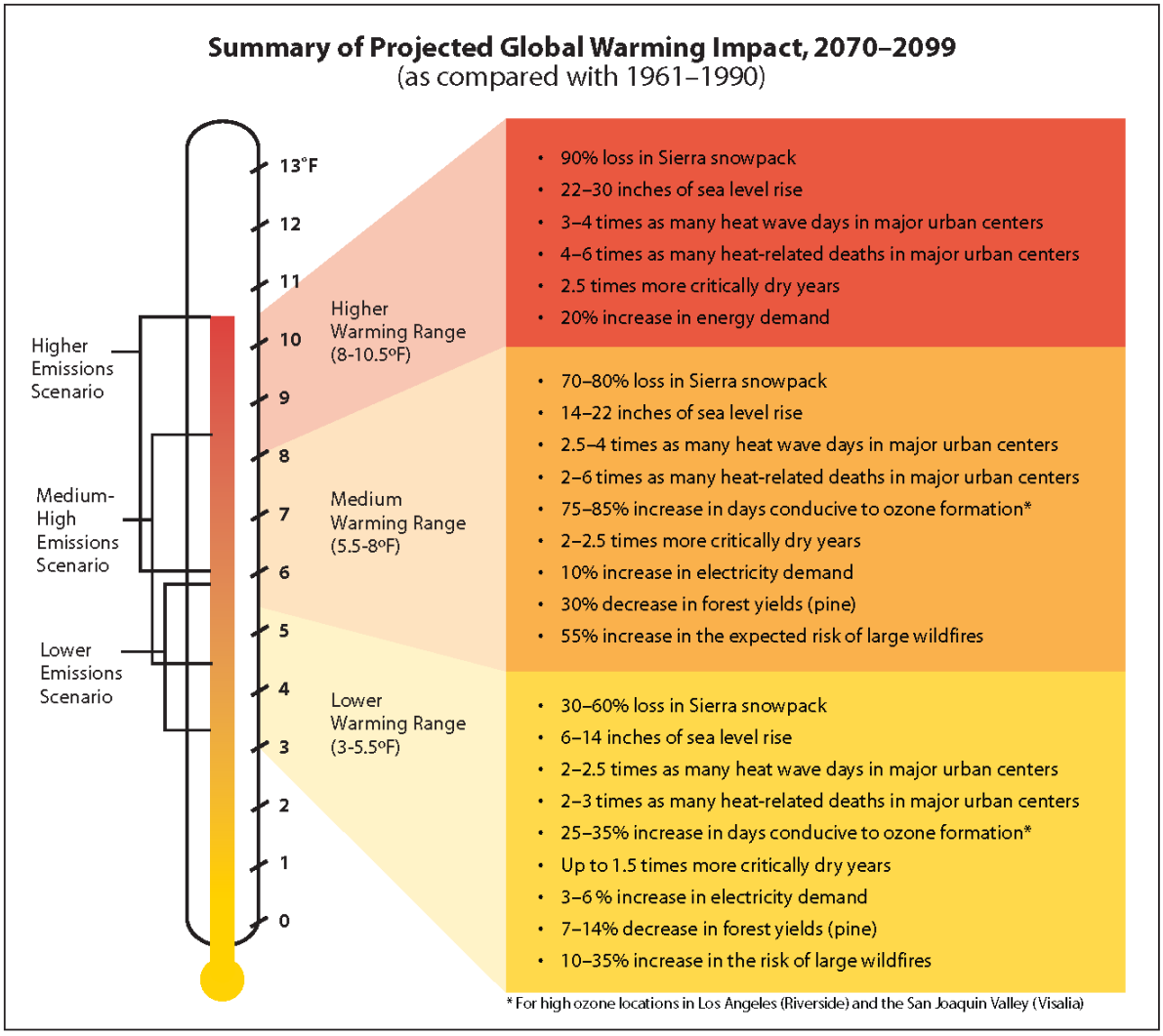
The potential health effects related directly to the emissions of carbon dioxide, methane, and nitrous oxide as they relate to development projects such as the proposed Project are still being debated in the scientific community. Their cumulative effects to global climate change have the potential to cause adverse effects to human health. Increases in Earth's ambient temperatures would result in more intense heat waves, causing more heat-related deaths. Scientists also purport that higher ambient temperatures would increase disease survival rates and result in more widespread disease. Climate change will likely cause shifts in weather patterns, potentially resulting in devastating droughts and food shortages in some areas (21). Exhibit 2-A presents the potential impacts of global warming.

Specific health effects associated with directly emitted GHG emissions are as follows:

Water Vapor: There are no known direct health effects related to water vapor at this time. It should be noted however that when some pollutants react with water vapor, the reaction forms a transport mechanism for some of these pollutants to enter the human body through water vapor.

Carbon Dioxide: According to the National Institute for Occupational Safety and Health (NIOSH) high concentrations of carbon dioxide can result in health effects such as: headaches, dizziness, restlessness, difficulty breathing, sweating, increased heart rate, increased cardiac output, increased blood pressure, coma, asphyxia, and/or convulsions. It should be noted that current concentrations of carbon dioxide in the earth's atmosphere are estimated to be approximately 370 parts per million (ppm), the actual reference exposure level (level at which adverse health effects typically occur) is at exposure levels of 5,000 ppm averaged over 10 hours in a 40-hour workweek and short-term reference exposure levels of 30,000 ppm averaged over a 15 minute period (22).

EXHIBIT 2-A: SUMMARY OF PROJECTED GLOBAL WARMING IMPACT



Methane: Methane is extremely reactive with oxidizers, halogens, and other halogen-containing compounds. Methane is also an asphyxiant and may displace oxygen in an enclosed space (23).

Nitrous Oxide: Nitrous Oxide is often referred to as laughing gas; it is a colorless greenhouse gas. The health effects associated with exposure to elevated concentrations of nitrous oxide include dizziness, euphoria, slight hallucinations, and in extreme cases of elevated concentrations nitrous oxide can also cause brain damage (23).

Fluorinated Gases: High concentrations of fluorinated gases can also result in adverse health effects such as asphyxiation, dizziness, headache, cardiovascular disease, cardiac disorders, and in extreme cases, increased mortality (22).

Aerosols: The health effects of aerosols are similar to that of other fine particulate matter. Thus aerosols can cause elevated respiratory and cardiovascular diseases as well as increased mortality (24).

2.7 REGULATORY SETTING

INTERNATIONAL

Climate change is a global issue involving GHG emissions from all around the world; therefore, countries such as the ones discussed below have made an effort to reduce GHGs.

Intergovernmental Panel on Climate Change. In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess the scientific, technical and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nations Framework Convention on Climate Change (Convention). On March 21, 1994, the U.S. joined a number of countries around the world in signing the Convention. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

International Climate Change Treaties. The Kyoto Protocol is an international agreement linked to the Convention. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing GHG emissions at an average of five percent against 1990 levels over the five-year period 2008–2012. The Convention (as discussed above) encouraged industrialized countries to stabilize emissions; however, the Protocol commits them to do so. Developed countries have contributed more emissions over the last 150 years; therefore, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."

In 2001, President George W. Bush indicated that he would not submit the treaty to the U.S. Senate for ratification, which effectively ended American involvement in the Kyoto Protocol. In December 2009, international leaders met in Copenhagen to address the future of international climate change commitments post-Kyoto. No binding agreement was reached in Copenhagen; however, the Committee identified the long-term goal of limiting the maximum global average temperature increase to no more than 2°C above pre-industrial levels, subject to a review in 2015. The UN Climate Change Committee held additional meetings in Durban, South Africa in November 2011; Doha, Qatar in November 2012; and Warsaw, Poland in November 2013. The meetings are gradually gaining consensus among participants on individual climate change issues.

On September 23, 2014 more than 100 Heads of State and Government and leaders from the private sector and civil society met at the Climate Summit in New York hosted by the United Nations. At the Summit, heads of government, business and civil society announced actions in areas that would have the greatest impact on reducing emissions, including climate finance, energy, transport, industry, agriculture, cities, forests, and building resilience.

Parties to the U.N. Framework Convention on Climate Change (UNFCCC) reached a landmark agreement on December 12, 2015 in Paris, charting a fundamentally new course in the two-decade-old global climate effort. Culminating a four-year negotiating round, the new treaty ends the strict differentiation between developed and developing countries that characterized earlier efforts, replacing it with a common framework that commits all countries to put forward their best efforts and to strengthen them in the years ahead. This includes, for the first time, requirements that all parties report regularly on their emissions and implementation efforts, and undergo international review.

The agreement and a companion decision by parties were the key outcomes of the conference, known as the 21st session of the UNFCCC Conference of the Parties, or COP 21. Together, the Paris Agreement and the accompanying COP decision:

- Reaffirm the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees;
- Establish binding commitments by all parties to make "nationally determined contributions" (NDCs), and to pursue domestic measures aimed at achieving them;
- Commit all countries to report regularly on their emissions and "progress made in implementing and achieving" their NDCs, and to undergo international review;
- Commit all countries to submit new NDCs every five years, with the clear expectation that they will "represent a progression" beyond previous ones;
- Reaffirm the binding obligations of developed countries under the UNFCCC to support the efforts of developing countries, while for the first time encouraging voluntary contributions by developing countries too;
- Extend the current goal of mobilizing $100 billion a year in support by 2020 through 2025, with a new, higher goal to be set for the period after 2025;
- Extend a mechanism to address "loss and damage" resulting from climate change, which explicitly will not "involve or provide a basis for any liability or compensation;"
- Require parties engaging in international emissions trading to avoid "double counting;" and
- Call for a new mechanism, similar to the Clean Development Mechanism under the Kyoto Protocol, enabling emission reductions in one country to be counted toward another country's NDC (C2ES 2015a) (25).

NATIONAL

Prior to the last decade, there have been no concrete federal regulations of GHGs or major planning for climate change adaptation. The following are actions regarding the federal government, GHGs, and fuel efficiency.

GHG Endangerment. In *Massachusetts v. Environmental Protection Agency* 549 U.S. 497 (2007), decided on April 2, 2007, the Supreme Court found that four GHGs, including carbon dioxide, are air pollutants subject to regulation under Section 202(a)(1) of the Clean Air Act. The Court held that the EPA Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On

December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs—carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section "Clean Vehicles" below. After a lengthy legal challenge, the U.S. Supreme Court declined to review an Appeals Court ruling that upheld the EPA Administrator's findings (26).

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the U.S. On April 1, 2010, the EPA and the Department of Transportation's National Highway Safety Administration announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the U.S.

The first phase of the national program applies to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards would cut carbon dioxide emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the National Highway Safety Administration issued final rules on a second-phase joint rulemaking establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012 (EPA 2012c). The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and medium duty passenger vehicles. The final standards are projected to result in an average industry fleetwide level of 163 grams/mile of carbon dioxide (CO_2) in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) if achieved exclusively through fuel economy improvements.

The EPA and the U.S. Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses on September 15, 2011, effective November 14, 2011. For combination tractors, the agencies are proposing engine and vehicle standards that begin in the 2014 model year and achieve up to a 20 percent reduction in carbon dioxide emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies are proposing separate gasoline and

diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10-percent reduction for gasoline vehicles and a 15 percent reduction for diesel vehicles by the 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10 percent reduction in fuel consumption and carbon dioxide emissions from the 2014 to 2018 model years.

Mandatory Reporting of GHGs. The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of GHGs Rule, which became effective January 1, 2010. The rule requires reporting of GHG emissions from large sources and suppliers in the U.S,, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the EPA.

New Source Review. The EPA issued a final rule on May 13, 2010, that establishes thresholds for GHGs that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these Clean Air Act permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. In the preamble to the revisions to the Federal Code of Regulations, the EPA states:

> This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the Clean Air Act, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to GHG sources, starting with the largest GHG emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources, but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for GHG emissions until at least April 30, 2016.

The EPA estimates that facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities.

Standards of Performance for GHG Emissions for New Stationary Sources: Electric Utility Generating Units. As required by a settlement agreement, the EPA proposed new performance standards for emissions of carbon dioxide for new, affected, fossil fuel-fired electric utility generating units on March 27, 2012. New sources greater than 25 megawatts would be required to meet an output based standard of 1,000 pounds of carbon dioxide per megawatt-hour, based on the performance of widely used natural gas combined cycle technology. It should be noted that on February 9, 2016 the U.S. Supreme Court issued a stay of this regulation pending litigation. Additionally, the current EPA Administrator has also signed a measure to repeal the Clean Power Plan, including the CO2 standards.

Cap and Trade. Cap and trade refers to a policy tool where emissions are limited to a certain amount and can be traded, or provides flexibility on how the emitter can comply. Successful examples in the U.S. include the Acid Rain Program and the NO_x Budget Trading Program and Clean Air Interstate Rule in the northeast. There is no federal GHG cap and trade program currently; however, some states have joined to create initiatives to provide a mechanism for cap and trade.

The Regional GHG Initiative is an effort to reduce GHGs among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Each state caps carbon dioxide emissions from power plants, auctions carbon dioxide emission allowances, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and build a clean energy economy. The Initiative began in 2008.

The Western Climate Initiative partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15 percent below 2005 levels by 2020. The partners were originally California, British Columbia, Manitoba, Ontario, and Quebec. However, Manitoba and Ontario are not currently participating. California linked with Quebec's cap and trade system January 1, 2014, and joint offset auctions took place in 2015 (C2ES 2015).

SmartWay Program. The SmartWay Program is a public-private initiative between the EPA, large and small trucking companies, rail carriers, logistics companies, commercial manufacturers, retailers, and other federal and state agencies. Its purpose is to improve fuel efficiency and the environmental performance (reduction of both GHG emissions and air pollution) of the goods movement supply chains. SmartWay is comprised of four components (EPA 2014):

1. SmartWay Transport Partnership: A partnership in which freight carriers and shippers commit to benchmark operations, track fuel consumption, and improve performance annually.
2. SmartWay Technology Program: A testing, verification, and designation program to help freight companies identify equipment, technologies, and strategies that save fuel and lower emissions.
3. SmartWay Vehicles: A program that ranks light-duty cars and small trucks and identifies superior environmental performers with the SmartWay logo.
4. SmartWay International Interests: Guidance and resources for countries seeking to develop freight sustainability programs modeled after SmartWay.

SmartWay effectively refers to requirements geared towards reducing fuel consumption. Most large trucking fleets driving newer vehicles are compliant with SmartWay design requirements. Moreover, over time, all heavy-duty trucks will have to comply with the ARB GHG Regulation that is designed with the SmartWay Program in mind, to reduce GHG emissions by making them more fuel-efficient. For instance, in 2015, 53 foot or longer dry vans or refrigerated trailers equipped with a combination of SmartWay-verified low-rolling resistance tires and SmartWay-verified aerodynamic devices would obtain a total of 10 percent or more fuel savings over traditional trailers.

Through the SmartWay Technology Program, the EPA has evaluated the fuel saving benefits of various devices through grants, cooperative agreements, emissions and fuel economy testing,

demonstration projects and technical literature review. As a result, the EPA has determined the following types of technologies provide fuel saving and/or emission reducing benefits when used properly in their designed applications, and has verified certain products:

- Idle reduction technologies – less idling of the engine when it is not needed would reduce fuel consumption.
- Aerodynamic technologies minimize drag and improve airflow over the entire tractor-trailer vehicle. Aerodynamic technologies include gap fairings that reduce turbulence between the tractor and trailer, side skirts that minimize wind under the trailer, and rear fairings that reduce turbulence and pressure drop at the rear of the trailer.
- Low rolling resistance tires can roll longer without slowing down, thereby reducing the amount of fuel used. Rolling resistance (or rolling friction or rolling drag) is the force resisting the motion when a tire rolls on a surface. The wheel will eventually slow down because of this resistance.
- Retrofit technologies include things such as diesel particulate filters, emissions upgrades (to a higher tier), etc., which would reduce emissions.
- Federal excise tax exemptions.

CALIFORNIA

Legislative Actions to Reduce GHGs

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any state in the nation. Some legislation such as the landmark Assembly Bill (AB 32) California Global Warming Solutions Act of 2006 was specifically enacted to address GHG emissions. Other legislation such as Title 24 and Title 20 energy standards were originally adopted for other purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

AB 32. The California State Legislature enacted AB 32, which requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. "GHGs" as defined under AB 32 include carbon dioxide, methane, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. The California Air Resources Board (ARB) is the state agency charged with monitoring and regulating sources of GHGs. AB 32 states the following:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

ARB approved the 1990 GHG emissions level of 427 $MMTCO_2e$ on December 6, 2007 (ARB 2007). Therefore, emissions generated in California in 2020 are required to be equal to or less than 427 $MMTCO_2e$. Emissions in 2020 in a "business as usual" (BAU) scenario were estimated to be 596

MMTCO$_2$e, which do not account for reductions from AB 32 regulations (ARB 2008). At that level, a 28.4 percent reduction was required to achieve the 427 million MTCO$_2$e 1990 inventory. In October 2010, ARB prepared an updated 2020 forecast to account for the recession and slower forecasted growth. The forecasted inventory without the benefits of adopted regulation is now estimated at 545 million MTCO$_2$e. Therefore, under the updated forecast, a 21.7 percent reduction from BAU is required to achieve 1990 levels (ARB 2010).

PROGRESS IN ACHIEVING AB 32 TARGETS AND REMAINING REDUCTIONS REQUIRED

The State has made steady progress in implementing AB 32 and achieving targets included in Executive Order S-3-05. The progress is shown in updated emission inventories prepared by ARB for 2000 through 2012 (ARB 2014a). The State has achieved the Executive Order S-3-05 target for 2010 of reducing GHG emissions to 2000 levels. As shown below, the 2010 emission inventory achieved this target.

- 1990: 427 million MTCO$_2$e (AB 32 2020 target)
- 2000: 463 million MTCO$_2$e (an average 8 percent reduction needed to achieve 1990 base)
- 2010: 450 million MTCO$_2$e (an average 5 percent reduction needed to achieve 1990 base)

ARB has also made substantial progress in achieving its goal of achieving 1990 emissions levels by 2020. As described earlier in this section, ARB revised the 2020 BAU inventory forecast to account for new lower growth projections, which resulted in a new lower reduction from BAU to achieve the 1990 base. The previous reduction from 2020 BAU needed to achieve 1990 levels was 28.4 percent and the latest reduction from 2020 BAU is 21.7 percent.

- 2020: 545 million MTCO$_2$e BAU (an average 21.7 percent reduction from BAU needed to achieve 1990 base)

ARB Scoping Plan. ARB's Climate Change Scoping Plan (Scoping Plan) contains measures designed to reduce the State's emissions to 1990 levels by the year 2020 to comply with AB 32 (ARB 2008). The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and

- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

The ARB approved the First Update to the Scoping Plan (Update) on May 22, 2014. The Update identifies the next steps for California's climate change strategy. The Update shows how California continues on its path to meet the near-term 2020 GHG limit, but also sets a path toward long-term, deep GHG emission reductions. The report establishes a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050. The Update identifies progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities Climate for the next several years. The Update does not set new targets for the State, but describes a path that would achieve the long term 2050 goal of Executive Order S-05-03 for emissions to decline to 80 percent below 1990 levels by 2050 (ARB 2014).

Forecasting the amount of emissions that would occur in 2020 if no actions are taken was necessary to assess the amount of reductions California must achieve to return to the 1990 emissions level by 2020 as required by AB 32. The no-action scenario is known as "business-as-usual" or BAU. The ARB originally defined the BAU scenario as emissions in the absence of any GHG emission reduction measures discussed in the Scoping Plan.

As part of CEQA compliance for the Scoping Plan, ARB prepared a Supplemental Functional Equivalent Document (FED) in 2011. The FED included an updated 2020 BAU emissions inventory projection based on current economic forecasts (i.e., as influenced by the economic downturn) and emission reduction measures already in place, replacing its prior 2020 BAU emissions inventory. ARB staff derived the updated emissions estimates by projecting emissions growth, by sector, from the state's average emissions from 2006–2008. The new BAU estimate includes emission reductions for the million-solar-roofs program, the AB 1493 (Pavley I) motor vehicle GHG emission standards, and the Low Carbon Fuels Standard. In addition, ARB factored into the 2020 BAU inventory emissions reductions associated with 33 percent Renewable Energy Portfolio Standard (RPS) for electricity generation. The updated BAU estimate of 507 $MMTCO_2e$ by 2020 requires a reduction of 80 $MMTCO_2e$, or a 16 percent reduction below the estimated BAU levels to return to 1990 levels (i.e., 427 $MMTCO_2e$) by 2020.

In order to provide a BAU reduction that is consistent with the original definition in the Scoping Plan and with threshold definitions used in thresholds adopted by lead agencies for CEQA purposes and many climate action plans, the updated inventory without regulations was also included in the Supplemental FED. The ARB 2020 BAU projection for GHG emissions in California was originally estimated to be 596 $MMTCO_2e$. The updated ARB 2020 BAU projection in the Supplemental FED is 545 $MMTCO_2e$. Considering the updated BAU estimate of 545 $MMTCO_2e$ by 2020, ARB estimates a 21.7 percent reduction below the estimated statewide BAU levels is necessary to return to 1990 emission levels (i.e., 427 $MMTCO_2e$) by 2020, instead of the approximate 28.4 percent BAU reduction previously reported under the original Climate Change Scoping Plan (2008).

2017 Climate Change Scoping Plan Update

In November 2017, ARB released the final 2017 Scoping Plan Update, which identifies the State's post-2020 reduction strategy. The 2017 Scoping Plan Update reflects the 2030 target of a 40 percent reduction below 1990 levels, set by Executive Order B-30-15 and codified by Senate Bill 32 (SB 32). Key programs that the proposed Second Update builds upon include the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and much cleaner cars, trucks and freight movement, utilizing cleaner, renewable energy, and strategies to reduce methane emissions from agricultural and other wastes.

The 2017 Scoping Plan establishes a new emissions limit of 260 MMTCO2e for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030.

California's climate strategy will require contributions from all sectors of the economy, including the land base, and will include enhanced focus on zero- and near-zero-emission (ZE/NZE) vehicle technologies; continued investment in renewables, including solar roofs, wind, and other distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for direct GHG reductions at refineries will further support air quality co-benefits in neighborhoods, including in disadvantaged communities historically located adjacent to these large stationary sources, as well as efforts with California's local air pollution control and air quality management districts (air districts) to tighten emission limits on a broad spectrum of industrial sources. Major elements of the 2017 Scoping Plan framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing ZEV buses and trucks.
- Low Carbon Fuel Standard (LCFS), with an increased stringency (18 percent by 2030).
- Implementing SB 350, which expands the Renewables Portfolio Standard (RPS) to 50 percent RPS and doubles energy efficiency savings by 2030.
- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of ZEV trucks.
- Implementing the proposed Short-Lived Climate Pollutant Strategy (SLPS), which focuses on reducing methane and hydroflurocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030.
- Continued implementation of SB 375.
- Post-2020 Cap-and-Trade Program that includes declining caps.
- 20 percent reduction in GHG emissions from refineries by 2030.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

In addition to the statewide strategies listed above, the 2017 Scoping Plan also identifies local governments as essential partners in achieving the State's long-term GHG reduction goals and identifies local actions to reduce GHG emissions. As part of the recommended actions, CARB

recommends that local governments achieve a community-wide goal to achieve emissions of no more than 6 MTCO2e or less per capita by 2030 and 2 MTCO2e or less per capita by 2050. For CEQA projects, CARB states that lead agencies may develop evidenced-based bright-line numeric thresholds—consistent with the Scoping Plan and the State's long-term GHG goals—and projects with emissions over that amount may be required to incorporate on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible; or, a performance-based metric using a climate action plan or other plan to reduce GHG emissions is appropriate.

According to research conducted by the Lawrence Berkeley National Laboratory and supported by ARB, California, under its existing and proposed GHG reduction policies, is on track to meet the 2020 reduction targets under AB 32 and could achieve the 2030 goals under SB 32. The research utilized a new, validated model known as the California LBNL GHG Analysis of Policies Spreadsheet (CALGAPS), which simulates GHG and criteria pollutant emissions in California from 2010 to 2050 in accordance to existing and future GHG-reducing policies. The CALGAPS model showed that GHG emissions through 2020 could range from 317 to 415 MTCO2e per year, "indicating that existing state policies will likely allow California to meet its target [of 2020 levels under AB 32]." CALGAPS also showed that by 2030, emissions could range from 211 to 428 MTCO2e per year, indicating that "even if all modeled policies are not implemented, reductions could be sufficient to reduce emissions 40 percent below the 1990 level [of SB 32]." CALGAPS analyzed emissions through 2050 even though it did not generally account for policies that might be put in place after 2030. Though the research indicated that the emissions would not meet the State's 80 percent reduction goal by 2050, various combinations of policies could allow California's cumulative emissions to remain very low through 2050 (27) (28).

Senate Bill 32. On September 8, 2016, Governor Jerry Brown signed the Senate Bill (SB) 32 and its companion bill, Assembly Bill (AB) 197. SB 32 requires the state to reduce statewide GHG emissions to 40 percent below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15. The new legislation builds upon the AB 32 goal of 1990 levels by 2020 and provides an intermediate goal to achieving S-3-05, which sets a statewide GHG reduction target of 80 percent below 1990 levels by 2050. AB 197 creates a legislative committee to oversee regulators to ensure that ARB is not only respond to the Governor, but also the Legislature (29) (30).

Cap and Trade Program. The Scoping Plan identifies a Cap-and-Trade Program as one of the key strategies for California to reduce GHG emissions. According to ARB, a cap-and-trade program will help put California on the path to meet its goal of reducing GHG emissions to 1990 levels by the year 2020 and ultimately achieving an 80 percent reduction from 1990 levels by 2050. Under cap-and-trade, an overall limit on GHG emissions from capped sectors is established, and facilities subject to the cap will be able to trade permits to emit GHGs within the overall limit.

ARB adopted a California Cap-and-Trade Program pursuant to its authority under AB 32. See 17 California Code of Regulations (CCR) §§ 95800 to 96023. The Cap-and-Trade Program is designed to reduce GHG emissions from major sources (deemed "covered entities") by setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve AB 32's emission-reduction mandate of returning to 1990 levels of emissions by 2020. The statewide cap for GHG

emissions from the capped sectors (e.g., electricity generation, petroleum refining, and cement production) commenced in 2013 and will decline over time, achieving GHG emission reductions throughout the program's duration.

Covered entities that emit more than 25.000 $MTCO_2e$ per year must comply with the Cap-and-Trade Program. Triggering of the 25.000 $MTCO_2e$ per year "inclusion threshold" is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of GHG Emissions (Mandatory Reporting Rule or "MRR").

Under the Cap-and-Trade Program, ARB issues allowances equal to the total amount of allowable emissions over a given compliance period and distributes these to regulated entities. Covered entities are allocated free allowances in whole or part (if eligible), and may buy allowances at auction, purchase allowances from others, or purchase offset credits. Each covered entity with a compliance obligation is required to surrender "compliance instruments" (30) for each $MTCO_2e$ of GHG they emit. There also are requirements to surrender compliance instruments covering 30 percent of the prior year's compliance obligation by November of each year. For example, in November 2014, a covered entity was required to submit compliance instruments to cover 30 percent of its 2013 GHG emissions.

The Cap-and-Trade Program provides a firm cap, ensuring that the 2020 statewide emission limit will not be exceeded. An inherent feature of the Cap-and-Trade program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an accumulative basis. As summarized by ARB in the First Update:

> The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. But as the cap declines, aggregate emissions must be reduced. In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program if there is a reduction in GHG emissions from other covered entities. Such a focus on aggregate GHG emissions is considered appropriate because climate change is a global phenomenon, and the effects of GHG emissions are considered cumulative (ARB 2014).

The Cap-and-Trade Program works with other direct regulatory measures and provides an economic incentive to reduce emissions. If California's direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California's direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will be responsible for relatively more emissions reductions. Thus. the Cap-and-Trade Program assures that California will meet its 2020 GHG emissions reduction mandate:

> The Cap-and-Trade Program establishes an overall limit on GHG emissions from most of the California economy—the "capped sectors." Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the [Low Carbon Fuel Standard] LCFS, and the 33 percent [Renewables Portfolio Standard] RPS. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap. The Cap-and-Trade Regulation provides assurance that California's 2020 limit will be met because the regulation sets a firm limit on 85 percent of California's GHG emissions. In sum, the Cap-and-Trade Program will achieve aggregate, rather than site specific or project-level, GHG emissions reductions. Also, due to the regulatory architecture adopted by ARB in AB 32, the reductions attributed to the Cap-and-Trade Program can change over time depending on the State's emissions forecasts and the effectiveness of direct regulatory measures (ARB 2014).

As of January 1, 2015, the Cap-and-Trade Program covered approximately 85 percent of California's GHG emissions. The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Accordingly, GHG emissions associated with CEQA projects' electricity usage are covered by the Cap-and-Trade Program.

The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the Program's first compliance period. While the Cap-and-Trade Program technically covered fuel suppliers as early as 2012, they did not have a compliance obligation (i.e., they were not fully regulated) until 2015. The Cap-and-Trade Program covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in-state or imported. The point of regulation for transportation fuels is when they are "supplied" (i.e., delivered into commerce). Accordingly, as with stationary source GHG emissions and GHG emissions attributable to electricity use, virtually all, if not all, of GHG emissions from CEQA projects associated with vehicle-miles traveled (VMT) are covered by the Cap-and-Trade Program (ARB 2015) (31).

In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. "Capped" strategies are subject to the proposed cap-and-trade program. The Scoping Plan states that the inclusion of these emissions within the Program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. "Uncapped" strategies that will not be subject to the cap-and-trade emissions caps and

requirements are provided as a margin of safety by accounting for additional GHG emission reductions.[4]

SB 375 - the Sustainable Communities and Climate Protection Act of 2008. Passing the Senate on August 30, 2008, Senate Bill (SB) 375 was signed by the Governor on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: it (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

Concerning CEQA, SB 375, as codified in Public Resources Code Section 21159.28, states that CEQA findings for certain projects are not required to reference, describe, or discuss (1) growth inducing impacts, or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network, if the project:

1. Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the ARB accepts as achieving the GHG emission reduction targets.
2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies).
3. Incorporates the mitigation measures required by an applicable prior environmental document.

AB 1493 Pavley Regulations and Fuel Efficiency Standards. California AB 1493, enacted on July 22, 2002, required ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA's denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the U.S. District Court for the District of Columbia in 2011.

The standards phase in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in about a 22 percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards will result in about a 30 percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and

[4] On March 17, 2011, the San Francisco Superior Court issued a final decision in *Association of Irritated Residents v. California Air Resources Board* (Case No. CPF-09-509562). While the Court upheld the validity of the ARB Scoping Plan for the implementation of AB 32, the Court enjoined ARB from further rulemaking under AB 32 until ARB amends its CEQA environmental review of the Scoping Plan to address the flaws identified by the Court. On May 23, 2011, ARB filed an appeal. On June 24, 2011, the Court of Appeal granted ARB's petition staying the trail court's order pending consideration of the appeal. In the interest of informed decision-making, on June 13, 2011, ARB released the expanded alternatives analysis in a draft Supplement to the AB 32 Scoping Plan Functional Equivalent Document. The ARB Board approved the Scoping Plan and the CEQA document on August 24, 2011.

improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.

The second phase of the implementation for the Pavley bill was incorporated into Amendments to the Low-Emission Vehicle Program referred to as LEV III or the Advanced Clean Cars program. The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation will reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The new rules will clean up gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles and hydrogen fuel cell cars. The package will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.

SB 350— Clean Energy and Pollution Reduction Act of 2015. In October 2015, the legislature approved and the Governor signed SB 350, which reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include an increase in the renewables portfolio standard (RPS), higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for electric vehicle charging stations. Provisions for a 50 percent reduction in the use of petroleum statewide were removed from the Bill because of opposition and concern that it would prevent the Bill's passage. Specifically, SB 350 requires the following to reduce statewide GHG emissions:

- Increase the amount of electricity procured from renewable energy sources from 33 percent to 50 percent by 2030, with interim targets of 40 percent by 2024, and 25 percent by 2027.
- Double the energy efficiency in existing buildings by 2030. This target will be achieved through the California Public Utility Commission (CPUC), the California Energy Commission (CEC), and local publicly-owned utilities.
- Reorganize the Independent System Operator (ISO) to develop more regional electrify transmission markets and to improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States (California Leginfo 2015).

EXECUTIVE ORDERS RELATED TO GHG EMISSIONS

California's Executive Branch has taken several actions to reduce GHGs through the use of Executive Orders. Although not regulatory, they set the tone for the state and guide the actions of state agencies.

Executive Order S-3-05. Former California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for GHG emissions:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be a mid-term target. Because this is

an executive order, the goals are not legally enforceable for local governments or the private sector.

Executive Order S-01-07 – Low Carbon Fuel Standard. The Governor signed Executive Order S-01-07 on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In particular, the Executive Order established a Low Carbon Fuel Standard and directed the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by California Energy Commission on December 24, 2007) and was submitted to ARB for consideration as an "early action" item under AB 32. The ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

The Low Carbon Fuel Standard was challenged in the U.S. District Court in Fresno in 2011. The court's ruling issued on December 29, 2011, included a preliminary injunction against ARB's implementation of the rule. The Ninth Circuit Court of Appeals stayed the injunction on April 23, 2012, pending final ruling on appeal, allowing ARB to continue to implement and enforce the regulation. The Ninth Circuit Court's decision, filed September 18, 2013, vacated the preliminary injunction. In essence, the court held that Low Carbon Fuel Standards adopted by ARB were not in conflict with federal law. On August 8, 2013, the Fifth District Court of Appeal (California) ruled ARB failed to comply with CEQA and the Administrative Procedure Act (APA) when adopting regulations for Low Carbon Fuel Standards. In a partially published opinion, the Court of Appeal reversed the trial court's judgment and directed issuance of a writ of mandate setting aside Resolution 09-31 and two executive orders of ARB approving Low Carbon Fuel Standards (LCFS) regulations promulgated to reduce GHG emissions. However, the court tailored its remedy to protect the public interest by allowing the LCFS regulations to remain operative while ARB complies with the procedural requirements it failed to satisfy.

To address the Court ruling, ARB was required to bring a new LCFS regulation to tits Board for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS as well as new provisions designed to foster investments in the production of the low-carbon intensity (low-CI) fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement. The second public hearing was held on September 24 and September 25, 2015, where the LCFS Regulation was adopted. The Final Rulemaking Package adopting the regulation was filed with Office of Administrative Law (OAL) on October 2, 2015. OAL had until November 16, 2015 to make a determination (ARB 2015d).

Executive Order S-13-08. Executive Order S-13-08 states that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the Order, the 2009 California Climate Adaptation Strategy (California Natural Resources Agency 2009) was adopted, which is the ". . . first statewide, multi-sector, region-specific, and

information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Executive Order B-30-15. On April 29, 2015, Governor Edmund G. Brown Jr. issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's executive order aligns California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris late 2015. The Order sets a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050 and directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of CO_2 equivalent ($MMCO_2e$). The Order also requires the state's climate adaptation plan to be updated every three years, and for the State to continue its climate change research program, among other provisions. As with Executive Order S-3-05, this Order is not legally enforceable for local governments and the private sector. Legislation that would update AB 32 to make post 2020 targets and requirements a mandate is in process in the State Legislature.

CALIFORNIA REGULATIONS AND BUILDING CODES

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations have kept California's energy consumption relatively flat even with rapid population growth.

Title 20 Appliance Efficiency Standards. California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. 23 categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the state and those designed and sold exclusively for use in recreational vehicles or other mobile equipment (CEC 2012).

Title 24 Energy Efficiency Standards and California Green Building Standards. California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The newest 2016 version of Title 24 was adopted by the California Energy Commission (CEC) and became effective on January 1, 2017.

The CEC indicates that the 2016 Title 24 standards will reduce energy consumption by 5 percent for nonresidential buildings above that achieved by the 2013 Title 24 (CEC 2015).

California Code of Regulations, Title 24, Part 11: California Green Building Standards Code (CALGreen) is a comprehensive and uniform regulatory code for all residential, commercial, and

school buildings that went in effect on January 1, 2011, and is administered by the California Building Standards Commission. CALGreen is updated on a regular basis, with the most recent update consisting of the 2016 California Green Building Code Standards that became effective January 1, 2017. Local jurisdictions are permitted to adopt more stringent requirements, as state law provides methods for local enhancements. CALGreen recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided they establish a minimum 50 percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. The State Building Code provides the minimum standard that buildings must meet in order to be certified for occupancy, which is generally enforced by the local building official. CALGreen requires:

- Short-term bicycle parking. If a commercial project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- Long-term bicycle parking. For new buildings with 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of tenant-occupied motorized vehicle parking capacity, with a minimum of one space (5.106.4.1.2).
- Designated parking. Provide designated parking in commercial projects for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).
- Recycling by Occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials for recycling (5.410.1).
- Construction waste. A minimum 65 percent diversion of construction and demolition waste from landfills, increasing voluntarily to 80 percent for new homes and commercial projects (5.408.1, A5.408.3.1 [nonresidential], A5.408.3.1 [residential]). All (100 percent) of trees, stumps, rocks and associated vegetation and soils resulting from land clearing shall be reused or recycled (5.408.3).
- Wastewater reduction. Each building shall reduce the generation of wastewater by one of the following methods:
    - The installation of water-conserving fixtures (5.303.3) or
    - Using nonpotable water systems (5.303.4).
- Water use savings. 20 percent mandatory reduction of indoor water use with voluntary goal standards for 30, 35 and 40 percent reductions (5.303.2, A5303.2.3 [nonresidential]).
- Water meters. Separate water meters for buildings in excess of 50,000 square feet or buildings projected to consume more than 1,000 gallons per day (5.303.1).
- Irrigation efficiency. Moisture-sensing irrigation systems for larger landscaped areas (5.304.3).
- Materials pollution control. Low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particleboard (5.404).
- Building commissioning. Mandatory inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies (5.410.2)..

Model Water Efficient Landscape Ordinance. The Model Water Efficient Landscape Ordinance (Ordinance) was required by AB 1881, the Water Conservation Act. The bill required local agencies to adopt a local landscape ordinance at least as effective in conserving water as the Model Ordinance by January 1, 2010. Reductions in water use of 20 percent consistent with (SBX-7-7) 2020 mandate are expected upon compliance with the ordinance. Governor Brown's Drought Executive Order of April 1, 2015 (EO B-29-15) directed Department of Water Resources (DWR) to update the Ordinance through expedited regulation. The California Water Commission approved the revised Ordinance on July 15, 2015 effective December 15, 2015. New development projects that include landscape areas of 500 square feet or more are subject to the Ordinance. The update requires:

- More efficient irrigation systems;
- Incentives for graywater usage;
- Improvements in on-site stormwater capture;
- Limiting the portion of landscapes that can be planted with high water use plants; and
- Reporting requirements for local agencies.

ARB Refrigerant Management Program. ARB adopted a regulation in 2009 to reduce refrigerant GHG emissions from stationary sources through refrigerant leak detection and monitoring, leak repair, system retirement and retrofitting, reporting and recordkeeping, and proper refrigerant cylinder use, sale, and disposal. The regulation is set forth in sections 95380 to 95398 of Title 17, California Code of Regulations. The rules implementing the regulation establish a limit on statewide GHG emissions from stationary facilities with refrigeration systems with more than 50 pounds of a high GWP refrigerant. The refrigerant management program is designed to (1) reduce emissions of high-GWP GHG refrigerants from leaky stationary, non-residential refrigeration equipment; (2) reduce emissions from the installation and servicing of refrigeration and air-conditioning appliances using high-GWP refrigerants; and (3) verify GHG emission reductions.

Tractor-Trailer GHG Regulation. The tractors and trailers subject to this regulation must either use EPA SmartWay certified tractors and trailers, or retrofit their existing fleet with SmartWay verified technologies. The regulation applies primarily to owners of 53-foot or longer box-type trailers, including both dry-van and refrigerated-van trailers, and owners of the heavy-duty tractors that pull them on California highways. These owners are responsible for replacing or retrofitting their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. Sleeper cab tractors model year 2011 and later must be SmartWay certified. All other tractors must use SmartWay verified low rolling resistance tires. There are also requirements for trailers to have low rolling resistance tires and aerodynamic devices.

Phase I and 2 Heavy-Duty Vehicle GHG Standards. ARB has adopted a new regulation for greenhouse gas (GHG) emissions from heavy-duty trucks and engines sold in California. It establishes GHG emission limits on truck and engine manufacturers and harmonizes with the U.S. EPA rule for new trucks and engines nationally. Existing heavy-duty vehicle regulations in California include engine criteria emission standards, tractor-trailer GHG requirements to implement SmartWay strategies (i.e., the Heavy-Duty Tractor-Trailer Greenhouse Gas

Regulation), and in-use fleet retrofit requirements such as the Truck and Bus Regulation. In September 2011, the U.S. EPA adopted their new rule for heavy-duty trucks and engines. The U.S. EPA rule has compliance requirements for new compression and spark ignition engines, as well as trucks from Class 2b through Class 8. Compliance requirements begin with model year (MY) 2014 with stringency levels increasing through MY 2018. The rule organizes truck compliance into three groupings, which include a) heavy-duty pickups and vans; b) vocational vehicles; and c) combination tractors. The U.S. EPA rule does not regulate trailers.

ARB staff has worked jointly with the U.S. Environmental Protection Agency (U.S. EPA) and the National Highway Traffic Safety Administration (NHTSA) on the next phase of federal greenhouse gas (GHG) emission standards for medium- and heavy-duty vehicles, called federal Phase 2. The federal Phase 2 standards were built on the improvements in engine and vehicle efficiency required by the Phase 1 emission standards and represent a significant opportunity to achieve further GHG reductions for 2018 and later model year heavy-duty vehicles, including trailers.

U.S. EPA and NHTSA issued a Notice of Proposed Rulemaking for Phase 2 in June 2015, and published the final rule in October 2016. ARB staff plans to bring a proposed California Phase 2 program before the Board in early 2018. ARB staff remains committed to a strong national program which will support California's GHG reduction commitments.

SB 97 and the CEQA Guidelines Update. Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)." Section 21097 was also added to the Public Resources Code. It provided CEQA protection until January 1, 2010 for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA.

On April 13, 2009, the Office of Planning and Research submitted to the Secretary for Natural Resources its recommended amendments to the CEQA Guidelines for addressing GHG emissions. On July 3, 2009, the Natural Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting these amendments pursuant to Public Resources Code section 21083.05. Following a 55-day public comment period and two public hearings, the Natural Resources Agency proposed revisions to the text of the proposed Guidelines amendments. The Natural Resources Agency transmitted the adopted amendments and the entire rulemaking file to the Office of Administrative Law on December 31, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.

The CEQA Amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change.

A new section, CEQA Guidelines Section 15064.4, was added to assist agencies in determining the significance of GHG emissions. The new section allows agencies the discretion to determine whether a quantitative or qualitative analysis is best for a particular project. However, little guidance is offered on the crucial next step in this assessment process—how to determine whether the project's estimated GHG emissions are significant or cumulatively considerable.

Also amended were CEQA Guidelines Sections 15126.4 and 15130, which address mitigation measures and cumulative impacts, respectively. GHG mitigation measures are referenced in general terms, but no specific measures are championed. The revision to the cumulative impact discussion requirement (Section 15130) simply directs agencies to analyze GHG emissions in an EIR when a project's incremental contribution of emissions may be cumulatively considerable, however it does not answer the question of when emissions are cumulatively considerable.

Section 15183.5 permits programmatic GHG analysis and later project-specific tiering, as well as the preparation of GHG Reduction Plans. Compliance with such plans can support a determination that a project's cumulative effect is not cumulatively considerable, according to Section 15183.5(b).

In addition, the amendments revised Appendix F of the CEQA Guidelines, which focuses on Energy Conservation. The sample environmental checklist in Appendix G was amended to include GHG questions.

REGIONAL

The project is within the Southern California Air Basin (SoCAB), which is under the jurisdiction of the SCAQMD.

South Coast Air Quality Management District

SCAQMD is the agency responsible for air quality planning and regulation in the SoCAB. The SCAQMD addresses the impacts to climate change of projects subject to SCAQMD permit as a lead agency if they are the only agency having discretionary approval for the project and acts as a responsible agency when a land use agency must also approve discretionary permits for the project. The SCAQMD acts as an expert commenting agency for impacts to air quality. This expertise carries over to GHG emissions, so the agency helps local land use agencies through the development of models and emission thresholds that can be used to address GHG emissions.

In 2008, SCAQMD formed a Working Group to identify GHG emissions thresholds for land use projects that could be used by local lead agencies in the SoCAB. The Working Group developed several different options that are contained in the SCAQMD Draft Guidance Document – Interim CEQA GHG Significance Threshold, that could be applied by lead agencies. The working group has not provided additional guidance since release of the interim guidance in 2008. The SCAQMD Board has not approved the thresholds; however, the Guidance Document provides substantial evidence supporting the approaches to significance of GHG emissions that can be considered by

the lead agency in adopting its own threshold. The current interim thresholds consist of the following tiered approach:

- Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA.
- Tier 2 consists of determining whether the project is consistent with a GHG reduction plan. If a project is consistent with a qualifying local GHG reduction plan, it does not have significant GHG emissions.
- Tier 3 consists of screening values, which the lead agency can choose, but must be consistent with all projects within its jurisdiction. A project's construction emissions are averaged over 30 years and are added to the project's operational emissions. If a project's emissions are below one of the following screening thresholds, then the project is less than significant:
    - Residential and Commercial land use: 3,000 $MTCO_2e$ per year
    - Based on land use type: residential: 3,500 $MTCO_2e$ per year; commercial: 1,400 $MTCO_2e$ per year; or mixed use: 3,000 $MTCO_2e$ per year
- Tier 4 has the following options:
    - Option 1: Reduce BAU emissions by a certain percentage; this percentage is currently undefined.
    - Option 2: Early implementation of applicable AB 32 Scoping Plan measures
    - Option 3, 2020 target for service populations (SP), which includes residents and employees: 4.8 $MTCO_2e$/SP/year for projects and 6.6 $MTCO_2e$/SP/year for plans;
    - Option 3, 2035 target: 3.0 $MTCO_2e$/SP/year for projects and 4.1 $MTCO_2e$/SP/year for plans
- Tier 5 involves mitigation offsets to achieve target significance threshold.

The SCAQMD's interim thresholds used the Executive Order S-3-05 year 2050 goal as the basis for the Tier 3 screening level. Achieving the Executive Order's objective would contribute to worldwide efforts to cap carbon dioxide concentrations at 450 ppm, thus stabilizing global climate.

SCAQMD only has authority over GHG emissions from development projects that include air quality permits. At this time, it is unknown if the project would include stationary sources of emissions subject to SCAQMD permits. Notwithstanding, if the Project requires a stationary permit, it would be subject to the applicable SCAQMD regulations.

SCAQMD Regulation XXVII, adopted in 2009 includes the following rules:

- Rule 2700 defines terms and post global warming potentials.
- Rule 2701, SoCal Climate Solutions Exchange, establishes a voluntary program to encourage, quantify, and certify voluntary, high quality certified GHG emission reductions in the SCAQMD.
- Rule 2702, GHG Reduction Program created a program to produce GHG emission reductions within the SCAQMD. The SCAQMD will fund projects through contracts in response to requests for proposals or purchase reductions from other parties.

2.8 CITY OF MORENO VALLEY GENERAL PLAN MEASURES

Although the City of Moreno Valley General Plan does not identify specific GHG or climate change policies or goal, a number of the measures identified in the General Plan's Air Quality Element act to reduce or control criteria pollutant emissions and peripherally reduce GHG emissions. The proposed Project has been evaluated for consistency with the City's General Plan Air Quality Element, as shown on Table 2-3.

TABLE 2-3: CITY OF MORENO VALLEY GENERAL PLAN CONSISTENCY

Objective 6.6: Promote land use patterns that reduce daily automotive trips and reduce trip distance for work, shopping, school, and recreation.	**Consistent.** *The Project site is providing employment opportunities to Moreno Valley and the surrounding area.*
Objective 6.7: Reduce mobile and stationary source air pollutant emissions.	**Consistent.** *The Project site is located proximate to existing and proposed major roadways, acting to generally reduce vehicle trip lengths, thereby reducing mobile source emissions. The Project will further reduce mobile source emissions by creating local employment opportunities, reducing commuter vehicle miles traveled (VMT) within the region. Additionally, the Project will implement energy efficient designs and operational programs meeting or surpassing California Code of Regulations (CCR) Title 24 Building Standards, including but not limited to compliance with or betterment of, energy conservation requirements identified at CCR Title 24, Part 6, Energy Code. Energy efficient designs and programs implemented by the Project reduce resources consumption with correlating reductions in stationary-source emissions.*
Policy 6.7.5: Require grading activities to comply with South Coast Air Quality Management District's Rule 403 regarding the control of fugitive dust.	**Consistent.** *The Project will be required to implement fugitive dust control measures consistent with SCAQMD Rule 403.*
Policy 6.7.6: Require building construction to comply with the energy conservation requirements of Title 24 of the California Administrative Code [California Code of Regulations].	**Consistent.** *Pursuant to City and State Building Code requirements, the Project will meet or surpass applicable CCR Title 24 energy conservation requirements.*

Source: City of Moreno Valley General Plan, Safety Element

2.9 CITY OF MORENO VALLEY ENERGY EFFICIENCY AND CLIMATE ACTION STRATEGY

The City of Moreno Valley released an Energy Efficiency and Climate Action Strategy (CAS) as well as a Greenhouse Gas Analysis for public review on May 8, 2012. The documents were approved on October 9, 2012. The CAS identifies ways that the City can reduce energy and water consumption and greenhouse gas emissions as an organization (its employees and the operation of its facilities) and outlines the actions that the City can encourage and community members can employ to reduce their own energy and water consumption and greenhouse gas emissions. The policies in the document are to reduce greenhouse gas emissions in 2010 by 15 percent by 2020. The following consists of an analysis of project consistency with the policies in the CAS.

- R2-T1: Land Use Based Trips and VMT Reduction Policies. Encourage the development of Transit Priority Projects along High-Quality Transit Corridors identified in the SCAG Sustainable Communities Plan, to allow a reduction in vehicle miles traveled.

  Project consistency: Not applicable.

- R2-T3: Employment-Based Trip Reductions. Require a Transportation Demand Management (TDM) program for new development to reduce automobile travel by encouraging ride-sharing, carpooling, and alternative modes of transportation.

  Project consistency: The Project will encourage carpooling and provide information to employees on the use of public transit.

- R2-E1: New Construction Residential Energy Efficiency Requirements. Require energy efficient design for all new residential buildings to be 10 percent beyond the current Title 24 standards. (Reach Code)

  Project consistency: Not applicable; this measure applies to residential projects.

- R2-E2: New Construction Residential Renewable Energy. Facilitate the use of renewable energy (such as solar (photovoltaic) panels or small wind turbines) for new residential developments. Alternative approach would be the purchase of renewable energy resources offsite.

  Project consistency: Not applicable; this measure applies to residential projects.

- R2-E5: New Construction Commercial Energy Efficiency Requirements. Require energy efficient design for all new commercial buildings to be 10% beyond the 2008 Title 24 standards (which were in effect at the time the CAP was adopted). (Reach Code)

  Project consistency: Consistent; Current 2016 Title 24 requirements would achieve greater reduction than envisioned by the City's Climate Action Strategy. Further, the Project would be required to comply with any adopted municipal code requirements set forth by the City of Moreno Valley. As such the Project would be consistent with R2-E5.

- R3-E1: Energy Efficient Development, and Renewable Energy Deployment Facilitation and Streamlining. Updating of codes and zoning requirements and guidelines to further implement green building practices. This could include incentives for energy efficient projects.

- Project consistency: Not applicable on a project-level.

- R3-L2: Heat Island Plan. Develop measures that address "heat islands." Potential measures include using strategically placed shade trees, using paving materials with a Solar Reflective Index of at least 29, an open grid pavement system, or covered parking.

  Project consistency: Consistent; the Project will comply with the City of Moreno Valley's landscaping requirements.

- R2-W1: Water Use Reduction Initiative. Consider adopting a per capita water use reduction goal, which mandates the reduction of water use of 20 percent per capita with requirements applicable to new development and with cooperative support of the water agencies.

  Project consistency: Consistent. California Green Building Standards Code, Chapter 5, Division 5.3, Section 5.303.2 requires that indoor water use be reduced by 20 percent. Section 5.304.3 requires irrigation controllers and sensors.

- R3-W1: Water Efficiency Training and Education. Work with EMWD and local water companies to implement a public information and education program that promotes water conservation.

  Project consistency: Not applicable at a project-level.

- R2-S1: City Diversion Program. For Solid Waste, consider a target of increasing the waste diverted from the landfill to a total of 75 percent by 2020.

  Project consistency: Consistent; the Project will comply with the City of Moreno Valley's citywide goal of solid waste reduction. Additionally, the Project will be compliant with the City of Moreno Valley's Municipal Code 8.80.030 by implementing a Waste Management Plan.

2.10 DISCUSSION ON ESTABLISHMENT OF SIGNIFICANCE THRESHOLDS

The criteria used to determine the significance of potential Project-related greenhouse gas impacts are taken from the Initial Study Checklist in Appendix G of the State CEQA Guidelines (14 California Code of Regulations §§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to air quality if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The City of Moreno Valley does not have an adopted threshold of significance for GHG emissions. For CEQA purposes, the City has discretion to select an appropriate significance criterion, based on substantial evidence. The SCAQMD's adopted numerical threshold of 10,000 $MTCO_2e$ per year for industrial stationary source emissions is selected as the significance criterion. The SCAQMD-adopted industrial threshold was selected by the City because the proposed Project is analogous to an industrial use much more closely than any other land use such as commercial or residential in terms of its expected operating characteristics. The Project proposes the development of warehouse and general light industrial uses within a single building that will serve mid- stream functions in the goods movement chain between manufacturers and consumers, characteristic of an industrial operation. Further, analysis of the Project's traffic generation in this EIR is based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017 for industrial and warehouse uses. Also, 10,000 $MTCO_2e$ has been used as the significance threshold by many local government lead agencies for logistics projects throughout the SCAG region since the SCAQMD adopted this threshold for its own use. Further, to ensure that the threshold is conservative in its application, although the SCAQMD uses their adopted 10,000 $MTCO_2e$ threshold to determine the significance of stationary source emissions for industrial projects, the 10,000 $MTCO_2e$ threshold used in this EIR is applied to all sources of Project-related GHG emissions whether stationary source, mobile source, area source, or other.

Use of this threshold is also consistent with guidance provided in the CAPCOA *CEQA and Climate Change* handbook, as such the City has opted to use a non-zero threshold approach based on Approach 2 of the handbook. Threshold 2.5 (Unit-Based Thresholds Based on Market Capture) establishes a numerical threshold based on capture of approximately 90 percent of emissions from future development. The latest threshold developed by SCAQMD using this method is 10,000 metric tons carbon dioxide equivalent ($MTCO_2E$) per year for industrial projects. This threshold is based on the review of 711 CEQA projects.

3 PROJECT GREENHOUSE GAS IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will result in a significant greenhouse gas

3.2 CALIFORNIA EMISSIONS ESTIMATOR MODEL™ EMPLOYED TO ESTIMATE GHG EMISSIONS

CEQA Guidelines 15064.4 (b) (1) states that a lead agency may use a model or methodology to quantify greenhouse gas emissions associated with a project (32).

On October 17, 2017, the SCAQMD in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the California Emissions Estimator Model™ (CalEEMod™) v2016.3.2. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (NO_x, VOC, PM_{10}, $PM_{2.5}$, SO_x, and CO) and greenhouse gas (GHG) emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (33). Accordingly, the latest version of CalEEMod™ has been used for this Project to determine construction and operational air quality emissions. Output from the model runs for both construction and operational activity are provided in Appendix 3.1 and Appendix 3.2.

3.3 CONSTRUCTION AND OPERATIONAL LIFE-CYCLE ANALYSIS

A full life-cycle analysis (LCA) for construction and operational activity is not included in this analysis due to the lack of consensus guidance on LCA methodology at this time. Life-cycle analysis (i.e., assessing economy-wide GHG emissions from the processes in manufacturing and transporting all raw materials used in the project development, infrastructure and on-going operations) depends on emission factors or econometric factors that are not well established for all processes. At this time a LCA would be extremely speculative and thus has not been prepared.

Additionally, the SCAQMD recommends analyzing direct and indirect project GHG emissions generated within California and not life-cycle emissions because the life-cycle effects from a project could occur outside of California, might not be very well understood or documented, and would be challenging to mitigate (34). Additionally, the science to calculate life cycle emissions is not yet established or well defined, therefore SCAQMD has not recommended, and is not requiring, life-cycle emissions analysis.

3.4 PROJECT RELATED GREENHOUSE GAS EMISSIONS

Construction activities associated with the Project would result in emissions of CO_2 and CH_4 from construction activities. The report Centerpointe Air Quality Impact Analysis Report, Urban Crossroads, Inc. (2018) contains detailed information regarding construction activity (35).

For construction phase Project emissions, GHGs are quantified and amortized over the life of the Project. To amortize the emissions over the life of the Project, the SCAQMD recommends calculating the total greenhouse gas emissions for the construction activities, dividing it by a 30-

year project life then adding that number to the annual operational phase GHG emissions (36). As such, construction emissions were amortized over a 30-year period and added to the annual operational phase GHG emissions.

3.5 OPERATIONAL EMISSIONS

Operational activities associated with the proposed Project will result in emissions of CO_2, CH_4, and N_2O from the following primary sources:

- Area Source Emissions
- Energy Source Emissions
- Mobile Source Emissions
- Solid Waste
- Water Supply, Treatment and Distribution
- On-Site Equipment Emissions

3.5.1 AREA SOURCE EMISSIONS

Landscape Maintenance Equipment

Landscape maintenance equipment would generate emissions from fuel combustion and evaporation of unburned fuel. Equipment in this category would include lawnmowers, shedders/grinders, blowers, trimmers, chain saws, and hedge trimmers used to maintain the landscaping of the Project. The emissions associated with landscape maintenance equipment were calculated based on assumptions provided in the CalEEMod model.

3.5.2 ENERGY SOURCE EMISSIONS

Combustion Emissions Associated with Natural Gas and Electricity

GHGs are emitted from buildings as a result of activities for which electricity and natural gas are typically used as energy sources. Combustion of any type of fuel emits CO_2 and other GHGs directly into the atmosphere; these emissions are considered direct emissions associated with a building. GHGs are also emitted during the generation of electricity from fossil fuels; these emissions are considered to be indirect emissions. Unless otherwise noted, CalEEMod™ default parameters were used.

3.5.3 MOBILE SOURCE EMISSIONS

Vehicles

Project-related operational greenhouse gas impacts derive predominantly from mobile sources. In this regard, over 85 percent (by weight) of all Project operational-source emissions would be generated by mobile sources (vehicles). Neither the Project Applicant nor the City has any regulatory control over these tail pipe emissions. Rather, vehicle tail pipe source emissions are regulated by CARB and USEPA. As summarized previously herein, as the result of CARB and USEPA

actions, Basin-wide vehicular-source emissions have been reduced dramatically over the past years and are expected to further decline as clean vehicle and fuel technologies improve.

The Project related operational air quality impacts derive primarily from vehicle trips generated by the Project. Trip characteristics available from the report, *Centerpointe Traffic Impact Analysis* (Urban Crossroads 2018) were utilized in this analysis (1).

Per the *Centerpointe Traffic Impact Analysis*, the Project is expected to generate a net total of approximately 486 trip-ends per day (actual vehicles) (1). The Project trip generation includes 100 truck trip-ends per day from the proposed Project site including 37.4% 2-axle trucks, 18.2% 3-axle trucks, and 44.4% 4+-axle trucks for General Light Industrial use, 16.7% 2-axle trucks, 20.7% 3-axle trucks, and 62.6% 4+-axle trucks for Warehousing use.

3.5.3.1 Trip Length

Background

A technical deficiency inherent in calculating the projected vehicle emissions associated with any project is related to the estimation of trip length and vehicle miles traveled (VMT). VMT for a given project is calculated by the total number of vehicle trips to/from the Project x average trip length. This method of estimating VMT for use in calculating vehicle emissions likely results in the over-estimation and double-counting of emissions because, for a distribution warehouse center such as the Project, the land use is likely to attract (divert) existing vehicle trips that are already on the circulation system as opposed to generating new trips. In this regard, the Project would, to a large extent, redistribute existing mobile-source emissions rather than generate additional emissions within the Basin. As such, the estimation of the Centerpointe Project's vehicular-source emissions are likely overstated in that no credit for, or reduction in, emissions is assumed based on diversion of existing trips.

Provided below is a summary of the VMT recommendations of the SCAQMD and SCAG, followed by a description of the methodology used to calculate the VMT rates used in this GHGA.

SCAQMD Recommendation

In the last five years, the SCAQMD has provided numerous comments on the trip length for warehouse/distribution and industrial land use projects (37). The SCAQMD asserts that the model-default trip length in CalEEMod™ and the URBan EMISsions (URBEMIS) 2007 model (version 9.2.4) would underestimate emissions. The SCAQMD asserts that for warehouse, distribution center, and industrial land use projects, most of the heavy-duty trucks would be hauling consumer goods, often from the Ports of Long Beach and Los Angeles (POLA and POLB) and/or to destinations outside of California. The SCAQMD states that for this reason, the CalEEMod™ and the URBan EMISsions model default trip length (approximately 12.6 miles) would not be representative of activities at like facilities. The SCAQMD generally recommends the use of a 40-mile one-way trip length.

Southern California Association of Government (SCAG) Heavy Duty Truck Model

SCAG is comprised of six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) and 190 cities in Southern California, and is the organization charged with addressing and resolving short- and long-term regional policy issues. The SCAG region also consists of 14 sub-regional entities recognized by the Regional Council as partners in the regional policy planning process. The SCAG region has more than 19 million residents and encompasses more than 38,000 square miles, representing the largest and most diverse region in the country.

SCAG maintains a regional transportation model. In its most recent (2008) transportation validation for the 2003 Regional Model, SCAG indicates the average internal truck trip length for the SCAG region is 5.92 miles for Light Duty Trucks, 13.06 miles for Medium Duty Trucks, and 24.11 miles for Heavy Duty Trucks.

Approach for Analysis of the Project

Trip lengths and VMT estimates employed in this AQIA report generate vehicular-source emissions that would represent a maximum impact scenario. Other CEQA compliance documents for similar land use projects within the region have utilized these same or similar estimates. Though the VMT analyzed in this analysis may differ from the Project's traffic impact analysis, to maintain analytic consistency and establish the maximum impact scenario noted above, the following approach has been utilized in calculating emissions associated with vehicles accessing the Project. This approach is consistent with professional industry practice (38) (39) (40).

For passenger car trips, the CalEEMod default for a one-way trip length of 16.6 miles was assumed. For heavy duty trucks, an average trip length was derived from distances from the Project site to the far edges of the South Coast Air Basin (SCAB) as follows.

- Project site to the Port of Los Angeles/Long Beach: 78 miles;
- Project site to East on State Route 60: 30 miles;
- Project site to San Diego County line: 60 miles;
- Project site to Inland Empire: 50 miles;
- Project site to Perris destinations: 10 miles;
- Project site to Moreno Valley destinations: 10 miles;

Assuming that 50% of all delivery trips will travel to and from the Project and the Port of Los Angeles/Long Beach, 10% go East on the State Route 60, 20% go to San Diego, 10% go to the Inland Empire, 5% go to Perris destinations and the remainder as Moreno Valley destinations. The average truck trip length is calculated as 60 miles.

Two separate model runs were utilized in order to more accurately model emissions resulting from vehicle operations. The first run analyzed passenger car emissions, which incorporated a default trip length of 16.6 miles for passenger cars and a fleet mix of 100% Light-Duty-Auto vehicles (LDA). The second run analyzed truck emissions, which incorporated an average truck trip length of 60 miles.

The vehicle fleet mix, in terms of actual trucks, as derived from the traffic study for the Project is comprised of the following based on land use:

- General Light Industrial: 37.42% LHD, 18.19% MHD, and 44.39% HHD
- Warehouse (without cold storage): 16.67% LHD, 20.69% MHD, and 62.64% HHD

The detailed emission calculations are provided in Appendix 3.1 and 3.2.

3.5.4 Solid Waste

Industrial land uses will result in the generation and disposal of solid waste. A large percentage of this waste will be diverted from landfills by a variety of means, such as reducing the amount of waste generated, recycling, and/or composting. The remainder of the waste not diverted will be disposed of at a landfill. GHG emissions from landfills are associated with the anaerobic breakdown of material. GHG emissions associated with the disposal of solid waste associated with the proposed Project were calculated by the CalEEMod™ model using default parameters.

3.5.5 Water Supply, Treatment and Distribution

Indirect GHG emissions result from the production of electricity used to convey, treat and distribute water and wastewater. The amount of electricity required to convey, treat and distribute water depends on the volume of water as well as the sources of the water. Unless otherwise noted, CalEEMod™ default parameters were used.

3.5.6 On-Site Equipment Emissions

As part of the Project's design, all on-site indoor and outdoor cargo handling equipment (CHE) (including yard trucks, hostlers, yard goats, pallet jacks, forklifts, and other on-site equipment) will be powered by non-combustion engines (e.g. electric). Since there are no exhaust emissions associated with the equipment, for purposes of the Project, emissions associated with yard trucks and forklifts are not included in the emissions totals.

3.6 Emissions Summary

The annual GHG emissions associated with the operation of the proposed Project are estimated to be 5,515.11 $MTCO_2e$ per year as summarized in Table 3-1.

TABLE 3-1: PROJECT GREENHOUSE GAS EMISSIONS (ANNUAL)

Emission Source	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2E
Annual construction-related emissions amortized over 30 years	16.96	0.00	0.00	17.01
Area	9.13E-03	2.00E-05	0.00	9.75E-03
Energy	350.433	0.01	3.86E-03	351.90
Mobile Sources (Passenger Cars)	1,895.67	0.04	0.00	1,896.64
Mobile Sources (Trucks)	2,883.01	0.13	0.00	2,886.30
Waste	41.41	2.45	0.00	102.60
Water Usage	210.71	1.55	0.04	260.66
Total CO_2E (All Sources)	**5,515.11**			
Screening Threshold (CO_2E)	**10,000**			
Threshold Exceeded?	**NO**			

3.7 GREENHOUSE GAS EMISSIONS FINDINGS AND RECOMMENDATIONS

GHG Impact #1: The Project would not generate direct or indirect greenhouse gas emission that would result in a significant impact on the environment.

The City of Moreno Valley does not have an adopted threshold of significance for GHG emissions. For CEQA purposes, the City has discretion to select an appropriate significance criterion, based on substantial evidence. The South Coast Air Quality Management District's (SCAQMD)'s adopted numerical threshold of 10,000 metric tons carbon dioxide equivalent ($MTCO_2e$) per year for industrial stationary source emissions is selected as the significance criterion. The SCAQMD-adopted industrial threshold was selected by the City because the proposed Project is analogous to an industrial use much more closely than any other land use such as commercial or residential in terms of its expected operating characteristics. The Project proposes a warehouse and industrial use that will serve mid- stream functions in the goods movement chain between manufacturers and consumers, characteristic of an industrial operation. Further, analysis of the Project's traffic generation in this report is based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017 for warehouse and industrial land use categories. Also, 10,000 $MTCO_2e$ has been used as the significance threshold by many local government lead agencies for logistics projects throughout the SCAG region since the SCAQMD adopted this threshold for its own use. Further, to ensure that the threshold is conservative in its application, although the SCAQMD uses their adopted 10,000 $MTCO_2e$ threshold to determine the significance of stationary source emissions for industrial projects, the 10,000 $MTCO_2e$ threshold used in this CEQA document is applied to all sources of Project-related GHG emissions whether stationary source, mobile source, area source, or other.

Use of this threshold is also consistent with guidance provided in the CAPCOA *CEQA and Climate Change* handbook, as such the City has opted to use a non-zero threshold approach based on

Approach 2 of the handbook. Threshold 2.5 (Unit-Based Thresholds Based on Market Capture) establishes a numerical threshold based on capture of approximately 90 percent of emissions from future development. The latest threshold developed by SCAQMD using this method is 10,000 $MTCO_2e$ based on the review of 711 CEQA projects.

The Project will result in approximately 732.18 $MTCO_2e$ per year from construction, area, energy, waste, and water usage. In addition, the Project has the potential to result in an additional 4,782.94 $MTCO_2e$ per year from mobile sources if the assumption is made that all of the vehicle trips to and from the Project are "new" trips resulting from the development of the Project. As shown on Table 3-1 (previously presented), the Project has the potential to generate a total of approximately 5,515.11 $MTCO_2e$ per year. As such, the Project would not exceed the SCAQMD's numeric threshold of 10,000 $MTCO_2e$ if it were applied. Thus, the Project would not have the potential to result in a cumulatively considerable impact with respect to GHG emissions.

GHG Impact #2: The Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

The Project's consistency with AB 32 and SB 32 are discussed below.

Scoping Plan

ARB's *Scoping Plan* identifies strategies to reduce California's greenhouse gas emissions in support of AB32 which requires the State to reduce its GHG emissions to 1990 levels by 2020. Many of the strategies identified in the Scoping Plan are not applicable at the project level, such as long-term technological improvements to reduce emissions from vehicles. Some measures are applicable and supported by the project, such as energy efficiency. Finally, while some measures are not directly applicable, the project would not conflict with their implementation. Reduction measures are grouped into 18 action categories, as follows:

1. **California Cap-and-Trade Program Linked to Western Climate Initiative Partner Jurisdictions.** Implement a broad-based California cap-and-trade program to provide a firm limit on emissions. Link the California cap–and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California.[5] Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms.
2. **California Light-Duty Vehicle Greenhouse Gas Standards.** Implement adopted Pavley standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals.
3. **Energy Efficiency.** Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly owned utilities).
4. **Renewables Portfolio Standards.** Achieve 33 percent renewable energy mix statewide.
5. **Low Carbon Fuel Standard.** Develop and adopt the Low Carbon Fuel Standard.

[5] California Air Resources Board. California GHG Emissions – Forecast (2002-2020). October 2010

6. **Regional Transportation-Related Greenhouse Gas Targets.** Develop regional greenhouse gas emissions reduction targets for passenger vehicles.
7. **Vehicle Efficiency Measures.** Implement light-duty vehicle efficiency measures.
8. **Goods Movement.** Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.
9. **Million Solar Roofs Program.** Install 3,000 megawatts of solar-electric capacity under California's existing solar programs.
10. **Medium- and Heavy-Duty Vehicles.** Adopt medium- (MD) and heavy-duty (HD) vehicle efficiencies. Aerodynamic efficiency measures for HD trucks pulling trailers 53-feet or longer that include improvements in trailer aerodynamics and use of rolling resistance tires were adopted in 2008 and went into effect in 2010.[6] Future, yet to be determined improvements, includes hybridization of MD and HD trucks.
11. **Industrial Emissions.** Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.
12. **High Speed Rail.** Support implementation of a high speed rail system.
13. **Green Building Strategy.** Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.
14. **High Global Warming Potential Gases.** Adopt measures to reduce high warming global potential gases.
15. **Recycling and Waste.** Reduce methane emissions at landfills. Increase waste diversion, composting and other beneficial uses of organic materials, and mandate commercial recycling. Move toward zero-waste.
16. **Sustainable Forests.** Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation. The 2020 target for carbon sequestration is 5 million MTCO2E/YR.
17. **Water.** Continue efficiency programs and use cleaner energy sources to move and treat water.
18. **Agriculture.** In the near-term, encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory by 2020.

Table 3-2 summarizes the project's consistency with the State Scoping Plan. As summarized, the project will not conflict with any of the provisions of the Scoping Plan and in fact supports seven of the action categories through energy efficiency, water conservation, recycling, and landscaping.

TABLE 3-2: SCOPING PLAN CONSISTENCY SUMMARY

[6] California Air Resources Board. Scoping Plan Measures Implementation Timeline. October 2010

Action	Supporting Measures[7]	Consistency
Cap-and-Trade Program	--	Not Applicable. These programs involve capping emissions from electricity generation, industrial facilities, and broad scoped fuels. Caps do not directly affect manufacturing projects.
Light-Duty Vehicle Standards	T-1	Not Applicable. This is a statewide measure establishing vehicle emissions standards.
Energy Efficiency	E-1	Consistent. The project will include a variety of building, water, and solid waste efficiencies consistent with 2016 CALGREEN requirements.
	E-2	
	CR-1	
	CR-2	
Renewables Portfolio Standard	E-3	Not Applicable. Establishes the minimum statewide renewable energy mix.
Low Carbon Fuel Standard	T-2	Not Applicable. Establishes reduced carbon intensity of transportation fuels.
Regional Transportation-Related Greenhouse Gas Targets	T-3	Not Applicable. This is a statewide measure and is not within the purview of this Project.
Vehicle Efficiency Measures	T-4	Not Applicable. Identifies measures such as minimum tire-fuel efficiency, lower friction oil, and reduction in air conditioning use.
Goods Movement	T-5	Not applicable. Identifies measures to improve goods movement efficiencies such as advanced combustion strategies, friction reduction, waste heat recovery, and electrification of accessories. While these measures are yet to be implemented and will be voluntary, the proposed Project would not interfere with their implementation.
	T-6	
Million Solar Roofs (MSR) Program	E-4	Not applicable. The MSR program sets a goal for use of solar systems throughout the state as a whole. The project currently does not include solar energy generation, and it is unknown if the building roof structure will be designed to support solar panels in the future.
Medium- & Heavy-Duty Vehicles	T-7	Not applicable. MD and HD trucks and trailers working from the proposed parcel delivery facility will be subject to aerodynamic and hybridization requirements as

[7] Supporting measures can be found at the following link: http://www.arb.ca.gov/cc/scopingplan/2013_update/appendix_b.pdf

Action	Supporting Measures[7]	Consistency
	T-8	established by ARB; no feature of the project would interfere with implementation of these requirements and programs.
Industrial Emissions	I-1	Not Applicable. These measures are applicable to large industrial facilities (> 500,000 MTCOE2/YR) and other intensive uses such as refineries.
	I-2	
	I-3	
	I-4	
	I-5	
High Speed Rail	T-9	Not Applicable. Supports increased mobility choice.
Green Building Strategy	GB-1	Consistent. The project will include a variety of building, water, and solid waste efficiencies consistent with 2016 CALGREEN requirements.
High Global Warming Potential Gases	H-1	Not Applicable. The proposed parcel delivery facility is not substantial sources of high GWP emissions and will comply with any future changes in air conditioning, fire protection suppressant, and other requirements.
	H-2	
	H-3	
	H-4	
	H-5	
	H-6	
	H-7	
Recycling and Waste	RW-1	Consistent. The project will be required recycle a minimum of 50 percent from construction activities and parcel delivery operations per State and County requirements.
	RW-2	
	RW-3	
Sustainable Forests	F-1	Consistent. The project will increase carbon sequestration by increasing on-site trees per the project landscaping plan.
Water	W-1	Consistent. The project will include use of low-flow fixtures and efficient landscaping per State requirements.
	W-2	
	W-3	
	W-4	
	W-5	
	W-6	
Agriculture	A-1	Not Applicable. The project is not an agricultural use.

SB 32

At the state level, Executive Orders S-3-05 and B-30-15 are orders from the State's Executive Branch for the purpose of reducing GHG emissions. The goal of Executive Order S-3-05 is to reduce GHG emissions to 1990 levels by 2020 was codified by the Legislature as the 2006 Global Warming Solutions Act (AB 32). The Project, as analyzed above, is consistent with AB 32. Therefore, the Project does not conflict with this component of Executive Order S-3-05. The Executive Orders also establish goals to reduce GHG emissions to 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. However, studies have shown that, in order to meet the 2030 and 2050 targets, aggressive technologies in the transportation and energy

sectors, including electrification and the decarbonization of fuel, will be required. In its Climate Change Scoping Plan, ARB acknowledged that the "measures needed to meet the 2050 are too far in the future to define in detail." In the First Scoping Plan Update, however, ARB generally described the type of activities required to achieve the 2050 target: "energy demand reduction through efficiency and activity changes; largescale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and rapid market penetration of efficiency and clean energy technologies that requires significant efforts to deploy and scale markets for the cleanest technologies immediately."

Unlike the 2020 and 2030 reduction targets of AB 32 and SB 32, respectively the 2050 target of Executive Order S-3-05 has not been codified. Accordingly, the 2050 reduction target has not been the subject of any analysis by CARB. For example, CARB has not prepared an update to the aforementioned Scoping Plan that provides guidance to local agencies as to how they may seek to contribute to the achievement of the 2050 reduction target.

In 2017, the California Supreme Court examined the need to use the Executive Order S-3-05 2050 reduction target in Cleveland National Forest Foundation v. San Diego Association of Governments (2017) 3 Cal.5th 497 (Cleveland National). The case arose from SANDAG's adoption of its 2050 Regional Transportation Plan, which included its Sustainable Communities Strategy, as required by SB 375 (discussed above). On review, the Supreme Court held that SANDAG did not violate CEQA by not considering the Executive Order S-3-05 2050 reduction target.

As explained above, the 2050 reduction target of Executive Order S-3-05 has not been codified, unlike the 2020 and 2030 reduction targets of AB 32 and SB 32, respectively. Accordingly, the 2050 reduction target has not been the subject of any analysis by CARB. For example, CARB has not prepared an update to the aforementioned Scoping Plan that provides guidance to local agencies as to how they may seek to contribute to the achievement of the 2050 reduction target.

Further, the Project is much smaller in size and scope in comparison to the Regional Transportation Plan examined in *Cleveland National*. In that case, the California Supreme Court held that SANDAG did not violate CEQA by not considering the Executive Order S-3-05 2050 reduction target. Accordingly, there is no information presently available to assess the Project's consistency with regard to the 2050 target of Executive Order S-3-05.

The 2017 Scoping Plan builds on the 2008 Scoping Plan in order to achieve the 40 percent reduction from 1990 levels by 2030. Major elements of the 2017 Scoping Plan framework that will achieve the GHG reductions include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing ZEV buses and trucks. When adopted, this measure would apply to all trucks accessing the Project site, this may include existing trucks or new trucks purchased by the project proponent could be eligible for incentives that expedite the Project's implementation of ZEVs.
- Low Carbon Fuel Standard (LCFS), with an increased stringency (18 percent by 2030). When adopted, this measure would apply to all fuel purchased and used by the Project in the state.
- Implementing SB 350, which expands the Renewables Portfolio Standard (RPS) to 50 percent RPS and doubles energy efficiency savings by 2030. When adopted, this measure would apply when electricity is provided to the Project by a utility company.

- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of ZEV trucks. When adopted, this measure would apply to all trucks accessing the Project site, this may include existing trucks or new trucks that are part of the statewide goods movement sector.
- Implementing the proposed Short-Lived Climate Pollutant Strategy (SLPS), which focuses on reducing methane and hydroflurocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030. When adopted, the Project would be required to comply with this measure and reduce SLPS accordingly.
- Continued implementation of SB 375. The Project is not within the purview of SB 375 and would therefore not conflict with this measure.
- Post-2020 Cap-and-Trade Program that includes declining caps. When adopted, the Project would be required to comply with the Cap-and-Trade Program if it generates emissions from sectors covered by Cap-and-Trade.
- 20 percent reduction in GHG emissions from refineries by 2030. When adopted, the Project would be required to comply with this measure if it were to utilize any fuel from refineries.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink. This is a statewide measure that would not apply to the Project.

As shown above, the Project would not conflict with any of the 2017 Scoping Plan elements as any regulations adopted would apply directly or indirectly to the Project.

Further, recent studies show that the State's existing and proposed regulatory framework will allow the State to reduce its GHG emissions level to 40 percent below 1990 levels by 2030 (27).

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6 CERTIFICATION

The contents of this GHGA represent an accurate depiction of the greenhouse gas impacts associated with the proposed Centerpointe Project. The information contained in this greenhouse gas report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5987.

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Master of Science in Environmental Studies
California State University, Fullerton • May, 2010

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PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Environmental Site Assessment – American Society for Testing and Materials • June, 2013
Planned Communities and Urban Infill – Urban Land Institute • June, 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007
AB2588 Regulatory Standards – Trinity Consultants • November, 2006
Air Dispersion Modeling – Lakes Environmental • June, 2006

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APPENDIX 3.1:

CALEEMOD OPERATIONAL EMISSIONS MODEL OUTPUTS (TRUCKS)

Centerpointe (Operations - Trucks)

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	163.22	1000sqft	3.75	163,218.00	0
General Light Industry	40.80	1000sqft	0.94	40,804.00	0
Parking Lot	164.00	Space	3.11	65,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot Acreage based on information provided in the Site Plan. Total Lot Acreage is 8.78.

Construction Phase - Operations Run Only.

Off-road Equipment - Operations Run Only.

Trips and VMT - Operations Run Only.

Vehicle Trips - Operations Run Only.

Fleet Mix - Operations Run Only.

Centerpointe (Operations - Trucks) - South Coast AQMD Air District, Annual

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	PhaseEndDate	1/18/2019	12/10/2018
tblConstructionPhase	PhaseStartDate	1/5/2019	12/10/2018
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tblFleetMix	HHD	0.03	0.63
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LHD1	0.02	0.37
tblFleetMix	LHD1	0.02	0.17
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00
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tblFleetMix	OBUS	2.0370e-003	0.00
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tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
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tblLandUse	LandUseSquareFeet	40,800.00	40,804.00
tblLandUse	LotAcreage	1.48	3.11
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
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tblVehicleTrips	CNW_TTP	41.00	0.00
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tblVehicleTrips	PR_TP	92.00	100.00
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tblVehicleTrips	SU_TR	1.68	0.35
tblVehicleTrips	WD_TR	6.97	1.06

tblVehicleTrips	WD_TR	1.68	0.35

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8374	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Energy	8.9400e-003	0.0812	0.0682	4.9000e-004		6.1700e-003	6.1700e-003		6.1700e-003	6.1700e-003	0.0000	350.4339	350.4339	0.0125	3.8600e-003	351.8968
Mobile	0.2938	8.3037	2.3868	0.0298	0.9544	0.0536	1.0080	0.2691	0.0513	0.3204	0.0000	2,883.0111	2,883.0111	0.1314	0.0000	2,886.2951
Waste						0.0000	0.0000		0.0000	0.0000	41.4142	0.0000	41.4142	2.4475	0.0000	102.6020
Water						0.0000	0.0000		0.0000	0.0000	14.9679	195.7374	210.7053	1.5454	0.0380	260.6567
Total	**1.1401**	**8.3850**	**2.4597**	**0.0303**	**0.9544**	**0.0598**	**1.0142**	**0.2691**	**0.0575**	**0.3266**	**56.3821**	**3,429.1916**	**3,485.5737**	**4.1368**	**0.0418**	**3,601.4603**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/10/2018	12/10/2018	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8374	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Energy	8.9400e-003	0.0812	0.0682	4.9000e-004		6.1700e-003	6.1700e-003		6.1700e-003	6.1700e-003	0.0000	350.4339	350.4339	0.0125	3.8600e-003	351.8968
Mobile	0.2938	8.3037	2.3868	0.0298	0.9544	0.0536	1.0080	0.2691	0.0513	0.3204	0.0000	2,883.0111	2,883.0111	0.1314	0.0000	2,886.2951
Waste						0.0000	0.0000		0.0000	0.0000	41.4142	0.0000	41.4142	2.4475	0.0000	102.6020
Water						0.0000	0.0000		0.0000	0.0000	14.9679	195.7374	210.7053	1.5454	0.0380	260.6567
Total	**1.1401**	**8.3850**	**2.4597**	**0.0303**	**0.9544**	**0.0598**	**1.0142**	**0.2691**	**0.0575**	**0.3266**	**56.3821**	**3,429.1916**	**3,485.5737**	**4.1368**	**0.0418**	**3,601.4603**

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2938	8.3037	2.3868	0.0298	0.9544	0.0536	1.0080	0.2691	0.0513	0.3204	0.0000	2,883.0111	2,883.0111	0.1314	0.0000	2,886.2951
Unmitigated	0.2938	8.3037	2.3868	0.0298	0.9544	0.0536	1.0080	0.2691	0.0513	0.3204	0.0000	2,883.0111	2,883.0111	0.1314	0.0000	2,886.2951

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	43.29	43.29	43.29	945,427	945,427
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	56.80	56.80	56.80	1,240,524	1,240,524
Total	100.09	100.09	100.09	2,185,952	2,185,952

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0
Parking Lot	60.00	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.000000	0.000000	0.000000	0.000000	0.374200	0.000000	0.181900	0.443900	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Unrefrigerated Warehouse-No Rail	0.000000	0.000000	0.000000	0.000000	0.166700	0.000000	0.206900	0.626400	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	262.0072	262.0072	0.0108	2.2400e-003	262.9445
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	262.0072	262.0072	0.0108	2.2400e-003	262.9445
NaturalGas Mitigated	8.9400e-003	0.0812	0.0682	4.9000e-004		6.1700e-003	6.1700e-003		6.1700e-003	6.1700e-003	0.0000	88.4267	88.4267	1.6900e-003	1.6200e-003	88.9522
NaturalGas Unmitigated	8.9400e-003	0.0812	0.0682	4.9000e-004		6.1700e-003	6.1700e-003		6.1700e-003	6.1700e-003	0.0000	88.4267	88.4267	1.6900e-003	1.6200e-003	88.9522

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	1.32572e+006	7.1500e-003	0.0650	0.0546	3.9000e-004		4.9400e-003	4.9400e-003		4.9400e-003	4.9400e-003	0.0000	70.7456	70.7456	1.3600e-003	1.3000e-003	71.1660
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	331333	1.7900e-003	0.0162	0.0136	1.0000e-004		1.2300e-003	1.2300e-003		1.2300e-003	1.2300e-003	0.0000	17.6812	17.6812	3.4000e-004	3.2000e-004	17.7862
Total		**8.9400e-003**	**0.0812**	**0.0682**	**4.9000e-004**		**6.1700e-003**	**6.1700e-003**		**6.1700e-003**	**6.1700e-003**	**0.0000**	**88.4267**	**88.4267**	**1.7000e-003**	**1.6200e-003**	**88.9522**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	1.32572e+006	7.1500e-003	0.0650	0.0546	3.9000e-004		4.9400e-003	4.9400e-003		4.9400e-003	4.9400e-003	0.0000	70.7456	70.7456	1.3600e-003	1.3000e-003	71.1660
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	331333	1.7900e-003	0.0162	0.0136	1.0000e-004		1.2300e-003	1.2300e-003		1.2300e-003	1.2300e-003	0.0000	17.6812	17.6812	3.4000e-004	3.2000e-004	17.7862
Total		**8.9400e-003**	**0.0812**	**0.0682**	**4.9000e-004**		**6.1700e-003**	**6.1700e-003**		**6.1700e-003**	**6.1700e-003**	**0.0000**	**88.4267**	**88.4267**	**1.7000e-003**	**1.6200e-003**	**88.9522**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	414161	131.9604	5.4500e-003	1.1300e-003	132.4325
Parking Lot	22960	7.3156	3.0000e-004	6.0000e-005	7.3417
Unrefrigerated Warehouse-No Rail	385194	122.7312	5.0700e-003	1.0500e-003	123.1703
Total		**262.0072**	**0.0108**	**2.2400e-003**	**262.9445**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	414161	131.9604	5.4500e-003	1.1300e-003	132.4325
Parking Lot	22960	7.3156	3.0000e-004	6.0000e-005	7.3417
Unrefrigerated Warehouse-No Rail	385194	122.7312	5.0700e-003	1.0500e-003	123.1703
Total		**262.0072**	**0.0108**	**2.2400e-003**	**262.9445**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8374	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Unmitigated	0.8374	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0955					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7415					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.4000e-004	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Total	**0.8374**	**4.0000e-005**	**4.7300e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**9.1300e-003**	**9.1300e-003**	**2.0000e-005**	**0.0000**	**9.7500e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0955					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7415					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.4000e-004	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Total	**0.8374**	**4.0000e-005**	**4.7300e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**9.1300e-003**	**9.1300e-003**	**2.0000e-005**	**0.0000**	**9.7500e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	210.7053	1.5454	0.0380	260.6567
Unmitigated	210.7053	1.5454	0.0380	260.6567

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	9.435 / 0	42.1369	0.3091	7.5900e-003	52.1262
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	37.7446 / 0	168.5684	1.2364	0.0304	208.5305
Total		**210.7053**	**1.5454**	**0.0380**	**260.6567**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	9.435 / 0	42.1369	0.3091	7.5900e-003	52.1262
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	37.7446 / 0	168.5684	1.2364	0.0304	208.5305
Total		**210.7053**	**1.5454**	**0.0380**	**260.6567**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	41.4142	2.4475	0.0000	102.6020
Unmitigated	41.4142	2.4475	0.0000	102.6020

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	50.59	10.2693	0.6069	0.0000	25.4418
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	153.43	31.1449	1.8406	0.0000	77.1602
Total		**41.4142**	**2.4475**	**0.0000**	**102.6020**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	50.59	10.2693	0.6069	0.0000	25.4418
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	153.43	31.1449	1.8406	0.0000	77.1602
Total		**41.4142**	**2.4475**	**0.0000**	**102.6020**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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APPENDIX 3.2:

CALEEMOD OPERATIONAL EMISSIONS MODEL OUTPUTS (PASSENGER CARS)

Centerpointe (Operations - Passenger Cars)

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	163.22	1000sqft	3.75	163,218.00	0
General Light Industry	40.80	1000sqft	0.94	40,804.00	0
Parking Lot	164.00	Space	3.11	65,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreaged based on information from Site Plan. Total Lot acreage is 8.78 acres.

Construction Phase - Operations Run Only.

Off-road Equipment - Operations Run Only.

Trips and VMT - Operations Run Only.

On-road Fugitive Dust - Operations Run Only.

Vehicle Trips - Trip Rates based on information provided in the TIA (2018)

Fleet Mix - Based on information provided in the TIA (2018)

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	PhaseEndDate	1/18/2019	12/10/2018
tblConstructionPhase	PhaseStartDate	1/5/2019	12/10/2018
tblFleetMix	HHD	0.03	0.00
tblFleetMix	HHD	0.03	0.00
tblFleetMix	LDA	0.55	1.00
tblFleetMix	LDA	0.55	1.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00

tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblLandUse	LandUseSquareFeet	163,220.00	163,218.00
tblLandUse	LandUseSquareFeet	40,800.00	40,804.00
tblLandUse	LotAcreage	1.48	3.11
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOnRoadDust	HaulingPercentPave	100.00	0.00
tblOnRoadDust	VendorPercentPave	100.00	0.00
tblOnRoadDust	WorkerPercentPave	100.00	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TL	16.60	60.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	CW_TTP	59.00	100.00

tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	2.54
tblVehicleTrips	ST_TR	1.68	0.15
tblVehicleTrips	SU_TR	0.68	1.24
tblVehicleTrips	SU_TR	1.68	0.06
tblVehicleTrips	WD_TR	6.97	3.90
tblVehicleTrips	WD_TR	1.68	1.39

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8374	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Energy	8.9400e-003	0.0812	0.0682	4.9000e-004		6.1700e-003	6.1700e-003		6.1700e-003	6.1700e-003	0.0000	350.4339	350.4339	0.0125	3.8600e-003	351.8968
Mobile	0.1470	0.4448	5.2811	0.0209	2.4660	0.0156	2.4816	0.6546	0.0144	0.6690	0.0000	1,895.6706	1,895.6706	0.0388	0.0000	1,896.6415
Waste						0.0000	0.0000		0.0000	0.0000	41.4142	0.0000	41.4142	2.4475	0.0000	102.6020
Water						0.0000	0.0000		0.0000	0.0000	14.9679	195.7374	210.7053	1.5454	0.0380	260.6567
Total	**0.9934**	**0.5260**	**5.3541**	**0.0214**	**2.4660**	**0.0218**	**2.4877**	**0.6546**	**0.0205**	**0.6752**	**56.3821**	**2,441.8510**	**2,498.2332**	**4.0443**	**0.0418**	**2,611.8068**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8374	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Energy	8.9400e-003	0.0812	0.0682	4.9000e-004		6.1700e-003	6.1700e-003		6.1700e-003	6.1700e-003	0.0000	350.4339	350.4339	0.0125	3.8600e-003	351.8968
Mobile	0.1470	0.4448	5.2811	0.0209	2.4660	0.0156	2.4816	0.6546	0.0144	0.6690	0.0000	1,895.6706	1,895.6706	0.0388	0.0000	1,896.6415
Waste						0.0000	0.0000		0.0000	0.0000	41.4142	0.0000	41.4142	2.4475	0.0000	102.6020
Water						0.0000	0.0000		0.0000	0.0000	14.9679	195.7374	210.7053	1.5454	0.0380	260.6567
Total	**0.9934**	**0.5260**	**5.3541**	**0.0214**	**2.4660**	**0.0218**	**2.4877**	**0.6546**	**0.0205**	**0.6752**	**56.3821**	**2,441.8510**	**2,498.2332**	**4.0443**	**0.0418**	**2,611.8068**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/10/2018	12/10/2018	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1470	0.4448	5.2811	0.0209	2.4660	0.0156	2.4816	0.6546	0.0144	0.6690	0.0000	1,895.6706	1,895.6706	0.0388	0.0000	1,896.6415
Unmitigated	0.1470	0.4448	5.2811	0.0209	2.4660	0.0156	2.4816	0.6546	0.0144	0.6690	0.0000	1,895.6706	1,895.6706	0.0388	0.0000	1,896.6415

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	159.08	103.63	50.59	2,962,814	2,962,814
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	227.20	24.48	9.79	3,651,297	3,651,297
Total	386.28	128.12	60.39	6,614,111	6,614,111

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	60.00	8.40	6.90	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Unrefrigerated Warehouse-No Rail	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	262.0072	262.0072	0.0108	2.2400e-003	262.9445
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	262.0072	262.0072	0.0108	2.2400e-003	262.9445
NaturalGas Mitigated	8.9400e-003	0.0812	0.0682	4.9000e-004		6.1700e-003	6.1700e-003		6.1700e-003	6.1700e-003	0.0000	88.4267	88.4267	1.6900e-003	1.6200e-003	88.9522
NaturalGas Unmitigated	8.9400e-003	0.0812	0.0682	4.9000e-004		6.1700e-003	6.1700e-003		6.1700e-003	6.1700e-003	0.0000	88.4267	88.4267	1.6900e-003	1.6200e-003	88.9522

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	1.32572e+006	7.1500e-003	0.0650	0.0546	3.9000e-004		4.9400e-003	4.9400e-003		4.9400e-003	4.9400e-003	0.0000	70.7456	70.7456	1.3600e-003	1.3000e-003	71.1660
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	331333	1.7900e-003	0.0162	0.0136	1.0000e-004		1.2300e-003	1.2300e-003		1.2300e-003	1.2300e-003	0.0000	17.6812	17.6812	3.4000e-004	3.2000e-004	17.7862
Total		**8.9400e-003**	**0.0812**	**0.0682**	**4.9000e-004**		**6.1700e-003**	**6.1700e-003**		**6.1700e-003**	**6.1700e-003**	**0.0000**	**88.4267**	**88.4267**	**1.7000e-003**	**1.6200e-003**	**88.9522**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	1.32572e+006	7.1500e-003	0.0650	0.0546	3.9000e-004		4.9400e-003	4.9400e-003		4.9400e-003	4.9400e-003	0.0000	70.7456	70.7456	1.3600e-003	1.3000e-003	71.1660
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	331333	1.7900e-003	0.0162	0.0136	1.0000e-004		1.2300e-003	1.2300e-003		1.2300e-003	1.2300e-003	0.0000	17.6812	17.6812	3.4000e-004	3.2000e-004	17.7862
Total		**8.9400e-003**	**0.0812**	**0.0682**	**4.9000e-004**		**6.1700e-003**	**6.1700e-003**		**6.1700e-003**	**6.1700e-003**	**0.0000**	**88.4267**	**88.4267**	**1.7000e-003**	**1.6200e-003**	**88.9522**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	414161	131.9604	5.4500e-003	1.1300e-003	132.4325
Parking Lot	22960	7.3156	3.0000e-004	6.0000e-005	7.3417
Unrefrigerated Warehouse-No Rail	385194	122.7312	5.0700e-003	1.0500e-003	123.1703
Total		**262.0072**	**0.0108**	**2.2400e-003**	**262.9445**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	414161	131.9604	5.4500e-003	1.1300e-003	132.4325
Parking Lot	22960	7.3156	3.0000e-004	6.0000e-005	7.3417
Unrefrigerated Warehouse-No Rail	385194	122.7312	5.0700e-003	1.0500e-003	123.1703
Total		**262.0072**	**0.0108**	**2.2400e-003**	**262.9445**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8374	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Unmitigated	0.8374	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0955					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7415					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.4000e-004	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Total	**0.8374**	**4.0000e-005**	**4.7300e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**9.1300e-003**	**9.1300e-003**	**2.0000e-005**	**0.0000**	**9.7500e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0955					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7415					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.4000e-004	4.0000e-005	4.7300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.1300e-003	9.1300e-003	2.0000e-005	0.0000	9.7500e-003
Total	**0.8374**	**4.0000e-005**	**4.7300e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**9.1300e-003**	**9.1300e-003**	**2.0000e-005**	**0.0000**	**9.7500e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	210.7053	1.5454	0.0380	260.6567
Unmitigated	210.7053	1.5454	0.0380	260.6567

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	9.435 / 0	42.1369	0.3091	7.5900e-003	52.1262
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	37.7446 / 0	168.5684	1.2364	0.0304	208.5305
Total		**210.7053**	**1.5454**	**0.0380**	**260.6567**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	9.435 / 0	42.1369	0.3091	7.5900e-003	52.1262
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	37.7446 / 0	168.5684	1.2364	0.0304	208.5305
Total		**210.7053**	**1.5454**	**0.0380**	**260.6567**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	41.4142	2.4475	0.0000	102.6020
Unmitigated	41.4142	2.4475	0.0000	102.6020

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	50.59	10.2693	0.6069	0.0000	25.4418
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	153.43	31.1449	1.8406	0.0000	77.1602
Total		**41.4142**	**2.4475**	**0.0000**	**102.6020**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	50.59	10.2693	0.6069	0.0000	25.4418
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	153.43	31.1449	1.8406	0.0000	77.1602
Total		**41.4142**	**2.4475**	**0.0000**	**102.6020**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

ARCADIS Design & Consultancy for natural and built assets

Draft

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

Centerpointe
NEC Brodiaea Avenue & Frederick Street
Moreno Valley, California 92553

January 15, 2018

DRAFT PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

Centerpointe
NEC Brodiaea Avenue & Frederick Street
Moreno Valley, California 92553

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Date:

January 15, 2018

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TABLES *(EMBEDDED IN TEXT)*

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ACRONYMS AND ABBREVIATIONS

AOC	area of concern
Arcadis	Arcadis U.S., Inc.
AST	aboveground storage tank
ASTM	ASTM International
bgs	below ground surface
CFR	Code of Federal Regulations
CREC	controlled recognized environmental condition
DTSC	Department of Toxic Substances Control
EDR	Environmental Data Resources, Inc.
ESA	Environmental Site Assessment
HREC	historical recognized environmental condition
LUST	Leaking Underground Storage Tank
MAFB	March Air Force Base
MARB	March Air Reserve Base
NWC	northwest corner
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCE	perchloroethylene
REC	recognized environmental condition
RWQCB	Regional Water Quality Control Board
TCE	trichloroethene
U.S. EPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

EXECUTIVE SUMMARY

Arcadis U.S., Inc. (Arcadis) was retained by Newcastle Partners (Newcastle) to conduct a Phase I Environmental Site Assessment (ESA) for 8.78-acres of land located at the northeast corner of Brodiaea Avenue and Frederick Street in Moreno Valley, Riverside County, California (the Site). The Site is currently undeveloped land proposed to be developed with a commercial use.

As directed by Newcastle, the Phase I ESA was performed in accordance with the ASTM International (ASTM) Standard E1527-13, Standard Practice for Environmental Site Assessments: *Phase I Environmental Site Assessment Process*. The goal of the Phase I ESA was to identify recognized environmental conditions (RECs), controlled recognized environmental conditions (CRECs), and historical recognized environmental conditions (HRECs) associated with the property in conformance with ASTM E1527-13.

The Phase I ESA included a visual inspection of the property completed on December 29, 2017; observation of adjacent properties; reviews of environmental regulatory agency records, historical documents, and facility records that were available on site; and interviews with personnel represented to be familiar with the Site as indicated elsewhere in the report.

The findings identified by Arcadis are summarized below and discussed in greater detail in the body of the report.

Historical Findings

Based on review of historical sources, the Site has been undeveloped land from 1901 to the present day. No evidence of agriculture, structures or other uses was identified on historic topographic maps or aerial photographs.

On-Site Findings

The approximate 8.78-acre, rectangular-shaped site consists of undeveloped land. The Site's surface has been disked and consists of exposed surface soil and some low-lying dry vegetation. Trees are present along the western boundary of the Site. Small piles of gravel and soil disturbance were observed along the eastern property boundary, likely the result of new construction east of the Site. Minor amounts of windblown trash were observed along the perimeter of the Site. The Site's surface is relatively level and no evidence of surface staining or the disposal of hazardous materials or wastes was observed onsite.

According to the National Pipeline Mapping System, a gas transmission line runs in an east/west direction beneath Brodiaea Avenue adjacent to the south of the Site.

Regulatory Findings

An environmental database report prepared by Environmental Data Resources, Inc. (EDR) was reviewed for local, state, and federal listings for the Site and properties within the site vicinity. Regulatory database lists were reviewed for cases pertaining to leaking underground storage tanks (USTs) and aboveground

storage tanks (ASTs), hazardous waste sites, and abandoned sites within the specified radii of standards established by ASTM guidelines. According to EDR's report, the Site is located within the boundaries of March Field, an historic area of March Air Force Base (MAFB) used for small arms training. The current status of March Field according to the Department of Toxic Substances Control (DTSC) is "inactive – action required." The most current documents available on the DTSC's ENVIROSTOR website are dated 2009. According to a *Site Inspection Report* (Parsons, 2009), March Field was established in 1918 to conduct primary flight training for aviators for World War I. The site consisted of three overlapping skeet ranges used for small arms training. Small arms training was conducted from 1943 to 1947. Contaminants of concern are the residual presence of munitions and explosives of concern (MEC) and munitions constituents (MC). The focus of the *Site Inspection Report* was Range Complex No. 1 (skeet) which includes the Site. Most of the investigation and soil sampling appears to have been conducted between Brodiaea Avenue and Cactus Avenue south of the Site, and east of Frederick Street. Arsenic, lead and various polycyclic aromatic hydrocarbons (PAHs) were detected in exceedance of their respective human health screening values for surface soil. The report stated "additional sampling is warranted." No more recent reports were available online. Therefore, Arcadis contacted the DTSC for a current update on the status of March Field and its potential impact on the Site. A response from the DTSC is pending at this time. The Site's location within March Field is a REC for the Site as metals and PAHs may be present in near-surface soil above regulatory screening criteria.

According to EDR's report, several properties, including MAFB, were identified within the ASTM search radius. However, based on their listing for tracking purposes only, distance from the Site, hydraulic location with respect to groundwater flow, regulatory oversight, identification of principal responsible parties, and/or case closure, these off-site properties are unlikely to represent a concern of environmental impairment or a vapor encroachment condition to the Site.

Conclusions

Arcadis has performed a Phase I ESA of the Site in conformance with the scope and limitations of ASTM Practice E1527-13 for Phase I ESAs. No RECs were identified in connection with the Site except for the following:

- The Site's location within March Field is a REC for the Site as metals and PAHs may be present in near-surface soil above regulatory screening criteria. Arcadis recommends baseline soil sampling for metals and PAHs.

The following *de minimis* condition was identified in connection with the Site:

- According to the National Pipeline Mapping System, a gas transmission line runs in an east/west direction beneath Brodiaea Avenue. Building setback requirements may be imposed based on the specific location of the pipeline in relation to the Site.

1 INTRODUCTION

Arcadis U.S., Inc. (Arcadis) was retained by Newcastle Partners (Newcastle) to conduct a Phase I Environmental Site Assessment (ESA) for 8.78-acres of land located at the northeast corner of Brodiaea Avenue and Frederick Street in Moreno Valley, Riverside County, California (the Site). The Site is currently undeveloped land proposed to be developed with a commercial use.

1.1 Purpose

Arcadis understands that the purpose for conducting this Phase I ESA is to assess and document the current status of environmental conditions at the Site.

1.2 Detailed Scope of Services

As directed by Newcastle, the Phase I ESA was conducted in accordance with the ASTM International (ASTM) E1527-13 Standard Practice for Site Assessments: Phase I Environmental Site Assessment Process. The goal of the Phase I ESA was to identify recognized environmental conditions (RECs), controlled recognized environmental conditions (CRECs), and historical recognized environmental conditions (HRECs) associated with the property in conformance with ASTM E1527-13.

A REC is defined as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: 1) due to release to the environment; 2) under conditions indicative of a release to the environment; or 3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not RECs.

A CREC is defined as a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority and that subjects the property to activity and/or use limitations.

A HREC is defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed in a manner accepted by the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent), without subjecting the property to any activity and use limitations.

The ASTM practice requires environmental professionals to identify data gaps following reasonable inquiry of site and Newcastle personnel and Arcadis' search for "reasonably ascertainable" resources. ASTM E1527-13 defines a data gap as "a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information."

Arcadis' scope of work included:

- On-site inspection of the Site to identify environmental conditions issues as defined above;
- Review of available environmental documents for the Site, including previous site assessments and investigations;
- Interviews with persons represented to be familiar with the operation and history of the Site;

- Review of property history through interviews, aerial photographs, on-line planning portals, and historical mapping (as available);
- Observation of adjacent properties and the local area to evaluate the potential for adverse environmental impact to the Site; and
- Contracting of Environmental Data Resources, Inc. (EDR) to identify sites of concern as required in the regulatory records review section of the ASTM practice for a Phase I ESA.

The Phase I ESA did not include the collection or analysis of soil, air, water, groundwater, transformer/ electrical fluids, hazardous building materials, or other samples, nor did it include a title search or search for environmental liens. This ESA did not include an assessment of the environmental (or health and safety) compliance status of the site operations.

1.3 Significant Assumptions

Arcadis has assumed that the information sources used for this assessment provided accurate information. Evaluations presented in this report are based exclusively on information provided by Newcastle and site personnel and observations made during the site visit. No invasive field activities were conducted and no laboratory analyses were performed.

The boundaries of the Site were described in documents provided by Newcastle and by interviews with Newcastle personnel. Arcadis assumed this information was accurate.

1.4 Limitations and Exceptions

The services performed and any opinions expressed by Arcadis in this report are based upon the limits of the assessment described herein. Arcadis has relied upon the accuracy of documents, information, data, and other materials provided or made available by Newcastle and others. Arcadis has not independently verified such information and assumes no liability for the accuracy or completeness of such information. Arcadis makes no guarantee that site conditions do not exist, or will not exist in the future, that were undetected or that could lead to liability in connection with the Site. Similarly, past and present activities on the Site indicating the potential for the existence of environmental concerns may not have been discovered by Arcadis. Such activities may include those that would indicate the potential for regulated hazardous substances at the Site. Likewise, site conditions or site activities that were outside the scope of the services described above, or changes to site conditions or regulatory requirements may lead to liabilities in connection with the Site that are not identified in this report. Arcadis has reviewed the information obtained in connection with the performance of the services described above, in keeping with existing applicable environmental consulting standards and enforcement practices, but cannot predict what actions any given agency may take or what standards and practices may apply in the future.

Where access to portions of the Site or to structures on the Site was unavailable or limited, Arcadis renders no opinion and accepts no responsibility for assessment of the condition of these portions of the Site, including specifically, but not limited to, the presence of hazardous substances or petroleum products at these locations. In addition, Arcadis renders no opinion concerning the presence or absence of hazardous substances or petroleum products where direct observation of any part of the Site, or structure on the Site, is limited by physical obstructions.

The conclusions and observations are based upon limited data and professional opinions, and the assessment is performed on a particular date. Site conditions and activities may change after that date. Therefore, the risk of undiscovered environmental impairment of the Site cannot be ruled out. Arcadis does not make any representations or warranties regarding the condition or value of the Site, regardless of the results of the assessment presented in this report.

Arcadis makes no guarantees, certifications, warranties, or representations of any kind whatsoever, whether expressed or implied, regarding this Phase I ESA, the condition of the Site, or the liabilities associated with the Site.

1.5 Special Terms and Conditions

No special terms and conditions were imposed on this Phase I ESA.

1.6 Reliance

It is understood that this report will be prepared for the sole use of Newcastle, and the contents thereof may not be used or relied upon by any other person without the express written consent and authorization of Arcadis. Use of this report by any other party shall be at such party's sole risk and liability.

1.7 Deviations

No deviations from the referenced ASTM Standard occurred.

1.8 Additional Services

No additional services beyond those outlined in ASTM E1527-13 were conducted as part of the assessment.

2 SITE LOCATION / LAND USE

2.1 Site Location

The rectangular-shaped, approximate 8.78-acre site is located at the northeast corner of the intersection of Brodiaea Avenue and Frederick Street in Moreno Valley, California. The Site is located approximately 1.5-miles east of the Escondido (215) Freeway. The Site Location Map and Site Plan are presented as **Figures 1 and 2**.

2.2 Site and Vicinity Characteristics

At the time of Arcadis' site reconnaissance, the Site was undeveloped land that has been disked for vegetation control. The site vicinity is comprised of undeveloped land, warehouse distribution buildings, government buildings, and retail/restaurant uses.

Photographs of the Site and surrounding areas were taken to document current conditions and are included in **Appendix A**.

2.3 Current Use of the Property

There are no current uses of the Site.

2.4 Description of Structures, Roads, and Other Improvements on the Site

There are no structures, paved or unpaved roads or other improvements onsite. However, it appears the Site is connected to local utilities, and two pad-mounted transformers are located on the southwest corner of the Site.

2.5 Current Uses of the Adjoining Properties

Land uses surrounding the Site predominately consist of commercial and municipal properties. The adjoining properties and land uses include:

- North: Undeveloped land followed by Alessandro Boulevard.
- East: Undeveloped land and a recently constructed warehouse distribution building.
- South: Brodiaea Avenue followed by County of Riverside Waste Management Headquarters buildings (14290 and 14310 Frederick Street).
- West: Frederick Street followed by multi-tenant commercial buildings and Moreno Valley City Hall.

Based on visual observations, current activities at the adjacent properties do not appear to be of environmental concern to the Site.

3 USER-PROVIDED INFORMATION

Arcadis was not provided with an ASTM User Questionnaire.

3.1 Environmental Liens

Arcadis' review of regulatory records did not identify environmental liens recorded for the Site.

3.2 Activity and Use Limitations

Arcadis' review of regulatory records did not identify activity and use limitations, such as engineering controls, land use restrictions or institutional controls, that are in place at the Site and/or have been filed or recorded in a registry.

3.3 Specialized Knowledge

Newcastle does not have specialized knowledge of the Site.

3.4 Valuation Reduction for Environmental Issues

Newcastle did not comment on whether the purchase price reasonably reflects the fair market value of the property.

3.5 Commonly Known or Reasonably Ascertainable Information

Newcastle is not aware of:

- The past use of the property;
- Specific chemicals that once were present at the property;
- Spills or other chemical releases that may have taken place at the property; or
- Environmental cleanups that may have taken place at the property.

3.6 Obvious Contamination Presence or Likely Presence

According to Newcastle, there are no obvious indicators that point to the presence or likely presence of contamination at the property.

3.7 Owner, Property Manager, and Occupant Information

The Site is owned and managed by Dr. Prabhu Dhalla and other individuals. According to Mr. Finn Comer, Senior Vice President with Lee & Associates and broker for the Site, Dr. Dhalla has owned the Site for approximately 20 years. He acquired the Site from the Resolution Trust Corporation. There are no site occupants.

3.8 Reason for Performing Phase I ESA

The reason for performing the Phase I ESA was to evaluate current environmental conditions at the Site.

4 SITE HISTORY

Historical information obtained by Arcadis from EDR during this Phase I ESA is summarized in **Table 1**.

Table 1 Historical Information Reviewed

Source	Date	Information Obtained
Sanborn® Fire Insurance Maps	Not Applicable	According to EDR, Sanborn Fire Insurance Maps are not available for the Site or site vicinity ("No Coverage" letter is presented in **Appendix B.**)
Topographic Maps (copies provided in **Appendix B**)	1901, 1942, 1947, 1953, 1967, 1980, and 2012	The 1901 map depicts the Site as undeveloped land south of an unnamed road in the current location of Alessandro Boulevard. Other than several roads, scattered residences and railroad tracks, the surrounding area is also depicted as undeveloped land. The 1942 and 1947 maps depict the Site as undeveloped land south of Alessandro Boulevard. The surrounding area is depicted as mostly undeveloped land although a concentration of residential development is shown west/northwest of the Site. The 1953 map depicts the Site as undeveloped land as is the immediate surrounding area. However, pockets of residential development are shown in the greater surrounding area, and March Field, a military installation, is now shown south of the Site. No significant onsite or offsite changes are shown on the 1967 map. However, a pipeline is now shown to run east/west near the southern boundary of the Site in the location of the present-day Brodiaea Avenue. The type of pipeline is not identified. No significant changes are shown onsite or offsite on the 1980 map. The Site is depicted as undeveloped land on the 2012 map. The pipeline at the southern end of the Site is not shown; however, the map indicates that Brodiaea Avenue has been constructed in the same location. March Field, March Air Force Base and March Air Reserve Base are all shown approximately 0.5-mile south of the Site at their closest point. No features were depicted on or off the Site on the maps reviewed that would indicate an obvious environmental concern for the Site. According to the National Pipeline Mapping System, a gas transmission line runs in an east/west direction beneath Brodiaea Avenue. Building setback requirements may be imposed based on the specific location of the pipeline in relation to the Site.

Source	Date	Information Obtained
Aerial Photographs (copies provided in **Appendix B**)	1938, 1949, 1953, 1959, 1967, 1978, 1985, 1989, 1994, 2005, 2006, 2009, 2010, and 2012. And Google Earth 2016 aerial image.	In the 1938 photograph, the Site and surrounding land are shown as undeveloped. However, a road is visible in the present-day location of Alessandro Boulevard north of the Site. The Site remains undeveloped land on the 1949, 1953 and 1959 photographs. The surrounding area is also shown as mostly undeveloped land although a limited amount of development is now visible over 1/3 mile south of the Site. In the 1967 photograph, two circular areas are visible on the Site. Similar features are observed offsite to the east and north. The features appear to be low-lying areas that have accumulated water. Small structures are now visible farther northwest of the Site. In the 1978 photograph, the circular features are no longer visible and the Site is undeveloped land. A trail appears to cross the Site in a northwest to southeast direction. The surrounding area is mostly undeveloped land except for land northwest of the Site, which appears to be developed residentially. No features are shown onsite in the 1985 photograph. More development is shown north of the Site across Alessandro Boulevard. In the 1989 photograph, an unpaved trail along the western boundary of the Site is visible. Land north of the Site is undeveloped followed by commercial/residential development; land west of the Site has been graded; land southwest of the Site has been developed with the present-day multi-tenant buildings; and land south and east of the Site is undeveloped. In the 1994 photograph, there appears to be a more defined unpaved road that meanders along the western boundary of the Site. The surrounding area appears similar to the 1989 photograph except City Hall has now been developed west of the Site. In the 2005 photograph, the Site has been graded and disked. The County of Riverside municipal offices have now been constructed south of the Site and more development is visible west of the Site. The Site remains undeveloped land with no obvious features on the 2006 through 2012 photographs. However, at times the southern boundary appears disturbed and may have been used as a laydown area for adjacent construction activities. No significant changes are observed on the 2016 Google Earth aerial image. The adjacent building east of the Site has not yet been constructed. No features were depicted on or off the Site on the photographs reviewed that would indicate an obvious environmental concern for the Site.

4.1 Previous Environmental Investigations

Arcadis was not provided with prior environmental reports for the Site.

5 RECORDS REVIEW

As part of this assessment, Arcadis reviewed regulatory databases and available agency files and records for the Site. Information from these sources is discussed in the following sections.

5.1 Regulatory Database Research

An environmental database report prepared by EDR was reviewed for local, state, and federal listings for properties within the site area. Included in EDR's report are regulatory databases reviewed by EDR for cases pertaining to leaking underground storage tanks (USTs) and aboveground storage tanks (ASTs), hazardous waste sites, and abandoned sites within the ASTM-specified radii **(Table 2)**. EDR also reviewed selected databases generated by the United States Environmental Protection Agency (U.S. EPA). Explanations of the regulatory agency databases reviewed are presented in EDR's report, which is included as **Appendix C**.

It should be noted that the computerized geocoding technology used in the database search is based on available census data and is only accurate to approximately ±300 feet. Also, elevations were determined from the U.S. Geological Survey Digital Elevation Model and are relative (not absolute). Sites with an elevation equal to or higher than the target property have been differentiated from sites with an elevation lower than the target property.

Sites identified within the study radii were evaluated to determine if they are likely to have adversely impacted the Site. The criteria used to evaluate the potential for adverse impact to the Site include:

- Distance from the Site;
- Expected depth and direction of groundwater and surface water flow;
- Expected storm water flow direction; and
- Presence/absence of documented contaminant releases at the identified sites not identified as remediated.

Table 2 **Regulatory Agency Databases / Lists Reviewed**

Search Radius	Agency	Database	Type of Records in Database
1 mile	U.S. EPA	NPL	Sites designated for Superfund cleanup by the U.S. EPA
	U.S. EPA	CORRACTS	RCRA facilities undergoing "corrective actions"
0.5 mile	U.S. EPA	CERCLIS	Sites under review by the U.S. EPA
	U.S. EPA	TSD	Facilities that treat, store, and/or dispose of hazardous waste
	RWQCB	LUST	Sites with LUSTs

Search Radius	Agency	Database	Type of Records in Database
	SWRCB	SWLF/SWAT	Sites permitted as solid waste landfills, incinerators, or transfer stations
	IWMB	WMUDS/SWAT	Tracking and inventory of waste management units
	U.S. EPA	CERCLIS-NFRAP	CERCLIS sites with no further remedial actions planned.
Site or Adjacent Properties	U.S. EPA	RCRA Generator	Sites that generate large or small quantities of hazardous waste
	U.S. EPA	ERNS	Sites with reported accidental releases of oil and hazardous substances
	RWQCB	UST	Sites with registered USTs

Notes:

BEP = Bond Expenditure Plan

CERCLIS = Comprehensive Environmental Response Compensation and Liability Information System

CORRACTS = Corrective Action Report

ERNS = Emergency Response Notification System

DHS = Department of Public Health

IWMB = Integrated Waste Management Board

LUST = Leaking Underground Storage Tank

NFRAP = No Further Remedial Action Planned

NPL= National Priorities List

OES = Office of Emergency Services

SWAT = Solid Waste Assessment Test

SWLF = Solid Waste Landfills

TSD = Transfer, Storage and Disposal

WMUDS = Waste Management Unit Database

5.1.1 Site

According to EDR's report, the Site is located within the boundaries of a Department of Defense (DOD) property identified as the closed March Air Force Base (MAFB). No further information is provided in the DOD database listing.

The Department of Toxic Substances Control (DTSC) database ENVIROSTOR identifies March Field at 14310 Frederick Street. This address is currently one of the buildings occupied by the south adjacent County of Riverside Waste Management Headquarters. The database listing indicates a current status of "inactive – action required." The database indicates that the property was previously used as a small arms firing range; the contaminant of concern is "explosives"; and the media impacted is soil. A review of this property on the ENVIROSTOR website indicates the area of concern (AOC) is bounded on the north by Alessandro Boulevard, on the east by Heacock Street, on the south by Cactus Avenue, and on the west by Old 215 Frontage Road. The Site lies within the boundaries of this AOC which encompasses 53.3 acres. The most current documents available on ENVIROSTOR are dated 2009. According to a *Site Inspection Report* (Parsons, 2009), March Field was established in 1918 to conduct primary flight training for aviators for World War I. The site consisted of three overlapping skeet ranges used for small arms training. Small arms training was conducted from 1943 to 1947. Contaminants of concern are the residual presence of munitions and explosives of concern (MEC) and munitions constituents (MC). The focus of

the *Site Inspection Report* was Range Complex No. 1 (skeet) which includes the Site. Most of the investigation and soil sampling appears to have been conducted between Brodiaea Avenue and Cactus Avenue south of the Site, and east of Frederick Street. Arsenic, lead and various polycyclic aromatic hydrocarbons (PAHs) were detected in exceedance of their respective human health screening values for surface soil. The report stated "additional sampling is warranted." No more recent reports were available online. Therefore, Arcadis contacted the DTSC for a current update on the status of this AOC and its potential impact on the Site. A response from the DTSC is pending at this time. The Site's location within March Field is a REC for the Site as metals and PAHs may be present in near-surface soil above regulatory screening criteria. See **Appendix D** for a copy of the Parsons report and maps.

The location of the Site is not listed in any other databases. The Site does not have a street address.

5.1.2 Off-Site Properties

According to EDR's report, several properties are listed in the surrounding area. Properties of note are as follows:

Riverside County Department of Waste Management at 14290 Frederick Street, located adjacent to the south of the Site, is listed in the UST database. No site-specific information is provided. As this property is not listed as a LUST site, the presence of a UST does not indicate an environmental concern for the Site. In addition, this facility was built sometime between the late 1990s to early 2000s, and therefore, the UST would be expected to be double-walled and provided with leak detection monitoring equipment.

Thrifty Oil at 22990 Alessandro Boulevard, located adjacent to the northwest of the Site, is listed in several UST databases and in the LUST database. Regarding the LUST listing, the contaminant was gasoline and the media impacted was soil only. The case was closed in 2004. Therefore, based on media impacted and case closure, this property is not expected to present an environmental concern for the Site. This address is also listed as Tesoro gas station in the UST database and as Arco gas station in several other tracking databases. This address is currently occupied by a USA Gasoline gas station. Based on a review of current records on the Regional Water Quality Control Board's (RWQCB) Geotracker website, this address is not an open release site. Therefore, current and past gas station uses at this location do not represent a current concern to the Site.

Plaza Hand Car Wash at 23100 Alessandro Boulevard, located adjacent to the north of the Site, is listed in the UST and LUST databases. The contaminant was gasoline and the media impacted was soil only. The case was closed in 2008. Therefore, based on media impacted and case closure, this property is not expected to present an environmental concern for the Site.

M&M Dry Cleaners at 23080 Alessandro Boulevard, Unit #220, located approximately 0.25-mile north of the Site, is listed in the SLIC and Brownfields databases. The facility has a status of "open – remediation as of 5/8/2017." According to the RWQCB, "In 2012 and 2013, preliminary investigations identified the presence of the dry cleaning solvent perchloroethylene (PCE) in soil and groundwater under the M&M Cleaners, the alley located north of the property, and under the parking lot located to the south. However, these initial investigations have not been able to determine how far the PCE may have migrated since it was released." The RWQCB further stated that "Mitigation of the soil vapor intrusion risk…is the current focus of work at the property."

Arcadis reviewed the most recent groundwater monitoring report for the property (Stantec 2017) posted on Geotracker. Groundwater samples were collected in September 2017 from five wells and analyzed for volatile organic compounds (VOCs) by EPA Test Method 8260B. PCE was detected in all five wells, and above the federal and state Maximum Contaminant Level (MCL) for PCE in drinking water of 5.0 micrograms per liter (µg/L) in four of the wells. The most elevated concentration detected was at the source area (former dry cleaning machine) and the second highest concentration was in the parking lot southwest of the cleaners, which is the interpreted direction of groundwater flow. Stantec states that the extent of groundwater impact has not yet been delineated and recommended continued monitoring of the onsite wells. The report states that a soil vapor extraction (SVE) system operated at the cleaners from May 2016 to February 2017, and helped to reduce the initial higher concentrations of PCE detected in groundwater. The highest concentration detected during the most recent sampling event was 73 µg/L and the historical high, prior to operation of the SVE system, was 310 µg/L. The well south of the cleaners and closest to the Site, was the only well with a concentration of PCE less than the MCL at 3.1 µg/L. According to a *PCE Iso-Concentration Map* in the report, the PCE plume appears to be confined to the general area of the dry cleaners. It is noted that the dry cleaner operated from at least 1991 to 2013, when the dry cleaning machine was removed and the use of PCE discontinued. The dry cleaner has operated as a drop-off only facility since that time.

It appears, based on the findings of the most recent groundwater sampling, previous remediation via the SVE system, regulatory oversight, distance from the Site, and the cross-gradient groundwater flow direction with respect to the Site, that it is unlikely that M&M Cleaners has impacted the Site. See **Appendix D** for a copy of the Stantec report and associated maps.

March Air Force Base (MAFB), located approximately 0.25-mile south of the Site at its closest point, is listed on numerous databases including NPL, CERCLIS, US ENG and INST CONTROLS, ENVIROSTOR, and DOD amongst other databases. A map in the EDR report indicates the northern edge of the Area of Concern (AOC) is Cactus Avenue, which is 0.25-mile south of the Site. The EPA provides the following information on the former MAFB:

> *The 7,123-acre March Air Force Base has been used for aircraft maintenance and repair, refueling operations, and training activities since 1918. In 1980, the Installation Restoration Program (IRP) was developed by the Department of Defense to locate and clean-up hazardous waste sites. The Air Force conducted a preliminary investigation of 39 potentially contaminated IRP sites on base which included three fire training areas, seven inactive landfills, underground solvent storage tanks, an engine test cell, and spills. There are now a total of 44 IRP sites on the March Air Force Base. Three zones of groundwater contamination beneath the base were identified and wells on base were shut down in the late 1980's. Groundwater contamination has migrated to wells located off base; however, a groundwater containment system has been installed to prevent off-site groundwater migration. These wells are no longer in use. Groundwater is contaminated with volatile organic compounds (VOCs) and jet fuel. Soils contain VOCs and heavy metals. The Air Force and Air Reserve Board (ARB) are the lead agencies and PRPs [principal responsible parties] for the site, with EPA and the State performing oversight. EPA, DTSC and RWQCB are working with March ARB to further characterize the groundwater contamination plume in the southeastern portion of the site.*

Based on maps in the most recent *5-Year Review* report (AECOM 2014), plumes of contaminated groundwater that migrated outside the boundaries of MAFB have flowed to the southeast, or away from

the Site. There is no indication that groundwater contamination generated by MAFB has migrated offsite to the north, in the direction of the Site. Therefore, based on the Site's location outside the AOC, the identification of PRPs and regulatory oversight, the former MAFB and current March ARB do not appear to represent an environmental concern for the Site.

Two other sites are listed within the ASTM search radius; however, based on their current status and location in relation to the Site, neither property appears to represent an environmental concern for the Site. In summary, it does not appear that offsite properties represent a concern of environmental impairment or a vapor encroachment condition to the Site at this time. However, prior to development, additional review of the status of M&M Dry Cleaners is recommended.

No properties are listed in EDR's Orphan Summary section other than one additional entry for MAFB.

5.2 Agency Research

Files and records available at the agencies listed in **Table 3** were reviewed for information on the Site.

Table 3 Local Agency Files

Source	Date	Information Obtained
California Regional Water Quality Control Board (RWQCB)	January 2018	Available information maintained by the RWQCB at http://geotracker.waterboards.ca.gov was reviewed for records concerning hazardous spills, USTs, and LUSTs at the Site. There were no records for the Site location. Relevant records for offsite properties are discussed in Section 5.1.2 above.
Department of Toxic Substances Control (DTSC)	January 2018	A review of the DTSC website (http://www.envirostor.dtsc.ca.gov/public/) did not identify any records for the Site location other than those for March Field, as discussed in Section 5.1.1 above.
Riverside County Department of Environmental Health, Hazardous Materials Management Branch (HMMB)	January 2018	No HMMB records were identified in the EDR report for the Site location.

6 ENVIRONMENTAL SETTING

6.1 Topography

According to information obtained from the U.S. Geological Survey 7.5-Minute Series Topographic Map of the Riverside East quadrangle, dated 2012, topography at the Site is approximately 1,562 feet above mean sea level. The general topographic gradient of the surrounding area is level with a slight downward slope to the south.

6.2 Geology

The general geology summary provided by EDR specifies that the sediments beneath the Site have been identified as part of the Cretaceous Granitic Rocks Series of the Cretaceous System of the Mesozoic Era. According to the United States Department of Agriculture Soil Conservation Service, the Site is underlain by the Monserate soil component, which has a soil surface texture of sandy loam and exhibits slow infiltration rates.

6.3 Surface Water

Arcadis did not observe surface water features onsite.

6.4 Hydrogeology

According to a report for a property located approximately 650 feet north of the Site, depth to groundwater in the vicinity of the Site is approximately 35 feet below ground surface with a flow direction to the west/southwest (Stantec 2017). Regional groundwater flow in the location of the former MAFB has been shown to flow to the southeast.

6.5 Flood Zones

According to the EDR report, the Site is not located within a flood zone.

7 SITE RECONNAISSANCE

On December 29, 2017, Ms. Janet Holtz, a representative of Arcadis, performed a reconnaissance-level assessment of the Site to observe general site conditions and indications of the possible release(s) of chemicals to the subsurface. A walk-over site reconnaissance was conducted to identify visible evidence of RECs. Ms. Holtz was unaccompanied during the site reconnaissance. Photographs taken during the site reconnaissance are included in **Appendix A**.

7.1 Methodology and Limiting Conditions

Arcadis' representative was granted full access to the Site. The methodology for the site visit included walking and driving and observing the entire site. There were no limiting conditions.

7.2 General Site Conditions

7.2.1 Site Observations

The approximate 8.78-acre, rectangular-shaped site consists of undeveloped land. The Site's surface has been disked and consists of exposed surface soil and some low-lying dry vegetation. Trees are present along the western boundary of the Site. Small piles of gravel and soil disturbance were observed along the eastern property boundary, likely the result of new construction east of the Site. Minor amounts of windblown trash were observed along the perimeter of the Site. The Site's surface is relatively level and no evidence of staining or the disposal of hazardous materials or wastes was observed onsite.

7.2.2 Hazardous Substances and Petroleum Products in Connection with Identified Uses

No hazardous substances or petroleum products were observed onsite.

7.2.3 Storage Tanks

Arcadis did not observe ASTs at the Site. No evidence of USTs, such as dispensers, pipes, or vent lines, was observed on the Site.

7.2.4 Odors

No odors that would indicate an environmental concern were noted on the Site.

7.2.5 Pools of Liquid

No readily visible standing surface water, pools, or sumps containing liquids likely to be hazardous substances or petroleum products were identified during this assessment.

7.2.6 Drums

No drums were observed onsite.

7.2.7 Hazardous Substances and Petroleum Product Containers (Not Necessarily in Connection with Identified Uses)

No hazardous substances or petroleum products were observed onsite.

7.2.8 Unidentified Substance Containers

No unidentified substance containers were observed during the site reconnaissance.

7.2.9 PCBs

Two pad-mounted transformers are located in the southwest corner of the Site. The transformers are owned and maintained by Southern California Edison (SCE) and are the responsibility of SCE. The transformers appeared to be in good condition and no evidence of seepage or releases was observed. No other electrical or hydraulic equipment known to contain polychlorinated biphenyls (PCBs) or likely to contain PCBs was identified onsite during this assessment.

7.2.10 Pits, Ponds, or Lagoons

During the site visit, Arcadis' representative looked for pits, ponds, or lagoons on the Site. Arcadis' representative also looked for pits, ponds, and lagoons on adjoining properties to the extent that such features could be visually and/ or physically observed from the Site or identified in the interviews or records review. No such features were identified onsite or offsite.

7.2.11 Stained Soil or Pavement

During the site visit, Arcadis' representative did not observe areas of stained soil or pavement.

7.2.12 Stressed Vegetation

During the site visit, Arcadis' representative looked for areas of stressed vegetation (from other than insufficient water). No areas of stressed vegetation were observed during this assessment.

7.2.13 Solid Waste

During the site visit, Arcadis looked for areas that were apparently filled or graded by non-natural causes (or filled with material of unknown origin) that suggest the presence of trash construction debris, demolition debris, or other solid waste disposal, or mounds or depressions suggesting trash or other solid waste disposal. No such areas were observed.

7.2.14 Wastewater

During the site visit, Arcadis looked for wastewater or other liquids (including storm water) or discharges into a drain, ditch, underground injection system, or stream on or adjacent to the Site. There is no process wastewater discharged on site.

7.2.15 Wells

During the site visit, Arcadis looked for wells, including dry wells, water wells, irrigation wells, injection wells, monitoring wells, abandoned wells, oil wells, or other wells. No wells were identified onsite or reported to be onsite.

7.2.16 Septic Systems

During the site visit, Arcadis looked for indications of on-site septic systems or cesspools. No septic systems or cesspools were observed.

7.2.17 Heating / Cooling

There are no structures onsite; therefore, heating and cooling systems were not evaluated for this assessment.

7.2.18 Stains or Corrosion

Arcadis did not observe areas of staining or corrosion during this site assessment.

7.2.19 Drains or Sumps

A storm water drainage feature is located on or adjacent to the southeast corner of the Site. No concerns were noted. Arcadis did not observe any sumps during this site assessment.

8 INTERVIEWS

8.1 Interview with Site Contacts

Mr. Finn Comer with Lee & Associates asked Dr. Dhalla, site owner, if he had any information regarding the Site's location within the historic March Field AOC. Mr. Dhalla replied "This issue has never come up."

9 FINDINGS AND CONCLUSIONS

Arcadis has performed a Phase I ESA in accordance with the ASTM International E1527-13 Standard Practice for Site Assessments: Phase I Environmental Site Assessment Process. Limitations or deviations from this practice are described in Section 1.4 of this report. The findings identified by Arcadis are summarized below and discussed in greater detail in the body of the report.

9.1 Recognized Environmental Conditions

No RECs were identified in connection with the Site, with the following exception:

- The Site's location within March Field is a REC for the Site as metals and PAHs may be present in near-surface soil above regulatory screening criteria.

9.2 Controlled Recognized Environmental Conditions

No CRECs were identified in connection with the Site.

9.3 Historical Recognized Environmental Conditions

No HRECs were identified in connection with the Site.

9.4 *De Minimis* Conditions

The following *de minimis* condition was identified in connection with the Site:

- According to the National Pipeline Mapping System, a gas transmission line runs in an east/west direction beneath Brodiaea Avenue. Building setback requirements may be imposed based on the specific location of the pipeline in relation to the Site.

9.5 Conclusions

Arcadis has performed a Phase I ESA of the Site in conformance with the scope and limitations of ASTM Practice E1527-13 for Phase I ESAs. This assessment has revealed no evidence of RECs in connection with the Site, other than as identified in Section 9.1 above. Arcadis recommends baseline soil sampling for metals and PAHs.

No Phase I ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property. This evaluation was intended to reduce, but not eliminate uncertainty in RECs.

10 DATA GAPS

The interval between aerial photographs and topographic maps exceeds 5 years. These limiting factors represent data gaps. Based on information obtained by Arcadis during our review of historical sources and observation of site conditions during our visit, additional photographs and maps would not appear to be significant and we do not anticipate that the information that could be obtained from these sources would change the conclusions of this report. Pertinent data, if any, obtained by Newcastle following the issuance of this report should be reviewed by an environmental professional and an addendum should be prepared to present an evaluation of the data and any changes to the conclusions of this report, as warranted by the data.

A response from the DTSC to questions on the current status of March Field is pending at this time.

11 ENVIRONMENTAL PROFESSIONALS STATEMENT

The environmental assessment described herein was conducted by the undersigned employee of Arcadis. Arcadis' assessment consisted solely of the activities described in the Introduction of this Report, and in accordance with the ASTM E1527-13 guidelines for Phase I Environmental Site Assessments signed prior to initiation of the assessment, as applicable.

I declare that, to the best of my professional knowledge and belief, I meet the definition of environmental professional as defined in §312.10 of 40 Code of Federal Regulations (CFR) 312, and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject Property. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. *

Report Prepared By:

January 15, 2018

Janet Holtz — Date
Principal Environmental Scientist

*A professional engineer's, geologist's or environmental professional's certification of conditions comprises a declaration of his or her professional judgment. It does not constitute a warranty or guarantee, expressed or implied, nor does it relieve any other party of its responsibility to abide by contract documents, applicable codes, standards, regulations, and ordinances.

12 REFERENCES

AECOM Technical Services, Inc. (AECOM). 2014. Final Third Five-Year Review Report, March Air Reserve Base and Former March Air Force Base, California. September 29.

ASTM International. 2013. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation E1527-13.

Environmental Data Resources, Inc. (EDR). 2017. Radius Map Report with GeoCheck. Inquiry #5146282.2s. December 28.

EDR. 2017. Aerial Photo Decade Package. December 28.

EDR. 2017. Historical Topographic Map Report. December 28.

EDR. 2017. Sanborn Map No Coverage Letter. December 28.

https://pvnpms.phmsa.dot.gov/PublicViewer/

https://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vwsoalphabetic/March+Air+Force+Base?OpenDocument

Parsons. 2009. Site Inspection Report, March Field, Riverside County, CA. June.

Stantec Consulting Services, Inc. 2017. Third Quarter 2017 Groundwater Monitoring Report, M&M Cleaners, 23080 Alessandro Boulevard, Moreno Valley, CA. October 27.

FIGURES

MAP SOURCE: Google Earth Pro 2017, 33°54'55.71"N, 117°15'35.63"W

0 2,500' 5,000'

GRAPHIC SCALE

CENTREPOINTE - UNDEVELOPED LAND
NEC BRODIAEA AVENUE AND FREDERICK STREET
MORENO VALLEY, CALIFORNIA

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: IRVINE, CA DIV/GROUP:ENVCAD DB: E. MURESAN PIC: J. HOLTZ
C:\Users\emuresa\OneDrive - ARCADIS\BIM 360 Docs\Newcastle Partners INC\CM0011971.0000 – Nwcstle PHI ESA\Prpsed Centerpointe Prj\00001 - Phase I ESA\01-DWG\Centrepointe Site plan.dwg LAYOUT: 2 SAVED: 1/15/2018 1:57 PM PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 1/15/2018 1:57 PM
BY: MURESAN, ELENA

MAP SOURCE: Google Earth Pro 2017, 33°54'55.71"N, 117°15'35.63"W

LEGEND:

PROPERTY BOUNDARY

W/D WAREHOUSE DISTRIBUTION

0 400' 800'

GRAPHIC SCALE

CENTREPOINTE - UNDEVELOPED LAND
NEC BRODIAEA AVENUE AND FREDERICK STREET
MORENO VALLEY, CALIFORNIA

SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

APPENDIX A

Site Photographs

ARCADIS

Photograph #1

Description of Photograph:
View of Site looking north from Brodiaea Avenue.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

Photograph #2

Description of Photograph:
Pad-mounted transformers in southwest corner of site.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

ARCADIS

Photograph #3

Description of Photograph:
West boundary of Site looking north.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

Photograph #4

Description of Photograph:
View of Site looking east. The building in the background is offsite.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

ARCADIS

Photograph #5

Description of Photograph:
View of Site from the east side looking west.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

Photograph #6

Description of Photograph:
View of eastern Site boundary adjacent to offsite newly constructed warehouse building.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

ARCADIS

Photograph #7

Description of Photograph:
Gravel piles from adjacent construction activities.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

Photograph #8

Description of Photograph:
Disturbed area in southeast corner of Site from adjacent construction activities.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

ARCADIS

Photograph #9

Description of Photograph:
Storm water feature either adjacent to the southeast corner of the Site or potentially onsite.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

Photograph #10

Description of Photograph:
Brodiaea Avenue followed by County municipal offices south of the Site.

Site Location:
Centerpointe
NEC Brodiaea Ave. & Frederick St.
Moreno Valley, California

Photograph Taken By:
Janet Holtz

Date of Photograph:
December 29, 2017

APPENDIX B

Historical Research Documentation

Centerpointe

Centerpointe

Moreno Valley, CA 92553

Inquiry Number: 5146282.4

December 28, 2017

EDR Historical Topo Map Repo

with QuadMatch

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

12/28/17

Site Name:	Client Name:
Centerpointe	ARCADIS U.S., Inc.
Centerpointe	320 Commerce Suite 200
Moreno Valley, CA 92553	Irvine, CA 92602-0000
EDR Inquiry # 5146282.4	Contact: Janet Holtz

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by ARCADIS U.S., Inc. were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	NA	**Latitude:**	33.91398 33° 54' 50" North
Project:	Newcastle - Moreno Valley	**Longitude:**	-117.260624 -117° 15' 38" West
		UTM Zone:	Zone 11 North
		UTM X Meters:	475907.67
		UTM Y Meters:	3752648.89
		Elevation:	1562.00' above sea level

Maps Provided:

2012
1980
1967
1953
1947
1942
1901

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

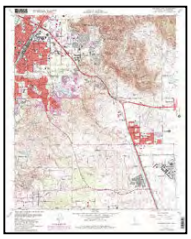
2012 Source Sheets

Riverside East
2012
7.5-minute, 24000

Sunnymead
2012
7.5-minute, 24000

1980 Source Sheets

Sunnymead
1980
7.5-minute, 24000
Aerial Photo Revised 1978



Riverside East
1980
7.5-minute, 24000
Aerial Photo Revised 1978

1967 Source Sheets

Riverside East
1967
7.5-minute, 24000
Aerial Photo Revised 1966

Sunnymead
1967
7.5-minute, 24000
Aerial Photo Revised 1966

1953 Source Sheets

Sunnymead
1953
7.5-minute, 24000
Aerial Photo Revised 1951

Riverside East
1953
7.5-minute, 24000
Aerial Photo Revised 1951

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1947 Source Sheets

RIVERSIDE
1947
15-minute, 50000

1942 Source Sheets

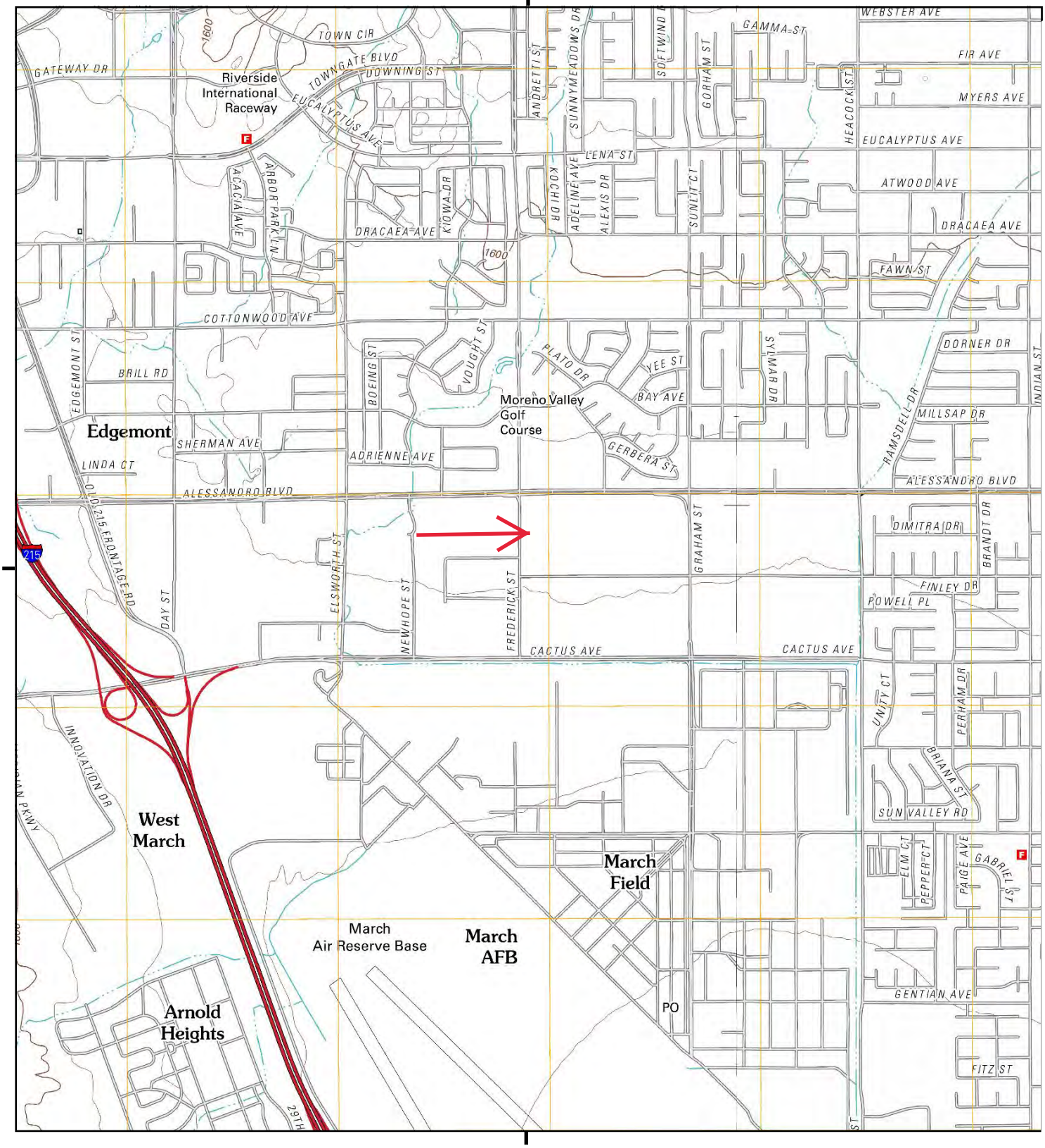
Perris
1942
15-minute, 62500
Aerial Photo Revised 1939

Riverside
1942
15-minute, 62500
Aerial Photo Revised 1939

1901 Source Sheets

Riverside
1901
15-minute, 62500

Historical Topo Map



This report includes information from the following map sheet(s).

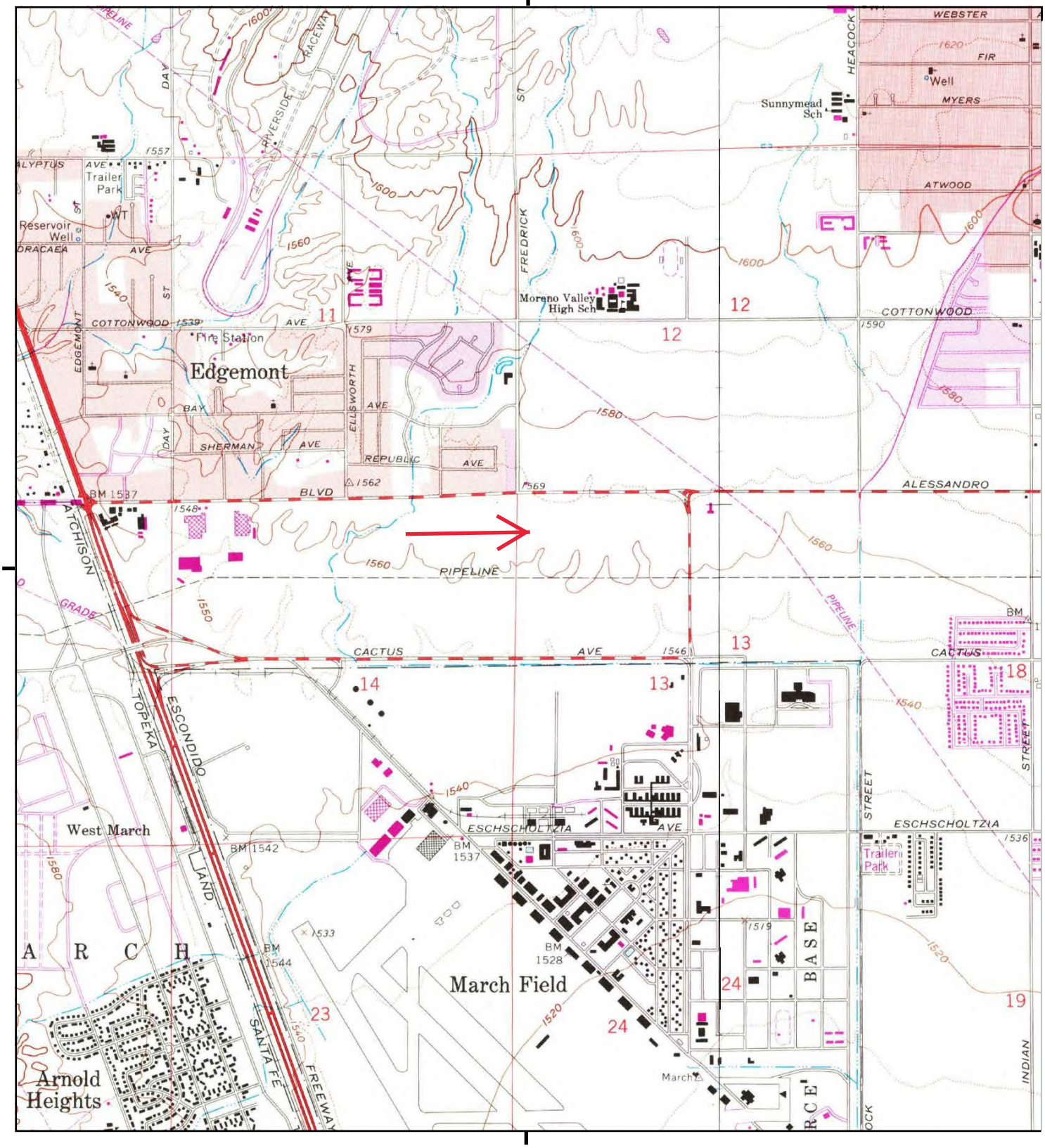
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Riverside East, 2012, 7.5-minute
E, Sunnymead, 2012, 7.5-minute

SITE NAME: Centerpointe
ADDRESS: Centerpointe
Moreno Valley, CA 92553
CLIENT: ARCADIS U.S., Inc.

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

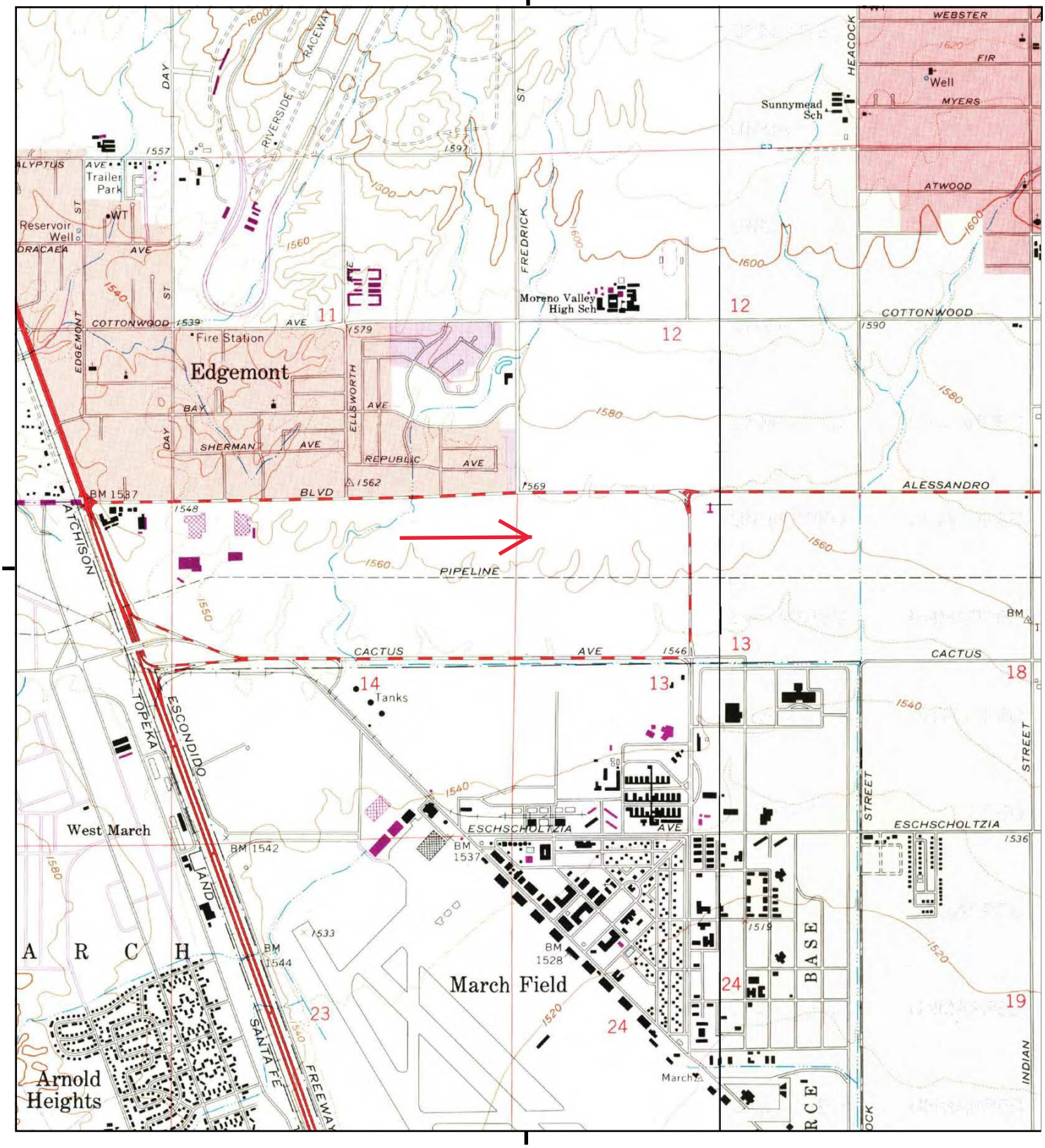
TP, Riverside East, 1980, 7.5-minute
E, Sunnymead, 1980, 7.5-minute

SITE NAME: Centerpointe
ADDRESS: Centerpointe
Moreno Valley, CA 92553
CLIENT: ARCADIS U.S., Inc.

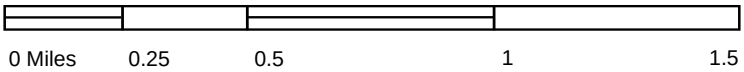
N

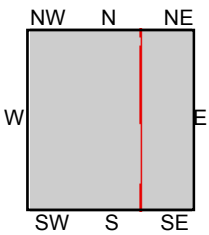
Attachment: Phase I Environmental Site Assessment (3273 : Centerpointe Commerce Center)

Historical Topo Map



This report includes information from the following map sheet(s).



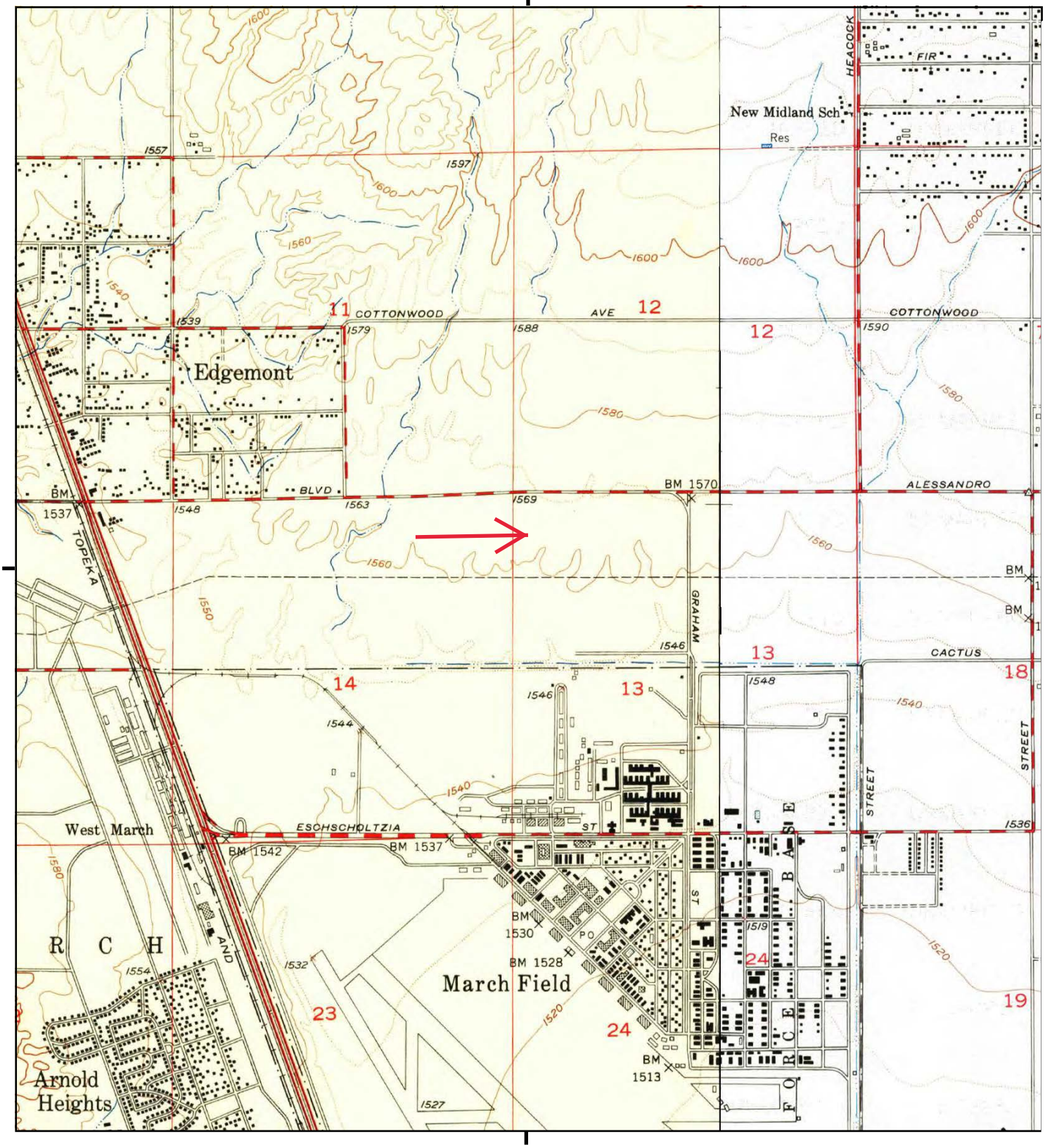


TP, Riverside East, 1967, 7.5-minute
E, Sunnymead, 1967, 7.5-minute

SITE NAME: Centerpointe
ADDRESS: Centerpointe
Moreno Valley, CA 92553
CLIENT: ARCADIS U.S., Inc.

N

Historical Topo Map



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

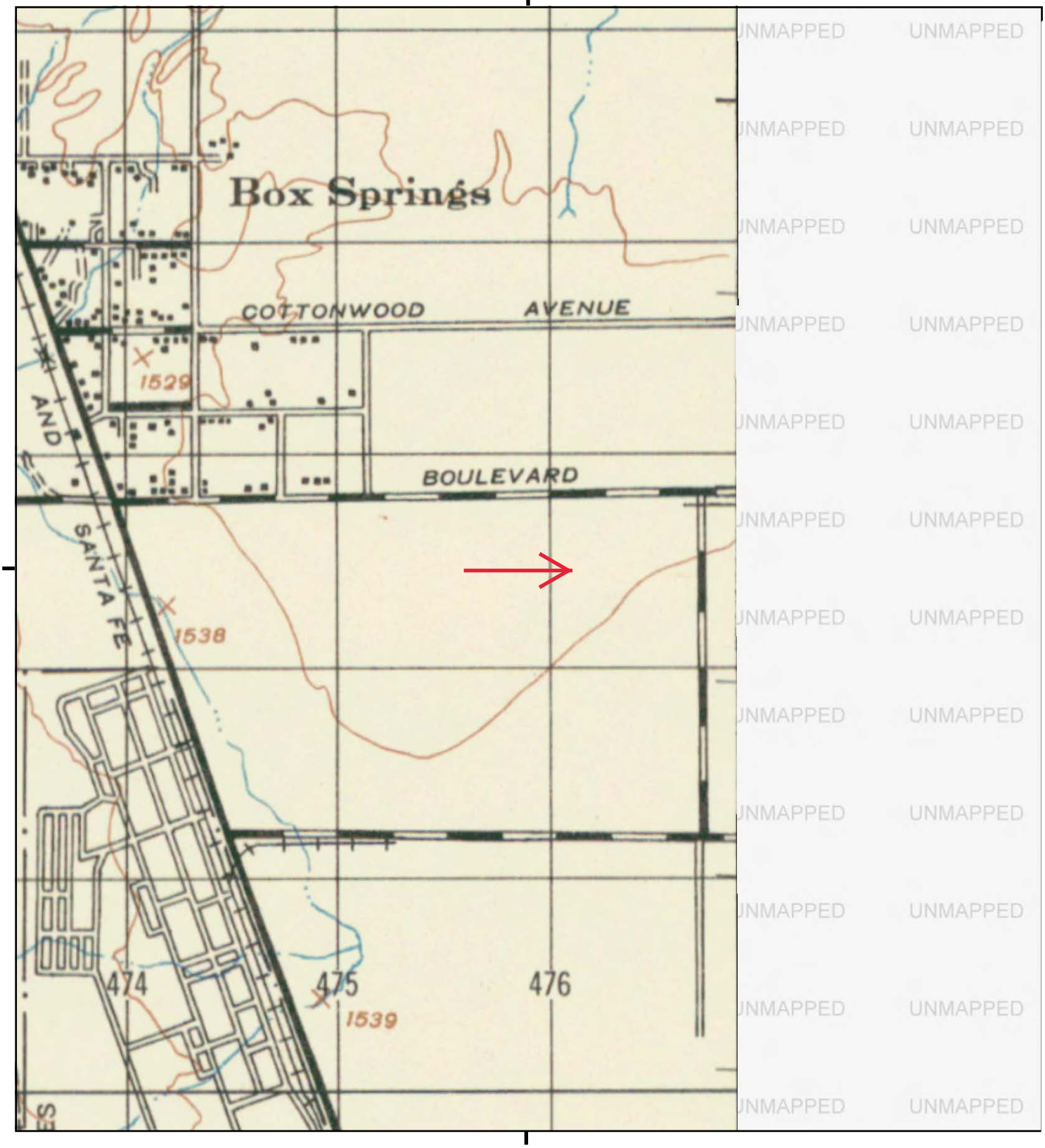
NW N NE
W E
SW S SE

TP, Riverside East, 1953, 7.5-minute
E, Sunnymead, 1953, 7.5-minute

SITE NAME: Centerpointe
ADDRESS: Centerpointe
Moreno Valley, CA 92553
CLIENT: ARCADIS U.S., Inc.

N

Historical Topo Map



This report includes information from the following map sheet(s).

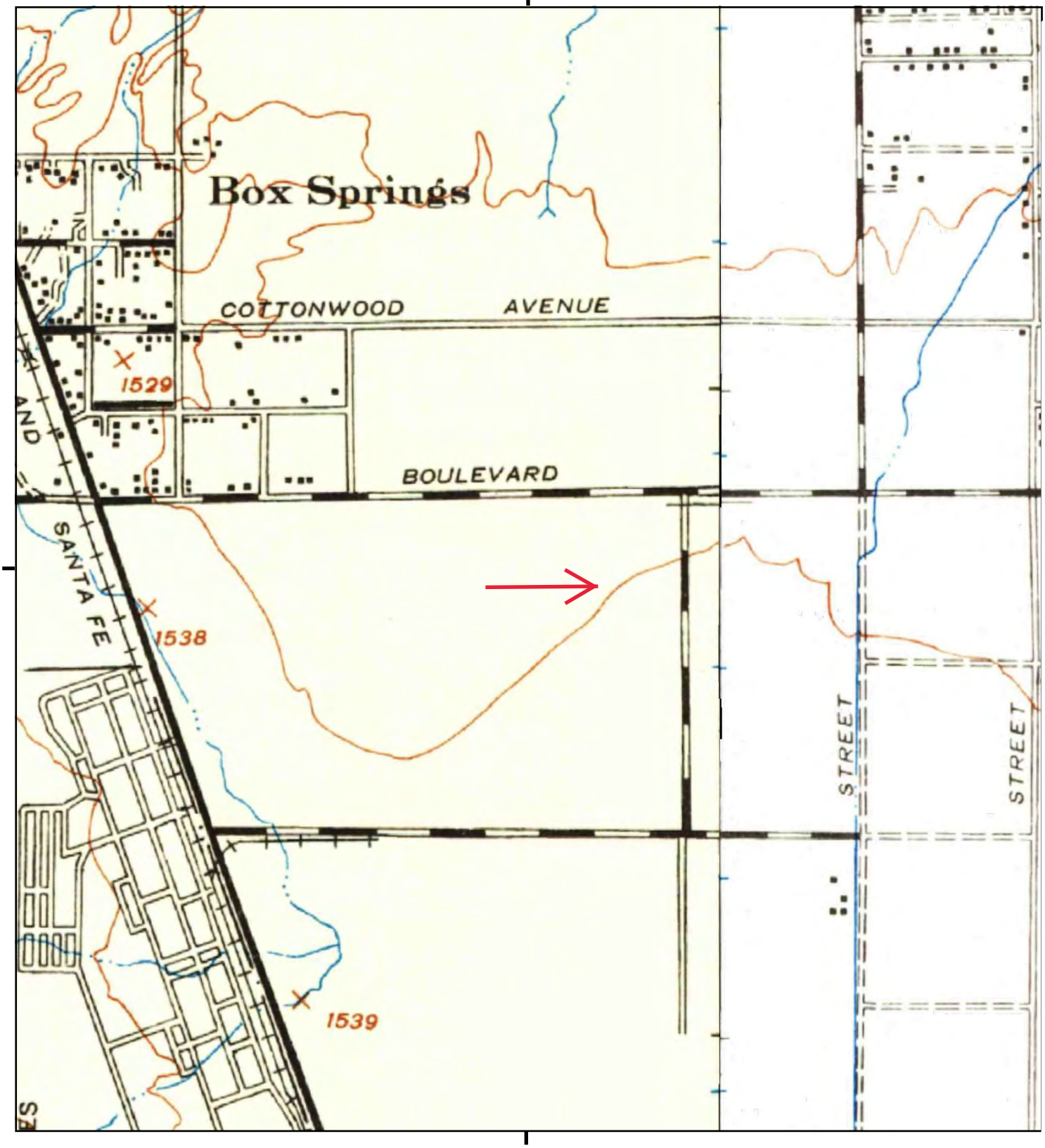
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, RIVERSIDE, 1947, 15-minute

SITE NAME: Centerpointe
ADDRESS: Centerpointe
Moreno Valley, CA 92553
CLIENT: ARCADIS U.S., Inc.

N



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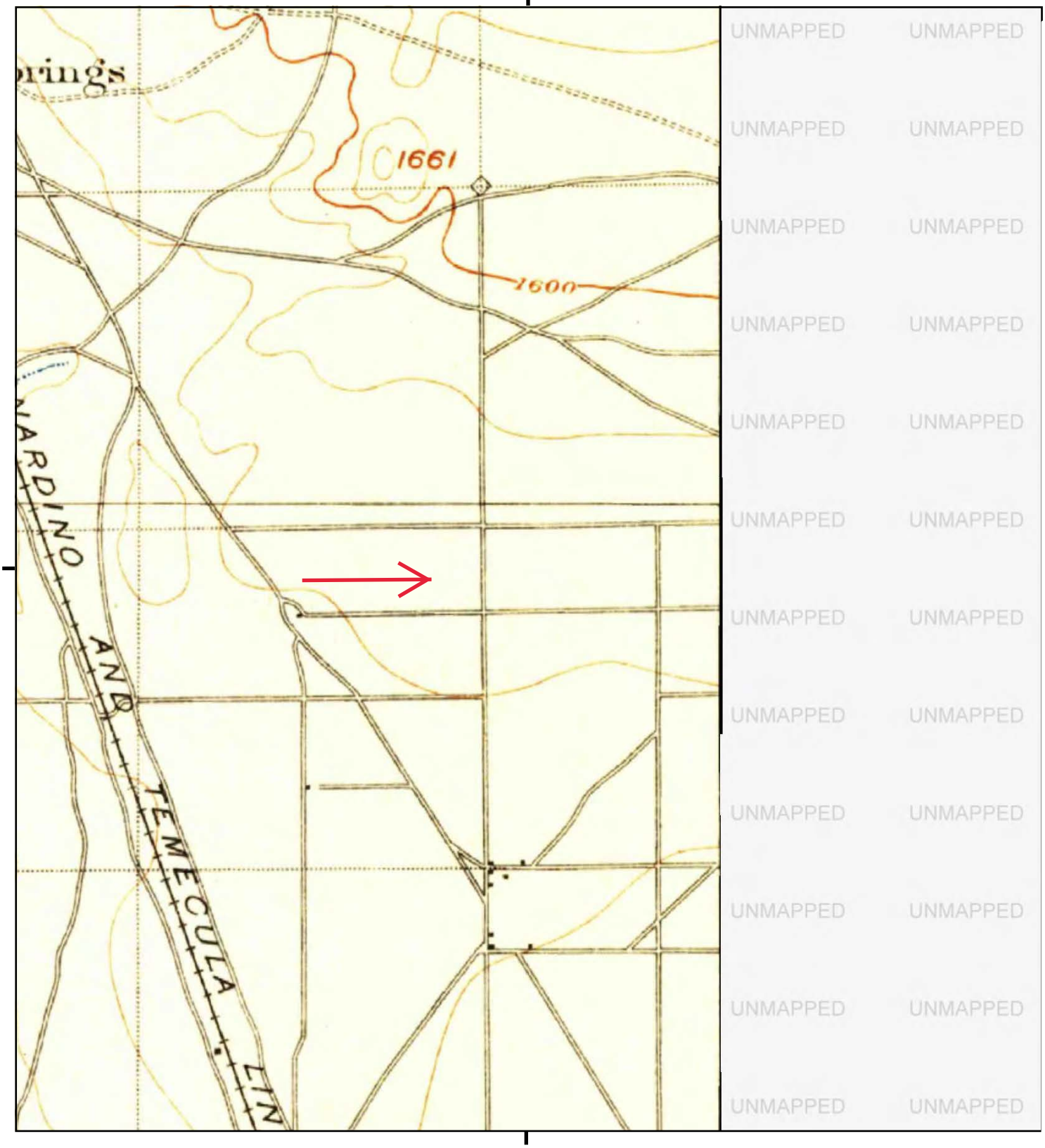
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Riverside, 1942, 15-minute
E, Perris, 1942, 15-minute

SITE NAME: Centerpointe
ADDRESS: Centerpointe
Moreno Valley, CA 92553
CLIENT: ARCADIS U.S., Inc.

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Riverside, 1901, 15-minute

SITE NAME: Centerpointe
ADDRESS: Centerpointe
Moreno Valley, CA 92553
CLIENT: ARCADIS U.S., Inc.

N

Centerpointe

Centerpointe

Moreno Valley, CA 92553

Inquiry Number: 5146282.9

December 28, 2017

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

12/28/17

Site Name:

Centerpointe
Centerpointe
Moreno Valley, CA 92553
EDR Inquiry # 5146282.9

Client Name:

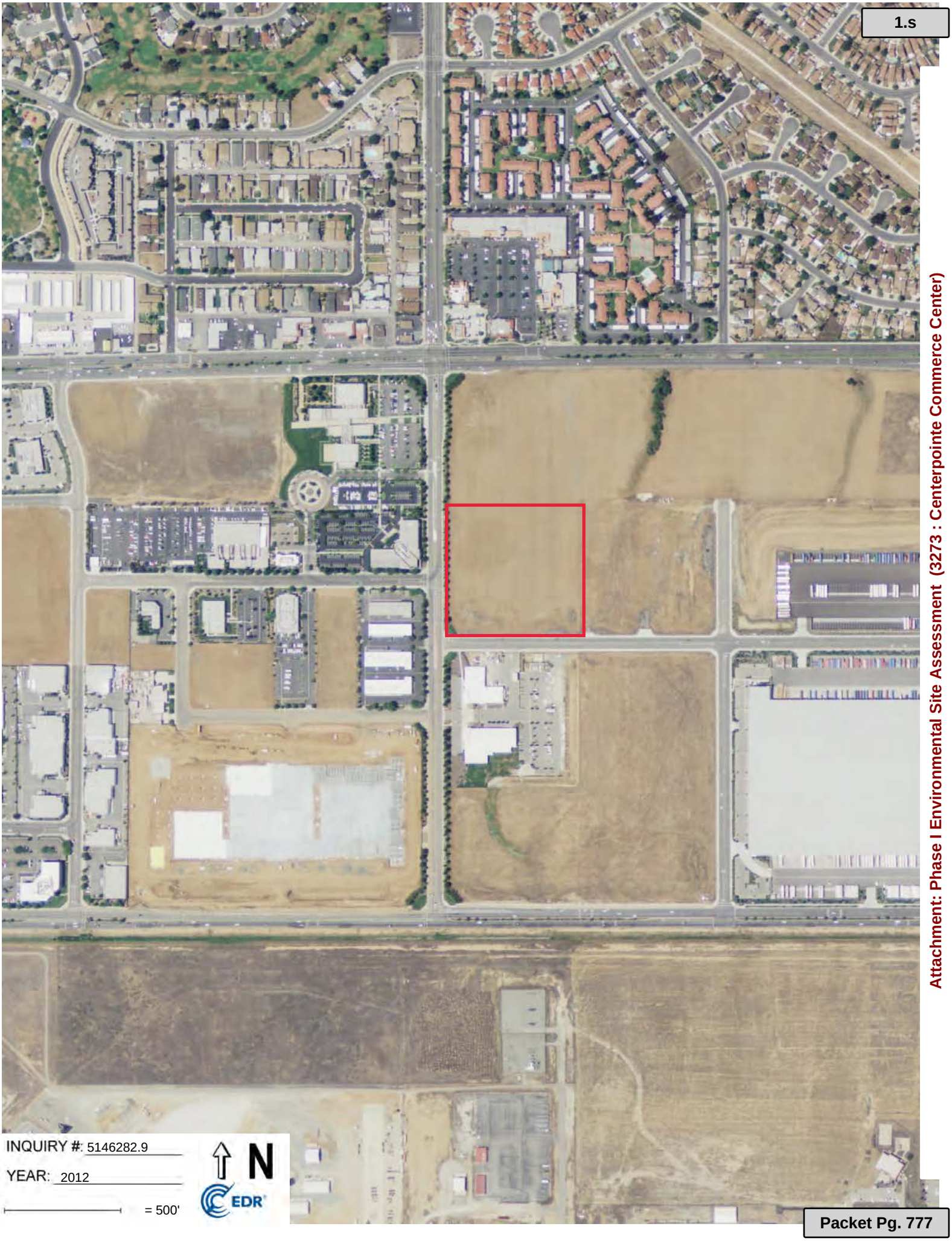
ARCADIS U.S., Inc.
320 Commerce Suite 200
Irvine, CA 92602-0000
Contact: Janet Holtz

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2010	1"=500'	Flight Year: 2010	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
1994	1"=500'	Acquisition Date: June 01, 1994	USGS/DOQQ
1989	1"=500'	Flight Date: August 15, 1989	USDA
1985	1"=500'	Flight Date: July 28, 1985	USDA
1978	1"=500'	Flight Date: September 20, 1978	USDA
1967	1"=500'	Flight Date: May 15, 1967	USDA
1959	1"=500'	Flight Date: October 15, 1959	USGS
1953	1"=500'	Flight Date: September 22, 1953	USDA
1949	1"=500'	Flight Date: May 06, 1949	USDA
1938	1"=500'	Flight Date: June 14, 1938	USDA

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.


INQUIRY #: 5146282.9
YEAR: 2012
= 500'
N
EDR

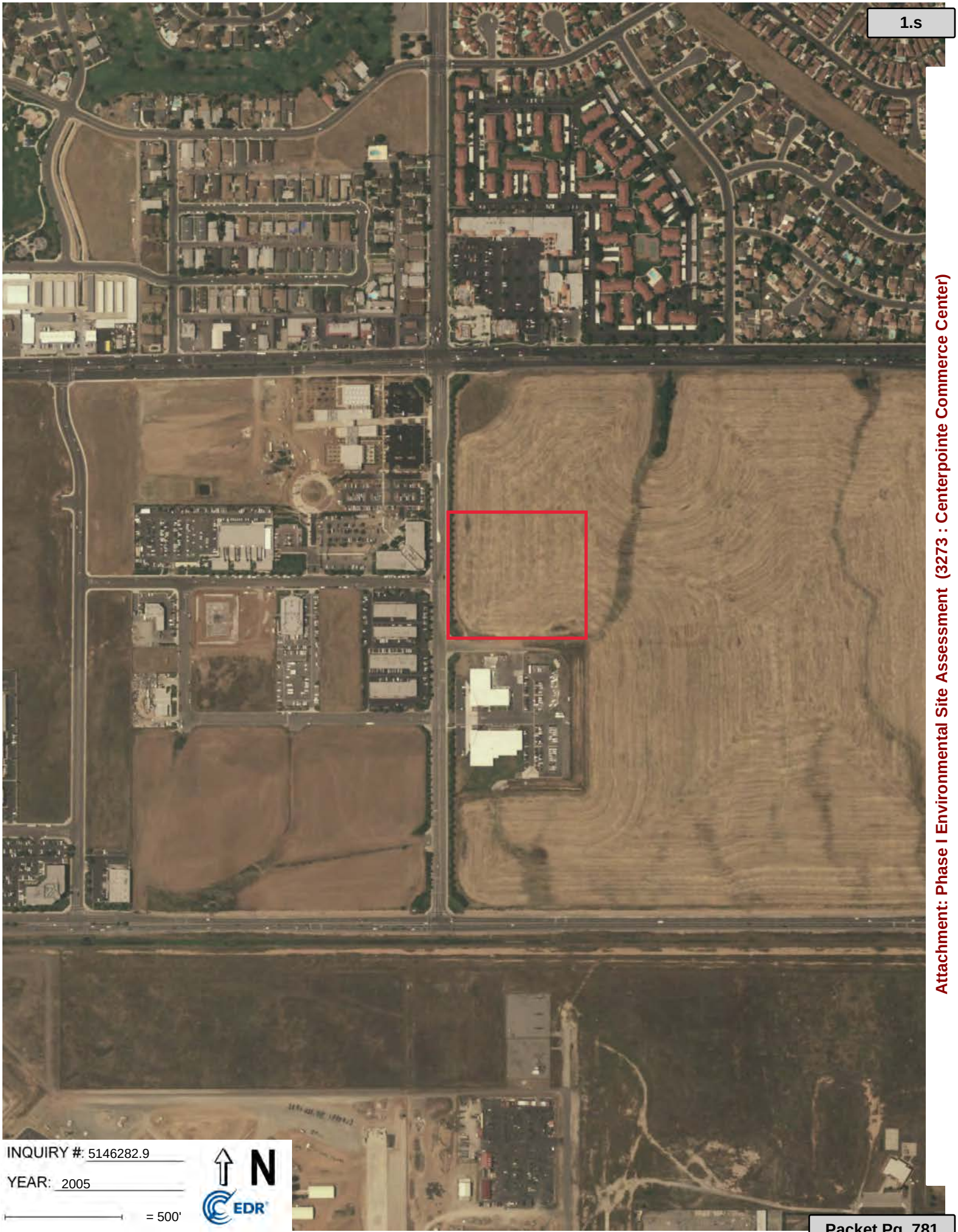
INQUIRY #: 5146282.9

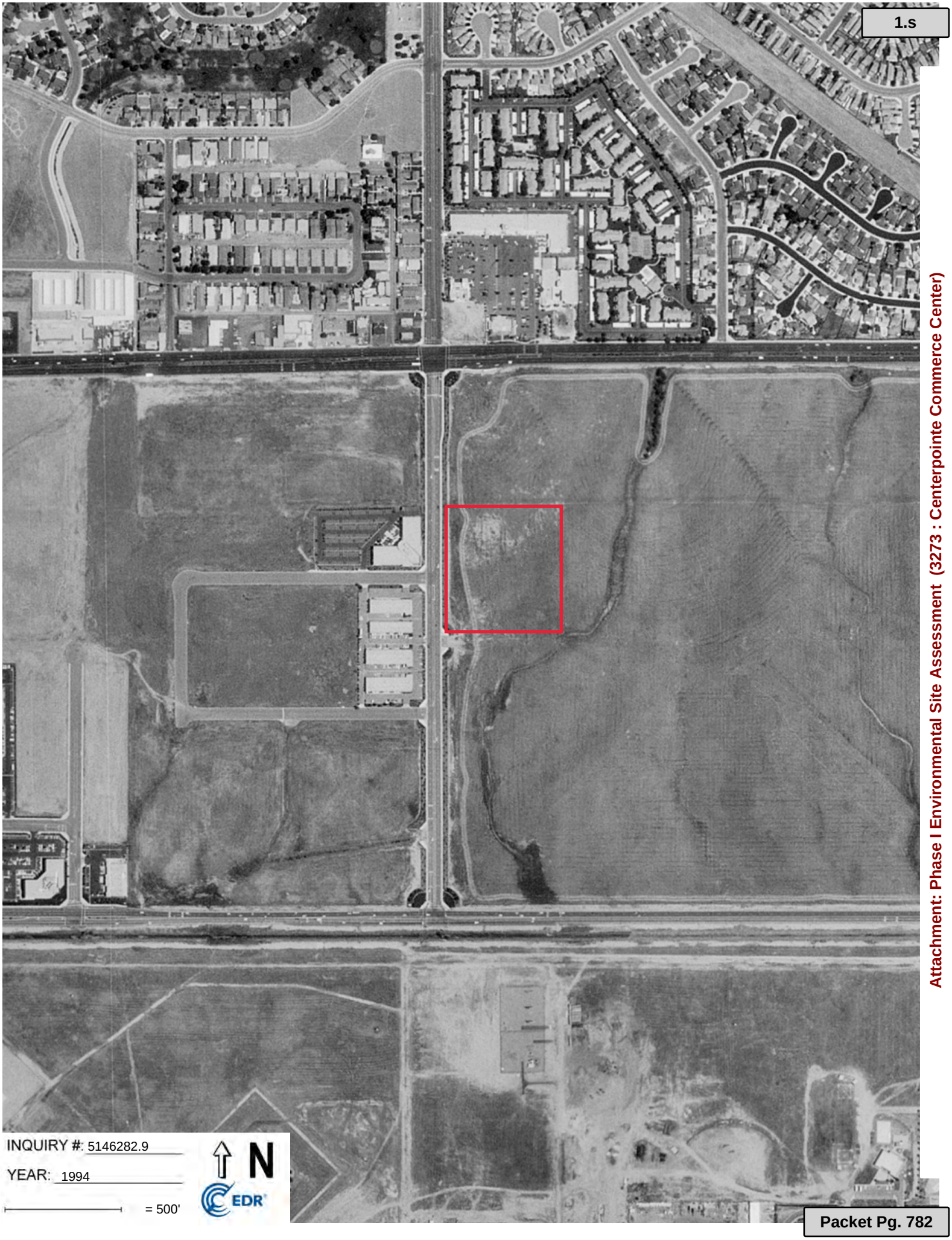
YEAR: 2006

= 500'

N

EDR




INQUIRY #: 5146282.9
YEAR: 1994
= 500'
N
EDR

INQUIRY #: 5146282.9

YEAR: 1989

= 500'

N

EDR

INQUIRY #: 5146282.9

YEAR: 1985

= 500'

N

EDR

INQUIRY #: 5146282.9

YEAR: 1978

= 500'

N

EDR

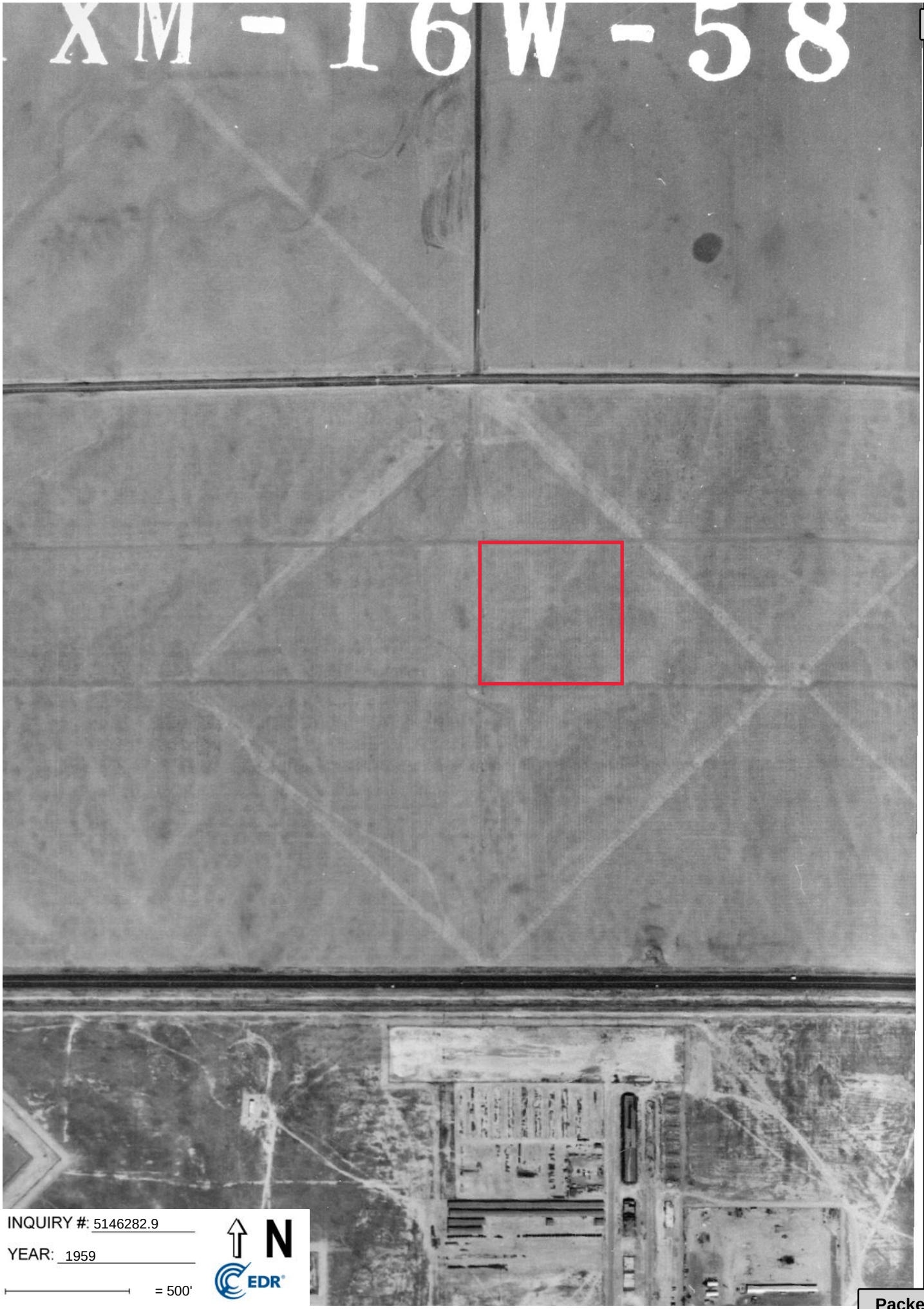
INQUIRY #: 5146282.9

YEAR: 1967

= 500'

N

EDR



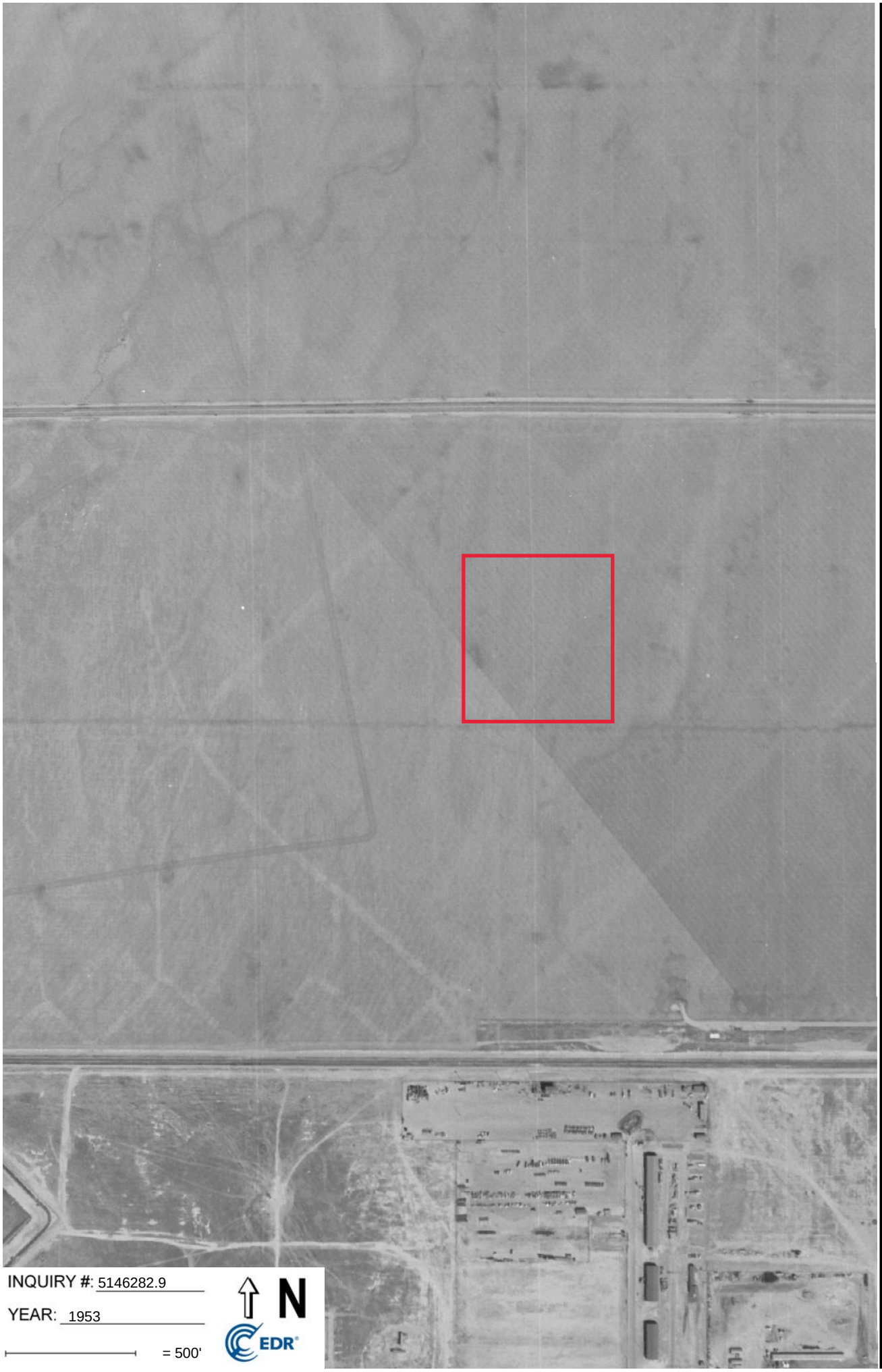
INQUIRY #: 5146282.9

YEAR: 1959

= 500'

N

EDR



INQUIRY #: 5146282.9

YEAR: 1953

= 500'

N

EDR

INQUIRY #: 5146282.9

YEAR: 1949

= 500'

N

EDR

INQUIRY #: 5146282.9

YEAR: 1938

= 500'

N

EDR

Centerpointe

Centerpointe

Moreno Valley, CA 92553

Inquiry Number: 5146282.3

December 28, 2017

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

12/28/17

Site Name:

Centerpointe
Centerpointe
Moreno Valley, CA 92553
EDR Inquiry # 5146282.3

Client Name:

ARCADIS U.S., Inc.
320 Commerce Suite 200
Irvine, CA 92602-0000
Contact: Janet Holtz

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by ARCADIS U.S., Inc. were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 0737-485E-9A62

PO # NA

Project Newcastle - Moreno Valley

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 0737-485E-9A62

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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APPENDIX C

EDR Radius Map Report

Centerpointe
Centerpointe
Moreno Valley, CA 92553

Inquiry Number: 5146282.2s
December 28, 2017

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

CENTERPOINTE
MORENO VALLEY, CA 92553

COORDINATES

Latitude (North):	33.9139800 - 33° 54' 50.32''
Longitude (West):	117.2606240 - 117° 15' 38.24''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	475907.1
UTM Y (Meters):	3752454.8
Elevation:	1562 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5641312 RIVERSIDE EAST, CA
Version Date:	2012
East Map:	5641326 SUNNYMEAD, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140527, 20140603
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
CENTERPOINTE
MORENO VALLEY, CA 92553

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & DIRECTIC
Reg	MARCH AIR FORCE BASE		DOD	Same	1 ft.
Reg	MARCH AIR FORCE BASE	22 CSG/CC	NPL, SEMS, RCRA-LQG, US ENG CONTROLS, US INST...	Same	1401, 0.265
A1	MARCH FIELD	14310 FREDERICK STRE	ENVIROSTOR, HWT	Higher	229, 0.043,
A2	RIVERSIDE COUNTY DEP	14290 FREDERICK ST	UST	Higher	252, 0.048,
3	MARCH FIELD SKEET RA		UXO	Higher	423, 0.080,
B4	TESORO USA #63348	22990 ALESSANDRO BLV	UST	Higher	1289, 0.244
B5	ARCO FACILITY NO 097	22990 ALLESANDRO BLV	RCRA-SQG, FINDS, ECHO	Higher	1289, 0.244
B6	THRIFTY OIL #348	22990 ALESSANDRO BLV	LUST, HIST UST	Higher	1289, 0.244
B7	THRIFTY OIL #348	22990 ALESSANDRO BLV	LUST, SWEEPS UST, CA FID UST, HIST CORTESE	Higher	1289, 0.244
8	PLAZA HAND CAR WASH	23100 ALESSANDRO BLV	LUST, UST	Higher	1345, 0.255
9	MORENO VALLEY RECYCL	22862 ALESSANDRO BLV	SWRCY	Higher	1580, 0.299
10	M&M DRY CLEANERS	23080 ALESSANDRO BOU	SLIC, BROWNFIELDS	Higher	1616, 0.306
11	CIRCLE K #300	22790 ALESSANDRO BLV	LUST, SWEEPS UST, CA FID UST, HIST CORTESE	Higher	1787, 0.338
12	ALPER CLEANERS	14420 ELSWORTH ST.,	ENVIROSTOR	Lower	3012, 0.570

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

Federal ERNS list

ERNS ---------- Emergency Response Notification System

EXECUTIVE SUMMARY

State- and tribal - equivalent NPL

RESPONSE ..... State Response Sites

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ..... Solid Waste Information System

State and tribal leaking storage tank lists

INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST ..... Underground Storage Tank Listing
AST ..... Aboveground Petroleum Storage Tank Facilities
INDIAN UST ..... Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP ..... Voluntary Cleanup Priority Listing
VCP ..... Voluntary Cleanup Program Properties

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT ..... Waste Management Unit Database
HAULERS ..... Registered Waste Tire Haulers Listing
INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
ODI ..... Open Dump Inventory
IHS OPEN DUMPS ..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ..... Delisted National Clandestine Laboratory Register
HIST Cal-Sites ..... Historical Calsites Database
SCH ..... School Property Evaluation Program
CDL ..... Clandestine Drug Labs
Toxic Pits ..... Toxic Pits Cleanup Act Sites
US CDL ..... National Clandestine Laboratory Register

Local Land Records

LIENS ..... Environmental Liens Listing
LIENS 2 ..... CERCLA Lien Information
DEED ..... Deed Restriction Listing

Records of Emergency Release Reports

HMIRS ..... Hazardous Materials Information Reporting System

EXECUTIVE SUMMARY

CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated
FUDS	Formerly Used Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
FINDS	Facility Index System/Facility Registry System
ECHO	Enforcement & Compliance History Information
DOCKET HWC	Hazardous Waste Compliance Docket Listing
FUELS PROGRAM	EPA Fuels Program Registered Listing
CA BOND EXP. PLAN	Bond Expenditure Plan
Cortese	"Cortese" Hazardous Waste & Substances Sites List
CUPA Listings	CUPA Resources List
DRYCLEANERS	Cleaner Facilities
EMI	Emissions Inventory Data
ENF	Enforcement Action Listing
Financial Assurance	Financial Assurance Information Listing
HAZNET	Facility and Manifest Data
ICE	ICE
HWP	EnviroStor Permitted Facilities Listing
MINES	Mines Site Location Listing
MWMP	Medical Waste Management Program Listing
NPDES	NPDES Permits Listing

EXECUTIVE SUMMARY

PEST LIC ---------- Pesticide Regulation Licenses Listing
PROC ---------- Certified Processors Database
Notify 65 ---------- Proposition 65 Records
UIC ---------- UIC Listing
WASTEWATER PITS ---------- Oil Wastewater Pits Listing
WDS ---------- Waste Discharge System
WIP ---------- Well Investigation Program Case List

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---------- EDR Proprietary Manufactured Gas Plants
EDR Hist Auto ---------- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ---------- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---------- Recovered Government Archive Solid Waste Facilities List
RGA LUST ---------- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: Also known as Superfund, the National Priority List database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program. The source of this database is the U.S. EPA.

A review of the NPL list, as provided by EDR, and dated 10/10/2017 has revealed that there is 1 NPL site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH AIR FORCE BASE	***22 CSG/CC***	***S 1/4 - 1/2 (0.265 mi.)***	***0***	***8***

EXECUTIVE SUMMARY

Federal CERCLIS list

SEMS: SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the SEMS list, as provided by EDR, and dated 07/11/2017 has revealed that there is 1 SEMS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH AIR FORCE BASE	*22 CSG/CC*	*S 1/4 - 1/2 (0.265 mi.)*	*0*	*8*

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 09/13/2017 has revealed that there is 1 RCRA-SQG site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ARCO FACILITY NO 097	*22990 ALLESANDRO BLV*	*NNW 1/8 - 1/4 (0.244 mi.)*	*B5*	*51*

Federal institutional controls / engineering controls registries

US ENG CONTROLS: A listing of sites with engineering controls in place.

A review of the US ENG CONTROLS list, as provided by EDR, and dated 08/10/2017 has revealed that there is 1 US ENG CONTROLS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH AIR FORCE BASE	*22 CSG/CC*	*S 1/4 - 1/2 (0.265 mi.)*	*0*	*8*

US INST CONTROL: A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

A review of the US INST CONTROL list, as provided by EDR, and dated 08/10/2017 has revealed that

EXECUTIVE SUMMARY

there is 1 US INST CONTROL site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH AIR FORCE BASE	***22 CSG/CC***	***S 1/4 - 1/2 (0.265 mi.)***	***0***	***8***

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 10/30/2017 has revealed that there are 2 ENVIROSTOR sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH FIELD	***14310 FREDERICK STRE***	***NW 0 - 1/8 (0.043 mi.)***	***A1***	***49***
Facility Id: 80000870				
Status: Inactive - Action Required				

Lower Elevation	Address	Direction / Distance	Map ID	Page
ALPER CLEANERS	14420 ELSWORTH ST.,	WSW 1/2 - 1 (0.570 mi.)	12	67
Facility Id: 33720002				
Status: Refer: 1248 Local Agency				

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 4 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
THRIFTY OIL #348	***22990 ALESSANDRO BLV***	***NNW 1/8 - 1/4 (0.244 mi.)***	***B6***	***53***
Database: LUST, Date of Government Version: 09/11/2017				
Status: Completed - Case Closed				
Global Id: T0606500421				
THRIFTY OIL #348	***22990 ALESSANDRO BLV***	***NNW 1/8 - 1/4 (0.244 mi.)***	***B7***	***55***
Database: LUST REG 8, Date of Government Version: 02/14/2005				
Database: RIVERSIDE CO. LUST, Date of Government Version: 10/11/2017				

EXECUTIVE SUMMARY

Facility Status: Preliminary site assessment underway
Facility Id: 95137
Facility Status: 9
Global ID: T0606500421

PLAZA HAND CAR WASH ***23100 ALESSANDRO BLV*** ***NNE 1/4 - 1/2 (0.255 mi.)*** ***8*** ***58***
Database: LUST, Date of Government Version: 09/11/2017
Database: RIVERSIDE CO. LUST, Date of Government Version: 10/11/2017
Status: Completed - Case Closed
Facility Id: 200521458
Global Id: T0606563337
Facility Status: 9

CIRCLE K #300 ***22790 ALESSANDRO BLV*** ***NW 1/4 - 1/2 (0.338 mi.)*** ***11*** ***63***
Database: LUST REG 8, Date of Government Version: 02/14/2005
Database: LUST, Date of Government Version: 09/11/2017
Database: RIVERSIDE CO. LUST, Date of Government Version: 10/11/2017
Status: Completed - Case Closed
Facility Status: Case Closed
Facility Id: 921020
Global Id: T0606500109
Facility Status: 9
Global ID: T0606500109

SLIC: Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the SLIC list, as provided by EDR, has revealed that there is 1 SLIC site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
M&M DRY CLEANERS	***23080 ALESSANDRO BOU***	***N 1/4 - 1/2 (0.306 mi.)***	***10***	***61***

Database: SLIC, Date of Government Version: 09/11/2017
Facility Status: Open - Remediation
Global Id: T10000004432

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, has revealed that there are 2 UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIVERSIDE COUNTY DEP	14290 FREDERICK ST	NNW 0 - 1/8 (0.048 mi.)	A2	50

Database: RIVERSIDE CO. UST, Date of Government Version: 10/12/2017
Database: UST, Date of Government Version: 09/11/2017

EXECUTIVE SUMMARY

Facility Id: FA0023076

TESORO USA #63348 | 22990 ALESSANDRO BLV | NNW 1/8 - 1/4 (0.244 mi.) | B4 | 51
Database: RIVERSIDE CO. UST, Date of Government Version: 10/12/2017
Database: UST, Date of Government Version: 09/11/2017
Facility Id: 68
Facility Id: FA0014719

State and tribal Brownfields sites

BROWNFIELDS: A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

A review of the BROWNFIELDS list, as provided by EDR, and dated 09/21/2017 has revealed that there is 1 BROWNFIELDS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
M&M DRY CLEANERS	***23080 ALESSANDRO BOU***	***N 1/4 - 1/2 (0.306 mi.)***	***10***	***61***

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: A listing of recycling facilities in California.

A review of the SWRCY list, as provided by EDR, and dated 09/11/2017 has revealed that there is 1 SWRCY site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MORENO VALLEY RECYCL Cert Id: RC11825	22862 ALESSANDRO BLV	NW 1/4 - 1/2 (0.299 mi.)	9	61

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is 1 SWEEPS UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
THRIFTY OIL #348 Status: A Tank Status: A	***22990 ALESSANDRO BLV***	***NNW 1/8 - 1/4 (0.244 mi.)***	***B7***	***55***

EXECUTIVE SUMMARY

Comp Number: 4735

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
THRIFTY OIL #348 Facility Id: 00000004735	***22990 ALESSANDRO BLV***	***NNW 1/8 - 1/4 (0.244 mi.)***	***B6***	***53***

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there is 1 CA FID UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
THRIFTY OIL #348 Facility Id: 33001092 Status: A	***22990 ALESSANDRO BLV***	***NNW 1/8 - 1/4 (0.244 mi.)***	***B7***	***55***

Other Ascertainable Records

DOD: Consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

A review of the DOD list, as provided by EDR, and dated 12/31/2005 has revealed that there is 1 DOD site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH AIR FORCE BASE		0 - 1/8 (0.000 mi.)	0	8

ROD: Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid the cleanup.

A review of the ROD list, as provided by EDR, and dated 09/27/2017 has revealed that there is 1 ROD site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH AIR FORCE BASE	***22 CSG/CC***	***S 1/4 - 1/2 (0.265 mi.)***	***0***	***8***

EXECUTIVE SUMMARY

UXO: A listing of unexploded ordnance site locations

A review of the UXO list, as provided by EDR, and dated 10/25/2016 has revealed that there is 1 UXO site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH FIELD SKEET RA		W 0 - 1/8 (0.080 mi.)	3	50

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 2 HIST CORTESE sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
THRIFTY OIL #348 Reg Id: 083302648T	***22990 ALESSANDRO BLV***	***NNW 1/8 - 1/4 (0.244 mi.)***	***B7***	***55***
CIRCLE K #300 Reg Id: 083301110T	***22790 ALESSANDRO BLV***	***NW 1/4 - 1/2 (0.338 mi.)***	***11***	***63***

HWT: A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

A review of the HWT list, as provided by EDR, and dated 10/10/2017 has revealed that there is 1 HWT site within approximately 0.25 miles of the target property.

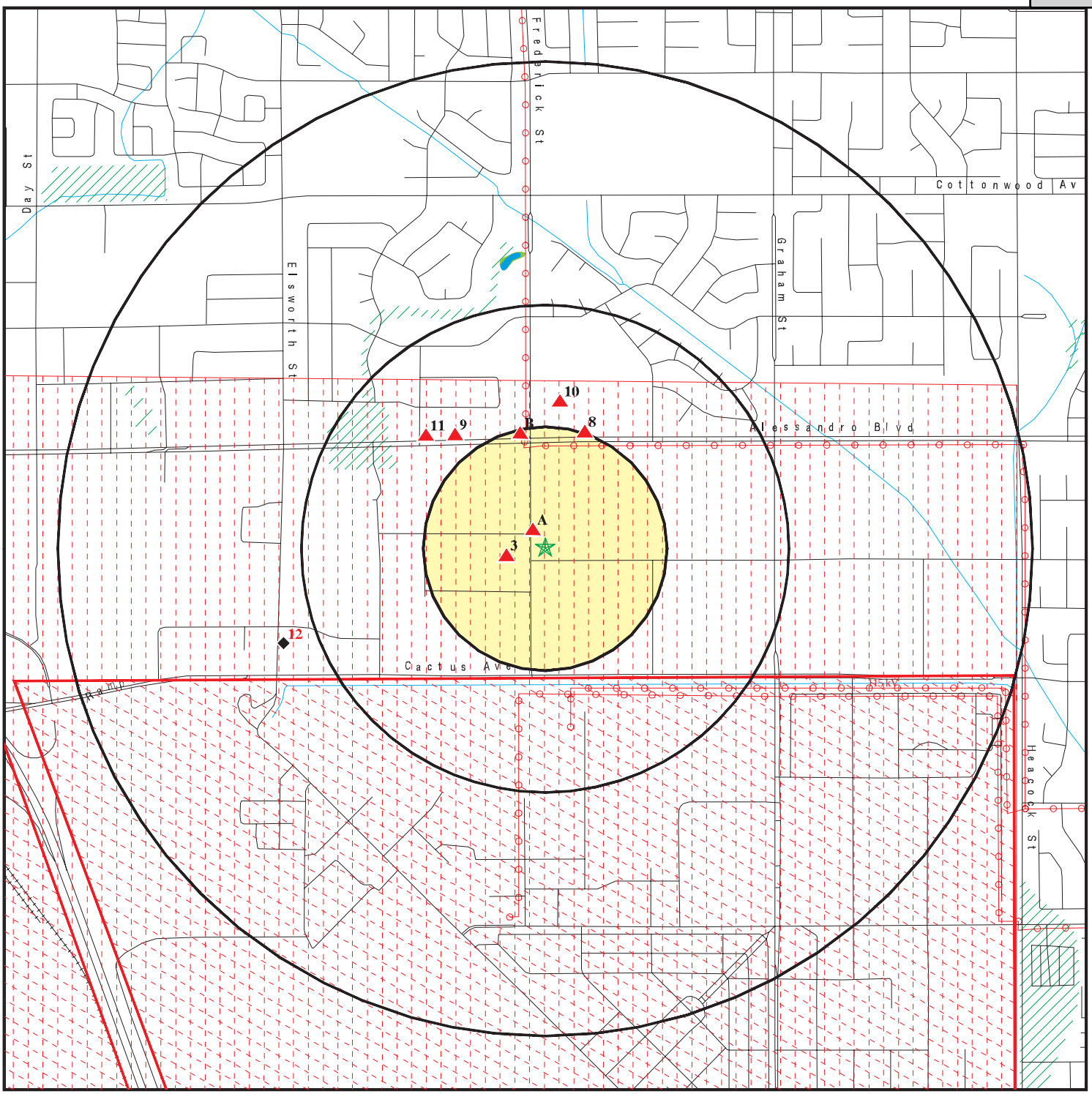
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH FIELD Reg Num: 3450	***14310 FREDERICK STRE***	***NW 0 - 1/8 (0.043 mi.)***	***A1***	***49***

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 1 records.

Site Name	Database(s)
U.S. AIR FORCE - MARCH AFB (FORMER	SLIC

OVERVIEW MAP - 5146282.2S



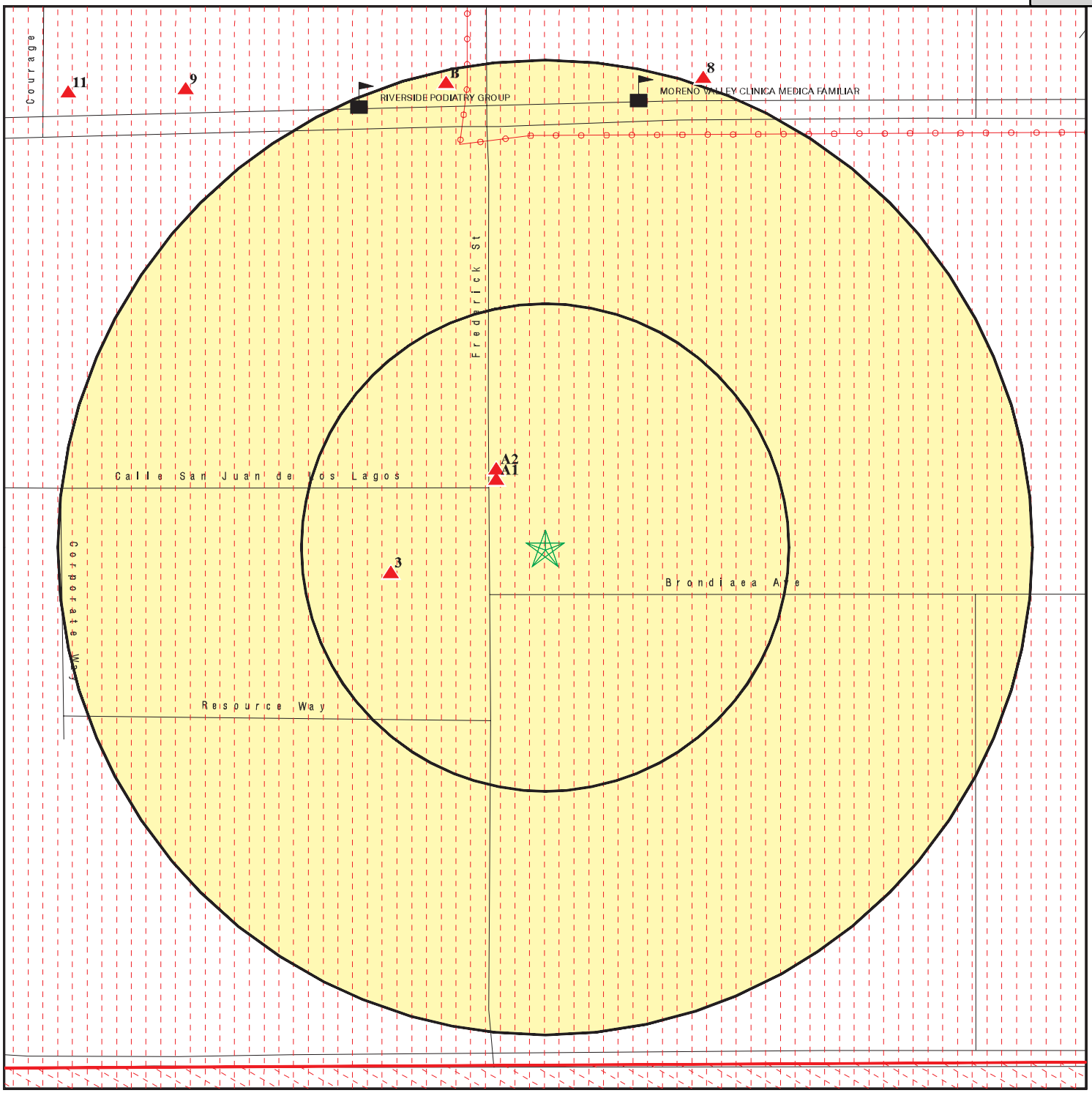
- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Upgradient Area
- Areas of Concern

0 1/4 1/2 1 Miles

This report includes Interactive Map Layers display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Centerpointe	CLIENT: ARCADIS U.S., Inc.
ADDRESS: Centerpointe Moreno Valley CA 92553	CONTACT: Janet Holtz
LAT/LONG: 33.91398 / 117.260624	INQUIRY #: 5146282.2s DATE: December 28, 2017 9:58 am

DETAIL MAP - 5146282.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Centerpointe	CLIENT: ARCADIS U.S., Inc.
ADDRESS: Centerpointe Moreno Valley CA 92553	CONTACT: Janet Holtz
LAT/LONG: 33.91398 / 117.260624	INQUIRY #: 5146282.2s DATE: December 28, 2017 10:01 am

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	1	0	NR	1
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	1	NR	NR	1
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	1	NR	NR	NR	1
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	1	NR	NR	1
US INST CONTROL	0.500		0	0	1	NR	NR	1
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		1	0	0	1	NR	2
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	2	2	NR	NR	4

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
SLIC	0.500		0	0	1	NR	NR	1
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		1	1	NR	NR	NR	2
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	1	NR	NR	1
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	1	NR	NR	1
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	1	NR	NR	NR	1
HIST UST	0.250		0	1	NR	NR	NR	1
CA FID UST	0.250		0	1	NR	NR	NR	1
Local Land Records								
LIENS	TP		NR	NR	NR	NR	NR	0
LIENS 2	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		1	0	0	0	NR	1
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	1	0	NR	1
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
UXO	1.000		1	0	0	0	NR	1
ECHO	TP		NR	NR	NR	NR	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
ICE	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	1	1	NR	NR	2
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		1	0	NR	NR	NR	1
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	5	8	11	1	0	25

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
DOD Region **< 1/8** **1 ft.**	**MARCH AIR FORCE BASE (CLOSED)** **MARCH AIR FORCE BASE (CLO (County), CA**	**DOD**	**CUSA143538** **N/A**

DOD:

Feature 1:	Air Force DOD
Feature 2:	Not reported
Feature 3:	Not reported
URL:	Not reported
Name 1:	March Air Force Base (Closed)
Name 2:	Not reported
Name 3:	Not reported
State:	CA
DOD Site:	Yes
Tile name:	CARIVERSIDE

NPL Region South 1/4-1/2 1401 ft.	**MARCH AIR FORCE BASE** **22 CSG/CC** **RIVERSIDE, CA 92518**	**NPL** **SEMS** **RCRA-LQG** **US ENG CONTROLS** **US INST CONTROL** **ROD** **PRP**	**1000169261** **CA4570024527**

NPL:

EPA ID:	CA4570024527
Cerclis ID:	902761
EPA Region:	9
Federal:	Y
Final Date:	1989-11-21 00:00:00
Site Score:	31.940000000000001
Latitude:	33.906379999999999
Longitude:	-117.2557

Category Details:

NPL Status:	Currently on the Final NPL
Category Description:	Depth To Aquifer-> 50 And <= 100 Feet
Category Value:	65

NPL Status:	Currently on the Final NPL
Category Description:	Distance To Nearest Population-> 0 And <= 1/4 Mile
Category Value:	10

Site Details:

Site Name:	MARCH AIR FORCE BASE
Site Status:	Final
Site Zip:	92518
Site City:	RIVERSIDE
Site State:	CA
Federal Site:	Yes
Site County:	RIVERSIDE
EPA Region:	09
Date Proposed:	07/14/89
Date Deleted:	Not reported
Date Finalized:	11/21/89

MARCH AIR FORCE BASE (Continued) **1000169261**

Substance Details:

NPL Status:	Currently on the Final NPL
Substance ID:	Not reported
Substance:	Not reported
CAS #:	Not reported
Pathway:	Not reported
Scoring:	Not reported

NPL Status:	Currently on the Final NPL
Substance ID:	A046
Substance:	POLYCHLORINATED BIPHENYLS
CAS #:	1336-36-3
Pathway:	GROUND WATER PATHWAY
Scoring:	3

NPL Status:	Currently on the Final NPL
Substance ID:	U210
Substance:	TETRACHLOROETHENE
CAS #:	127-18-4
Pathway:	GROUND WATER PATHWAY
Scoring:	2

NPL Status:	Currently on the Final NPL
Substance ID:	U228
Substance:	TRICHLOROETHYLENE (TCE)
CAS #:	79-01-6
Pathway:	GROUND WATER PATHWAY
Scoring:	2

Summary Details:

Conditions at proposal July 14, 1989): March Air Force Base MAFB) covers approximately 7,000 acres near Riverside in the Moreno Valley in Riverside County, California. MAFB is adjacent to light industrial, agricultural, and residential areas. Established in 1918 as the Alessandro Aviation Field, MAFB has served as a training base and refueling operations base. Industrial operations including aircraft maintenance and repair) involved use of solvents and disposal of solvent wastes. MAFB is participating in the Installation Restoration Program IRP), established in 1978. Under this program, the Department of Defense seeks to identify, investigate, and clean up contamination from ha ardous materials. As part ofIRP, the Air Force investigated 28 potentially contaminated disposal areas. MAFB Well No. 1 on-base was found to be contaminated with trichloroethylene, tetrachloroethylene, and cis-1,2-dichloroethylene at levels that exceed State drinking water standards. It was taken out of service. Soils on the base are contaminated with toluene and ben ene. An estimated 11,600 people obtain drinking water from municipal wells within 3 miles of ha ardous substances on MAFB. The Air Forceis conducting a remedial investigation/ feasibility study RI/FS) to determine the type and extent of contamination at the base and identify alternatives for remedial action. Status November 21, 1989): Field work continues on the RI/FS.

Site Status Details:

NPL Status:	Final
Proposed Date:	07/14/1989
Final Date:	11/21/1989
Deleted Date:	Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

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Narratives Details:
NPL Name: MARCH AIR FORCE BASE
City: RIVERSIDE
State: CA

SEMS:
Site ID: 902761
EPA ID: CA4570024527
Federal Facility: Y
NPL: Currently on the Final NPL
Non NPL Status: Not reported

Following information was gathered from the prior CERCLIS update completed in 10/2013:
Site ID: 0902761
EPA ID: CA4570024527
Facility County: RIVERSIDE
Short Name: MARCH AIR FORCE BASE
Congressional District: 41
IFMS ID: 09N6
SMSA Number: 6780
USGC Hydro Unit: 18070202
Federal Facility: Federal Facility
DMNSN Number: 7000.00000
Site Orphan Flag: N
RCRA ID: Not reported
USGS Quadrangle: Not reported
Site Init By Prog: Not reported
NFRAP Flag: Not reported
Parent ID: Not reported
RST Code: Not reported
EPA Region: 09
Classification: Federal Facility
Site Settings Code: SU
NPL Status: Currently on the Final NPL
DMNSN Unit Code: ACRE
RBRAC Code: Not reported
RResp Fed Agency Code: USAF
Non NPL Status: Not reported
Non NPL Status Date: / /
Site Fips Code: 06065
CC Concurrence Date: / /
CC Concurrence FY: Not reported
Alias EPA ID: Not reported
Site FUDS Flag: Not reported

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Contact ID: 13004003.00000
Contact Name: Carl Brickner
Contact Tel: Not reported
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

CERCLIS Site Alias Name(s):
Alias ID: 101
Alias Name: MARCH AFB
Alias Address: Not reported
CA
Alias ID: 102
Alias Name: MARCH AIR FORCE BASE
Alias Address: 22 CSG/CC
MARCH AFB, CA 92518
Alias ID: 103
Alias Name: MARCH AIR FORCE BASE
Alias Address: 22 CSG/CC
RIVERSIDE, CA 92518
Alias ID: 9270150
Alias Name: MARCH USAF BASE
Alias Address: OLDB MARCH 3430 BUNDY AVENUE
MARCH AFB, CA 92311
Alias ID: 101
Alias Comments: PREVIOUS EPA ID# AZD 981 416 977
Site Description: March Air Force Base originally a 640 acres site called Alessandro Aviation Field, was officially opened March 1, 1918. The base was initially used to train "Jenny" pilots during World War I. The base was closed for about four years after the war and was then reopened in 1927. By 1938, the base was considered to be the central location for west coast bombing and gunnery training. In 1949, the Strategic Air Command took control of the base. Since that time, the base has hosted bombers, refuelers, and cargo aircraft. In June 1992, the base became an Air Mobility Command installation. Its primary mission is refueling, but reserve and guard units have cargo and fighter missions as well. In September 1993, March AFB was designated by Congress to realign its forces. The Base will be redesignated "March Air Reserve Base" and is xpected to decrease to about 1/3 of its present size. After realignment, property that is not retained by the base will be available for transfer.
The U.S. Air Force, due to its primary mission in national defense, has long been engaged in a wide variety of operations that involve the use, storage, and disposal of hazardous waste. In 1980, the Installation Restoration Program (IRP) was developed by the Department of Defense (DOD) to locate and cleanup hazardous waste sites. At March AFB, aircraft maintenance, fuel storage operations, fire-training exercises, and base operations have generated a variety of hazardous wastes. Consequently, several areas of soil and groundwater on-base have been contaminated. In September 1983 the IRP process began. The results were records indicating 30 potentially contaminated sites which required further investigation. A second study,

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completed in March 1987, indicated that 5 of the 30 sites required even further investigation to determine the type and extent of contamination in the soil and groundwater. In June 1987, further investigation was done, indicating that additional work was required to better define the extent of contamination and to research possible off-base migration of TCE in groundwater. In November 1989, March AFB was add to the National Priorities List (NPL) primarily due to the contamination of groundwater on-base. In September 1990, a Federal Facilities Agreement (FFA) was signed by the Air Force, U.S. Environmental Protection Agency (EPA), and the State of California. Three separate OUs were created based on geographic location of sites, similarity of contaminants, and location of groundwater contaminant plumes. The subject of this ROD (6/20/96) is OU-1, OU-1 includes Sites 4,5,7,9,10,13,14,15,16,18,29,31,34, and 38. Groundwater at Sites 4, 18,31,and the OU-1 Groundwater Plume, and soil at Sites 4,10,15,18,31, and 34 require remedial action. Sites 5,7,9,13,14,6,29, and 38 are considered no further action. Sites 21 and 23 are covered in OU-2 ROD. Site 33, the Panero Aircraft Fueling System is detailed in OU-3. The following are Sites that require Groundwater remediation: OU 1-Groundwater Plume - The OU-1 Groundwater Plume is the most widespread plume at the base, extending from Site 31 south and east through the area of Sites 34, 9, and 5, and extending to a maximum of approximately 1300 feet beyond the eastern boundary and 1500 feet south of Site 5 off-base. Numerous contaminants, including TCE, were detected. Site 4 Groundwater Plume - This plume is localized in the vicinity of Site 4 with the apparent source area near the southern end of Site 4. The contaminants with the highest concentration are TCE and PCE. Site 18 - Groundwater Plume - This plume is localized in the vicinity of Site 18 with the apparent source area west of the engine test cell in the center of Site 18. Fuel has been detected in four of the ten monitoring wells to date. Site 31 - Groundwater Plume - Concentrations of contaminants at Site 31, primarily TCE, are much higher than those in the rest of the OU-1 Plume, and these high concentrations are confined to a relatively small area. These conditions coupled with the history of Site 31 (reported solvent disposal) indicate that Site 31 is a likely source for much of the TCE found in OU-1 groundwater. Therefore, even though the Site 31 plume has the same contaminants and is continuous with the OU-1 plume, it is appropriate to treat Site 31 separately from the remainder of the OU-1 plume, in order to eliminate the source of contamination. Sites That Require Soil Remediation Include: Site 4 - Landfill No.6 - a landfill operating from 1955 to 1969, covering 8.5 acres, and located along the eastern boundary of the base, south of the East Gate. The landfill is up to 25 feet deep, containing primarily sanitary waste, construction rubble, and debris. Small amounts of medical wastes and empty fuel containers are also present. There are low levels of chlorinated solvents in the soil and soil gas, as well as elevated concentrations of trichloroethylene (TCE) and tetrachloroethylene (PCE) in the groundwater. Both TCE and PCE are found in solvents used to clean and degrease military equipment. Vinyl chloride, a breakdown product of TCE and PCE, has also been detected in Site 4 groundwater. The landfill is considered the source of contaminants detected in groundwater downgradient of the Site. Site 10 - Flightline Drainage Channel - This site, installed prior to 1940, is located southeast of the flightline aircraft maintenance areas. The channel is concrete lined (since the 1960s) up to the eastern boundary of the base where it discharges to the Perris Valley Storm Drain (PVSD). The PVSD flows east approximately 2 miles, where it joins another drainage and flows south approximately 6 miles to the San Jacinto River. The channel has reportedly received various waste oils, hydraulic fluids, diesel fuel, jet fuel, waste paints, paint strippers, paint thinners, battery acids and solvents, including TCE. Prior to 1974, wastes may have been discharged directly to the PVSD. Since 1974, the main oil/water separator has pretreated

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the runoff before its discharge off-base. Site 15 - Fire Protection Training Area No.3- This site is located southeast of the end of runway 12-30 and between Sites 5 and 7. The area was developed in 1978 and was reportedly constructed by placing an underdrain system and gravel over a clay liner. Firefighting water, solutions of Aqueous Film Forming Foam (AFFF), and residual fuel used during training exercises were drained to a formerly unlined water holding pond located adjacent to Site 15. Approximately 6,000 gallons per year of contaminated JP-4 have been burned in training exercises since the facility was constructed in 1978. This Site is no longer being used as a fire training area. Site 18 - Engine Test Cell - This site is located on the flightline, south of Taxiway No.2, and has been inactive for several years. The test cell was constructed in 1957 for the purpose of testing aircraft engines. An oil/water separator was installed in 1976, water from the seperator was discharged to the base wastewater treatment plant. The oil was collected by a contractor for off-base disposal. Prior to 1976, spills of oil, fuel, and solvents were drained to a nearby ditch. Potential sources of fuel include overflow of tanker trucks and fuel tanks on aircraft that have been parked nearby. Site 31 - Unconfirmed Solvent Disposal - Site 31 is located off Graeber Street on the east side of Building 1211. The practice of discharging solvents on the ground reportedly occurred from about the mid-1950s to the mid-1970s. In addition, floor drains from maintenance shops may have leaked solvents to the subsurface. Groundwater sampling at the site has indicated TCE concentrations which exceed State and Federal drinking water standards. Site 34 - Pritchard Aircraft Fueling System - Site 34 is located next to Building 1245, at the southeast end of Taxiway No, 1. In 1962, six 50,000 gallon tanks were moved to this site from the Pabero Fueling System. In 1990, this system was discontinued, and in 1991, the tanks and system were removed. During a geological investigation stained soils and fuel odors were observed. Sites With No Further Action Planned: Site 5 - Landfill No.3 - This Site covers approximately 5 acres and is located southeast of the present flightline. The landfill was reportedly operated from the late 1940s to approximately 1960. Landfill wastes consist primarily of sanitary waste and construction rubble. Site 7 - Fire Training Area No.2 - This Site is located on the eastern part of the base, north of the Alert Facility. Between 1954 and 1978, fire training exercises were conducted in unlined training pits. Three distinct burn pits were identified in historic aerial photographs of the base. A portion of this Site may have been used for crash rescue training. Wastes used in those exercises reportedly included contaminated fuel, waste solids, and spent solvents. Site 9 - Main Oil/Water Separator - Site 9 is located north of the Site 5 at the southeast end of the flightline apron. The facility was constructed in 1974 and serves the main storm, drainage system for the flightline apron and the flightline shops. The storm drains have reportedly received waste oils, hydraulic fluids, diesel fuel, waste paints, spent solvents, paint strippers, paint thinners, and battery acids. The oil/water separator is of earthen construction with a large baffle that divides the separator into two compartments. The separated oil is picked up by a skimmer and pumped to a holding tank for Off-base disposal. This facility drains into the flightline Drainage Channel (Site 10) and then to the Perris Valley Storm Drain Lateral A. Site 13 - Tank Truck Spill Site - Site 13 is located along the eastern perimeter road of the base, within the northern portion of Site 5. In 1973, approximately 5,000 gallons of JP-4 jet fuel spilled from a tank truck to the ground at this location. The accidental discharge resulted from a mechanical malfunction. There was no reported containment or cleanup activities. Site 14 - Liquid Fuel Pump Station Overflow - Site 14 is located southeast of the flightline apron and about 50 to100 feet west of the East March Sludge Drying Beds (Site 16). In 1973, approximately 1,000 gallons of JP-4 jet fuel spilled onto the ground. The spill occurred due to an overflow

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of the liquid fuel pump station at Building 1245. The spill was contained in the unpaved area south of the pump station and allowed to percolate into the ground. Site 16 - East March Sludge Drying Beds - Site 16 is located on the eastern part of the base, at the south end of the flight line parking apron, and near the former East March Wastewater Treatment Plant. The treatment plant was constructed in 1938 and provided secondary treatment for sanitary and industrial wasterwater. Primary and secondary sludges were digested anaerobically, dewatered on unlined sludge drying beds, and disposed of in an on-base landfill. The sludge may have contained heavy metals and organics resulting from discharges of industrial wastes to the sanitary sewer system. These drying beds ope3rated from 1938 to 1977, when the plant was destroyed in place. Site 29 - Fire Training Area No.1 - Site 29 is located at the eastern part of the base, north of Site 9. The area was used as a fire training pit prior to 1951. Suspected contaminants at the site include contaminated fuel, waste oil, and spent solvents Site 38 (PCB Contamination, Building 1311), Building 1311 is located at the southeast end of the taxiway, northwest of IRP Site 23. In 1984, soils from four areas contaminated with transformer oils were sampled. Soils from two of the areas (Buildings 317 and 1305) were determined to be PCB-contaminated. The soils were excavated and removed from the Base. Records to verify the cleanup have not been located. The RI/FS report and Proposed Plan for OU-1 were released to the public on April 28, 1994. These two documents were made available via the Administrative Record, the information repositories at the Moreno Valley and March AFB libraries, and at the Moreno Valley Chamber of Commerce. A fact sheet, condensed from the Proposed Plan, was sent to everyone on the March AFB mailing list, which includes Restoration Advisory Board (RAB) members. An OU-1 RI/FS subcommittee, formed by the RAB, provided oral comments to the RAB at its April 26, 1994 meeting. The Final RI/FS Report was published in July 1994. A public comment period was held from April 28 to May 28, 1994. In addition, a public meeting was held on May 12, 1994 at 7 p.m. at Best Western Image Suites in Moreno Valley. Representatives of the U.S. Air Force, EPA, Department of Toxic Substances Control, and California Regional Water Quality Control Board, Santa Ana, attended the public meeting to address any questions about the RI/FS and Proposed Plan. March Air Force Base (AFB) is located on 7,123 Acres in the northern end of the Perris Valley, east of the city of Riverside, in Riverside County, California, approximately 60 miles east of Los Angeles and 90 miles north of San Diego. The base lies in sections of Township 3 South, Range 4 West. The population of Riverside County is 1,700,413 and consists primarily of English and Spanish speaking citizens. The climate of the March AFB area is characterized as Mediterranean to semi-arid, varying according to elevation and distance from the Pacific Ocean. The weather generally consists of warm to hot, dry summers and mild winters. Current land use on March AFB is classified as residential and light industrial. Maintenance facilities, warehouses, and administrative centers support the mission. The land surrounding March AFB area includes areas of residences in all directions around the Site, light industry to the north, and agriculture to the east and south. With the exception of small surface water ponds that are used for agricultural purposes, there are two permanent surface water bodies within 3.5 miles of March AFB. Lake Perris, located 4 miles southeast of the base, provides approximately 130,000 acre feet of storage for State Project Water brought in by the California Aqueduct which runs north and east of the base. An east-west portion of the Colorado River Aqueduct is located approximately 3.5 miles south of the base. This aqueduct flows in to Lake Matthews, which is located about 10 miles west of March AFB. A very small recreation lake is located approximately 2 miles east of the base. It is maintained by the Moreno Valley Ranch homeowners association and is located just south of Iris Street and west of Lasselle Street in the City of Moreno Valley. A number of

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wetlands and riparian areas have been identified on and in the immediate area of the base, most are located on West March, outside OU-1. The U.S. Army Corps of Engineers determined that approximately 2.17 acres of jurisdictional wetlands exist in the Heacock Drain Channel, with .8 acres of wetlands adjacent to the Site 4 landfill. The wetlands are not continuous but are localized patches of wetland vegetation that change position each year due to high volume, high velocity storm water flow from the spring rains through these channels which causes scouring of the earthen bottom and sides. Manyindustrial, agricultural and domestic wells exist in the Perris Valley. Four on-base wells and two off-site wells southeast of the base were formerly used for the base water supply. One of these wells was shut down in February 1984 due to trichloroethylene (TCE) contamination, the other 3 on-base wells were shut down due to low yields. The two off-site wells are located southeast of the base in the center of Perris Valley. Although both of these wells are operable only one is occasionally used for emergency service, while the other is dormant. All base water is currently supplied by the Eastern Municipal Water District. OU-1 is made up of Sites 4,5,7,9,10,13,14,15,16,18,29,31,34, and 38. Sites 21 and 23 are included in the OU-2 ROD. Site 10 (Flightline Drainage Channel). This site is located southeast of the flightline aircraft maintenance areas. The drainage channel, which was installed prior to 1940, has reportedly received various waste oils, hydraulic fluids, diesel fuel, jet fuel, waste paints, paint strippers, paint thinners, battery acids and solvents (including TCE). The drainage channel is concrete lined (since the 1960s) up to the eastern boundary of the base where it discharges to the Penis Valley Storm Drain. The Penis Valley Storm Drain flows east approximately 2 miles, where joins another drainage and flows south approximately 6 miles to the San Jacinto River. Prior to 1974, waste disposed of in the drainage channel may have been discharged directly to the Penis Valley Storm Drain. Since 1974, the main oil/water separator (Site 9) has pretreated the runoff before its discharge off base. Primary contaminants of concern are polycyclic aromatic hydrocarbons (PAHs), which were detected in drainage ditch sediments. PAHs are a series of petroleum derivatives found in many fuel and asphalt compounds. Site 15 (Fire Protection Training Area Number 3). This site is located southeast of runway 12-30 and between Sites 5 and 7. The area was developed in 1978 and was reportedly constructed by placing an underdrain system and gravel over a clay liner. Firefighting water, solutions of Aqueous Film Forming Foam (AFFF), and residual fuel used during training exercises were drained to a formerly unlined water holding pond located adjacent to Site 15. Approximately 6,000 gallons per year of contaminated JP-4 have been burned in framing exercises since the facility was constructed in 1978. The site is no longer being used as a fire training area. The primary contaminant of concern is phenanthrene, a PAH. Selected Remedy (as described in the OU 1 ROD): For both Sites 10 and 15, the preferred method of cleanup of these soils is excavation and low-temperature thermal desorption. Need for Explanation of Significant Differences (ESD): The Record of Decision (ROD) selected remedy for soils at Sites 10 and 15 was excavation and low temperature thermal desorption. The soils were excavated and treated by bio-remediation and properly recycled to approved regulatory standards. This ESD will be entered in the Administrative Record maintained at March AFB. An Explanation of Significant Differences for Operable Unit 01 for the March Air Force Base Site was completed in August 2000. Sites that require soil remediation include Sites 4, 10, 15, 18, 31, 34. Sites that require groundwater remediation include OU1 and Sites 4,18, and 31 groundwater plumes. Sites with No Further Action Planned: Site 5,7,9,13,14,16,29,38.
OU 2: In 1980, the Installation Restoration Program (IRP) was developed by the Department of Defense as the mechanism for the CERCLA process, incorporating applicable Resource Conservation Recovery Act (RCRA) regulations

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as well as meeting requirements of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) (40 CFR. Part 300). The Air Force conducted a Phase I records search of 30 potentially contaminated IRP sites on the Base. There are now a total of 44 IRP sites at the former March AFB and current March ARB. The primary contaminants identified in the IRP include chlorinated solvents, fuels, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs). Contamination by PAHs and PCBs appears to be restricted to surface and near-surface soils whereas fuel hydrocarbons and solvents tend to be predominant contaminants in subsurface soils and groundwater. The lead agency for cleanup of the closed portions of March AFB is the Air Force. The EPA, the California Department of Toxic Substances Control (DTSC), and the Santa Ana Regional Water Quality Control Board (RWQCB) are all support agencies for cleanup activities at the Base. The current land use and adjacent land use for most of the OU 2 Air Force Real Property Agency (AFRPA) sites is vacant land/open space with limited commercial and residential land use adjacent to some of the sites. Site 3 and the adjacent areas are undeveloped land. Site 6 contains an engineered waste cell. There is a residential area to the south and a golf course is to the east of Site 6. Site 12 was the former civil engineering yard with numerous structures. Site 12 is not currently utilized. Residential land use occurs to the east of Site 17. Air Force commercial facilities such as offices are located to the north and west of the Site 17. Site 19 is currently a part of the operating wastewater treatment plant. Structures relating to plant operations are located on-site and to the west and north. Site 20 and 26 and the adjacent areas are undeveloped land. A former water treatment plant is south of Site 26 and west of Site 20. This facility is no longer used. Site 23 is an active agricultural area, surrounded by currently vacant land to the north, south and east. Air Force land consisting of open space is west of Site 23. Site 25 and the adjacent areas is undeveloped land, with nearby residential development to the south. The three Site 35 subareas and Site 42 are former UST locations within landscaped areas adjacent to structures. The areas near Site 35a, 35b and Site 42 are still actively used as office and dormitory areas, but the Site 35c area is no longer used. Sites 30 and 40 are open space with some riparian vegetation. A residential area is located to the north and west of Site 40. The OU 2 sites are located on that portion of March AFB that may be converted to non-Air Force use. Site 23 is on private land. The anticipated land use for most of the OU 2 Air Force Real Property Agency (AFRPA) sites is commercial or industrial use. Alternative land uses have also been assessed and areas of West March could remain open space such as the Stephens' Kangaroo Rat (SKR) Conservation Area. March AFB is located in the North Perris Groundwater Basin. Currently, there are no potable groundwater resources extracted at the OU 2 AFRPA sites. The relatively thin water-bearing zone on West March is not anticipated to yield substantial quantities of water. Therefore, the potential for extraction and use of groundwater from the West March AFRPA sites is limited, both now and in the foreseeable future. Water-bearing zones producing sufficient groundwater for use may be present at AFRPA sites on the Main Base and Site 23, and should be considered a potential potable water source. Surface water is not currently used at the OU 2 AFRPA sites. Surface water areas such as at Site 6, 30 and 40 may remain as wetlands depending on future site development. OU2 consists of a number of sites. Each site is described below. Site 3 is a former 23-acre landfill located south of Cactus Avenue and west of Plummer Road. Riparian vegetation is found in the drainage areas. Site 3 is located in the 1,300-acre Stephens' Kangaroo Rat (SKR) reserve. The Site 3 landfill was used from 1954 through 1974. The landfill received household and dumpster waste, construction debris, and military waste from the Base. The military wastes included empty tanks, spent munitions, and miscellaneous wastes such as parachutes, medical waste, and fire hoses. Some of the contaminants found in the wastes included

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volatile organic compounds, pesticides, PCBs, PAHs, and munitions residues. The Air Force was concerned that the waste in the landfill might contaminate the soil and groundwater. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by removing the landfilled waste. An interim removal action was completed in late 1995 and early 1996. Approximately 223,200 cubic yards of landfilled materials and soil were removed. Excavated materials from Site 3 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans. Site 6 is located on West March, north of the Air Force Village West residential development, south of Van Buren Boulevard, east of Plummer Road, and west of Air Force Village West Drive. The landfill comprised three discrete areas: Site 6a (approximately 15 acres) the location of the main former landfill area; Site 6b Quarry (approximately 0.6 acre) the location of a former quarry; and Site 6b Pond (approximately 2.6 acres) the location of a pond. Site 6 was used by March AFB from the early 1950s to the early 1 980s for disposal of household waste and construction debris. Polynuclear aromatic hydrocarbons (PAHs), PCBs, pesticides, herbicides, and dioxins were found in samples of soil and water collected during the OU2 RI. An interim, removal action was conducted in 1995; approximately 63,000 cubic yards of waste were removed from Site 6a and temporarily stockpiled. Waste at Site 6a was removed from the vadose zone and beneath groundwater including soil contaminated with petroleum hydrocarbons. Waste was also removed from the pond, including debris and tar. Two engineered waste cells, over 12 acres in size, were constructed in the Site 6a area. No confirmation samples were taken of soils and bedrock under Site 6a because the bottom of the excavation was below the water table and sample results would not be meaningful. This site was treated as a closure in place rather than a clean closure. Stockpiled waste from Site 6a was landfilled back into the engineered waste cells over Site 6a. Excavated materials from Site 6a to be disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans. Site 12, the 20-acre Base Civil Engineering Yard, is located north of MacDill Street, between Lackland Avenue and Travis Avenue. The area is developed with numerous structures and is partially paved with asphalt. From the l950's to 1996, Site 12 was the civil engineering yard for general maintenance operations for March AFB. It included a carpentry shop, electrical shop, paint shop, pesticide shop, and storage areas for heavy equipment. These shops used and stored a variety of hazardous materials including paints and paint-related products, pesticides, solvents, acids, and drums labeled hazardous waste. During the OU2 RI, PAHs and hexavalent chromium were found in soil samples. The contaminant 1,1-dichloroethene (1, 1-DCE) was found in soil vapor samples in a small area in deeper soils near Building 2507. Groundwater beneath Site 12 has become impacted by trichloroethene (TCE) and tetrachloroethene (PCE). The groundwater contamination is in a small area and is only slightly above maximum contaminant levels (MCLs). Periodic monitoring of the groundwater to observe changes in contaminant concentrations is being conducted. After discussions with the regulatory agencies and the public, a limited interim removal action was taken in 1996 to ensure that the site could be used for industrial purposes by removing soils contaminated with PAHs and hexavalent chromium at the northwest portion of Site 12. Approximately 2,000 cubic yards of non-hazardous contaminated soil was excavated from a small area in the northwest portion of the site and placed in the engineered waste cells at Site 6. Excavated materials from Site 12 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and prior to excavation activities for the removal

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action according to approved work plans. Site 17 is a former Base swimming pool located on the Main Base on U Street between DeKay and K Streets. The area is vacant land, adjoining Base housing to the east and south. The former swimming pool at Site 17 was closed in the 1 970s. After it was closed, the pool was used as a disposal site and the wastes were covered with soil. After discussions with the regulatory agencies and the public, a decision was made to clean the site by removing the waste. The pool and its contents were removed during a 1994 interim removal action. The wastes were taken off the Base for disposal. After the interim removal action, low levels of PCBs were still detected in soils at least 8 feet beneath the ground surface. The pool excavation was filled with clean soil, leaving the PCBs in place. No PCB contamination has been found in the groundwater and the PCBs are not expected to migrate to groundwater. Confirmation sampling conducted after the interim removal action demonstrated that PCBs remain at the site at levels of concern to human health Site 19 is about 7 acres in size, located at the southern end of West March, east of the active wastewater treatment plant. The site is generally vacant land with four concrete lined drying beds in the western portion of the site. Site 19 contains the four active lined sludge-drying beds and three inactive, unlined sludge-drying beds associated with the wastewater treatment plant. The plant was constructed in 1941 and used to process the wastewater from Camp Haan and March AFB. A total of 10 sludge-drying beds have historically been used at the site. Three of these beds have been backfilled. In 1990 when the plant was upgraded, four lined drying beds were constructed at the location of previously unlined beds. In the past, wastewater treatment sludge was spread out in the unlined drying beds to dry. When dry, the sludge was removed from the drying beds. Recently, the dried sludge has been removed from the Base for disposal. Past disposal practices are unknown. PAHs, PCBs, hexavalent chromium, and thallium were found in soil samples in the area of the unlined sludge beds at levels above residential PRGs. Site 20 is located adjacent to the southwest portion of March AFB, on the property acquired by the Department of Veterans Affairs from the Air Force in the 1970s. Site 20 is a former landfill about 7 acres in size used between 1958 and 1965 as a disposal site for household waste and construction debris. Some of the chemicals found in the soils at Site 20 included PAHs, dieldrin, PCBs, and 1 ,4-dichlorobenzene. The Air Force was concerned the waste in the landfill could contaminate soil and groundwater. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by removing the landfilled waste. The interim removal action at Site 20 was conducted in conjunction with the removal of dried sludge at Site 26a and 26b Dried sludge of Site 26b covered a portion of Site 20. Approximately 116,000 cubic yards of non-hazardous soil, debris, and dried sludge were removed from Sites 20 and 26 in 1996 and placed in the engineered waste cells at Site. Excavated materials from Site 20 to be transported to and disposed of in he engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans According to the As-Built Construction Report OU2, Site 6a, all materials from Site 20 placed in the Site 6 engineered waste cells met the requirements of CCR Title 23, Section 2523 (currently CCR Title 27, Section 20220) for a non-hazardous solid waste landfill. After the waste was removed from Site 20, confirmation samples from beneath the former landfill were tested. The results confirmed that the site had been cleaned to levels protective of human health and the environment. No restriction on future use of the land is required. Site 22 is a suspected former landfill east of and adjacent to Interstate 215. The original 7-acre area of Site 22 was expanded to 15 acres by extending the northern site boundary to ensure all potential areas of concern were investigated. The location of the landfill was based on limited evidence. Investigations could not locate any landfllled materials or debris.

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Geophysical surveys were used to fmd buried metal or disturbed soils. Soil gas sampling was also conducted at this site. Finally, soil and groundwater were sampled. No contaminants were found in any of the samples and the geophysical surveys found no buried waste. This evidence showed that a landfill did not exist in this area. This site was investigated during the OU2 remedial investigation and levels of contamination requiring remedial action were not identified. There was no risk assessment completed on Site 22 because no contaminants were found and the site poses no risk to human health or the environment. No restriction on future use of the land is required. Site 23 is located off-Base to the east, near the intersection of Nandina Avenue andHeacock Street in the City of Moreno Valley. Between 1938 and 1977, Site 23 was a 1-acre holding pond for wastewater that had been treated and used for irrigation of agricultural crops. In 1991, the pond was filled in, and it and the surrounding areas were leveled. The land is now used as a commercial sod farm and irrigated with reclaimed water from the Moreno Valley wastewater treatment plant. This site was investigated during the OU1 remedial investigation and no contamination requiring remedial action was identified. There was no risk assessment completed on Site 23 because no contaminants were found and the site poses no risk to human health or the environment. No restriction on future use of the land is required. Site 24 is a former 3-acre landfill, west of Site 19. Site 24 was reportedly used between 1941 and 1965 to dispose of household waste and military waste. A small amount of soil from bullet backstop berms may have been placed in the landfill as well as some ash from an incinerator. Some of the contaminants found in the waste included PAHs, PCBs, antimony, barium, and cadmium. The Air Force was concerned that the waste in the landfill could contaminate groundwater. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by removing the landfilled waste. In December 1996, approximately 19,300 cubic yards of non-hazardous, landfilled waste was removed and placed in the engineered waste cells at Site 6. Excavated materials from Site 24 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans. Site 25 covers approximately 33 acres and is located south of Cactus Avenue. Site 25 was used in the past for open air detonation and burning of munitions. Three areas with shallow trenches were used to bury munitions residue after destruction. Some of the contaminants found in the soils at this site included nickel, l,3,5-trinitrobenzene, nitroglycerin, benzo(a)pyrene, and RDX, all of which are munition residues. Additionally, 1,1 -dichloroethene was also found. The Air Force was concerned that the contaminants in soil would cause groundwater contamination. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by removing the debris and contaminated soils. Approximately 3,000 cubic yards of non-hazardous waste from the trenches and contaminated soils were removed and disposed of in the engineered waste cells at Site 6. Excavated materials from Site 25 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents at a rate of about 1 sample for every 200 cubic yards of excavated materials during the removal action. Testing was also performed as part of the remedial investigation. Site 26 covers approximately 3 acres and is located in the southwest portion of March AFB. Site 26 is subdivided into two areas, Site 26a and 26b. Site 26b is located over a portion of the Site 20 landfill. Site 26a is located on property controlled by the AFRPA and Site 26b is on the property of the Department of Veterans Affairs. Site 26 was used for disposal of lime sludge that was a waste from the treatment of drinking water for March AFB. From 1941 to 1984, the water treatment plant treated Colorado River water used to supplement the drinking water supply for the Base. Arsenic from the treated Colorado River

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water was found in the lime sludge at low levels. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by removing the sludge. As mentioned in the description of the landfill at Site 20, approximately 116,000 cubic yards of non-hazardous soil and dried sludge were removed from Sites 20 and 26 in 1996 and disposed of in the engineered waste cells at Site 6. Excavated materials from Site 26 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans. Site 30 covered approximately 40 acres, south of Alessandro Boulevard and west of Interstate 215. Site 30 is located in the 1,300 acre SKR reserve. There is no evidence that Site 30 ever operated as a March AFB-controlled landfill, but illegal dumping of domestic waste from the surrounding community has occurred and some minor amounts of construction debris were found. Soil and groundwater samples taken at the site did not detect contaminants at levels not protective of human health. After discussions with the regulators and the public, a decision was made to clean up the site by removing the domestic and construction debris. Domestic and construction debris was, removed from the site in April 1997 and disposed of off the Base. The Air Force has installed gates on access roads to prevent vehicular traffic to the site. Warning signs were placed in several areas, and gates remain padlocked to help prevent access by unauthorized persons. Site 35 consisted of three subareas (Sites 35a, 35b, and 35c) located in the former 15th Air Force Headquarter complex on West March. The subareas were locations of former underground storage tanks (USTs) associated with. Buildings 3409 (Site 35a), 3417/34 18 (Site 35b), and 3406 (Site 35c). Site 35a, a former 8,000-gallon fuel oil tank, was located west of Allen Avenue and south of 11th street, east of Building 3409. Site 35b, two former diesel tanks of 6,650-gallon and 3,500-gallon, was located between Building 3417 and 3418, west of Allen Avenue and Bundy Avenue. Site 35c, a former 1,000-gallon diesel tank, was located north of 5th Street and west of Dalla Avenue, east of Building 3406. All tanks have been removed and the locations closed without restrictions in accordance with state and county regulations. Fuel leaks have been associated with the tanks at Site 35. Sites 35a and 35b were investigated during the OU2 remedial investigation and other studies and levels of contamination requiring remedial action were not identified. After discussions with the regulatory agencies, the Air Force decided to clean up the soil by bioventing at Site 35c where fuel had leaked. Bioventing has reduced diesel fuel contamination to levels protective of human health and the environment at Site 35c. No restriction on future use of the land is required.

Site 40 covers approximately 49 acres on West March, north of Van Buren Boulevard and west of Plummer Road. The most prominent feature at the site is the abandoned quarry, containing a pond with riparian vegetation. The pond is replenished by groundwater and by surface flow from an intermittent stream channel entering the pond from the west. Site 40 is located in the 1,300 acre SKR reserve. Site 40 was used as a disposal location for drums, construction debris, battery casings, and motor vehicle parts. After discussions with the regulatory agencies, a decision was made to complete an expedited cleanup of the area exposed by the erosion and other debris at the site. The time-critical removal action completed in 1994 included removal of the drums, miscellaneous waste, and contaminated soil. Hazardous waste from the site was taken off the Base for proper disposal. Approximately 6,800 cubic, yards of non-hazardous materials were disposed of at the Site 6 engineered waste cells. Excavated materials from Site 40 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents at a rate of about one sample for every 100 cubic yards of excavated materials during the removal action. Testing was also performed as part of the remedial investigation. Building 3404 is located on less than one acre near the

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intersections of 1 1th Street and Davis Avenue on West March. Transformers located in Building 3404 reportedly leaked oils containing PCBs onto the floor of the transformer room. These oils were also spilled onto the soil surrounding the building. After discussions with the regulatory agencies and the public, a decision was made to clean up the area outside of Building 3404 by removing the contaminated soil. In the interim removal action, the contaminated soils were excavated and taken offsite for proper disposal. A total of 330 tons of contaminated soils were removed from the site. The PCB concentrations were low enough to allow disposal of 292 tons of contaminated soils as non-hazardous waste. An additional 38 tons was disposed of off the Base as hazardous waste. Clean fill was placed in the excavation to grade and a gravel cover was placed on top of the previously excavated area. Confirmation sampling conducted after the interim removal action confirmed that the site had been cleaned to levels protective of human health and the environment. No restriction on future use of the land is required. Transformer oils may be present in the concrete floor of Building 3404. The Air Force attempted to remove the PCBs from the concrete. Minimal levels of PCBs were left and have been encapsulated. The concrete is not addressed in this AFRPA OU2 ROD because building interiors are not regulated under CERCLA. The current landowner, the County of Riverside, has entered into a land use covenant with the State that restricts use of the building to industrial activities and contains other measures to prevent exposure to residual contamination. The current land use and adjacent land use for most of the OU2 AFRPA sites is vacant land/open space with limited commercial and residential land use adjacent to some of the sites as discussed below. Site 3 and the adjacent areas are undeveloped land. Site 6 contains an engineered waste cell. There is a residential area to the south and a golf course is to the east of Site 6. Site 12 was the former civil engineering yard with numerous structures. Site 12 is not currently utilized. Residential land use occurs to the east of Site 17. Air Force commercial facilities such as offices are located to the north and west of the Site 17. Site 19 is currently a part of the operating wastewater treatment plant. Structures relating to plant operations are located on-site and to the west and north. Site 20 and 26 and the adjacent areas are undeveloped land. A former water treatment plant is south of Site 26 and west of Site 20. This facility is no longer used. Site 23 is an active agricultural area, surrounded by currently vacant land to the north, south and east. Air Force land consisting of open space is west of Site 23. Site 25 and the adjacent areas is undeveloped land, with nearby residential development to the south. The three Site 35 subareas and Site 42 are former UST locations within landscaped areas adjacent to structures. The areas near Site 35a, 35b and Site 42 are still actively used as office and dormitory areas, but the Site 35c area is no longer used. Sites 30 and 40 are open space with some riparian vegetation. A residential area is located to the north and west of Site 40. The OU2 sites other than site 23 discussed in this AFRPA OU2 ROD are located on that portion of March AFB that may be converted to non-Air Force use. Site 23 is on private land. The anticipated land use for most of the OU2 AFRPA sites is commercial or industrial use. Alternative land uses have also been assessed and areas of West March could remain open space such as the SKR Conservation Area. March AFB is located in the North Perris Groundwater Basin. Currently, there are no potable groundwater resources extracted at the OU2 AFRPA sites. The relatively thin water-bearing zone on West March is not anticipated to yield substantial quantities of water. Therefore, the potential for extraction and use of groundwater from the West March AFRPA sites is limited, both now and in the foreseeable future. Water-bearing zones producing sufficient groundwater for use may be present at AFRPA sites on the Main Base and Site 23, and should be considered a potential potable water source. Surface water is not currently used at the OU2 AFRPA sites. Surface water areas such as at Site 6, 30 and 40 may remain as wetlands depending on future site

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development. A Record of Decision (ROD) for OU2 was completed May 11, 2004. A ROD addressing OU2 was completed in September 2005. Operable Unit (OU) 4: A total of three IRP sites (IRP Sites 21, 41, and 44), three AOCs (Water Tower 3410, Water Tank 6601, and the former Base Hospital and Dental Clinic), and one RFA site (Site L) are addressed in this OU4. Site 21 is off base approximately 1.5 miles south of the southern extension of the active March ARB runway. Although never physically part of March AFB, the site is considered to be part of the former base for purposes of the IRP because treated wastewater produced on base was held in this off-base pond. John Cordures, property owner until his death, used the water for irrigation of surrounding agricultural land from 1941 to 1946 and again from 1955 to 1984. The estate was sold to Ross Department Stores in 2001. The site is near the intersection of Morgan Street and Webster Avenue, in the City of Perris. Site 21 encompasses 1.5 acres and is part of a landscaped berm and below-grade parking area for warehouse trucks associated with a Ross warehouse distribution facility. The general surface-water drainage in the area is to the east following the gently sloping terrain (surface gradient at the site is approximately 20 to 40 feet per mile). Bedrock was not encountered during the investigation phases at Site 21. Groundwater at Site 21 is at a depth of more than 150 feet below ground surface (bgs) and the general groundwater flow direction is to the south and southeast. Site 21 was used from 1941 to 1946, and again from 1955 to 1984, to hold treated wastewater from the base. Sanitary and industrial wastewater received primary and secondary treatment on the base prior to discharge into this holding pond. The treated effluent was held in the pond and used for irrigation of the surrounding agricultural land. The boundaries of the effluent pond were physically well defined by the pond's berm during the 1993 OU1 Remedial Investigation/Feasibility Study (RI/FS). At that time the site covered an area of approximately 2.2 acres and was being used by private parties as an illegal dump. In approximately 1998, the berm was removed, and the site was incorporated into the surrounding sod farm. In 2001, the land was sold and the former pond area now consists of a landscaped berm on the west side of the site and a truck parking area that lies approximately 8 feet below grade on the east side. Based on historic use, the primary contaminants of concern at Site 21 include metals, volatile organic compounds (VOCs), and pesticides. Site 21 is part of a Ross warehouse distribution facility in the city of Perris. Adjacent and surrounding land uses consist of commercial/industrial development, and some land is in agricultural production. Although much of the surrounding property is currently agriculture, other properties are zoned for light industrial/commercial. As development occurs, agriculture zoning will likely change to general industrial. Site 41 is approximately 1 mile south of State Highway 58 and 11 miles east of Kramer Junction (the intersection of U.S. Highway 395 and State Highway 58) in San Bernardino County, California. Structures currently remaining at the site include a concrete bunker no longer in use. The general surface water drainage is to the northeast following the very gently sloping terrain (surface gradient at the site is approximately 20 to 40 feet per mile). Depth to beneficial groundwater is approximately 300 feet bgs. However, perched zone water is found between 100 and 150 feet bgs at nearby sites. A regional hardpan soil, approximately 3 to 4 feet thick at a depth of approximately 34 feet bgs, is reported in the area. The Air Force obtained right of entry for an approximate 315-acre parcel from the Bureau of Land Management (BLM) in the late 1950s for construction and operation of a radio relay station for use by George AFB. The parcel was transferred to Edwards AFB in 1963 and to March AFB in February 1968. The Radio Relay Annex was declared excess and was scheduled for deactivation in October 1968. The station facilities included a septic system, storage tanks for water and petroleum products, 4 miles of runway, a radio tower, a water well, an aboveground bunker, and several support

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buildings. The Air Force closed the station in the mid-1980s. Investigations and cleanup actions were conducted between February 1995 and May 1996 and included identification and removal of asbestos-containing material and lead-based paint, destruction of the water-supply well, removal of underground storage tanks (USTs) (oil, water, and septic) and contaminated soil, and confirmation sampling. Small amounts of diesel fuel leaked from the USTs. Based on historic use, the primary contaminant of concern at the site is total petroleum hydrocarbons (TPH) diesel fuel. Site 41 is in a remote area of the Mojave Desert. The Hawes site extends across 315 acres of desert land. The site is in the process of being transferred from the DOD back to the BLM, and the site will likely remain vacant due to its remote location and reversion to BLM control. Site 44 is in the central portion of the March ARB, east of the intersection of Graeber Street and Meyer Drive. Site 44 includes a 110-foot-tall, 200,000-gallon water tower, two large water storage tanks, and several buildings used by March ARB water system maintenance personnel. The area is characterized by relatively flat topography. A concrete-lined drainage ditch, just north of the site, flows eastward to the Heacock Storm Drain that drains south along the eastern perimeter of the former base. Groundwater at Site 44 is estimated to be approximately 30 feet bgs. Groundwater flow direction in this area is generally to the south and southeast. The water tower at Site 44 utilized a valve controller with a 6-inch mercury pot for water flow control. Past spills from the mercury pot caused mercury contamination of soils beneath and surrounding the valve controller. The flow controller at the water tower was in a subsurface valve box, 12 feet below grade. During a construction project to place a concrete floor in the below-grade box, approximately 80 cubic feet of soil were removed and stockpiled south and east of the valve box. In November 1995, the Air Force contracted to characterize the valve box and surrounding area for elemental mercury contamination. Based on the results of initial investigations at Site 44, the Air Force initiated a removal action. Soil was excavated in several discrete areas around the water tower. The primary soil removal areas were the valve box and surface soils in areas adjacent to the borings that identified "hot spots" of contamination. The excavated soil was segregated and packaged for off-site disposal. Once excavation of the valve pit was completed, the site was restored by filling the excavated area with sand to approximately 3 feet below the valve. A 6-inch-thick concrete floor was installed in the bottom of the valve pit. Land uses on adjacent and surrounding properties are exclusively industrial and commercial. As Site 44 will remain Air Force property, Site 44 is expected to stay industrial/commercial in the foreseeable future. Water Tower 3410 is an aboveground water storage tank on Former March AFB at the intersection of Plummer Road and 11th Street. Water Tower 3410 is in an area characterized by relatively flat topography, with a gentle slope to the east/northeast. No surface water bodies or major surface water drainages are associated with the site. Groundwater levels underlying Water Tower 3410 are between approximately 33 and 48 feet bgs. The groundwater flow direction is to the east. Although Water Tower 3410 was not specifically included in the Basewide RI/FS Work Plan, due to the presence of mercury pot water flow controllers at other March water storage facilities and the similarity of Water Tower 3410 with Water Tower 407 (Site 44), it was suspected that Water Tower 3410 might also have mercury-contaminated soils. March ARB Department of Public Works was contacted to determine if a mercury vault ever existed at the site. Interviews with Department personnel indicated that the building never contained a mercury vault. The only mercury controls at Water Tower 3410 are those that control associated pumps. Four aboveground controls are attached to the water tower rather than in a vault and contain only small amounts of elemental mercury. Water Tower 3410 is in an area characterized by industrial/commercial land use intermixed with vacant parcels. Adjacent and

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surrounding land use is also a mix of industrial/commercial use and vacant parcels. March Joint Powers Authority (MJPA) plans for the area, including Water Tower 3410, are for an industrial/business park. Water Tank 6601 is an aboveground storage tank north of Van Buren Boulevard and west of Plummer Road, west of 1-215. Water Tank 6601 is at an elevation of approximately 1,660 feet above mean sea level. The site is characterized by highly dissected upland topography and consists of highly eroded gullies and exposures of weathered bedrock. The primary flow of surface water in the vicinity of Water Tank 6601 is to the east. One primary intermittent stream channel drains to the east near the facility. The site is underlain by shallow surface soils, with a maximum thickness of soil only tens of feet thick. Based on information presented by Tetra Tech in the OU2 RI/FS, just south of the water tank, groundwater is encountered in weathered bedrock at depths ranging from 10 to 40 feet bgs. Groundwater flow is generally to the east. Water Tank 6601 is an active, 200,000-gallon water tank constructed in approximately 1942, with valves, piping, and electronic controls inside a fenced area with a concrete floor and a metal roof. The enclosure was constructed in the mid 1980s, in response to repeated vandalism at the site. Each incidence of vandalism resulted in releases of elemental mercury at the site due to breakage of a reservoir or "mercury pot." Some of the elemental mercury was recovered after each incident; however, no formal cleanup actions were performed. A cage was constructed to protect the controls from additional vandalism. The mercury control was removed and replaced with controls without mercury prior to the OU4 RI/FS investigation. Water Tank 6601 is in an undeveloped area, which is fenced. Adjacent and surrounding land use is mixed industrial/ vacant. Water Tank 6601 is expected to remain industrial. MJPA plans for the adjacent and surrounding land are for industrial/commercial development. The former base Hospital and Dental Clinics are in the northeast corner of the former base, near the intersection of Cactus Avenue and Heacock Street. The main Hospital building is five stories and the Dental Clinic is a one-story structure. The surface topography in and around the site is relatively flat with a gentle slope (surface gradient at the site is approximately 20 to 30 feet per mile). Major drainage features lie north and east of the site and consist of intermittent drainage channels (Cactus Channel Storm Drain and Heacock Storm Drain). There are no major drainages across the site, and there are no perennial water bodies near the site. While groundwater was not part of the investigation, groundwater is reported to be 25 to 30 feet bgs in the area of the former hospital and dental clinic. Groundwater flow direction is to the south and east. Construction of the Hospital was completed in 1966 and modified in subsequent years. The latest addition was completed in 1974. The original construction of the Dental Clinic was completed in 1985. A sewer main extends from the Hospital/Dental Clinic complex, south along the eastern base boundary to the last manhole before the connection of the hospital lines with the "old trunk line" from western portions of the March ARB. The sewer line, which services both the Hospital and Dental Clinic, was first brought on line with completion of the original hospital building. Two primary lines collect effluent from the complex. The two lines ultimately empty into the old sewer main that flows directly south to the current lifting station, from which sewage is transferred around the south end of the active runway to the current wastewater treatment plant. The former base Hospital and Dental Clinic are in an area characterized by institutional (i.e., medical) land use. Adjacent and surrounding land use is a mix of residential, commercial, a small amount of vacant property and land in agricultural use, and a small corridor of public facilities to the east of the Hospital for an electrical transmission line easement. MJPA plans for the Hospital/Dental Clinic site are for similar reuse. Site L, formerly a swimming pool at the Non-Commissioned Officer (NCO) Club, is east of Riverside Drive and north of Meyer Drive. The site is

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outside the boundary of March ARB that was established as a result of the realignment of March AFB in May 1996. It is part of the land identified as available for transfer by the AFRPA. Site L is in an area characterized by relatively flat topography. No major drainages are associated with the site. Groundwater levels at the site are approximately 26 feet bgs. The groundwater flow direction is to the southeast. The swimming pool at Site L was reportedly constructed in 1953 along with the NCO Club. After decommissioning at an unspecified time, it was used as a repository for a variety of wastes, some potentially hazardous. The pool and wastes were covered with soil, and the area was allowed to become overgrown with grass and weeds. The facility was abandoned and a chain-link fence restricted access to the former pool. In 1993, the pool was identified as an AOC during a comprehensive RFA/Expanded Source Investigation (ESI), which concluded that the pool was filled with a variety of wastes, including waste soils, solvents, and PCBs. In 1994, as part of the RFA investigation, a soil gas survey was conducted to screen for the presence of VOCs. No VOCs were detected above the laboratory reporting limits. Site L is currently open space (parking lot) with no structures, and is bordered on the north by vacant land and on the south by a parking area adjacent to Meyer Drive. The NCO Club is to the east of Site L, and the U.S. Army Reserve Center, with associated landscaping and parking is to the west. Surrounding land uses include institutional/medical, commercial, public facilities/recreation, and vacant land. The MJPA plans for Site L and the surrounding land are commercial in nature. A portion of the parcel in which Site L is located is currently leased to a catering business. A Record of Decision addressing OU4 was completed in September of 2005.

CERCLIS Assessment History:

Action Code:	001
Action:	DISCOVERY
Date Started:	/ /
Date Completed:	02/01/85
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

Action Code:	001
Action:	PRELIMINARY ASSESSMENT
Date Started:	/ /
Date Completed:	02/01/87
Priority Level:	Low priority for further assessment
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

Action Code:	001
Action:	SITE INSPECTION
Date Started:	/ /
Date Completed:	06/01/87
Priority Level:	Low priority for further assessment
Operable Unit:	SITEWIDE

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

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Primary Responsibility: Federal Facilities
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: HAZARD RANKING SYSTEM PACKAGE
Date Started: / /
Date Completed: 06/01/87
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: PROPOSAL TO NATIONAL PRIORITIES LIST
Date Started: / /
Date Completed: 07/14/89
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: FINAL LISTING ON NATIONAL PRIORITIES LIST
Date Started: / /
Date Completed: 11/21/89
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: Notice Letters Issued
Date Started: / /
Date Completed: 02/07/90
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: INTERAGENCY AGREEMENT NEGOTIATIONS
Date Started: 02/07/90

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

Date Completed: 09/27/90
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: Federal Enforcement
Planning Status: Alternate
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: FEDERAL INTERAGENCY AGREEMENT
Date Started: 09/27/90
Date Completed: 09/27/90
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: Federal Enforcement
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 004
Action: FEDERAL FACILITY REMEDIAL INVESTIGATION/FEASIBILITY STUDY
Date Started: 01/24/92
Date Completed: 04/30/95
Priority Level: Not reported
Operable Unit: WEST MARCH - SOILS/GW
Primary Responsibility: Federal Facilities
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: FEDERAL FACILITY REMEDIAL DESIGN
Date Started: 04/07/96
Date Completed: 04/18/96
Priority Level: Not reported
Operable Unit: EAST MARCH - SOILS/GW
Primary Responsibility: Federal Facilities
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: FEDERAL FACILITY REMEDIAL INVESTIGATION/FEASIBILITY STUDY
Date Started: 09/27/90
Date Completed: 06/20/96
Priority Level: Not reported
Operable Unit: EAST MARCH - SOILS/GW
Primary Responsibility: Federal Facilities
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: RECORD OF DECISION

MARCH AIR FORCE BASE (Continued) **1000169261**

Date Started:	/ /
Date Completed:	06/20/96
Priority Level:	Not reported
Operable Unit:	EAST MARCH - SOILS/GW
Primary Responsibility:	Federal Facilities
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

Action Code:	001
Action:	Explanation Of Significant Differences
Date Started:	/ /
Date Completed:	08/24/00
Priority Level:	Not reported
Operable Unit:	EAST MARCH - SOILS/GW
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

Action Code:	001
Action:	FEDERAL FACILITY FIVE YEAR REVIEW
Date Started:	09/30/03
Date Completed:	11/19/03
Priority Level:	Not reported
Operable Unit:	EAST MARCH - SOILS/GW
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

Action Code:	004
Action:	RECORD OF DECISION
Date Started:	/ /
Date Completed:	05/11/04
Priority Level:	Not reported
Operable Unit:	WEST MARCH - SOILS/GW
Primary Responsibility:	Federal Facilities
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

Action Code:	002
Action:	FEDERAL FACILITY REMEDIAL INVESTIGATION/FEASIBILITY STUDY
Date Started:	09/27/90
Date Completed:	09/29/05
Priority Level:	Not reported
Operable Unit:	BASEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

Action Code: 003
Action: RECORD OF DECISION
Date Started: / /
Date Completed: 09/29/05
Priority Level: Not reported
Operable Unit: BASEWIDE
Primary Responsibility: Federal Facilities
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 005
Action: RECORD OF DECISION
Date Started: / /
Date Completed: 09/30/05
Priority Level: Not reported
Operable Unit: WEST MARCH - SOILS/GW
Primary Responsibility: Federal Facilities
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 003
Action: FEDERAL FACILITY FIVE YEAR REVIEW
Date Started: / /
Date Completed: 09/30/09
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: Federal Facilities
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: Restoration Advisory Board
Date Started: 01/01/93
Date Completed: / /
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: Federal Facilities
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: FEDERAL FACILITY REMEDIAL ACTION
Date Started: 03/05/96
Date Completed: / /
Priority Level: Not reported
Operable Unit: EAST MARCH - SOILS/GW
Primary Responsibility: Federal Facilities
Planning Status: Primary
Urgency Indicator: Not reported

MARCH AIR FORCE BASE (Continued) **1000169261**

Action Anomaly: Not reported

Action Code: 005
Action: FEDERAL FACILITY REMEDIAL INVESTIGATION/FEASIBILITY STUDY
Date Started: 10/30/05
Date Completed: / /
Priority Level: Not reported
Operable Unit: SITE 8 & 36
Primary Responsibility: Federal Facilities
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Federal Register Details:
Fed Register Date: 11/21/89
Fed Register Volume: 54
Page Number: 48184

Fed Register Date: 07/14/89
Fed Register Volume: 54
Page Number: 29820

RCRA-LQG:
Date form received by agency: 02/29/2016
Facility name: MARCH AIR RESERVE BASE
Facility address: 610 MEYER DR
BLDG 2403
MARCH ARB, CA 92518
EPA ID: CA4570024527
Mailing address: MEYER DR
BLDG 2403
MARCH ARB, CA 92518
Contact: CRAIG HUNTER
Contact address: MEYER DR BLDG 2403
MARCH ARB, CA 92518
Contact country: US
Contact telephone: 951-655-5082
Contact email: CRAIG.HUNTER.1@US.AF.MIL
EPA Region: 09
Land type: Federal
Classification: Large Quantity Generator
Description: Handler: generates 1,000 kg or more of hazardous waste during any calendar month; or generates more than 1 kg of acutely hazardous waste during any calendar month; or generates more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than 100 kg of that material at any time

Map ID
Direction
Distance
Elevation | Site

MAP FINDINGS

Database(s) | EDR ID Number
EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

Owner/Operator Summary:
- Owner/operator name: US AIR FORCE
- Owner/operator address: GRAEBER BLDG 470
  MARCH ARB, CA 92518
- Owner/operator country: US
- Owner/operator telephone: 951-655-4665
- Owner/operator email: Not reported
- Owner/operator fax: Not reported
- Owner/operator extension: Not reported
- Legal status: Federal
- Owner/Operator Type: Owner
- Owner/Op start date: 01/01/1945
- Owner/Op end date: Not reported

- Owner/operator name: GEN. RUSSELL A. MUNCY
- Owner/operator address: Not reported
  Not reported
- Owner/operator country: Not reported
- Owner/operator telephone: Not reported
- Owner/operator email: Not reported
- Owner/operator fax: Not reported
- Owner/operator extension: Not reported
- Legal status: Federal
- Owner/Operator Type: Operator
- Owner/Op start date: 11/01/2013
- Owner/Op end date: Not reported

Handler Activities Summary:
- U.S. importer of hazardous waste: No
- Mixed waste (haz. and radioactive): No
- Recycler of hazardous waste: No
- Transporter of hazardous waste: No
- Treater, storer or disposer of HW: No
- Underground injection activity: No
- On-site burner exemption: No
- Furnace exemption: No
- Used oil fuel burner: No
- Used oil processor: No
- User oil refiner: No
- Used oil fuel marketer to burner: No
- Used oil Specification marketer: No
- Used oil transfer facility: No
- Used oil transporter: No

Universal Waste Summary:
- Waste type: Batteries
- Accumulated waste on-site: Yes
- Generated waste on-site: No

- Waste type: Lamps
- Accumulated waste on-site: Yes
- Generated waste on-site: No

- Waste type: Thermostats
- Accumulated waste on-site: Yes
- Generated waste on-site: No

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

. Waste code: 141
. Waste name: Off-specification, aged, or surplus inorganics

. Waste code: 151
. Waste name: Asbestos-containing waste

. Waste code: 181
. Waste name: Other inorganic solid waste

. Waste code: 223
. Waste name: Unspecified oil-containing waste

. Waste code: 241
. Waste name: Tank bottom waste

. Waste code: 281
. Waste name: Adhesives

. Waste code: 331
. Waste name: Off-specification, aged, or surplus organics

. Waste code: 343
. Waste name: Unspecified organic liquid mixture

. Waste code: 352
. Waste name: Other organic solids

. Waste code: 723
. Waste name: Liquids with chromium (VI) > 500 mg/l

. Waste code: 791
. Waste name: Liquids with pH < 2

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D003
. Waste name: REACTIVE WASTE

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

MARCH AIR FORCE BASE (Continued) **1000169261**

. Waste code: D011
. Waste name: SILVER

. Waste code: D018
. Waste name: BENZENE

. Waste code: D035
. Waste name: METHYL ETHYL KETONE

Historical Generators:
Date form received by agency: 10/22/2014
Site name: MARCH AIR RESERVE BASE
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D011
. Waste name: SILVER

. Waste code: D018
. Waste name: BENZENE

. Waste code: D035
. Waste name: METHYL ETHYL KETONE

. Waste code: F002
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2, TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF

MARCH AIR FORCE BASE (Continued) **1000169261**

ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Date form received by agency: 03/20/2013
Site name: MARCH AIR RESERVE BASE
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D011
. Waste name: SILVER

. Waste code: D018
. Waste name: BENZENE

. Waste code: F002
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2, TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F003
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NONHALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS, AND A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number / EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Date form received by agency: 07/15/2010
Site name: MARCH AIR RESERVE BASE
Classification: Large Quantity Generator

. Waste code: 181
. Waste name: Other inorganic solid waste

. Waste code: 214
. Waste name: Unspecified solvent mixture

. Waste code: 223
. Waste name: Unspecified oil-containing waste

. Waste code: 281
. Waste name: Adhesives

. Waste code: 342
. Waste name: Organic liquids with metals (see 121)

. Waste code: 343
. Waste name: Unspecified organic liquid mixture

. Waste code: 352
. Waste name: Other organic solids

. Waste code: 461
. Waste name: Degreasing sludge

. Waste code: 541
. Waste name: Photochemicals / photo processing waste

. Waste code: 792
. Waste name: Liquids with pH < 2 with metals

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D011
. Waste name: SILVER

. Waste code: D018

MARCH AIR FORCE BASE (Continued) **1000169261**

. Waste name: BENZENE

. Waste code: F002
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2, TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F003
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NONHALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS, AND A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Date form received by agency: 03/26/2008
Site name: MARCH AIR RESERVE BASE
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D004
. Waste name: ARSENIC

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008

MARCH AIR FORCE BASE (Continued) **1000169261**

. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

. Waste code: D011
. Waste name: SILVER

. Waste code: D018
. Waste name: BENZENE

. Waste code: D021
. Waste name: CHLOROBENZENE

. Waste code: D035
. Waste name: METHYL ETHYL KETONE

. Waste code: F002
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2, TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: U188
. Waste name: PHENOL

. Waste code: U227
. Waste name: 1,1,2-TRICHLOROETHANE (OR) ETHANE, 1,1,2-TRICHLORO-

Date form received by agency: 02/08/2006
Site name: MARCH AIR RESERVE BASE
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

Date form received by agency: 02/25/2004
Site name: MARCH AIR RESERVE BASE
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D004
. Waste name: ARSENIC

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D011
. Waste name: SILVER

. Waste code: D018
. Waste name: BENZENE

Date form received by agency: 04/10/2002
Site name: MARCH AIR RESERVE BASE
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D003
. Waste name: REACTIVE WASTE

. Waste code: D004
. Waste name: ARSENIC

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number / EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

. Waste code: D008
. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

. Waste code: P098
. Waste name: POTASSIUM CYANIDE (OR) POTASSIUM CYANIDE K(CN)

Date form received by agency: 10/12/2000
Site name: MARCH ARB CA
Classification: Large Quantity Generator

Date form received by agency: 07/14/2000
Site name: MARCH AIR RESERVE BASE
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D008
. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

. Waste code: F001
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLORETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F002
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2, TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F003
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NONHALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NONHALOGENATED

MARCH AIR FORCE BASE (Continued) **1000169261**

SOLVENTS, AND A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Date form received by agency: 03/04/1999
Site name: MARCH ARB, CA
Classification: Large Quantity Generator

Date form received by agency: 09/01/1996
Site name: MARCH AIR RESERVE BASE
Classification: Large Quantity Generator

Date form received by agency: 03/26/1996
Site name: MARCH AFB, CA
Classification: Large Quantity Generator

Date form received by agency: 03/31/1994
Site name: MARCH AIR FORCE BASE, CA
Classification: Large Quantity Generator

Date form received by agency: 03/30/1992
Site name: MARCH AIR FORCE BASE
Classification: Large Quantity Generator

Biennial Reports:

Last Biennial Reporting Year: 2017

Annual Waste Handled:

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Amount (Lbs): 15899.4

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.
Amount (Lbs): 186

MARCH AIR FORCE BASE (Continued) **1000169261**

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.
Amount (Lbs): 1

Waste code: D005
Waste name: BARIUM
Amount (Lbs): 8

Waste code: D006
Waste name: CADMIUM
Amount (Lbs): 843

Waste code: D007
Waste name: CHROMIUM
Amount (Lbs): 1026

Waste code: D008
Waste name: LEAD
Amount (Lbs): 843

Waste code: D009
Waste name: MERCURY
Amount (Lbs): 2

Waste code: D011
Waste name: SILVER
Amount (Lbs): 1

Waste code: D018
Waste name: BENZENE
Amount (Lbs): 3436

Waste code: D035
Waste name: METHYL ETHYL KETONE
Amount (Lbs): 11381

Facility Has Received Notices of Violations:
Regulation violated: FR - 262.30-34.C
Area of violation: Generators - General
Date violation determined: 04/27/1995
Date achieved compliance: 04/27/2000
Violation lead agency: EPA
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/28/1995
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: FR - 262.10-12.A

MARCH AIR FORCE BASE (Continued) **1000169261**

Area of violation: Generators - General
Date violation determined: 03/05/1984
Date achieved compliance: 04/04/1995
Violation lead agency: EPA
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/18/1984
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 11/02/2006
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/06/1996
Evaluation: FOLLOW-UP INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 04/04/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 04/27/2000
Evaluation lead agency: EPA

Evaluation date: 03/05/1984
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 04/04/1995
Evaluation lead agency: EPA

US ENG CONTROLS:
EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Actual Date: 09/30/2005
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: Explanation Of Significant Differences
Action Completion date: 08/24/2000
Operable Unit: 01
Contaminated Media : Soil

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number / EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

Engineering Control: Bioremediation (Ex-Situ)
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Discharge
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Extraction
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Liquid Phase Carbon Adsorption
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Monitoring
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Other, (N.O.S.)
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number / EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Cap
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Disposal
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Excavation
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Impermeable Barrier
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Low Temperature Thermal Desorption
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Monitoring
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number / EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Operations & Maintenance (O&M)
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Recycling
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 06/20/1996
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Soil Vapor Extraction (in-situ)
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 003
Action Name: RECORD OF DECISION
Action Completion date: 09/29/2005
Operable Unit: 04
Contaminated Media : Groundwater
Engineering Control: No Action
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 003
Action Name: RECORD OF DECISION
Action Completion date: 09/29/2005
Operable Unit: 04
Contaminated Media : Soil
Engineering Control: Monitoring
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 003
Action Name: RECORD OF DECISION
Action Completion date: 09/29/2005
Operable Unit: 04
Contaminated Media : Soil
Engineering Control: No Action
Contact Name: Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 005
Action Name: RECORD OF DECISION
Action Completion date: 09/30/2005
Operable Unit: 02
Contaminated Media : Groundwater
Engineering Control: No Action
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

Action ID: 005
Action Name: RECORD OF DECISION
Action Completion date: 09/30/2005
Operable Unit: 02
Contaminated Media : Soil
Engineering Control: No Action
Contact Name: Not reported
Contact Phone and Ext: Not reported
Event Code Description: Not reported

US INST CONTROL:
EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Covenant
Actual Date: 09/30/2005
Complet. Date: 09/29/2005
Operable Unit: 04
Contaminated Media : Soil
Contact Name : Not reported
Contact Phone and Ext : Not reported
Event Code Description: Not reported

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Deed Notices
Actual Date: 09/30/2005
Complet. Date: 09/29/2005
Operable Unit: 04
Contaminated Media : Soil

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

Contact Name : Not reported
Contact Phone and Ext : Not reported
Event Code Description: Not reported

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Subdivision regulation
Actual Date: 09/30/2005
Complet. Date: 09/29/2005
Operable Unit: 04
Contaminated Media : Soil
Contact Name : Not reported
Contact Phone and Ext : Not reported
Event Code Description: Not reported

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Zoning regulation
Actual Date: 09/30/2005
Complet. Date: 09/29/2005
Operable Unit: 04
Contaminated Media : Soil
Contact Name : Not reported
Contact Phone and Ext : Not reported
Event Code Description: Not reported

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Covenant
Actual Date: 06/15/2004
Complet. Date: 05/11/2004
Operable Unit: 02
Contaminated Media : Groundwater
Contact Name : Not reported
Contact Phone and Ext : Not reported
Event Code Description: Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number / EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Covenant
Actual Date: 06/15/2004
Complet. Date: 05/11/2004
Operable Unit: 02
Contaminated Media : Soil
Contact Name : Not reported
Contact Phone and Ext : Not reported
Event Code Description: Not reported

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Base use plan change
Actual Date: 09/30/2005
Complet. Date: 09/30/2005
Operable Unit: 02
Contaminated Media : Soil
Contact Name : Not reported
Contact Phone and Ext : Not reported
Event Code Description: Not reported

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Building, demolition, or excavation regulation
Actual Date: 09/30/2005
Complet. Date: 09/30/2005
Operable Unit: 02
Contaminated Media : Soil
Contact Name : Not reported
Contact Phone and Ext : Not reported
Event Code Description: Not reported

ROD:
Full-text of USEPA Record of Decision(s) is available from EDR.

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

MARCH AIR FORCE BASE (Continued) **1000169261**

PRP:
PRP name: STATE OF CALIFORNIA/DEPT. OF HEALTH SERVICES
STATE OF CALIFORNIA/DEPT. OF WATER QUALITY
U.S. AIR FORCE
U.S. AIR FORCE

A1 **MARCH FIELD** **ENVIROSTOR** **S109348567**
NW **14310 FREDERICK STREET** **HWT** **N/A**
< 1/8 **MORENO VALLEY, CA 92533**
0.043 mi.
229 ft. **Site 1 of 2 in cluster A**

Relative: Higher

Actual: 1564 ft.

ENVIROSTOR:

Facility ID:	80000870
Status:	Inactive - Action Required
Status Date:	11/30/2010
Site Code:	401438
Site Type:	Military Evaluation
Site Type Detailed:	FUDS
Acres:	53.3
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Daniel Cordero
Supervisor:	Manny Alonzo
Division Branch:	Cleanup Cypress
Assembly:	61
Senate:	31
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	DERA
Latitude:	33.89166
Longitude:	-117.2597
APN:	NONE SPECIFIED
Past Use:	FIRING RANGE - SMALL ARMS ETC...
Potential COC:	Explosives (UXO, MEC Munitions Debris (MD
Confirmed COC:	30011-NO 32000-NO
Potential Description:	SOIL
Alias Name:	CA99799F999100
Alias Type:	Federal Facility ID
Alias Name:	J09CA7168
Alias Type:	INPR
Alias Name:	401438
Alias Type:	Project Code (Site Code)
Alias Name:	80000870
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Correspondence
Completed Date:	09/14/1998
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Tech Memo

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

MARCH FIELD (Continued) **S109348567**

Completed Date: 03/02/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 07/02/2009
Comments: Final site specific work plan received.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment/Site Inspection Report (PA/SI)
Completed Date: 07/22/2009
Comments: Comments included the SI phase of this project is done.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

HWT:
Reg Num: 3450
Expiration Date: 06/30/2018

A2 **RIVERSIDE COUNTY DEPARTMENT OF WASTE RESOURCES (HE** **UST** **U003839113**
NNW **14290 FREDERICK ST** **N/A**
< 1/8 **MORENO VALLEY, CA 92553**
0.048 mi.
252 ft. **Site 2 of 2 in cluster A**

Relative:
Higher

Actual:
1564 ft.

UST:
Facility ID: FA0023076
Permitting Agency: Riverside County Department of Environmental Health
Latitude: 33.93304
Longitude: -117.26141

RIVERSIDE CO. UST:
Region: RIVERSIDE
Total Tanks: 2

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3 **MARCH FIELD SKEET RANGE** **UXO** **1018150389**
West **N/A**
< 1/8 **MARCH AIR FORCE BASE, CA**
0.080 mi.
423 ft.

Relative:
Higher

Actual:
1563 ft.

UXO:
DoD Component: FUDS
Sort Order: 5
Installation Name: MARCH FIELD

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

MARCH FIELD SKEET RANGE (Continued) **1018150389**

Facility Address 2: Not reported
Site ID: 01OEW
Site Type: Trap and Skeet Range
Latitude: 33.913799
Longitude: -117.262001

B4 **TESORO USA #63348** **UST** **U003839089**
NNW **22990 ALESSANDRO BLVD** **N/A**
1/8-1/4 **MORENO VALLEY, CA 92553**
0.244 mi.
1289 ft. **Site 1 of 4 in cluster B**

Relative: Higher

Actual: 1571 ft.

UST:
Facility ID: 68
Permitting Agency: RIVERSIDE COUNTY
Latitude: 33.918903
Longitude: -117.260162

Facility ID: FA0014719
Permitting Agency: Riverside County Department of Environmental Health
Latitude: 33.91755
Longitude: -117.26151

RIVERSIDE CO. UST:
Region: RIVERSIDE
Total Tanks: 3

B5 **ARCO FACILITY NO 09718** **RCRA-SQG** **1004677900**
NNW **22990 ALLESANDRO BLVD** **FINDS** **CAR000102798**
1/8-1/4 **MORENO VALLEY, CA 92553** **ECHO**
0.244 mi.
1289 ft. **Site 2 of 4 in cluster B**

Relative: Higher

Actual: 1571 ft.

RCRA-SQG:
Date form received by agency: 07/15/2002
Facility name: ARCO FACILITY NO 09718
Facility address: 22990 ALLESANDRO BLVD
MORENO VALLEY, CA 92553
EPA ID: CAR000102798
Mailing address: P O BOX 6038
ARTESIA, CA 90702-6038
Contact: JACK OMAN
Contact address: P O BOX 6038
ARTESIA, CA 90702-6038
Contact country: US
Contact telephone: 714-690-2425
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

ARCO FACILITY NO 09718 (Continued) **1004677900**

Owner/Operator Summary:
- Owner/operator name: B P W COAST PRODUCTS LLC
- Owner/operator address: P O BOX 6038
  ARTESIA, CA 90702
- Owner/operator country: Not reported
- Owner/operator telephone: 714-690-2425
- Owner/operator email: Not reported
- Owner/operator fax: Not reported
- Owner/operator extension: Not reported
- Legal status: Private
- Owner/Operator Type: Owner
- Owner/Op start date: Not reported
- Owner/Op end date: Not reported

Handler Activities Summary:
- U.S. importer of hazardous waste: No
- Mixed waste (haz. and radioactive): No
- Recycler of hazardous waste: No
- Transporter of hazardous waste: No
- Treater, storer or disposer of HW: No
- Underground injection activity: No
- On-site burner exemption: No
- Furnace exemption: No
- Used oil fuel burner: No
- Used oil processor: No
- User oil refiner: No
- Used oil fuel marketer to burner: No
- Used oil Specification marketer: No
- Used oil transfer facility: No
- Used oil transporter: No

. Waste code: D000
. Waste name: Not Defined

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D018
. Waste name: BENZENE

Violation Status: No violations found

FINDS:

Registry ID: 110012215753

Environmental Interest/Information System

California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

ARCO FACILITY NO 09718 (Continued) **1004677900**

corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
- Envid: 1004677900
- Registry ID: 110012215753
- DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110012215753

B6 **THRIFTY OIL #348** **LUST** **U001576570**
NNW **22990 ALESSANDRO BLVD** **HIST UST** **N/A**
1/8-1/4 **MORENO VALLEY, CA 92508**
0.244 mi.
1289 ft. **Site 3 of 4 in cluster B**

Relative: Higher

Actual: 1571 ft.

LUST:
- Lead Agency: RIVERSIDE COUNTY LOP
- Case Type: LUST Cleanup Site
- Geo Track: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606500421
- Global Id: T0606500421
- Latitude: 33.9176348419259
- Longitude: -117.261419145998
- Status: Completed - Case Closed
- Status Date: 12/06/2004
- Case Worker: SCB
- RB Case Number: 083302648T
- Local Agency: RIVERSIDE COUNTY LOP
- File Location: Not reported
- Local Case Number: 95137
- Potential Media Affect: Soil
- Potential Contaminants of Concern: Gasoline
- Site History: Not reported

LUST:
- Global Id: T0606500421
- Contact Type: Local Agency Caseworker
- Contact Name: SHARON BOLTINGHOUSE
- Organization Name: RIVERSIDE COUNTY LOP
- Address: 3880 LEMON ST SUITE 200
- City: RIVERSIDE
- Email: sbolting@rivco.org
- Phone Number: 9519558980

- Global Id: T0606500421
- Contact Type: Regional Board Caseworker
- Contact Name: VALERIE JAHN-BULL
- Organization Name: SANTA ANA RWQCB (REGION 8)
- Address: 3737 MAIN STREET, SUITE 500
- City: RIVERSIDE
- Email: vjahn-bull@waterboards.ca.gov
- Phone Number: 9517824903

LUST:
- Global Id: T0606500421
- Action Type: Other

Map ID
Direction
Distance
Elevation | Site

MAP FINDINGS

Database(s) | EDR ID Number
EPA ID Number

THRIFTY OIL #348 (Continued) **U001576570**

Date: 02/15/1995
Action: Leak Reported

Global Id: T0606500421
Action Type: Other
Date: 01/30/1995
Action: Leak Discovery

Global Id: T0606500421
Action Type: ENFORCEMENT
Date: 12/05/2004
Action: File review - #RCDEH Upload Site File 10/27/2015

Global Id: T0606500421
Action Type: Other
Date: 01/30/1995
Action: Leak Stopped

Global Id: T0606500421
Action Type: ENFORCEMENT
Date: 12/06/2004
Action: Closure/No Further Action Letter - #Riv Co Closure

LUST:
Global Id: T0606500421
Status: Completed - Case Closed
Status Date: 12/06/2004

Global Id: T0606500421
Status: Open - Case Begin Date
Status Date: 01/30/1995

Global Id: T0606500421
Status: Open - Site Assessment
Status Date: 02/15/1995

Global Id: T0606500421
Status: Open - Site Assessment
Status Date: 05/09/1996

Global Id: T0606500421
Status: Open - Site Assessment
Status Date: 06/03/1996

HIST UST:
File Number: 0002A7FD
URL: http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0002A7FD.pdf
Region: STATE
Facility ID: 00000004735
Facility Type: Gas Station
Other Type: Not reported
Contact Name: Not reported
Telephone: 2139239876
Owner Name: THRIFTY OIL CO.
Owner Address: 10000 LAKEWOOD BLVD.

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

THRIFTY OIL #348 (Continued) **U001576570**

Owner City,St,Zip:	DOWNEY, CA 90240
Total Tanks:	0004
Tank Num:	001
Container Num:	348-1
Year Installed:	Not reported
Tank Capacity:	00010164
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	348-2
Year Installed:	Not reported
Tank Capacity:	00010164
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	003
Container Num:	348-3
Year Installed:	Not reported
Tank Capacity:	00010164
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	004
Container Num:	348-10
Year Installed:	Not reported
Tank Capacity:	00000280
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	12
Leak Detection:	Stock Inventor

Click here for Geo Tracker PDF:

B7 **THRIFTY OIL #348** **LUST** **S101589927**
NNW **22990 ALESSANDRO BLVD** **SWEEPS UST** **N/A**
1/8-1/4 **MORENO VALLEY, CA 92388** **CA FID UST**
0.244 mi. **HIST CORTESE**
1289 ft. **Site 4 of 4 in cluster B**

Relative:
Higher

Actual:
1571 ft.

LUST REG 8:

Region:	8
County:	Riverside
Regional Board:	Santa Ana Region
Facility Status:	Preliminary site assessment underway
Case Number:	083302648T
Local Case Num:	95137
Case Type:	Soil only
Substance:	Gasoline
Qty Leaked:	Not reported
Abate Method:	Not reported

Map ID
Direction
Distance
Elevation | Site

MAP FINDINGS

Database(s) | EDR ID Number
EPA ID Number

THRIFTY OIL #348 (Continued) **S101589927**

Cross Street:	FREDERICK
Enf Type:	Not reported
Funding:	Not reported
How Discovered:	Tank Closure
How Stopped:	Not reported
Leak Cause:	UNK
Leak Source:	UNK
Global ID:	T0606500421
How Stopped Date:	1/30/1995
Enter Date:	4/20/1995
Date Confirmation of Leak Began:	2/15/1995
Date Preliminary Assessment Began:	6/3/1996
Discover Date:	1/30/1995
Enforcement Date:	Not reported
Close Date:	Not reported
Date Prelim Assessment Workplan Submitted:	5/9/1996
Date Pollution Characterization Began:	Not reported
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	4/20/1995
GW Qualifies:	=
Soil Qualifies:	ND
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.9173103
Longitude:	-117.2614274
MTBE Date:	9/12/2001
Max MTBE GW:	45
MTBE Concentration:	0
Max MTBE Soil:	0
MTBE Fuel:	1
MTBE Tested:	MTBE Detected. Site tested for MTBE & MTBE detected
MTBE Class:	*
Staff:	VJJ
Staff Initials:	SCB
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	SAN JACINTO (8-5)
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: Not reported

RIVERSIDE CO. LUST:

Region:	RIVERSIDE
Facility ID:	95137
Employee:	Boltinghous-LOP
Site Closed:	Yes
Case Type:	Drinking Water Aquifer affected
Facility Status:	closed/action completed
Casetype Decode:	An Aquifer used for Drinking Water supply has been contaminated.
Fstatus Decode:	Closed/Action completed

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number / EPA ID Number

THRIFTY OIL #348 (Continued) **S101589927**

SWEEPS UST:

Status:	Active
Comp Number:	4735
Number:	1
Board Of Equalization:	44-010930
Referral Date:	11-19-92
Action Date:	11-19-92
Created Date:	08-25-89
Owner Tank Id:	348-1
SWRCB Tank Id:	33-000-004735-000001
Tank Status:	A
Capacity:	10000
Active Date:	11-19-92
Tank Use:	M.V. FUEL
STG:	P
Content:	LEADED
Number Of Tanks:	3

Status:	Active
Comp Number:	4735
Number:	1
Board Of Equalization:	44-010930
Referral Date:	11-19-92
Action Date:	11-19-92
Created Date:	08-25-89
Owner Tank Id:	348-2
SWRCB Tank Id:	33-000-004735-000002
Tank Status:	A
Capacity:	10000
Active Date:	11-19-92
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported

Status:	Active
Comp Number:	4735
Number:	1
Board Of Equalization:	44-010930
Referral Date:	11-19-92
Action Date:	11-19-92
Created Date:	08-25-89
Owner Tank Id:	348-3
SWRCB Tank Id:	33-000-004735-000003
Tank Status:	A
Capacity:	10000
Active Date:	11-19-92
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported

CA FID UST:

Facility ID:	33001092
Regulated By:	UTNKA
Regulated ID:	Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

THRIFTY OIL #348 (Continued) **S101589927**

Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 7146539919
Mail To: Not reported
Mailing Address: 10000 LAKEWOOD BLVD
Mailing Address 2: Not reported
Mailing City,St,Zip: MORENO VALLEY 92388
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

HIST CORTESE:
Region: CORTESE
Facility County Code: 33
Reg By: LTNKA
Reg Id: 083302648T

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8 **PLAZA HAND CAR WASH** **LUST U003949023**
NNE **23100 ALESSANDRO BLVD** **UST N/A**
1/4-1/2 **MORENO VALLEY, CA 92553**
0.255 mi.
1345 ft.

Relative: Higher

Actual: 1575 ft.

LUST:
Lead Agency: RIVERSIDE COUNTY LOP
Case Type: LUST Cleanup Site
Geo Track: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606563337
Global Id: T0606563337
Latitude: 33.917960094
Longitude: -117.259563628
Status: Completed - Case Closed
Status Date: 12/31/2008
Case Worker: SCB
RB Case Number: Not reported
Local Agency: RIVERSIDE COUNTY LOP
File Location: Local Agency
Local Case Number: 200521458
Potential Media Affect: Soil
Potential Contaminants of Concern: Gasoline
Site History: Not reported

LUST:
Global Id: T0606563337
Contact Type: Regional Board Caseworker
Contact Name: Ken Williams
Organization Name: SANTA ANA RWQCB (REGION 8)
Address: 3737 MAIN STREET, SUITE 500
City: RIVERSIDE
Email: kwilliams@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0606563337
Contact Type: Local Agency Caseworker
Contact Name: SHARON BOLTINGHOUSE

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number
EPA ID Number

PLAZA HAND CAR WASH (Continued) **U003949023**

Organization Name: RIVERSIDE COUNTY LOP
Address: 3880 LEMON ST SUITE 200
City: RIVERSIDE
Email: sbolting@rivco.org
Phone Number: 9519558980

LUST:
Global Id: T0606563337
Action Type: ENFORCEMENT
Date: 11/27/2007
Action: LOP Case Closure Summary to RB

Global Id: T0606563337
Action Type: Other
Date: 04/28/2005
Action: Leak Reported

Global Id: T0606563337
Action Type: ENFORCEMENT
Date: 04/27/2005
Action: Other Report - #UST Sample Analytical Report

Global Id: T0606563337
Action Type: ENFORCEMENT
Date: 11/13/2008
Action: Staff Letter - #RCDEH111308

Global Id: T0606563337
Action Type: RESPONSE
Date: 04/25/2008
Action: Other Report / Document

Global Id: T0606563337
Action Type: RESPONSE
Date: 10/15/2007
Action: Monitoring Report - Quarterly

Global Id: T0606563337
Action Type: ENFORCEMENT
Date: 02/22/2008
Action: Staff Letter - #RCDEH022208

Global Id: T0606563337
Action Type: Other
Date: 04/28/2005
Action: Leak Discovery

Global Id: T0606563337
Action Type: ENFORCEMENT
Date: 03/25/2007
Action: Technical Correspondence / Assistance / Other - #RCDEH 032507

Global Id: T0606563337
Action Type: RESPONSE
Date: 07/15/2007
Action: Monitoring Report - Quarterly

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number
EPA ID Number

PLAZA HAND CAR WASH (Continued) **U003949023**

Global Id: T0606563337
Action Type: ENFORCEMENT
Date: 12/31/2008
Action: Closure/No Further Action Letter - #RCDEH Closure Docs

Global Id: T0606563337
Action Type: Other
Date: 03/29/2005
Action: Leak Stopped

Global Id: T0606563337
Action Type: RESPONSE
Date: 12/15/2008
Action: Well Destruction Report

Global Id: T0606563337
Action Type: RESPONSE
Date: 12/27/2007
Action: Other Report / Document

LUST:
Global Id: T0606563337
Status: Completed - Case Closed
Status Date: 12/31/2008

Global Id: T0606563337
Status: Open - Case Begin Date
Status Date: 03/29/2005

Global Id: T0606563337
Status: Open - Site Assessment
Status Date: 04/28/2005

Global Id: T0606563337
Status: Open - Site Assessment
Status Date: 06/22/2006

Global Id: T0606563337
Status: Open - Verification Monitoring
Status Date: 03/24/2007

RIVERSIDE CO. LUST:
Region: RIVERSIDE
Facility ID: 200521458
Employee: Boltinghous-LOP
Site Closed: Yes
Case Type: Soil only
Facility Status: closed/action completed
Casetype Decode: Soil only is impacted
Fstatus Decode: Closed/Action completed

UST:
Facility ID: 593
Permitting Agency: RIVERSIDE COUNTY
Latitude: 33.9194115

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

PLAZA HAND CAR WASH (Continued) **U003949023**

Longitude: -117.2579269

9
NW
1/4-1/2
0.299 mi.
1580 ft.

MORENO VALLEY RECYCLING **SWRCY** **S107137332**
22862 ALESSANDRO BLVD **N/A**
MORENO VALLEY, CA 92553

Relative:
Higher

Actual:
1570 ft.

SWRCY:

Reg Id:	25282
Cert Id:	RC11825
Mailing Address:	3249 W El Segundo Blvd
Mailing City:	Hawthorne
Mailing State:	CA
Mailing Zip Code:	90250
Website:	Not reported
Email:	Not reported
Phone Number:	(951) 616-6978
Grand Father:	N
Rural:	N
Operation Begin Date:	08/14/2003
Aluminium:	Y
Glass:	Y
Plastic:	Y
Bimetal:	Y
Agency:	N/A
Monday Hours Of Operation:	CLOSED
Tuesday Hours Of Operation:	9:30 am - 5:45 pm; Closed 1:00 pm - 1:30 pm
Wednesday Hours Of Operation:	9:30 am - 5:45 pm; Closed 1:00 pm - 1:30 pm
Thursday Hours Of Operation:	9:30 am - 5:45 pm; Closed 1:00 pm - 1:30 pm
Friday Hours Of Operation:	9:30 am - 5:45 pm; Closed 1:00 pm - 1:30 pm
Saturday Hours Of Operation:	9:30 am - 5:45 pm; Closed 1:00 pm - 1:30 pm
Sunday Hours Of Operation:	9:30 am - 5:45 pm; Closed 1:00 pm - 1:30 pm
Organization ID:	31689
Organization Name:	E & M Recycling Company

10
North
1/4-1/2
0.306 mi.
1616 ft.

M&M DRY CLEANERS **SLIC** **S112274195**
23080 ALESSANDRO BOULEVARD, UNIT 220 **BROWNFIELDS** **N/A**
MORENO VALLEY, CA 92553

Relative:
Higher

Actual:
1576 ft.

SLIC:

Region:	STATE
Facility Status:	**Open - Remediation**
Status Date:	05/08/2017
Global Id:	T10000004432
Lead Agency:	SANTA ANA RWQCB (REGION 8)
Lead Agency Case Number:	Not reported
Latitude:	33.9187890255534
Longitude:	-117.259790647816
Case Type:	Cleanup Program Site
Case Worker:	JML
Local Agency:	Not reported
RB Case Number:	2080099
File Location:	All Files are on GeoTracker or in the Local Agency Database

M&M DRY CLEANERS (Continued) **S112274195**

Potential Media Affected: Indoor Air, Other Groundwater (uses other than drinking water), Soil, Soil Vapor
Potential Contaminants of Concern: Tetrachloroethylene (PCE)
Site History: The M&M Cleaners is located at 23080 Alessandro Boulevard, Moreno Valley, California, and occupies Unit No. 220 of the shopping center. In 2012 and 2013, preliminary investigations identified the presence of the dry cleaning solvent, tetrachloroethene (also known as perchloroethylene or PCE), in soil and groundwater under the M&M Cleaners, the alley located north of the Property, and under the parking lot located to the south. However, these initial investigations have not been able to determine how far the PCE may have migrated since it was released. Soil gas investigations that were conducted in 2013 and early 2014 detected the presence of elevated concentrations of PCE in the soil vapor beneath the dry cleaners, adjacent units of the shopping center, the alley behind the shopping center, and the parking area of the Sienna Pointe apartments. Mitigation of the soil vapor intrusion risk is a driving factor in the selection of remediation technologies and is the current focus of work at the Site.

Click here to access the California GeoTracker records for this facility:

BROWNFIELDS:

Global ID:	T10000004432
Latitude:	33.918789026
Longitude:	-117.25979065
Project Type:	Cleanup Program Site
Status:	Open - Remediation
Status Date:	05/08/2017
Lead Agency:	SANTA ANA RWQCB (REGION 8)
Last Correspondence Date:	07/26/2017
Release Type:	Clarifier / Dry Cleaning Unit / Vapor Degreaser, Unknown
Contaminant(s) of Concern:	Tetrachloroethylene (PCE)
Media of Concern:	Indoor Air, Other Groundwater (uses other than drinking water), Soil, Soil Vapor
Past Use(s) that Caused Contamination:	DRY CLEANING
Human Health Exposure Controlled:	INSUFFICIENT DATA
Human Health Exposure Controlled Date:	Not reported
Groundwater Migration Controlled:	UNDETERMINED
Groundwater Migration Controlled Date:	Not reported
Primary Caseworker Name:	JESSICA LAW
Primary Caseworker Organization Name:	SANTA ANA RWQCB (REGION 8)
Primary Caseworker Phone Number:	951-782-4381
Primary Caseworker Address:	3737 MAIN STREET, SUITE 500
Primary Caseworker Address:	RIVERSIDE
Primary Caseworker Address:	CA
Primary Caseworker Email:	jessica.law@waterboards.ca.gov

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
11 **NW** **1/4-1/2** **0.338 mi.** **1787 ft.**	**CIRCLE K #300** **22790 ALESSANDRO BLVD** **MORENO VALLEY, CA 92388**	**LUST** **SWEEPS UST** **CA FID UST** **HIST CORTESE**	**S101619611** **N/A**

Relative:
Higher

Actual:
1570 ft.

LUST:

Lead Agency:	RIVERSIDE COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606500109
Global Id:	T0606500109
Latitude:	33.9174245000084
Longitude:	-117.264727617722
Status:	Completed - Case Closed
Status Date:	09/10/1998
Case Worker:	RIV
RB Case Number:	083301110T
Local Agency:	RIVERSIDE COUNTY LOP
File Location:	Local Agency Warehouse
Local Case Number:	921020
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

LUST:

Global Id:	T0606500109
Contact Type:	Regional Board Caseworker
Contact Name:	CARL BERNHARDT
Organization Name:	SANTA ANA RWQCB (REGION 8)
Address:	3737 MAIN STREET, SUITE 500
City:	RIVERSIDE
Email:	cbernhardt@waterboards.ca.gov
Phone Number:	9517824495

Global Id:	T0606500109
Contact Type:	Local Agency Caseworker
Contact Name:	Riverside County LOP
Organization Name:	RIVERSIDE COUNTY LOP
Address:	3880 LEMON ST SUITE 200
City:	RIVERSIDE
Email:	Not reported
Phone Number:	9519558980

LUST:

Global Id:	T0606500109
Action Type:	Other
Date:	10/26/1992
Action:	Leak Discovery

Global Id:	T0606500109
Action Type:	Other
Date:	11/04/1992
Action:	Leak Reported

Global Id:	T0606500109
Action Type:	Other
Date:	10/26/1992
Action:	Leak Stopped

Map ID
Direction
Distance
Elevation | Site

MAP FINDINGS

Database(s) | EDR ID Number
EPA ID Number

CIRCLE K #300 (Continued) **S101619611**

Global Id: T0606500109
Action Type: ENFORCEMENT
Date: 03/25/2009
Action: Closure/No Further Action Letter - #Site Closure

Global Id: T0606500109
Action Type: ENFORCEMENT
Date: 09/10/1998
Action: Closure/No Further Action Letter

Global Id: T0606500109
Action Type: ENFORCEMENT
Date: 03/24/2009
Action: File review - #RCDEH Upload Site File 5/15/2015

LUST:
Global Id: T0606500109
Status: Completed - Case Closed
Status Date: 09/10/1998

Global Id: T0606500109
Status: Open - Case Begin Date
Status Date: 10/26/1992

Global Id: T0606500109
Status: Open - Remediation
Status Date: 03/07/1995

Global Id: T0606500109
Status: Open - Remediation
Status Date: 02/09/1996

Global Id: T0606500109
Status: Open - Site Assessment
Status Date: 11/04/1992

Global Id: T0606500109
Status: Open - Site Assessment
Status Date: 07/13/1993

Global Id: T0606500109
Status: Open - Site Assessment
Status Date: 10/31/1994

LUST REG 8:
Region: 8
County: Riverside
Regional Board: Santa Ana Region
Facility Status: Case Closed
Case Number: 083301110T
Local Case Num: 911020
Case Type: Soil only
Substance: Gasoline
Qty Leaked: Not reported
Abate Method: Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

CIRCLE K #300 (Continued) **S101619611**

Cross Street:	VULTEE
Enf Type:	CLOS
Funding:	Not reported
How Discovered:	Tank Closure
How Stopped:	Not reported
Leak Cause:	UNK
Leak Source:	UNK
Global ID:	T0606500109
How Stopped Date:	10/26/1992
Enter Date:	1/6/1993
Date Confirmation of Leak Began:	11/4/1992
Date Preliminary Assessment Began:	7/13/1993
Discover Date:	10/26/1992
Enforcement Date:	Not reported
Close Date:	9/10/1998
Date Prelim Assessment Workplan Submitted:	11/4/1992
Date Pollution Characterization Began:	10/31/1994
Date Remediation Plan Submitted:	3/7/1995
Date Remedial Action Underway:	2/9/1996
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	1/6/1993
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.9171412
Longitude:	-117.2651675
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	1
MTBE Tested:	Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
MTBE Class:	*
Staff:	CAB
Staff Initials:	UNK
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	SAN JACINTO (8-5)
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: Not reported

RIVERSIDE CO. LUST:

Region:	RIVERSIDE
Facility ID:	921020
Employee:	Boltinghous-LOP
Site Closed:	Yes
Case Type:	Soil only
Facility Status:	closed/action completed
Casetype Decode:	Soil only is impacted
Fstatus Decode:	Closed/Action completed

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

CIRCLE K #300 (Continued) **S101619611**

SWEEPS UST:
Status: Active
Comp Number: 13650
Number: 1
Board Of Equalization: 44-017983
Referral Date: 10-28-92
Action Date: 10-28-92
Created Date: 02-29-88
Owner Tank Id: 000035
SWRCB Tank Id: 33-000-013650-000001
Tank Status: A
Capacity: 9940
Active Date: 10-28-92
Tank Use: M.V. FUEL
STG: P
Content: LEADED
Number Of Tanks: 2

Status: Active
Comp Number: 13650
Number: 1
Board Of Equalization: 44-017983
Referral Date: 10-28-92
Action Date: 10-28-92
Created Date: 02-29-88
Owner Tank Id: 000035
SWRCB Tank Id: 33-000-013650-000002
Tank Status: A
Capacity: 9940
Active Date: 10-28-92
Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: Not reported

CA FID UST:
Facility ID: 33000356
Regulated By: UTNKA
Regulated ID: 00013650
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 7146534289
Mail To: Not reported
Mailing Address: P O BOX 52084
Mailing Address 2: Not reported
Mailing City,St,Zip: MORENO VALLEY 92388
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

HIST CORTESE:
Region: CORTESE

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CIRCLE K #300 (Continued) **S101619611**

Facility County Code: 33
Reg By: LTNKA
Reg Id: 083301110T

12
WSW
1/2-1
0.570 mi.
3012 ft.

ALPER CLEANERS **ENVIROSTOR** **S106797644**
14420 ELSWORTH ST., SUITE 114 **N/A**
MORENO VALLEY, CA 92553

Relative:
Lower

Actual:
1553 ft.

ENVIROSTOR:

Facility ID:	33720002
Status:	Refer: 1248 Local Agency
Status Date:	06/07/2004
Site Code:	Not reported
Site Type:	Evaluation
Site Type Detailed:	Evaluation
Acres:	0
NPL:	NO
Regulatory Agencies:	RIVERSIDE COUNTY
Lead Agency:	RIVERSIDE COUNTY
Program Manager:	Not reported
Supervisor:	Referred - Not Assigned
Division Branch:	Cleanup Cypress
Assembly:	61
Senate:	31
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not Applicable
Latitude:	33.91112
Longitude:	-117.2692
APN:	297140026, 297150012
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	297140026
Alias Type:	APN
Alias Name:	297150012
Alias Type:	APN
Alias Name:	33720002
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	Not reported
Completed Sub Area Name:	Not reported
Completed Document Type:	Not reported
Completed Date:	Not reported
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	ALPER CLEANERS (Continued)		**S106797644**

Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Count: 1 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MORENO VALLEY	S108985918	U.S. AIR FORCE - MARCH AFB (FORMER	N/A GRAHAM		SLIC

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/10/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 42

Source: EPA
Telephone: N/A
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/10/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 42

Source: EPA
Telephone: N/A
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/10/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 42

Source: EPA
Telephone: N/A
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 92

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 10/06/2017
Next Scheduled EDR Contact: 01/15/2018
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 07/11/2017
Date Data Arrived at EDR: 07/21/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 77

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 07/11/2017
Date Data Arrived at EDR: 07/28/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 70

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/22/2017
Date Data Arrived at EDR: 06/13/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 94

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/08/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/10/2017
Date Data Arrived at EDR: 08/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/27/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/10/2017
Date Data Arrived at EDR: 08/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/27/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/18/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 22

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 09/21/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 10/30/2017
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 10/30/2017
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/13/2017
Date Data Arrived at EDR: 11/14/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 23

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)
Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 58

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/25/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 31

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 11/07/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/13/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/01/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/24/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/26/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 58

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 10/13/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 57

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/26/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/24/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 134

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 05/02/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/01/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/13/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/25/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 10/30/2017
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Quarterly

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/20/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 09/21/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 49

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 08/21/2017
Date Data Arrived at EDR: 09/20/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/19/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 9

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 05/30/2017
Date Data Arrived at EDR: 05/31/2017
Date Made Active in Reports: 08/15/2017
Number of Days to Update: 76

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 11/09/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 10/30/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/20/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 11/03/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 07/13/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 30

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 10/30/2017
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2017
Date Data Arrived at EDR: 08/18/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 34

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 10/10/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 07/13/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 30

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 11/27/2017
Date Data Arrived at EDR: 11/29/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 19

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 08/31/2017
Date Data Arrived at EDR: 09/05/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 64

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 07/11/2017
Date Data Arrived at EDR: 07/26/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 09/05/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 63

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 09/21/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 22

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 09/21/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 05/09/2017
Date Data Arrived at EDR: 07/26/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 57

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 58

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 58

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 11/22/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/13/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/11/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/17/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 10/17/2017
Date Data Arrived at EDR: 11/01/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/09/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 14

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 133

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 09/27/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 8

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 126

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/13/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 10/11/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 11/20/2017
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/08/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 10/26/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/02/2017
Date Data Arrived at EDR: 10/05/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 10/05/2017
Next Scheduled EDR Contact: 01/15/2018
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2017
Date Data Arrived at EDR: 08/03/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 78

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/18/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/11/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 12/23/2016
Date Data Arrived at EDR: 12/27/2016
Date Made Active in Reports: 02/17/2017
Number of Days to Update: 52

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 11/02/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/22/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 10/10/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 07/31/2017
Date Data Arrived at EDR: 08/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 44

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/01/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/01/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/25/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 24

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 12/19/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/23/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 9

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 10/25/2016
Date Data Arrived at EDR: 06/02/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 133

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 02/13/2017
Date Data Arrived at EDR: 02/15/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 261

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/02/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/17/2017
Date Data Arrived at EDR: 08/17/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 29

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 09/21/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 22

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/02/2017
Date Data Arrived at EDR: 08/08/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 69

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 03/21/2017
Date Made Active in Reports: 08/15/2017
Number of Days to Update: 147

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 34

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 10/23/2017
Date Data Arrived at EDR: 10/24/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 52

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/14/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 31

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 11/09/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/12/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 97

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 10/10/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 11/20/2017
Date Data Arrived at EDR: 11/20/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 37

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/20/2017
Date Data Arrived at EDR: 11/20/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 37
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 10/10/2017
Date Data Arrived at EDR: 10/10/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 7
Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/10/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/01/2017
Number of Days to Update: 50
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 09/01/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 63
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 11/13/2017
Date Data Arrived at EDR: 11/14/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 23
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 09/05/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 63
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 10/18/2017
Number of Days to Update: 36
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 06/16/2017
Date Data Arrived at EDR: 06/20/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 119
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/13/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: No Update Planned

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 94
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water board?s review found that more than one-third of the region?s active disposal pits are operating without permission.

Date of Government Version: 04/15/2015
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/23/2015
Number of Days to Update: 67
Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 10/13/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9
Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Quarterly

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/19/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 09/22/2017
Date Data Arrived at EDR: 09/22/2017
Date Made Active in Reports: 10/10/2017
Number of Days to Update: 18

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 09/21/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 10/11/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 27

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/10/2017
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 12/08/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 15

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 09/18/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 08/31/2017
Date Data Arrived at EDR: 09/05/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 64

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/20/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 08/07/2017
Date Data Arrived at EDR: 08/08/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 69

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 08/17/2017
Date Data Arrived at EDR: 08/22/2017
Date Made Active in Reports: 10/25/2017
Number of Days to Update: 64

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 10/30/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 10/31/2017
Date Data Arrived at EDR: 11/01/2017
Date Made Active in Reports: 11/14/2017
Number of Days to Update: 13

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 10/25/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/04/2017
Date Data Arrived at EDR: 12/06/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 21

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 10/30/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 10/03/2017
Date Data Arrived at EDR: 10/06/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 40

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 09/27/2017
Next Scheduled EDR Contact: 01/15/2018
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 10/25/2017
Date Data Arrived at EDR: 10/27/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 19

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 08/03/2017
Date Data Arrived at EDR: 08/08/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 69

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 10/23/2017
Date Data Arrived at EDR: 10/24/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 22

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INYO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/08/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 08/04/2017
Number of Days to Update: 56

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/20/2017
Number of Days to Update: 43

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 11/14/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 28

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 11/09/2017
Date Data Arrived at EDR: 11/10/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 5

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 07/24/2017
Date Data Arrived at EDR: 07/26/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 82

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

LOS ANGELES COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206
Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 12/13/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 10/11/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 5
Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 10/10/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/16/2017
Date Data Arrived at EDR: 10/17/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 51
Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 10/17/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 04/21/2017
Date Made Active in Reports: 10/09/2017
Number of Days to Update: 171
Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/14/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 31
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 03/10/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 54
Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 07/11/2017
Date Data Arrived at EDR: 07/14/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 69

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 10/10/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 10/26/2017
Date Data Arrived at EDR: 10/27/2017
Date Made Active in Reports: 11/06/2017
Number of Days to Update: 10

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/28/2017
Date Data Arrived at EDR: 10/05/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 34

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 09/27/2017
Next Scheduled EDR Contact: 01/15/2018
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 10/02/2017
Date Data Arrived at EDR: 10/03/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 14

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 11/21/2017
Date Data Arrived at EDR: 11/27/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 30

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

MONTEREY COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/15/2017
Date Made Active in Reports: 11/28/2017
Number of Days to Update: 74

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 11/22/2017
Date Data Arrived at EDR: 11/27/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 22

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 8

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 10/25/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/09/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 28

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/09/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 36

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 42

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/07/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 09/05/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 63

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 10/23/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 12

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/11/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 28

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/15/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/12/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 27

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/15/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/02/2017
Date Data Arrived at EDR: 10/03/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 3

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/03/2017
Next Scheduled EDR Contact: 01/15/2018
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 08/02/2017
Date Data Arrived at EDR: 10/03/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 44

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/03/2017
Next Scheduled EDR Contact: 01/15/2018
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 11/17/2017
Number of Days to Update: 14

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 08/31/2017
Date Data Arrived at EDR: 09/19/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 58

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/05/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 63

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 11/29/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 42

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 10/03/2017
Date Data Arrived at EDR: 10/06/2017
Date Made Active in Reports: 10/10/2017
Number of Days to Update: 4

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/13/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 11/16/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 31

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

SAN MATEO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 09/15/2017
Date Data Arrived at EDR: 09/19/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 28

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/06/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 09/15/2017
Date Data Arrived at EDR: 09/19/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 51

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/06/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 12/13/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 08/07/2017
Date Data Arrived at EDR: 08/10/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 67

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 34

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 09/26/2017
Date Data Arrived at EDR: 09/27/2017
Date Made Active in Reports: 11/10/2017
Number of Days to Update: 44

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/08/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 09/26/2017
Date Data Arrived at EDR: 09/27/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 42

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/08/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 09/25/2017
Date Data Arrived at EDR: 09/27/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 50

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 12/19/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 10/03/2017
Date Data Arrived at EDR: 10/06/2017
Date Made Active in Reports: 11/10/2017
Number of Days to Update: 35

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/19/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/10/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 6

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Varies

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 12/01/2017
Date Data Arrived at EDR: 12/04/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 15

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 12/01/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA Facility List

Cupa facilities

Date of Government Version: 11/16/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 31

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 10/23/2017
Date Data Arrived at EDR: 10/24/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 23

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

TULARE COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List
Cupa program facilities

Date of Government Version: 09/27/2017
Date Data Arrived at EDR: 09/28/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 18

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 12/18/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 10/24/2017
Date Data Arrived at EDR: 10/25/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 22

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 09/26/2017
Date Data Arrived at EDR: 10/25/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 43

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 11/08/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Quarterly

Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 09/26/2017
Date Data Arrived at EDR: 10/25/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 43

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 08/28/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 9

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/11/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 09/27/2017
Date Data Arrived at EDR: 10/02/2017
Date Made Active in Reports: 11/14/2017
Number of Days to Update: 43

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 09/27/2017
Next Scheduled EDR Contact: 01/15/2018
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 11/08/2017
Date Data Arrived at EDR: 11/10/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 6

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 10/25/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/11/2017
Date Data Arrived at EDR: 11/14/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 34

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/11/2017
Date Made Active in Reports: 07/27/2017
Number of Days to Update: 107

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/05/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 10/01/2017
Date Data Arrived at EDR: 11/01/2017
Date Made Active in Reports: 11/13/2017
Number of Days to Update: 12

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/25/2017
Date Made Active in Reports: 09/25/2017
Number of Days to Update: 62

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 06/19/2015
Date Made Active in Reports: 07/15/2015
Number of Days to Update: 26

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/16/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/13/2017
Date Made Active in Reports: 07/14/2017
Number of Days to Update: 92

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/11/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.
Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.
Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

CENTERPOINTE
CENTERPOINTE
MORENO VALLEY, CA 92553

TARGET PROPERTY COORDINATES

Latitude (North):	33.91398 - 33° 54' 50.33''
Longitude (West):	117.260624 - 117° 15' 38.25''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	475907.1
UTM Y (Meters):	3752454.8
Elevation:	1562 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5641312 RIVERSIDE EAST, CA
Version Date:	2012
East Map:	5641326 SUNNYMEAD, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

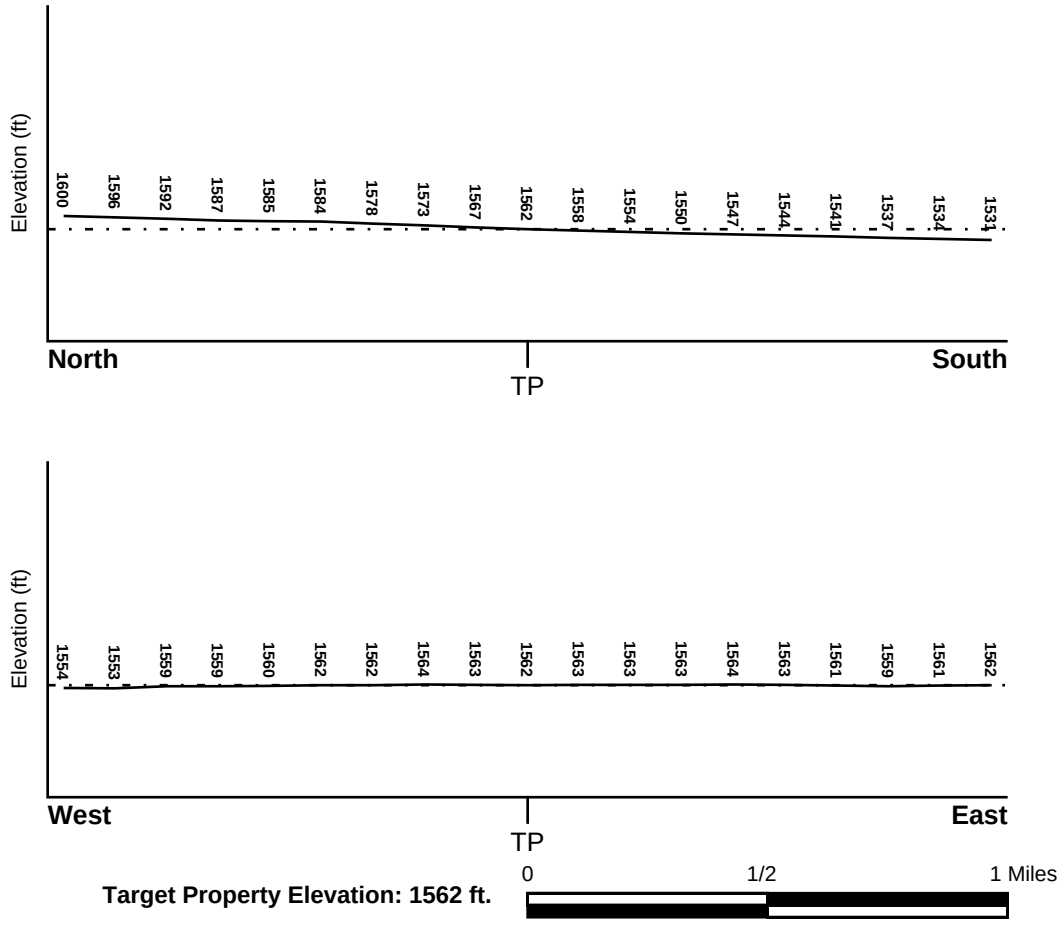
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General South

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06065C0745G	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06065C0761G	FEMA FIRM Flood data
06065C0765G	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
1	1/8 - 1/4 Mile NNW	Not Reported
1G	1/8 - 1/4 Mile NNW	Not Reported

For additional site information, refer to Physical Setting Source Map Findings.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

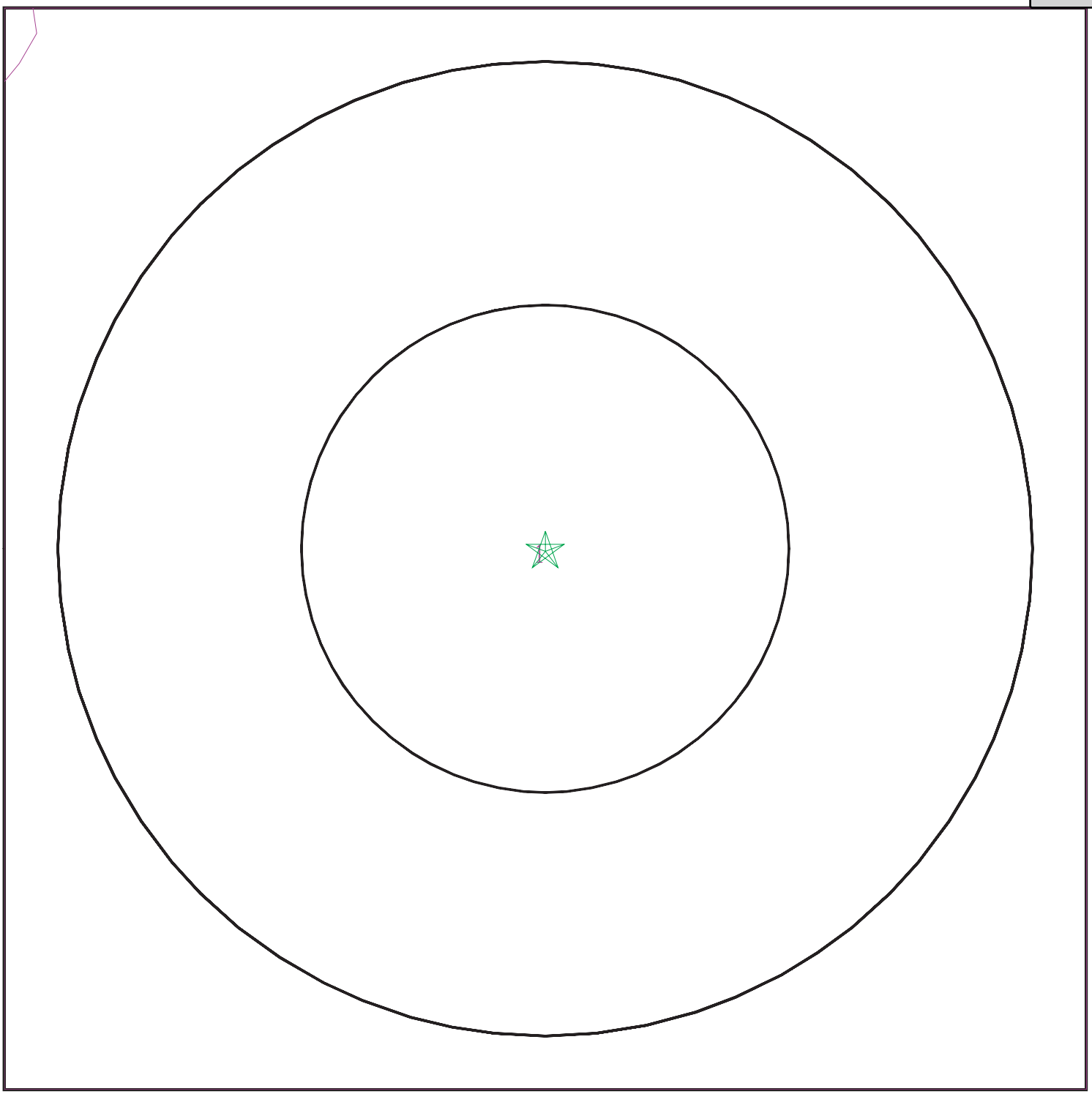
Era:	Mesozoic
System:	Cretaceous
Series:	Cretaceous granitic rocks
Code:	Kg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 5146282.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Centerpointe	CLIENT:	ARCADIS U.S., Inc.
ADDRESS:	Centerpointe Moreno Valley CA 92553	CONTACT:	Janet Holtz
		INQUIRY #:	5146282.2s
LAT/LONG:	33.91398 / 117.260624	DATE:	December 28, 2017 10:01 am

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: MONSERATE

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	9 inches	27 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1
3	27 inches	44 inches	indurated	Not reported	Not reported	Max: 0.01 Min: 0	Max: Min:
4	44 inches	57 inches	cemented	Not reported	Not reported	Max: 0.01 Min: 0	Max: Min:
5	57 inches	70 inches	loamy coarse sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 8.4 Min: 6.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A3	USGS40000138876	1/2 - 1 Mile SSE
A4	USGS40000138875	1/2 - 1 Mile SSE
5	USGS40000138874	1/2 - 1 Mile SSE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
2	3523	1/2 - 1 Mile South

PHYSICAL SETTING SOURCE MAP - 5146282.2s

1.s

0 1/4 1/2 1 Miles

- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Centerpointe
ADDRESS:	Centerpointe Moreno Valley CA 92553
LAT/LONG:	33.91398 / 117.260624
CLIENT:	ARCADIS U.S., Inc.
CONTACT:	Janet Holtz
INQUIRY #:	5146282.2s
DATE:	December 28, 2017 10:01 am

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

			Database	EDR ID Number
1 **NNW** **1/8 - 1/4 Mile** **Higher**	Site ID:	083302648T	**AQUIFLOW**	**50177**
	Groundwater Flow:	Not Reported		
	Shallow Water Depth:	100		
	Deep Water Depth:	Not Reported		
	Average Water Depth:	Not Reported		
	Date:	08/21/1996		

2
South
1/2 - 1 Mile
Lower

CA WELLS **3523**

Water System Information:

Prime Station Code:	03S/04W-24D01 S	User ID:	WAT
FRDS Number:	3310700001	County:	Riverside
District Number:	14	Station Type:	WELL/AMBNT
Water Type:	Well/Groundwater	Well Status:	Abandoned
Source Lat/Long:	335409.0 1171537.0	Precision:	100 Feet (one Second)
Source Name:	WELL 01 - ABANDONED		
System Number:	3310700		
System Name:	MARCH AFB		
Organization That Operates System:			
	722 CES/CC 840 MACDILL,BLD2506 MARCH AFB, CA 92518		
Pop Served:	8186	Connections:	2348
Area Served:	MARCH AFB		

A3
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000138876**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-335405117152402		
Monloc name:	003S004W24D002S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18070202	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.9014064
Longitude:	-117.2575397	Sourcemap scale:	Not Reported
Horiz Acc measure:	Unknown	Horiz Acc measure units:	Unknown
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	Not Reported
Vert measure units:	Not Reported	Vertacc measure val:	Not Reported
Vert accmeasure units:	Not Reported		
Vertcollection method:	Not Reported		
Vert coord refsys:	Not Reported	Countrycode:	US
Aquifername:	California Coastal Basin aquifers		
Formation type:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

A4
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000138875**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-335405117152401		
Monloc name:	003S004W24D001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18070202	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.9014064
Longitude:	-117.2575397	Sourcemap scale:	Not Reported
Horiz Acc measure:	Unknown	Horiz Acc measure units:	Unknown
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	Not Reported
Vert measure units:	Not Reported	Vertacc measure val:	Not Reported
Vert accmeasure units:	Not Reported		
Vertcollection method:	Not Reported		
Vert coord refsys:	Not Reported	Countrycode:	US
Aquifername:	California Coastal Basin aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

5
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000138874**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-335405117151201		
Monloc name:	003S004W24C001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18070202	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.9014065
Longitude:	-117.2542062	Sourcemap scale:	Not Reported
Horiz Acc measure:	Unknown	Horiz Acc measure units:	Unknown
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	Not Reported
Vert measure units:	Not Reported	Vertacc measure val:	Not Reported
Vert accmeasure units:	Not Reported		
Vertcollection method:	Not Reported		
Vert coord refsys:	Not Reported	Countrycode:	US
Aquifername:	California Coastal Basin aquifers		
Formation type:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

1G
NNW
1/8 - 1/4 Mile
Lower

Site ID:	083302648T
Groundwater Flow:	Not Reported
Shallow Water Depth:	100
Deep Water Depth:	Not Reported
Average Water Depth:	Not Reported
Date:	08/21/1996

AQUIFLOW **50177**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92553	13	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

APPENDIX D

Agency Information

FINAL

Site Inspection Report
March Field
Riverside County, California

U.S. Army Corps of Engineers
Southwest IMA Region

FUDS Project No. J09CA716801
Contract: W912DY-04-D-0005
Task Order: 0009

Prepared For
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Blvd
Los Angeles, California 90017-3401
and
U.S. Army Corps of Engineers
South Pacific Division Range Support Center

Prepared By

PARSONS
5390 Triangle Parkway, Suite 10
Norcross, Georgia 3009

June 2009

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LIST OF ACRONYMS

af	Acre Feet
APP	Accident Prevention Plan
ARC	Annual Report to Congress
ASR	Archives Search Report
Banks	Banks Environmental
bgs	Below Ground Surface
BTAG	Biological Technical Assistance Group
CDF&G	California Department of Fish and Game
CEMVS	U.S. Army Corps of Engineers, St. Louis District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESPL	U.S. Army Corps of Engineers, Los Angeles District
CFR	Code of Federal Regulations
CHE	Chemical Hazard Evaluation
CHHSL	California Human Health Screening Level
CNDDB	California Natural Diversity Database
CRREL	Cold Regions Research and Engineering Laboratory
CRWQCB	California Regional Water Quality Control Board
CSEM	Conceptual Site Exposure Model
CSM	Conceptual Site Model
CWM	Chemical Warfare Materiel
CWP	Center for Watershed Protection
CZMA	Coastal Zone Management Area
CZMP	Coastal Zone Management Program
DERP	Defense Environmental Response Program
DMM	Discarded Military Munitions
DoD	Department of Defense
DOI	Department of the Interior
DQO	Data Quality Objective
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EHE	Explosive Hazard Evaluation
EPP	Environmental Protection Plan
ER	Engineer Regulation
ESA	Eastside Service Area
°F	Degrees Fahrenheit

LIST OF ACRONYMS (CONTINUED)

FTL	Field Team Leader
FUDS	Formerly Used Defense Site
FUDSMIS	Formerly Used Defense Site Management Information System
GIS	Geographic Information System
gpm	Gallons Per Minute
GPS	Global Positioning System
HHE	Health Hazard Evaluation
HRS	Hazard Ranking System
HTW	Hazardous and Toxic Waste
I&E	Installations and Environment
IGD	Interim Guidance Document
INPR	Inventory Project Report
lb	Pound
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MC	Munitions Constituents
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Response Program
MPA	Marine Protected Area
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
MWD	Metropolitan Water District
NAD	North American Datum
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDAI	No DoD Action Indicated
NERRS	National Estuarine Research Reserve System
NFS	National Forest Service
NHA	National Heritage Areas
NHL	National Historic Landmarks
NMS	National Marine Sanctuaries
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRIS	National Register Information System

LIST OF ACRONYMS (CONTINUED)

NRHD	National Register of Historic District
NRHP	National Register of Historic Places
NRIS	National Register Information System
NWI	National Wetlands Inventory
NWRS	National Wildlife Refuge System
OHP	Office of Historic Preservation
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbon
Parsons	Parsons Corporation
PCL	Protective Concentration Level
PM	Project Manager
PQL	Practical Quantitation Limit
PRG	Preliminary Remediation Goal
PSAP	Programmatic Sampling and Analysis Plan
PWP	Programmatic Work Plan
PWS	Performance Work Statement
QA	Quality Assurance
QC	Quality Control
QR	Qualitative Reconnaissance
RA	Removal Action
RAC	Risk Assessment Code
RCWMD	Riverside County Waste Management Department
RI/FS	Remedial Investigation/Feasibility Study
ROE	Right of Entry
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SAWPA	Santa Ana Watershed Project Authority
SCHR	South Coast Hydrologic Region
SI	Site Inspection
SL	Screening Level
SLERA	Screening Level Ecological Risk Assessment
SLRA	Screening Level Risk Assessment
SPD RSC	South Pacific Division Range Support Center
SSL	Soil Screening Level
SS-WP	Site-Specific Work Plan
SVT	Site Visit Team

LIST OF ACRONYMS (CONTINUED)

SWP	State Water Project
TBD	To Be Determined
TDS	Total Dissolved Solids
T&E	Threatened and Endangered
TESS	Threatened and Endangered Species System
TPP	Technical Project Planning
USACE	U.S. Army Corps of Engineers
USAESCH	Engineering and Support Center, Huntsville
USC	U.S. Code
USDA FS	U.S. Department of Agriculture – Forest Service
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound

Linda S Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi, Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

June 11, 2009

Mr. Lloyd Godard
United States Army Corps of Engineers
Los Angeles District
915 Wilshire Boulevard, Suite 15018
Los Angeles, California 90017

DRAFT FINAL SITE INVESTIGATION REPORT FOR MARCH FIELD, RIVERSIDE COUNTY, CALIFORNIA

Dear Mr. Godard:

The Department of Toxic Substances Control (DTSC) has completed its review of the draft final Site Inspection (SI) Report detailing the site investigation results for munitions and explosives of concern (MEC) and munitions constituents (MC) in soil, surface water, and groundwater.

March Field was established in 1918 to conduct primary flight training for aviators for World War 1. The site consisted of three overlapping skeet ranges used for small arms training. Small arms training was conducted from 1943 to 1947.

Based on the Site Investigation sampling results that indicate MC was detected above human health risk screening levels, DTSC concur with the draft final SI report recommendation for Remedial Investigation and Feasibility Study (RI/FS) with additional MC sampling.

If you have any questions or comments regarding this transmittal or other project matters, please do not hesitate to contact me at (714) 484-5452.

Sincerely,

Daniel Cordero Jr.
Project Manager
Brownfields and Environmental Restoration Program

GLOSSARY OF TERMS

Anomaly	Any item that deviates from the expected subsurface ferrous and non-ferrous material at a site (i.e., pipes, power lines, etc.).
Inhabited Structure	Permanent or temporary structure, other than military munitions-related structures, routinely occupied by one or more persons for any portion of a day.
Magnetometer	An instrument for measuring the strength of a magnetic field; used to detect buried iron and other metal objects.
Military Munitions	All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof.
Munitions and Explosives of Concern (MEC)	Military munitions that may pose unique explosives safety risks, including UXO, discarded military munitions, or munitions constituents present in high enough concentrations to pose an explosive or other health hazard.
Munitions Constituents (MC)	Any materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.
Munitions Debris (MD)	Remnants of munitions (e.g., penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

GLOSSARY OF TERMS (CONTINUED)

Munitions Response	Response actions, including investigation, removal actions, and remedial actions, to address the explosive safety, human health, or environmental risks presented by unexploded ordnance, discarded military munitions, or munitions constituents, or to support a determination that no removal or remedial action is required.
Munitions Response Area (MRA)	Any area on a defense site that is known or suspected to contain UXO, discarded military munitions, or MC. Examples include former ranges and munitions burial areas. A munitions response area is comprised of one or more munitions response sites.
Munitions Response Site (MRS)	A discrete location within an MRA that is known to require a munitions response.
Projectile	Object projected by an applied force and continuing in motion by its own inertia. This includes bullets, bombs, shells, grenades, guided missiles, and rockets.
Unexploded Ordnance (UXO)	Military munitions that have been primed, fuzed, armed, or otherwise prepared for action; that have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material; and that remain unexploded whether by malfunction, design, or any other cause.

EXECUTIVE SUMMARY

ES.1 The Army Air Corps established March Field in early 1918 to conduct primary flight training for aviators for World War I; the first cadet officially landed at March Field on March 1, 1918. The site consisted of three overlapping skeet sub ranges that included a Triple Skeet Range (36.1 acres), a High Tower Shot Gun Range East (29.4 acres), and a High Tower Shot Gun Range West (29.4 acres). All three sub ranges were used for small arms training beginning sometime after September 1943 and continuing until Spring 1947. A site inspection (SI), documented in this report, was conducted to determine whether the munitions response site (MRS) identified within the March Field site (refer to Table ES.1) warrants subsequent characterization as part of a remedial investigation/feasibility study (RI/FS) or no Department of Defense (DoD) action indicated (NDAI). The SI was performed to gather and evaluate evidence of the potential residual presence of munitions and explosives of concern (MEC) and munitions constituents (MC) within MRS01 – Range Complex No. 1 (skeet) associated with March Field. To accomplish the objective, qualitative reconnaissance (QR) and MC sampling were performed.

ES.2 The technical project planning (TPP) Team identified that, in addition to 1.0 mile of QR, the collection of up to ten surface soil samples (plus associated quality assurance [QA]/quality control [QC] samples), would be sufficient to meet the project objectives.

ES.3 The SI evaluation included the conduct of approximately 1.4 miles of pedestrian QR as well as the collection of ten surface soil samples.

ES.4 All surface soil samples were analyzed by TestAmerica for metals and polycyclic aromatic hydrocarbons (PAHs). Surface soil samples collected in the area of the former firing points and ambient surface soil samples included additional explosives analysis. One explosive compound, nitroglycerine, was detected in one surface soil sample (and its field duplicate). All four MC metals analyzed and all PAHs were detected above background concentrations.

ES.5 Ecological receptors are not considered to be a target of migration pathways because March Field is not considered to be an important ecological place; threatened and endangered (T&E) species are not present.

ES.6 No MEC or munitions debris (MD) were observed during the SI field effort at MRS01 – Range Complex No. 1 (skeet).

Table ES.1
Summary of Site Inspection Results
March Field, Riverside County, California

MRS	Acreage	Munitions and Explosives of Concern and/or Munitions Debris Assessment(1)	Munitions Constituent Assessment(2)	Recommendation
01 – Range Complex No. 1 (skeet)	53.3	No	Yes	Factors such as current land use and the potential unacceptable risk for human receptors exposed to MC metals arsenic and lead, and PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene at MRS01 warrant **RI/FS and additional MC sampling.** ***Immediate Removal Action is not required at this time.***

Notes:
1 - "Yes" in the "MEC/MD Assessment" column of the table indicates confirmed MEC or MD presence indicative of potential MEC presence and RI/FS recommendation for the MRS. "No" in this column of the table indicates no confirmed MEC or MD indicative of potential MEC presence and NDAI recommendation for this MRS.
2 - "Yes" in the "MC Assessment" column of the table indicates confirmed MC presence at levels indicating a potential elevated risk to human health or ecological receptors and RI/FS recommendation for the MRS. "No" in this column of the table indicates absence of MC at levels indicating a potential risk to human health or ecological receptors and NDAI recommendation for this MRS.

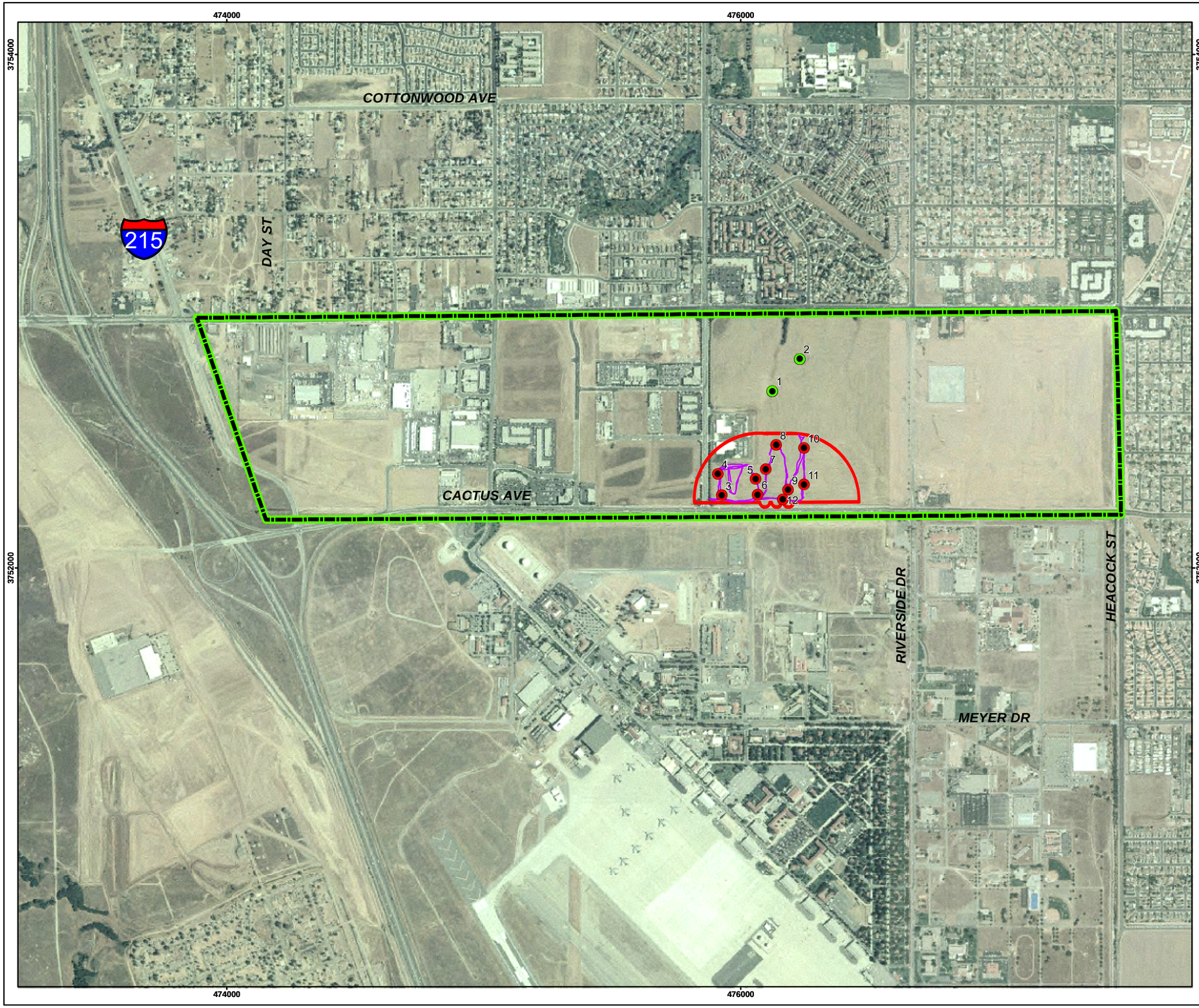
ES.7 Munitions reportedly used at the March Field site during World War II included small arms (shotgun, 12-gage) only. ***No MEC or MD was observed during the SI field visit at the MRS; however, clay pigeon debris was observed throughout the site. The ground surface was saturated with clay pigeon debris in some areas. There have been no reports of MEC since site closure. The site visit associated with the 1999 Inventory Project Report (INPR) did not observe MEC or MD; however, debris from clay pigeons was observed. The site visit conducted in support of the 2004 Preliminary Assessment (PA) observed clay pigeon debris as well as a couple of pieces of individual shot.***

ES.8 Based on the SI environmental sampling results, the maximum detected concentrations of nitroglycerin, antimony, copper, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(g,h,i)perylene, fluoranthene, fluorine, naphthalene, phenanthrene, and pyrene did not exceed their respective human health screening values for surface soil; there is no unacceptable risk to human health due to exposure to these MC metals, single explosive, or PAHs in surface soil at the site. However, arsenic, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded their respective human health screening values for surface soil. Therefore, based on the analytical results presented in this report, an unacceptable risk is possible for human receptors exposed to MC metals arsenic and lead, and PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. Due to the presence of MC metals arsenic and lead at levels that may pose an unacceptable risk to human receptors at MRS01-Range Complex No. 1 (skeet), and the presence of PAHs (which are not considered MC) at levels that may pose an unacceptable risk to human receptors and may represent potential MC contamination, this site is recommended to proceed to RI/FS status***. Additional sampling is warranted in the RI/FS phase.***

Figure ES.1

General Site Overview
March Field
FUDS Project No. J09CA716801

Riverside County, California



Legend

- Field Observation Location
- Ambient Soil Sample Location
- Biased Soil Sample Location
- MRS01-Range Complex No. 1 (skeet)
- FUDS Property Boundary
- FUDS Eligible Boundary
- Qualitative Reconnaissance Track

Site Location in California

N

Image: 2004 Orthophoto
Projection: UTM Zone 11 NAD83, Map Units in Meters

300 150 0 300 Meters

PARSONS	U.S. ARMY SOUTH PACIFIC DIVISION RANGE SUPPORT CENTER

DESIGNED BY: BT	General Site Overview		
DRAWN BY: BT		SCALE: As Shown	PROJECT NUMBER: 744653.8613(
CHECKED BY: JR		DATE: June 2009	PAGE NUMBER: ES-4
SUBMITTED BY: DS		FILE: X:\GIS\Site_inspections_sw\Maps\marchfield_calFigES_1.mxd	

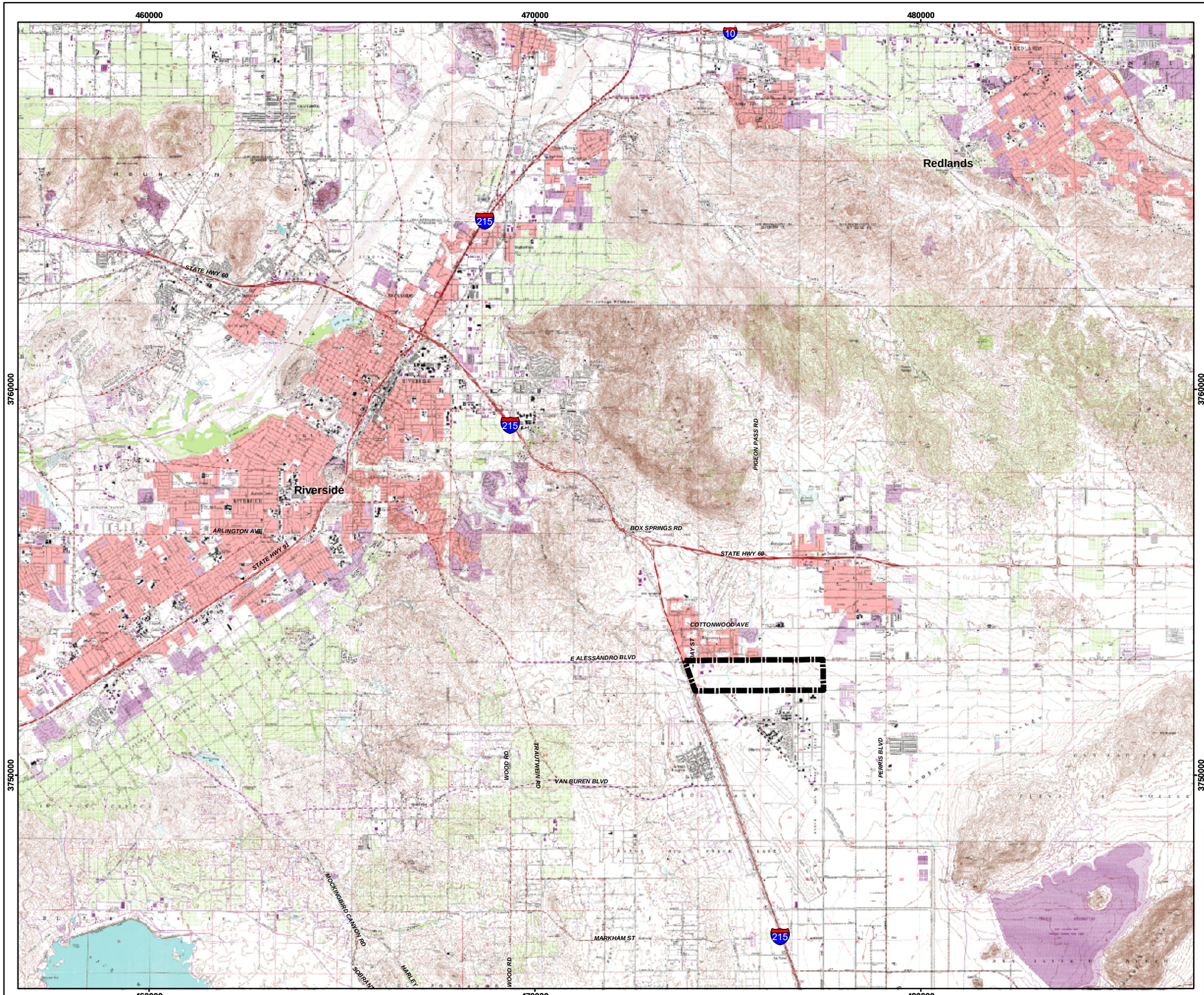


Figure 1.1

Site Location
March Field
FUDS Project No. J09CA716801

Riverside County, California

Legend

FUDS Property Boundary

Site Location in California

N

Image Source: USGS 7.5' Topo Quadrangles, 1978
Projection: UTM Zone 11 NAD83, Map Units in Meters

2 1 0 2 Kilometers

PARSONS	U.S. ARMY SOUTH PACIFIC DIVISION RANGE SUPPORT CENTER

DESIGNED BY: BT	Site Location	
DRAWN BY: BT		
CHECKED BY: JR	SCALE: As Shown	PROJECT NUMBER: 744653.8613(
SUBMITTED BY: DS	DATE: June 2009	PAGE NUMBER: 1-4
	FILE: X:\GIS\Site_inspections_sw\Maps\marchfield_ca\Fig1_1.mxd	

CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

1.1.1 Parsons Corporation (Parsons) received Contract No. W912DY-04-D-0005, Task Order No. 0009, from the United States Army Corps of Engineers (USACE), Engineering and Support Center, Huntsville (USAESCH) to perform a Site Inspection (SI) at the March Field Formerly Used Defense Site (FUDS). The Army Air Corps established March Field in early 1918 to conduct primary flight training for aviators for World War I; the first cadet officially landed at March Field on March 1, 1918. March Field transitioned from primary flight training to bombardment in 1931. Prior to World War II, March Field was expanded and more than quadrupled in size by 1942. Property acquisitions in support of the mission in the 1940s resulted in a comprehensive FUDS-eligible acreage totaling 53.3 acres, as depicted in Figure 1.1. March Field consists of one munitions response site (MRS), Range Complex No. 1 (skeet), as identified in Table 1.1. March Field has been assigned FUDS Project No. J09CA716801.

Table 1.1
March Field

MRS	MRS Acreage[(1)]	X-Coordinate[(2)] (meters)	Y-Coordinate[(2)] (meters)
01 – Range Complex No. 1 (skeet)	53.3	475987.47E	3752384.60 N

1 - Acreage based on review of Annual Report to Congress (ARC), Archives Search Report (ASR) Supplement, and the FUDS Management Information System (FUDSMIS).
2 - Universal Transverse Mercator (UTM) Zone 11 North American Datum (NAD) 83.

1.1.2 The Department of Defense (DoD) established the Military Munitions Response Program (MMRP) to address DoD sites suspected of containing munitions and explosives of concern (MEC) or munitions constituents (MC). Under the MMRP, the USACE is conducting environmental response activities at FUDS for the Army, the DoD's executive agent for the FUDS program.

1.1.3 Pursuant to the USACE's Engineer Regulation (ER) 200-3-1 (USACE, 2004) and the Management Guidance for the Defense Environmental Restoration Program (DERP) (Office of the Deputy Under Secretary of Defense [Installations and Environment], 2001), USACE is conducting FUDS response activities. All work is performed in accordance with the following:

- The DERP statute (10 U.S. Code [USC] 2701 *et seq*.);
- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC §9601 *et seq*);
- Executive Orders 12580 and 13016; and
- The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] Part 300).

1.1.4 USACE is conducting remedial SIs, as set forth in the NCP, to evaluate hazardous substance releases or threatened releases from eligible FUDS.

1.1.5 While not all MEC/MC constitute CERCLA hazardous substances, pollutants, or contaminants, the DERP statute provides DoD the authority to respond to releases of MEC/MC, and DoD policy states that such responses shall be conducted in accordance with CERCLA and the NCP.

1.1.6 This report summarizes the work performed during the SI and presents an accounting of any MEC and MC contamination identified on the site. The SI was limited exclusively to MEC and MC contamination issues requiring collection of a sufficient and appropriate amount of information, but does not consider other unrelated hazardous and toxic waste (HTW) concerns the site may pose. Per ER 200-3-1, guidance for conducting an SI, Section 4-4.1.2:

> *The SI is not intended as a full-scale study of the nature and extent of contamination or explosive hazards. The objectives of the remedial SI are to: (i) Eliminate from further consideration those releases that pose no significant threat to public health or the environment; (ii) Determine the potential need for removal action; (iii) Collect or develop additional data, appropriate for Hazard Ranking System (HRS) scoring by [US]EPA; and (iv) Collect data, as appropriate, to characterize the release for effective and rapid initiation of the Remedial Investigation/Feasibility Study (RI/FS).*

1.2 PROJECT OBJECTIVES

1.2.1 The primary objective of the MMRP SI is to determine whether or not a FUDS project warrants further response action under CERCLA. The SI collects sufficient and appropriate information necessary to make this determination, as well as:

- determines the potential need for a removal action;
- collects or develops additional data, as appropriate, for Hazard Ranking System (HRS) scoring by the U.S. Environmental Protection Agency (USEPA); and
- collects data, as appropriate, to characterize the release for effective and rapid initiation of the RI/FS.

1.2.2 Another objective of the MMRP SI is to collect the additional data necessary to complete the Munitions Response Site Prioritization Protocol (MRSPP).

1.3 PROJECT SCOPE

1.3.1 The site visit associated with the 1999 Inventory Project Report (INPR) did not observe MEC or munitions debris (MD); however, debris from clay pigeons was observed. The site visit conducted on July 27, 2004, in support of the Preliminary Assessment (PA) observed clay pigeon debris as well as a couple of pieces of individual shot. No MEC has been reported to date at March Field. The findings of the INPR, PA, and Archives Search Report (ASR) Supplement are recorded in Section 2.5 of this SI Report.

1.3.2 The primary project planning documents used to perform the SI included the USACE South Pacific Division Range Support Center (SPD RSC) Programmatic Work Plan (PWP) (Parsons, 2005), the Programmatic Sampling and Analysis Plan (PSAP) (USACE, 2005), and the PSAP Addendum (Parsons, 2006), and the Final Site Specific Work Plan (SS-WP) Addendum to the PWP for March Field (Parsons, 2008b). The Performance Work Statement for this project is included in Appendix A.

1.3.3 The USACE, Los Angeles District (CESPL) facilitated a technical project planning (TPP) meeting on June 6, 2008, that included representatives from the CESPL, Riverside County Waste Management Department (RCWMD), the California Department of Toxic Substances Control (DTSC), and Parsons. The TPP Team unanimously concurred with the technical approach presented in the Final TPP Memorandum (Parsons, 2008a), including the locations of ten surface soil samples, sampling methods, and laboratory analyses for explosives, select metals, and polycyclic aromatic hydrocarbons (PAHs)

1.3.4 As detailed in the Final SS-WP Addendum, the TPP Team concurred that comparison criteria for the soil sampling results would be the most conservative from USEPA Region 9 Residential Preliminary Remediation Goals (PRGs) and CAL-Modified Residential Soil PRGs. *Subsequent to the TPP meeting and the issuance of the Final SS-WP Addendum, it was identified that California now has its own set of screening values known as California Human Health Screening Levels (CHHSLs). It was confirmed with Daniel Cordero, DTSC, on November 6, 2008, that the screening process will include the new CHHSLs supplemented with the USEPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites. Analytes for which there are no published CHHSLs or RSLs, the Texas Risk Reduction Program Rule Tier 1 30-acre total soil combined Protective Concentration Levels (PCLs) dated April 23, 2008 were used.* The TPP Team agreed that a soil sampling depth of 2 to 6 inches below ground surface (bgs) at locations where MD and/or clay pigeon debris was observed and at ambient sample locations. The sampling depth would be from 6 to 12 inches bgs at sample locations where debris was not observed. *Sample MF-MRS01-SS-612-05 was the only sample collected from 6 to 12 inches due to the lack of debris in the area of the sample location.*

Riverside County
Waste Management Department
Hans W. Kernkamp, General Manager-Chief Engineer

June 15, 2009

Lloyd Godard, FUDS Project Manager
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Boulevard, Suite 15018
Los Angeles, CA 90017-3401

RE: Draft-Final Site Inspection Report, March Field, Riverside County, California, FUDS Project No. J09CA716801

Dear Mr. Godard:

The Riverside County Waste Management Department (Department) received the subject report on May 29, 2009. Department staff reviewed the subject report and attended the stakeholder meeting on June 9, 2009. This letter documents the Department's comments regarding the subject report, based upon Department staff's review of the subject report and attendance at the stakeholder meeting.

Background

We understand that the Site Inspection Report for March Field was initiated by your agency to determine whether a former skeet range warrants subsequent characterization as part of a remedial investigation/feasibility study. The report indicates that while no Munitions and Explosives of Concern (MEC) where found, certain constituents of concern were detected above background concentrations and/or human health risk screening concentrations on neighboring property to our headquarters facility and at sample depths of 2-12 inches below ground surface (bgs). The report indicates that these constituents are most likely from shotgun, handgun or clay pigeons used during Air Force training on land formerly controlled by the Department of Defense. A downrange portion of the former skeet range (southeastern approximately 4.3 acres of our 9 acre property) may have overlapped our current facility and the firing range(s) occupied the area off our property, just north of Cactus Avenue.

Comments

1. The subject report concluded that "an unacceptable risk is possible for human receptors" exposed to select Munitions Constituent (MC) metals and Polycyclic Aromatic Hydrocarbons (PAHs). Thus far, soil sampling upon which the report is based has only been performed on property adjacent to the Department's headquarters facility (14310 Frederick Street, Moreno Valley, CA 92553). Human receptors identified in the subject report, page J-2, include construction workers, commercial or industrial workers, and visitors or recreational users working on or adjacent to the sample sites. Each of these receptors has existed, currently exist and will exist in the future at the Department's facility. Further, complete exposure pathways for incidental ingestion, dermal contact and inhalation (dust) were identified for each of these receptors.

   The Department is concerned that a potential unacceptable human health risk exists to workers, employees and visitors at the Department's facility. The Department's objective is to provide adequate, responsible and timely notification and protection to Department employees and visitors regarding this potential unacceptable human health

CHAPTER 2
PROPERTY DESCRIPTION AND HISTORY

2.1 SITE DESCRIPTION

The March Field site consists of 53.3 acres located in Riverside County, California. The site is located north of the active March Air Reserve Base in Moreno Valley, California, directly east of Interstate 215 and north of Cactus Avenue. Roughly 40 percent of the site has been redeveloped for a mixture of uses including industrial and production facilities, and commercial and office buildings. The rest of the site has remained undeveloped or in agricultural use without housing (Figure 2.1 and Appendix E). Future development will include light industrial.

2.2 SITE LOCATION AND SETTING

2.2.1 Topography and Vegetation

2.2.1.1 The natural vegetation is primarily barren or low grass; however, irrigation allows for agricultural production of portions of the site throughout the year (CEMVS, 2004a).

2.2.1.2 The site is on the northwestern-western edge of the Perris Valley, characterized by flat topography. The topography of March Field can generally be described as flat varying in elevation from about 1,550 feet on the west to 1,590 feet on the east (CEMVS, 2004a). Within the MRS elevation ranges from 1,553 feet along Cactus Ave to 1,560 feet at the northern portion of the MRS.

2.2.2 Climate

2.2.2.1 The climate for Moreno Valley is generally mild. Moreno Valley is located in a semiarid region of western Riverside County just east of the San Bernardino Mountains and south of the San Gabriel Mountains. A meager average of close to ten inches of rain falls in any given year. Moreno Valley average annual rainfall is 9.93 inches (CEMVS, 2004a).

2.2.2.2 Winters in Moreno Valley are mild with highs generally in the middle 60s with nights dipping into the upper 30s to lower 40s. On occasion there can be warm spells with highs jumping into the 70s and even lower 80s, as a warming wind descends from the mountains to the north and east. There are a few cold spells each winter when high temperatures barely make it to the 50s and nighttime temperatures drop close to the freezing point. Much of the yearly rainfall in the City of Moreno Valley occurs in the four months from December to March; nearly 70 percent of the average annual precipitation occurs in these months. On occasion, from late October through March, "Santa Ana Winds" visit Moreno Valley and other parts of the Inland Empire. Santa Ana Winds are gusty, sometimes strong winds that blow from the north and northeast and generally last 12 to 36 hours. This wind event generally occurs between five and ten times a season (CEMVS, 2004a).

2.2.2.3 The summers in the Moreno Valley generally feature sunny, very warm to hot days and clear, mild nights with an afternoon and evening southwest breeze each day. The hottest months of July and August have average daily temperatures in the middle 90s with nights in the lower and middle 60s. The naturally occurring low humidity makes these months easier to tolerate than other parts of the nation with similar temperatures. On occasion, from the middle of May through September an unusual hot spell can send afternoon temperatures well over the century mark. These hot spells typically last only a few days before cooling takes place. Rainfall in the months from May through September is quite unusual. On a rare occasion a "Monsoon" pattern develops; moisture moves up from the tropical regions of the Pacific and Gulf of Mexico bringing higher humidity that causes afternoon and evening thunderstorms over the mountains. Then one or two thunderstorms move out into the valley from the desert. The spring and fall months bring the most temperate time of year to the region. Many days are still sunny and rain events are uncommon with high temperatures in the 70s and 80s and lows in the 50s (CEMVS, 2004a).

2.2.3 Significant and Inhabited Structures

2.2.3.1 The March Field site is located in Moreno Valley in Riverside County, California, north of the active March Air Reserve Base directly east of State Highway 215 and north of Cactus Avenue. The site visit team (SVT) observed commercial and/or industrial buildings and undeveloped land in the immediate vicinity of the MRS during the SI field effort. The SVT also noted that dense residential development had taken place within three-quarters of a mile of the MRS (Appendix D).

2.2.3.2 Based on a review of recent satellite imagery (Google Earth, 2008), there are 1 to 5 inhabited structures located within MRS01 – Range Complex No. 1 (skeet), and thousands of inhabited structures within two miles of MRS01 – Range Complex No. 1 (skeet). Inhabited structures are permanent or temporary structures, other than military munitions-related structures, that are routinely occupied by one or more persons for any portion of a day.

2.2.4 Demographics

The March Field site is located approximately 9 miles east of the City of Riverside, California and within the City of Moreno Valley, California. Based on census data for the year 2000, there are no residents living on site. The total population residing within a four-mile radius of the site is estimated at 147,126. The population density for Riverside County is 215 persons per square mile. The population density for Moreno Valley, California is 2,759.3 persons per square mile (U.S. Census, 2000). Table 2.1 and Figure 2.2 provide additional population proximity information for the site.

Table 2.1
Population Information in the Vicinity of
the March Field Site
Riverside County, California

Range	On-site	¼ mile	½ mile	1 mile	2 miles	3 miles	4 miles	Total
Entire Site	0	0	1,685	11,801	37,552	56,390	39,698	147,126

Source: U.S. Census 2000 data

2.2.5 Current and Future Land Use

2.2.5.1 The site is located in Moreno Valley, Riverside County, California. According to the ASR, the site is currently owned by Riverside County and private landowners/developers. Roughly 50 percent has been redeveloped for a mixture of uses including: industrial/production facilities; commercial and office buildings. Portions of the site remain undeveloped, used for agricultural purposes. RCWMD developed their industrial facility on a portion of the site in 2001. The site is accessible from public paved roads as well as by foot. Projected land use within the MRS will continue as light industrial.

2.2.5.2 The land use under present ownership would not have contributed MC or MEC-related contamination.

2.2.5.3 Access to the site is unrestricted and accessible by established roadways Cactus Avenue and Alessandro Boulevard directly east of State Highway 215, and by foot. No warning signs regarding the potential presence of ordnance are posted.

2.3 SITE OWNERSHIP AND HISTORY

2.3.1 The Army Air Corps established March Field in early 1918 to conduct primary flight training for aviators for World War I; the first cadet officially landed at March Field on March 1, 1918. March Field transitioned from primary flight training to bombardment in 1931. Prior to World War II, March Field was expanded and more than quadrupled in size by 1942. The FUDS was part of that expansion and the probable acquisition date of the 654.61-acre parcel that includes the MRS was February 26, 1942, under a lease agreement with Mary Hendrick Trautwein, et al. The two remaining parcels of the 663.93-acre FUDS: 0.14 acres and 9.18 acres were acquired by separate

Declarations of Taking in 1942 and 1952, respectively. However, these two parcels are not included in the MMRP site designation and are not part of this investigation. The site consisted of three overlapping skeet sub ranges that included a Triple Skeet Range (36.1 acres), a High Tower Shot Gun Range East (29.4 acres), and a High Tower Shot Gun Range West (29.4 acres). The high towers measured 16 feet 6 inches by 16 feet 6 inches and were used to release the clay pigeons over the gunners to better simulate fighter attacks. The gun areas were set up to simulate a gun station with the exception of the weapon being a shotgun, rather than a .50 caliber or 20mm gun. All three sub ranges were used for small arms training beginning sometime after September 1943 and continuing until Spring 1947. The parcels were released over time by the War Department with no restrictive covenants or land use restrictions starting October 31, 1943, and ending June 15, 1964.

2.3.2 Military improvements at the 654.61-acre March Field included three skeet platforms, two shotgun high towers, a small control house, a turret, and two small storage buildings; however, none remain today.

2.3.3 For the purpose of this SI, the range identification (included in Table 2.2) lists the eligible range for the FUDS program that has demonstrated former military use. Additional data for the range is shown in the Conceptual Site Model (CSM) located in Appendix J and discussed further in Chapter 3.

Table 2.2
Range and Suspect Past Department of Defense Activities
March Field, Riverside County, CA

Range Name/Suspect Past DoD Activities	Acreage*
MRS01 – Range Complex No. 1 (skeet)	53.3
Triple Skeet Range, two High Tower Shot Gun Ranges, and Buffer Area	
TOTAL	**53.3**

*Number represents actual acreage for the MRS and may include area outside the project boundaries. Total acreage reported in FUDSMIS and ARC.

2.4 SITE OPERATIONS AND WASTE CHARACTERISTICS

2.4.1 Munitions Response Site-Specific Descriptions/Operations

The March Field site consists of one MRS, totaling 53.3 acres (CEMVS, 2004b), which corresponds to the area depicted in Figure 2.1. The MRS (listed below) is currently owned by Riverside County and private landowners/developers. The risk assessment code (RAC) score for MRS01 – Range Complex No. 1 is a 5 (Small Arms Range RAC Override) indicating minimal or no hazard potential.

- **MRS01 – Range Complex No. 1 (skeet)** – The MRS consists of three overlapping skeet sub ranges that include a Triple Skeet Range (36.1 acres), a High Tower Shot Gun Range East (29.4 acres), and a High Tower Shot Gun Range West (29.4 acres). It is presumed that the range was active from late-1943

to early-1947. There have been no reports of MEC or MD in this MRS since site closure. The site visit associated with the 1999 INPR did not observe MEC or MD; however, debris from clay pigeons was observed. The site visit conducted in support of the 2004 PA observed clay pigeon debris as well as a couple of pieces of individual shot. The ASR Supplement reported a RAC score of 5 for this MRS with a Hazard Severity Value of "none" based on the usage of small arms ammunition, specifically shotgun, and evidence of MD in the form of lead shot and clay pigeon debris. A Hazard Probability of "frequent" based on the potential of unexpended small arms ammunition buried in the ground being unearthed, greater than 26 buildings located within a two-mile radius of the hazard area, and the lack of a barrier denying access (CEMVS, 2004b). The ARC incorrectly reports a RAC score of "4."

Note: Information related to RAC scoring is provided for historical purposes and this MRS has been re-evaluated using the MRSPP scoring system using information obtained from this SI (Appendix K).

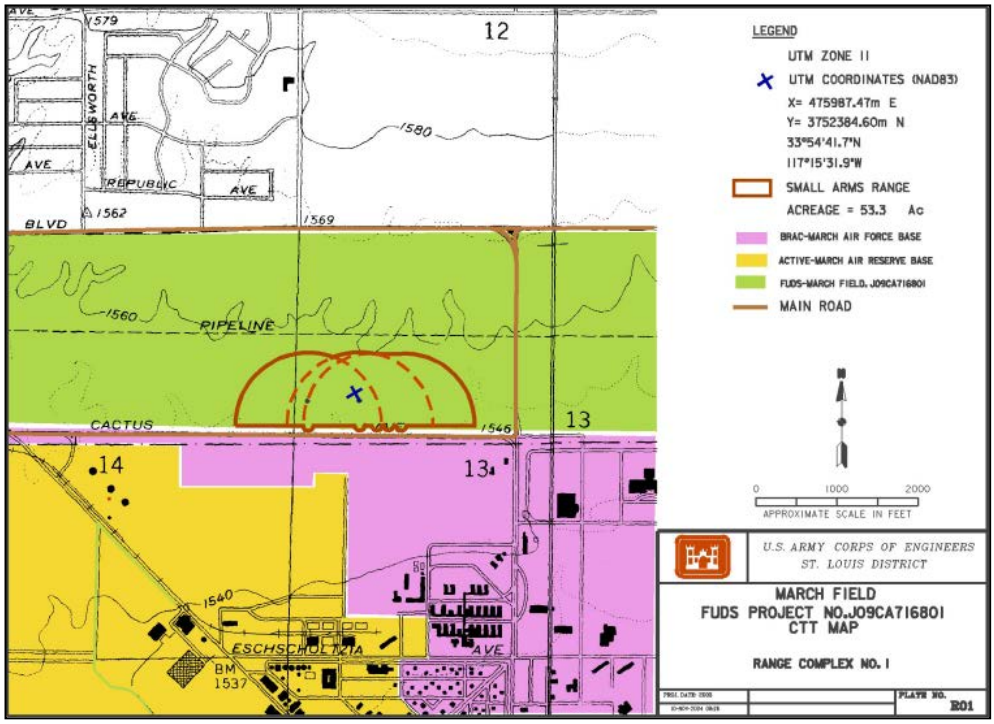


Figure A. Map from 2008 FUDS Management Information System (FUDSMIS) (MRS01)

2.4.2 REGULATORY COMPLIANCE

The USACE is conducting the SI at the March Field site as part of FUDS response activities pursuant to and in accordance with the guidance, regulations, and legislation listed in Chapter 1.

2.5 PREVIOUS INVESTIGATIONS/CLEARANCE ACTIONS

Parsons performed a historical document review for the March Field site. Documents reviewed included the 1999 INPR (CESPL, 1999), the 2004 PA (CEMVS, 2004a), and the 2004 ASR Supplement (CEMVS, 2004b). Previous investigations have determined that March Field was used by the military as a small arms practice range.

2.5.1 Historical Dedudding Operations

According to the archives search performed as part of the 2004 PA the search did not reveal any certificates of ordnance clearance, decontamination, or dedudding associated with the March Field.

2.5.2 1999 Inventory Project Report

An INPR was completed by CESPL and signed on September 29, 1999, establishing the March Field site as a FUDS, establishing the preliminary site boundary, and assigned the FUDS Property Number J09CA716800. The INPR determined that the site was eligible for the FUDS Program. The site visit performed in support of the INPR did not observe MEC or MD; however, debris from clay pigeons was observed.

2.5.3 2004 Preliminary Assessment

The PA was completed by CEMVS in September 2004. The PA presents the findings of a historical records search and site inspection for the presence of ordnance and explosives located at the March Field site. The investigation focused on the 663.93 acres identified as the former March Field (this included the 0.14-acre and 9.18-acre parcels not included in the MMRP site designation and not part of this investigation). The site visit conducted on July 27, 2004, in support of the PA observed clay pigeon debris as well as a couple of pieces of individual shot.

2.5.4 2004 Archives Search Report Supplement

The ASR Supplement was completed by CEMVS as an addition to the 2004 PA. This document applied standard range configurations to the site; yielding specific range boundaries for the target area (refer to Figure B that follows). The ASR Supplement identified range land and access restrictions, range owners, and other pertinent information as well a list of MEC that may be found within the range area. No site visit was conducted in support of the ASR Supplement. The MRS identified in the ASR Supplement for March Field, its suspected acreage, and types of munitions include:

- **MRS01 – Range Complex No. 1 (skeet);** 53.3 acres. Small arms, General

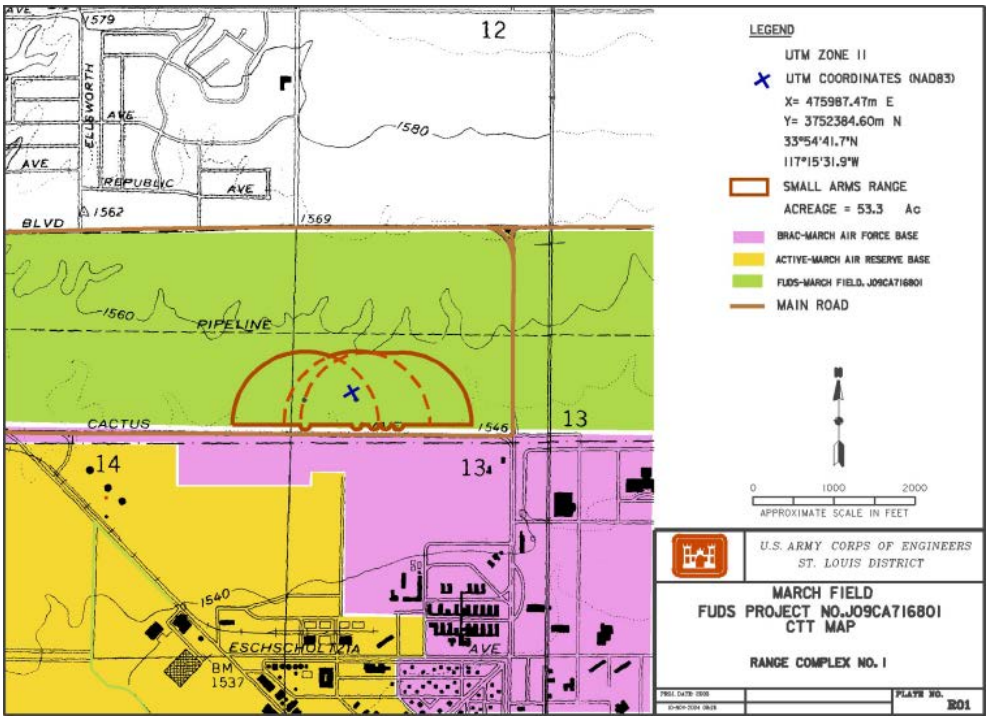


Figure B. Installation Map from 2004 Archives Search Report (ASR) Supplement (MRS01)

risk. The Department requests that the U.S. Army Corps of Engineers (USACE) provide additional information to assist in fulfilling our objective. The Department specifically requests the following information:

A. Written recommendations to protect Department construction workers from exposure to surface and subsurface soils.

B. Written recommendations to protect Department employees and visitors from exposure to surface soils.

C. A quantitative human health risk assessment to assess potential exposure scenarios for Department construction workers, employees and visitors. The Department requests that a preliminary risk assessment be performed using the existing MC metals and PAH data from the subject report and a final risk assessment be performed in conjunction with the remedial investigation/feasibility study (RI/FS) phase.

2. The subject report does not provide a timeframe for implementation of the recommended RI/FS phase. Table 29, of Appendix K, of the subject report identifies the Munitions Response Site (MRS) priority rating as 5, with a value of 1 being the highest and 8 being the lowest. During the stakeholder meeting, the Department queried the USACE regarding the RI/FS timeframe implementation. Considering the MRS priority rating of 5, the USACE indicated that RI/FS phase may commence in approximately two years.

   Given the possible unacceptable human health risk to Department construction workers, employees and visitors, the Department requests that RI/FS phase be implemented expeditiously. The Department also requests that the USACE develop a timeline that specifies the expected start and end of the RI/FS phase.

Closure

The Department appreciates the opportunity to review and comment on the subject report, and participate in stakeholder meetings regarding March Field. As indicated in our comments above, the Department is concerned and committed to the safety and welfare or our employees and visitors. Your timely response to our comments and requests will be appreciated.

If you have any questions regarding this letter, please contact Todd Shibata of my staff at (951) 486-3261.

Sincerely,

Hans W. Kernkamp
General Manager – Chief Engineer

HWK:jrm/acmd/tds
PD#78607

cc: Don Silkebakken, Parsons Corporation
Jim Sessions – Riverside County Risk Management Division
Tim Miller, Riverside County Facilities Management Department

US Army Corps of Engineers	**Response to Stakeholder Comments**	Los Angeles District

Project:	FUDS **March Field**, J09CA716801, MMRP SI Phase				
Stakeholder:	Riverside County Waste Management Department, signed by Hans W. Kernkamp, General Manager-Chief Engineer, dated June 15, 2009.				
Document Reviewed:	Draft-Final Site Inspection Report, 5/8/2009, Prepared by Parsons for USACE on FUDS MMRP Site Inspections at Multiple Sites, W912DY-04-D-0005; T.O. 0009				
Response to Comments By:	Lloyd E. Godard, 213-452-4014	**E Mail:**	lloyd.e.godard@usace.army.mil	**Date:**	06/21/2009
Responder's Title:	FUDS Project Manager	**Section:**	CESPL-PM-M		

Item	Reference	Stakeholder's Comments	USACE Response to Comments
1	Comment 1, Sub-Par A	The subject report concluded that "an unacceptable risk is possible for human receptors" exposed to select Munitions Constituent (MC) metals and Polycyclic Aromatic Hydrocarbons (PAHs). Thus far, soil sampling upon which the report is based has only been performed on property adjacent to the Department's headquarters facility (14310 Frederick Street, Moreno Valley, CA 92553). Human receptors identified in the subject report, page J-2, include construction workers, commercial or industrial workers, and visitors or recreational users working on or adjacent to the sample sites. Each of these receptors has existed, currently exist and will exist in the future at the Department's facility. Further, complete exposure pathways for incidental ingestion, dermal contact and inhalation (dust) were identified for each of these receptors. The Department is concerned that a potential unacceptable human health risk exists to workers, employees and visitors at the Department's facility. The Department's objective is to provide adequate, responsible and timely notification and protection to Department employees and visitors regarding this potential unacceptable human health risk. The Department requests that the U.S. Army Corps of Engineers (USAGE) provide additional information to assist in fulfilling our objective. The Department specifically requests the following information: A. Written recommendations to protect Department construction workers from exposure to surface and subsurface soils.	After discussions with my FUDS Program Manager, Jeff Armentrout (213-452-3990), we recommend that you contact your Occupational Safety and Health Specialist to determine necessary protective measures due to this hazard.
2	Comment 1, Sub-Par B	B. Written recommendations to protect Department employees and visitors from exposure to surface soils.	See response to A. above.
3	Comment 1, Sub-Par C	C. A quantitative human health risk assessment to assess potential exposure scenarios for Department construction workers, employees and visitors. The Department requests that a preliminary risk assessment be performed using the existing MC metals and PAH data from the subject report and a final risk assessment be performed in conjunction with the remedial investigation/feasibility study (RI/FS) phase.	A quantitative human heath risk assessment will be conducted under the RI/FS phase, as appropriate.
4	Comment 2	The subject report does not provide a timeframe for implementation of the recommended RI/FS phase. Table 29, of Appendix K, of the subject report identifies the Munitions Response Site (MRS) priority rating as 5, with a value of 1 being the highest and 8 being the lowest. During the stakeholder meeting, the Department queried the USAGE regarding the RI/FS timeframe implementation.	All our military munitions projects are scheduled in our database according to their MRSPP score or RAC Score (old system) and how much funding we expect to get in

US Army Corps of Engineers	**Response to Stakeholder Comments**	Los Angeles District

Project:	FUDS **March Field**, J09CA716801, MMRP SI Phase				
Stakeholder:	Riverside County Waste Management Department, signed by Hans W. Kernkamp, General Manager-Chief Engineer, dated June 15, 2009.				
Document Reviewed:	Draft-Final Site Inspection Report, 5/8/2009, Prepared by Parsons for USACE on FUDS MMRP Site Inspections at Multiple Sites, W912DY-04-D-0005; T.O. 0009				
Response to Comments By:	Lloyd E. Godard, 213-452-4014	**E Mail:**	lloyd.e.godard@usace.army.mil	**Date:**	06/21/2009
Responder's Title:	FUDS Project Manager	**Section:**	CESPL-PM-M		

		Considering the MRS priority rating of 5, the USAGE indicated that RI/FS phase may commence in approximately two years. Given the possible unacceptable human health risk to Department construction workers, employees and visitors, the Department requests that RI/FS phase be implemented expeditiously. The Department also requests that the USAGE develop a timeline that specifies the expected start and end of the RI/FS phase.	the future. This project is currently scheduled over 10 years in the future. With a MRSPP score of 5, the date may move in a little. However, my FUDS Program Manager has some say as to when each project will be done. He has indicated that he will attempt to start the RI/FS sooner.

CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Parsons has completed the Final Site Inspection report for March Field, Riverside County, California. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions was verified. This included review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy.

Joni Jorgensen-Risk

June 23, 2009

Study/Design Team Leader and Team Members

June 23, 2009

Independent Technical Review Team Leader

Significant concerns and the explanation of the resolution are as follows:

None

As noted above, all concerns resulting from independent technical review of the project have been considered.

June 23, 2009

Parsons Program Manager(s)

PARSONS
Parsons Infrastructure & Technology Group, Inc.
5390 Triangle Parkway • Suite 100 • Norcross, Georgia 30092 • (770) 446-4900 • Fax: (770) 446-4910 • www.parsons.com

June 23, 2009

U.S. Army Corps of Engineers, Los Angeles District
ATTN: CESPL-PM-M (Mr. Lloyd Godard)
915 Wilshire Blvd.
Los Angeles, CA 90017-3401
(213) 452-4014

Subject: Contract W912DY-04-D-0005, Delivery Order 0009
MMRP SI for SW IMA Region –Final SI Report
March Field, Riverside County, California

Dear Mr. Godard:

Parsons has prepared this Final Site Inspection (SI) Report in accordance with the Performance Work Statement (PWS) to include the completed Munitions Response Site Prioritization Protocol (MRSPP). All USACE and stakeholder comments received on the Draft and Draft Final SI Report have been addressed. One copy has been provided for your records. Five additional copies have been provided for your distribution to the regulators (DTSC) and other key project stakeholders.

The SI Report determined that an unacceptable risk is possible to human receptors exposed to arsenic and lead, as well as PAHs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene in surface soils within the munitions response site (MRS).

As discussed during the Closure Meeting for March Field, conducted on June 9, 2009, the U.S. Army Corps of Engineers, Los Angeles District, will be certain to provide a copy of this Final SI Report to the landowner within the MRS; Ridge Moreno Valley, C/O Flanagan and Bilton, doing business in California as Ridge Moreno Valley Property, LLC.

We have forwarded a DVD to Brian Jordan (SW Region Program Manager) and single copies to EM CX. Electronic copies have also been provided. If you have any questions or comments, please contact me at (678) 969-2384 or (404) 606-0346 (cell), or the Co-Program Manager (Ms. Laura Kelley) at (678) 969-2437.

Sincerely,

PARSONS

Don Silkebakken, P.E.
MMRP SI Project/Program Manager

cc: SPD Brian Jordan – 1 DVD
Brad McCowan/Deborah Walker (EM CX) – 1 copy/DVD
Heidi Novotny (EM CX) – 1 DVD
Rochelle Hance (EM CX) – 1 DVD
Joni Jorgensen-Risk, Parsons-1 copy/DVD
Laura Kelley/Project File (744653.86130)

U.S. Army Corps of Engineers
Southwest IMA Region

FINAL
Site Inspection Report

March Field
Riverside County, California

FUDS Project No. J09CA716801
June 2009

In Support of
FUDS MMRP Site Inspections Project

Prepared by:
PARSONS
5390 Triangle Parkway, Suite 100
Norcross, Georgia 30092

Prepared for:

U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Blvd., Suite 15018
Los Angeles, California 90017-3401

&

U.S. Army Corps of Engineers
South Pacific Division Range Support Center

Contract: W912DY-04-D-0005
Task Order: 0009

THIRD QUARTER 2017 GROUNDWATER MONITORING REPORT

M&M Cleaners
23080 Alessandro Boulevard
Moreno Valley, California
Global ID: T10000004432

Stantec Project No.: 185802753

Stantec

Submitted to:
Ms. Jessica Law
California Regional Water Quality Control Board, Santa Ana Region
3737 Main Street, Suite 500
Riverside, California 92501-3348

Submitted by:
Stantec Consulting Services Inc.
25864-F Business Center Drive
Redlands, California

October 27, 2017

Stantec

THIRD QUARTER 2017 GROUNDWATER MONITORING REPORT

Site Address:	23080 Alessandro Boulevard, Moreno Valley, CA (the "Site"; Figure 1)
Consulting Co./Contact Person(s):	Stantec Brian Viggiano and Kevin Miskin
Project No.:	185802753
Geotracker Global ID No.:	T10000004432

BACKGROUND:

The Site is located within the Plaza Del Sol Shopping Center located at the northeast corner of Alessandro Blvd and Frederick Street in the City of Moreno Valley, CA. M & M Cleaners is located in unit 220 of Building D at 23080 Alessandro Blvd. M & M Cleaners occupies a small unit, measuring approximately 20 feet east-to-west by approximately 75 feet north-to-south. The dry-cleaning machine was removed from the premises in early January 2013, and the Site currently operates as a drop-off only facility. Stantec's review of historical reports (Encon, 2012) indicates that the Site has operated as a dry-cleaning facility using tetrachloroethene (PCE) since at least 1991.

On February 15, 2012, Encon completed an initial Site investigation that consisted of four soil borings using a limited access direct-push drilling rig at various locations surrounding the dry-cleaning machine. Soil gas samples were collected from temporary soil gas implants at five feet bgs and analyzed for the presence of volatile organic compounds (VOCs) in an on-Site mobile laboratory following EPA test method 8260B. The results of the investigation identified the presence of tetrachloroethylene (PCE) in all four soil gas samples at concentrations ranging from 462 µg/L to 1,068 µg/L. These concentrations exceeded the published California Office of Environmental Health Hazard Assessment (OEHHA) California Human Health Screening Levels (CHHSLs) for soil vapors for commercial uses at 1.6 µg/L. Based on these PCE concentrations, Encon concluded that there was a potential for vapor intrusion into the overlying structure. In addition, the vertical and lateral limits of soil and soil vapor were not defined at the site, nor was a determination made as to whether groundwater was affected by the detected impacts.

Based on the results of the preliminary investigation completed by Encon (2012), Stantec was retained to conduct an expanded Site assessment to evaluate the distribution of PCE in soil, soil gas and groundwater matrices.

In July 2012 Stantec performed a field investigation that consisted of drilling and sampling soil, soil gas and groundwater matrices. Based on the results of the investigation, impact to soil and groundwater was identified at the Site. Soil gas concentrations of several of the identified chemicals of potential concern (COPCs) exceeded published health-based screening levels (e.g., CHHSLs and California Regional Water Quality Control Board [RWQCB] Region 2 Environmental Screening Levels [ESLs]). In addition, VOC impact to groundwater was identified at concentrations exceeding State of California Maximum Contaminant Levels (MCLs). The results of these findings are summarized in Stantec's Site Assessment Report, dated August 24, 2012.

On November 20, 2012, Dr. Nick Amini of the RWQCB visited the Site for inspection and, via email communication, requested that additional investigation be conducted to better delineate the vertical and lateral limits of VOC impact in soil and groundwater.

On January 10, 2013, Stantec submitted a *Work Plan for Subsurface Investigation* to the RWQCB providing a scope of work to install three groundwater monitoring wells, two soil vapor extraction (SVE) wells, and 12 shallow soil gas sampling points. The work plan was approved by the RWQCB in correspondence dated February 8, 2013.

As a result of these initial investigations, the RWQCB requested that additional Site assessment activities be conducted, including, but not limited to, the Installation of one groundwater monitoring well down gradient of the known and suspected source areas. On September 9, 2013, Stantec prepared and submitted a *Work Plan for Continued Site Assessment Activities* (Work Plan) that included a scope of work to conduct additional Site assessment activities requested by the RWQCB. The Work Plan was approved by the RWQCB on September 19, 2013.

Historical Site assessment activities completed by Stantec and others have identified the presence of a diffuse PCE soil vapor plume beneath the M&M Cleaners and adjacent vacant units. Concentrations of PCE were also reported in groundwater above State of California MCLs. As a result, Stantec recommended the implementation of a quarterly groundwater monitoring program of monitoring wells MW-1 through MW-4, to evaluate groundwater plume stability and seasonal variations in groundwater concentrations.

On May 30 and 31, 2015, Stantec installed one dual-nested groundwater monitoring well (MW-5) to better evaluate the lateral and vertical down gradient location of the source area. In addition to the monitoring well, Stantec also installed three additional SVE wells (SVE-06 through SVE-08) between April 1 and 2, 2015.

Soil vapor extraction (SVE) was initiated at the Site on May 16, 2016 and has consisted of the operation of a 300 standard cubic feet per minute (SCFM) blower connected to extraction wells SVE-01, SVE-02 and SVE-04S/D through SV-08S/D and two, 2,000-pound granular activated carbon (GAC) vessels to treat extracted vapor in accordance with a South Coast Air Quality Management District (SCAQMD) various locations permit.

SVE operation was suspended on February 10, 2017 after achieving asymptotic inlet concentrations. Two rounds of post SVE rebound testing have been completed and, based on the results indicating limited rebound and no unacceptable health risk, a request was submitted to the Regional Board to remove the SVE system on April 12, 2017.

The following narrative provides the results of the analysis of groundwater samples collected from six Site wells (MW-1 through MW-5 S/D) during the third quarter of 2017. This report also includes a table of results for previous sampling events since the installation of the monitoring wells.

WORK PERFORMED THIS QUARTER [Third – 2017]:

1. Gauged depth-to-water (DTW) and depth to bottom of well for the following on-site wells: MW-1 through MW-5 S/D (Figure 2).
2. Performed third quarter 2017 groundwater sampling as required by the RWQCB.

WORK PROPOSED FOR NEXT QUARTER [Fourth – 2017]:

1. Gauge existing monitoring wells and perform fourth quarter 2017 groundwater monitoring.
2. Submit third quarter 2017 Groundwater Monitoring Report.

Current Phase of Project:	Monitoring (Third Quarter 2017)
Frequency of Sampling:	Quarterly
Frequency of Monitoring:	Quarterly
Approximate Depth to First Groundwater:	35.41 (MW-4) to 37.30 (MW-5S)
Average Groundwater Flow Direction:	265 degrees from north
Average Groundwater Gradient:	0.003 ft/ft wsw

DISCUSSION:

Groundwater Elevation Data

On September 29, 2017, Stantec personnel gauged groundwater in six (6) groundwater monitoring wells (Figure 2; Table 1). Groundwater elevations ranged from 1,541.11 feet AMSL in well MW-3 to 1,541.44 feet AMSL in well MW-4. Groundwater elevation data are tabulated on Table 2. The average ground water flow direction was calculated to be approximately 265 degrees from North at an average hydraulic gradient of approximately 0.003 feet/foot (Figure 3). Average groundwater levels have increased approximately 0.45 feet since the first quarter monitoring event, and have risen approximately 3.37 feet since June 2013 when groundwater monitoring activities began.

Groundwater monitoring field parameters including depth to water measurements, pH, oxidation reduction potential (ORP), temperature, and turbidity are provided on attached field data sheets (Appendix A).

Groundwater Analytical Results

Groundwater samples were collected from wells MW-1 through MW-5 S/D in accordance with the attached purging and sampling procedures (Appendix A). Groundwater samples were analyzed for volatile organic compounds (VOCs) by EPA Test Method 8260B. Analytical results are reported in Table 3. Analytical laboratory reports including associated QC data are included in Appendix B. PCE results and isoconcentrations are presented on Figure 4. Hydrographs presenting groundwater elevations and concentrations of PCE versus time are presented in Appendix D.

The following summarizes the third quarter 2017 sampling results:

- With the exception of well MW-5D, PCE was reported in all Site monitoring wells above laboratory reporting limits at concentrations ranging from 3.1 µg/L (MW-4) to 73 µg/L (MW-2). The MCL was exceeded at four well locations: MW-1 (54 µg/L), MW-2 (73 µg/L), MW-3 (71 µg/L) and MW-5S (7.4 µg/L). PCE concentrations in source area well MW-02 increased slightly from 62 µg/L to 73 ug/L, however, the reported concentration is significantly lower than the historical high of 310 µg/L. The decrease in reported PCE concentration is believed to be the result of the SVE remediation.
- Chloroform was reported in Site monitoring wells MW-1, MW-2, MW-3, and MW-4 at concentrations ranging from 0.25j µg/L in well MW-5S, to 2.0 µg/L in well MW-3.
- No other VOCs were reported above laboratory method detection limits.

In comparison to the previous sampling event, the laboratory results indicate that PCE concentrations have generally increased slightly. Increases in PCE concentrations were observed in wells MW-1 (33 µg/l to 54 µg/l), MW-2 (62 µg/l to 73 µg/l), MW-3 (45 µg/L to 71 µg/L), MW-4 (3.0 µg/L to 3.1 µg/L) and MW-5S (6.4 µg/L to 7.4 µg/L). Based on these results, Stantec recommends continued groundwater monitoring of all Site wells to evaluate post remediation variations and trends, and plume stability.

Should there be any questions regarding the information provided within the accompanying report, please do not hesitate to contact the undersigned at (909) 335-6116.

Respectfully submitted,

STANTEC CONSULTING SERVICES INC.

Prepared by:

Brian Viggiano, PG
Senior Geologist

Approved by:

Kevin Miskin, PE
Principal Engineer

ATTACHMENTS:

TABLES:

Table 1 – Well Construction Details
Table 2 – Summary of Groundwater Elevation Data
Table 3 – Summary of Groundwater Analytical Results – VOCs

FIGURES:

Figure 1 – Site Location Map

APPENDICES:

TABLES

Table 1
Well Construction Details
M & M Cleaners
23080 Allessandro Blvd
Moreno Valley, CA

Well ID	Installation Date	Top of Casing Elevation (feet msl)	Top of Well Box Elevation (feet msl)	Latitude (DD)	Longitude (DD)	Boring Depth (feet bgs)	Casing Type	Screen Interval (feet bgs)	Screen Slot Size (inches)
Groundwater Monitoring Wells									
MW-1	6/20/2013	1578.01	1578.34	33.9190427	-117.2598074	51.5	PVC	35-50	0.01
MW-2	6/19/2013	1578.38	1578.73	33.9189277	-117.2597795	51.5	PVC	35-50	0.01
MW-3	6/21/2013	1577.46	1577.81	33.9187170	-117.2598629	52.5	PVC	37-52	0.01
MW-4	10/7/2013	1576.49	1576.49	33.9186002	-117.2596721	51.5	PVC	35-50	0.01
MW-5D	4/8/2015	1578.44	1578.73	33.9188649	-117.2600509	60	PVC	55-60	0.01
MW-5S	4/8/2015	1578.45	1578.73	33.9188649	-117.2600509	60	PVC	35-45	0.01

Notes:

DD: Decimal Degrees
Elevation Datum: NAVD 88
Coordinates: based on California State Plane Coordinate System (NAD 83), California Zone 6

Table 2
Summary of Groundwater Elevation Data
M & M Cleaners
23080 Allessandro Blvd
Moreno Valley, CA

Well ID	Well Head Elevation (feet AMSL)	Date	Depth to groundwater (feet bgs)	Groundwater Elevation (feet AMSL)
MW-1	1578.01	6/28/2013	40.16	1537.85
		2/21/2014	39.33	1538.68
		6/24/2014	38.91	1539.10
		9/9/2014	38.67	1539.34
		12/23/2014	38.58	1539.43
		3/27/2015	38.43	1539.58
		5/14/2015	38.16	1539.85
		7/14/2015	38.02	1539.99
		12/8/2015	37.84	1540.17
		3/30/2016	37.71	1540.30
		6/29/2016	37.56	1540.45
		9/21/2016	37.53	1540.48
		12/21/2016	37.62	1540.39
		3/17/2017	37.11	1540.90
		6/6/2017	36.84	1541.17
		9/29/2017	36.67	1541.34
MW-2	1578.38	6/28/2013	40.62	1537.76
		2/21/2014	39.78	1538.60
		6/24/2014	39.35	1539.03
		9/9/2014	39.13	1539.25
		12/23/2014	39.02	1539.36
		3/27/2015	38.68	1539.70
		5/14/2015	38.61	1539.77
		7/14/2015	38.5	1539.88
		12/8/2015	38.34	1540.04
		3/30/2016	38.18	1540.20
		6/29/2016	38.03	1540.35
		9/21/2016	37.95	1540.43
		12/21/2016	38.05	1540.33
		3/17/2017	37.60	1540.78
		6/6/2017	37.31	1541.07
		9/29/2017	37.14	1541.24
MW-3	1577.46	6/28/2013	39.85	1537.61
		2/21/2014	38.99	1538.47
		6/24/2014	38.60	1538.86
		9/9/2014	38.43	1539.03
		12/23/2014	38.29	1539.17
		3/27/2015	37.92	1539.54
		5/14/2015	37.83	1539.63
		7/14/2015	37.72	1539.74
		12/8/2015	37.52	1539.94
		3/30/2016	37.37	1540.09
		6/29/2016	37.25	1540.21
		9/21/2016	37.23	1540.23
		12/21/2016	37.27	1540.19
		3/17/2017	36.81	1540.65
		6/6/2017	36.51	1540.95
		9/29/2017	36.35	1541.11
MW-4	1576.85	10/14/2013	38.59	1538.26
		2/21/2014	38.05	1538.80
		6/24/2014	37.66	1539.19
		9/9/2014	37.49	1539.36
		12/23/2014	37.34	1539.51
		3/27/2015	37.00	1539.85
		5/14/2015	36.88	1539.97
		7/14/2015	36.75	1540.10
		12/8/2015	36.54	1540.31
		3/30/2016	36.42	1540.43
		6/29/2016	36.29	1540.56
		9/21/2016	36.28	1540.57
		12/21/2016	36.33	1540.52
		3/17/2017	35.83	1541.02
		6/6/2017	35.57	1541.28
		9/29/2017	35.41	1541.44

Table 2
Summary of Groundwater Elevation Data
M & M Cleaners
23080 Allessandro Blvd
Moreno Valley, CA

Well ID	Well Head Elevation (feet AMSL)	Date	Depth to groundwater (feet bgs)	Groundwater Elevation (feet AMSL)
MW-5S	1578.45	4/10/2015	38.90	1537.95
		5/14/2015	38.80	1539.65
		7/14/2015	38.67	1539.78
		12/8/2015	38.48	1539.97
		3/30/2016	38.34	1540.11
		6/29/2016	38.24	1540.21
		9/21/2016	38.20	1540.25
		12/21/2016	No Access	
		3/17/2017	37.75	1540.70
		6/6/2017	37.49	1540.96
		9/29/2017	37.30	1541.15
MW-5D	1578.44	4/10/2015	38.91	1539.54
		5/14/2015	38.78	1539.66
		7/14/2015	38.66	1539.78
		12/8/2015	38.50	1539.94
		3/30/2016	38.35	1540.09
		6/29/2016	38.22	1540.22
		9/21/2016	38.21	1540.23
		12/21/2016	No Access	
		3/17/2017	37.75	1540.69
		6/6/2017	37.48	1540.96
		9/29/2017	37.31	1541.13

bgs: below ground surface
AMSL: above mean sea level

Table 3
Summary of Groundwater Analytical Results - VOCs
M & M Cleaners
23080 Allessandro Blvd
Moreno Valley, CA

Sample Name	Collection Date	VOCs (ug/L)[1]					
		PCE	TCE	c-1,2-DCE	t-1,2-DCE	VC	Other VOCs
MW-1	6/28/2013	**16**	<2.0	<2.0	<2.0	<5.0	<varies
	2/21/2014	**80**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.45j
	6/24/2014	**58**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.51j
	9/10/2014	**70**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.40j
	12/23/2014	**83**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.43j
	3/27/2015	**69**	<2.0	<2.0	<2.0	<5.0	<varies
	5/14/2015	**110**	<2.0	<2.0	<2.0	<5.0	<varies
	7/14/2015	**72**	<2.0	<2.0	<2.0	<5.0	<varies
	12/8/2015	**87**	0.81j	<2.0	<2.0	<5.0	chloroform: 0.43j
	3/30/2016	**120**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.49j
	6/29/2016	**77**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.40j
	9/21/2016	**36**	<2.0	<2.0	<2.0	<5.0	chloroform:0.34j methylene chloride: 1.1j
	12/21/2016	**30**	<2.0	<2.0	<2.0	<5.0	chlroform: 0.41j
	3/17/2017	**32**	<2.0	<2.0	<2.0	<5.0	chlroform: 0.41j
	6/6/2017	**33**	<2.0	<2.0	<2.0	<5.0	chlroform: 0.37j
	9/29/2017	**54**	<2.0	<2.0	<2.0	<5.0	chlroform: 0.41j
MW-2	6/28/2013	**67**	<2.0	<2.0	<2.0	<5.0	<varies
	2/21/2014	**270**	<5.0	<5.0	<5.0	<13	chloroform: 0.97j
	6/24/2014	**310**	<5.0	<5.0	<5.0	<13	chloroform: 0.94
	9/10/2014	**150**	<5.0	<5.0	<5.0	<13	chloroform: 0.67j
	12/23/2014	**220**	<5.0	<5.0	<5.0	<13	chloroform: 0.70j
	3/27/2015	**100**	<2.0	<2.0	<2.0	<5.0	<varies
	5/14/2015	**110**	<2.0	<2.0	<2.0	<5.0	<varies
	7/14/2015	**220**	<2.0	<2.0	<2.0	<5.0	<VARIES
	12/8/2015	**220**	<10	<10	<10	<25	<varies
	3/30/2016	**220**	<10	<10	<20	<25	<varies
	6/29/2016	**200**	<8	<8	<8	<20	<varies
	9/21/2016	**82**	<5.0	<5.0	<5.0	<13	methylene chloride: 3.3j
	12/21/2016	**65**	<2.0	<2.0	<2.0	<5.0	chlroform: 0.60j
	3/17/2017	**56**	<2.0	<2.0	<2.0	<5.0	chlroform: 0.57j
	6/6/2017	**62**	<2.0	<2.0	<2.0	<5.0	chlroform: 0.60j
	9/29/2017	**73**	<2.0	<2.0	<2.0	<5.0	chlroform: 0.52j
MW-3	6/28/2013	**2.2**	<2.0	<2.0	<2.0	<5.0	chloroform: 2.0
	2/21/2014	**5.7**	<2.0	<2.0	<2.0	<5.0	chloroform: 2.2
	6/24/2014	**5.6**	<2.0	<2.0	<2.0	<5.0	chloroform: 2.1
	9/10/2014	**6.1**	<2.0	<2.0	<2.0	<5.0	chloroform: 2.0
	12/23/2014	**8.5**	<2.0	<2.0	<2.0	<5.0	chloroform: 2.2
	3/27/2015	**7.6**	<2.0	<2.0	<2.0	<5.0	<varies
	5/14/2015	**8.4**	<2.0	<2.0	<2.0	<5.0	chloroform 2.1
	7/14/2015	**8**	<2.0	<2.0	<2.0	<5.0	
	12/8/2015	**16**	0.80j	<2.0	<2.0	<5.0	chloroform: 1.9j
	3/30/2016	**23**	<2.0	<2.0	<2.0	<5.0	chloroform: 2.2
	6/29/2016	**26**	<2.0	<2.0	<2.0	<5.0	chloroform: 1.7j
	9/21/2016	**31**	<2.0	<2.0	<2.0	<5.0	chloroform: 1.7j methylene chloride: 1.2j
	12/21/2016	**43**	<2.0	<2.0	<2.0	<5.0	chloroform: 1.9j
	3/17/2017	**49**	<2.0	<2.0	<2.0	<5.0	chloroform: 2.5
	6/6/2017	**45**	<2.0	<2.0	<2.0	<5.0	chloroform: 2.2
	9/29/2017	**71**	<2.0	<2.0	<2.0	<5.0	chloroform: 2.0
MW-4	10/14/2013	<2.0	<2.0	<2.0	<2.0	<5.0	chloroform: 0.73j
	2/21/2014	0.65j	<2.0	<2.0	<2.0	<5.0	chloroform: 0.68j
	6/24/2014	0.91j	<2.0	<2.0	<2.0	<5.0	chloroform: 0.78j chloromethane: 0.73j
	9/10/2014	1.0j	<2.0	<2.0	<2.0	<5.0	chloroform: 0.66j
	12/23/2014	1.4j	<2.0	<2.0	<2.0	<5.0	chloroform: 0.65j
	3/27/2015	<2.0	<2.0	<2.0	<2.0	<5.0	<varies
	5/14/2015	<2.0	<2.0	<2.0	<2.0	<5.0	<varies
	7/14/2015	<2.0	<2.0	<2.0	<2.0	<2.0	<varies
	12/8/2015	**2.5**	0.36j	<2.0	<2.0	<5.0	chloroform: 0.56j
	3/30/2016	**2.8**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.64j
	6/29/2016	**3.1**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.55j
	9/21/2016	**3.2**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.44j methylene chloride: 1.2j
	12/21/2016	**3.3**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.53j
	3/17/2017	**3.4**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.56j
	6/6/2017	**3.0**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.62j
	9/29/2017	**3.1**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.45j

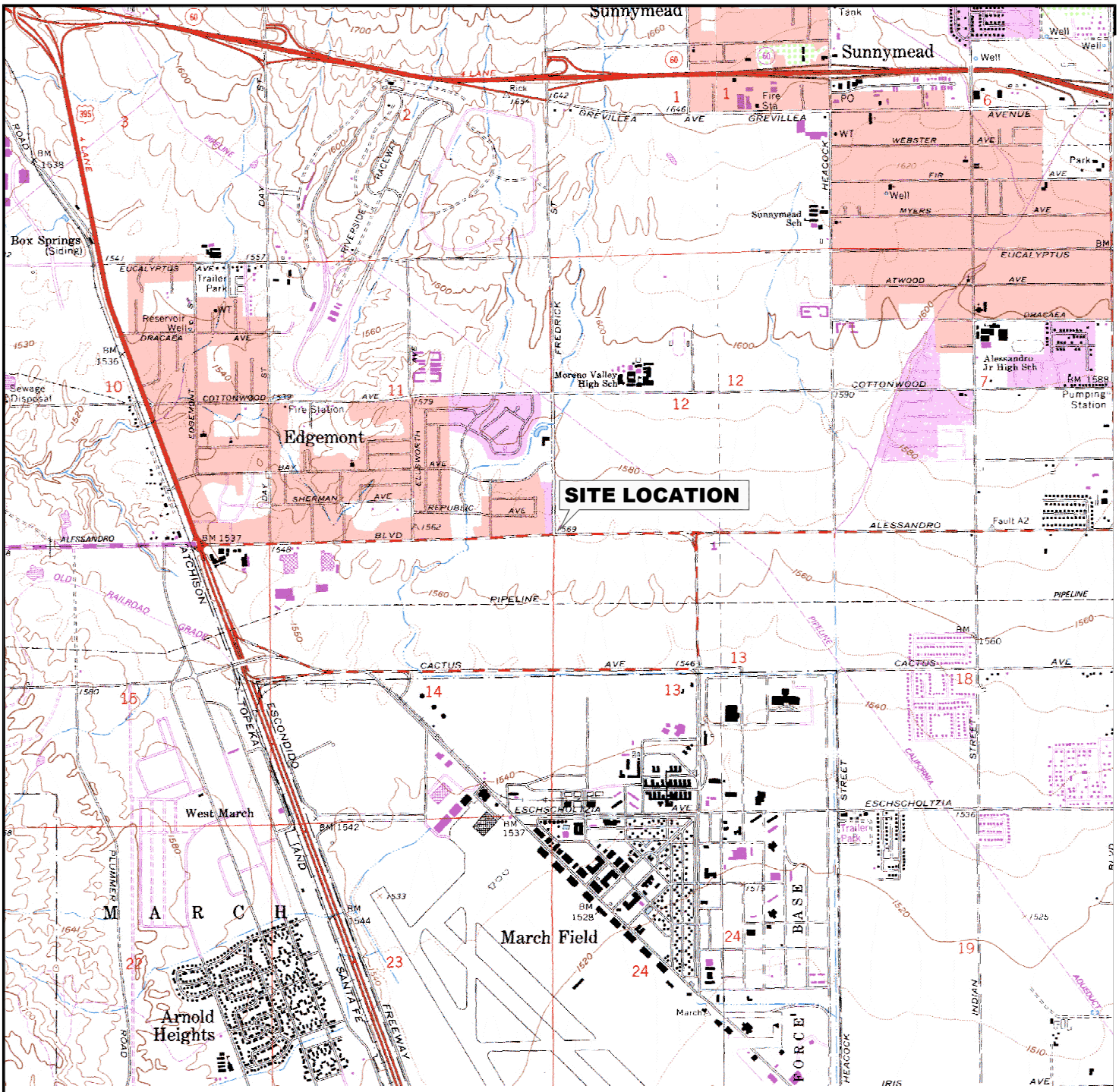
Table 3
Summary of Groundwater Analytical Results - VOCs
M & M Cleaners
23080 Allessandro Blvd
Moreno Valley, CA

Sample Name	Collection Date	VOCs (ug/L)[1]					
		PCE	TCE	c-1,2-DCE	t-1,2-DCE	VC	Other VOCs
MW-5S	4/10/2015	**27**	<2.0	<2.0	<2.0	<5.0	<varies
	5/14/2015	**16**	<2.0	<2.0	<2.0	<5.0	<varies
	7/14/2015	**4.1**	<2.0	<2.0	<2.0	<5.0	<varies
	12/8/2015	**7.4**	0.79j	<2.0	<2.0	<5.1	chloroform: 0.63j
	3/30/2016	**5.9**	<2.0	<2.0	<2.0	<5.0	chloroform: 0.79j
	6/29/2016	**8.2**	0.42j	<2.0	<2.0	<5.0	chloroform: 0.50j
	9/21/2016	**8.7**	0.69j	<2.0	<2.0	<5.0	chloroform: 0.53j
	12/21/2016	No Access					
	3/17/2017	**7.1**	0.71j	<2.0	<2.0	<5.0	chloroform: 0.54j
	6/6/2017	**6.4**	0.76j	<2.0	<2.0	<5.0	chloroform: 0.43j
	9/29/2017	**7.4**	0.58j	<2.0	<2.0	<5.0	chloroform: 0.25j
MW-5D	4/10/2015	<2.0	<2.0	<2.0	<2.0	<5.0	<varies
	5/14/2015	<2.0	<2.0	<2.0	<2.0	<5.0	<varies
	7/14/2015	0.42j	<2.0	<2.0	<2.0	<5.0	<varies
	12/8/2015	0.83j	0.28j	<2.0	<2.0	<5.1	chloroform: 0.50j
	3/30/2016	0.35j	<2.0	<2.0	<2.0	<5.0	chloroform: 0.52j
	6/29/2016	0.35j	<2.0	<2.0	<2.0	<5.0	chloroform: 0.47j
	9/21/2016	0.41j	<2.0	<2.0	<2.0	<5.0	chloroform: 0.49j methylene chlroide: 1.1j
	12/21/2016	No Access					
	3/17/2017	<2.0	<2.0	<2.0	<2.0	<5.0	chloroform: 0.60j
	6/6/2017	<2.0	<2.0	<2.0	<2.0	<5.0	chloroform: 0.52j
	9/29/2017	<2.0	<2.0	<2.0	<2.0	<5.0	chloroform: 0.59j
California Maximum Contaminant Levels		5	5	6	10	1	varies

Notes:
(1) EPA Test Method 8260B - Volatile Organics by GC/MS + Oxygenates
< - Indicates the concentration was not detected above the laboratory method detection limit.
Indicates the concentration was detected above the laboratory method dectection limit
Indicates the concentration exceeds respective MCL
MCL - California Maximum Contaminant Level, Updated January 30, 2013
j - estimated concentration between the method detection limit and reporting limit

Abbreviations:
VOCs - Volatile Organic Compounds
PCE - Tetrachloroethene
TCE - Trichloroethene
c-1,2-DCE - cis-1,2-dichloroethene
t-1,2-DCE - trans-1,2-dichloroethene
VC - Vinyl chloride

FIGURES



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Block o33119c2 & o033119c3, Downloaded 5/14/10

Stantec
25864-F BUSINESS CENTER DRIVE
REDLANDS, CALIFORNIA 92374
PHONE: (909) 335-6116 FAX: (909) 556-6516

FOR:
M&M CLEANERS
23080 ALESSANDRO BLVD
MORENO VALLEY, CALIFORNIA

SITE LOCATION MAP

FIGURE: 1

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185802753	J. RESENDIZ	B. VIGGIANO		AUG. 2012

FILEPATH:P:\CADD\PROJECTS\OTHER\M&M Cleaners\M&M Cleaners_2012.dwg|jresendiz|Aug 13, 2012 at 12:33|Layout: F1-SLM

PLANTER
(LANDSCAPING)

MW-1

ALLEY

BOILER

FORMER DRY
CLEANING
MACHINE

BATHROOM

MW-2

UNIT 214
(VACANT)

MW-05-S
MW-05-D

UNIT 220
(M&M
CLEANERS)

UNIT 222
(VACANT)

UNIT 224
ZUMBA
FITNESS

WALKWAY

MW-3

PARKING LOT

MW-4

LEGEND

PROPERTY LINE

MW-1 GROUNDWATER MONITORING WELL

DUAL NESTED MONITORING WELL

N

0 25 50

APPROXIMATE SCALE IN FEET

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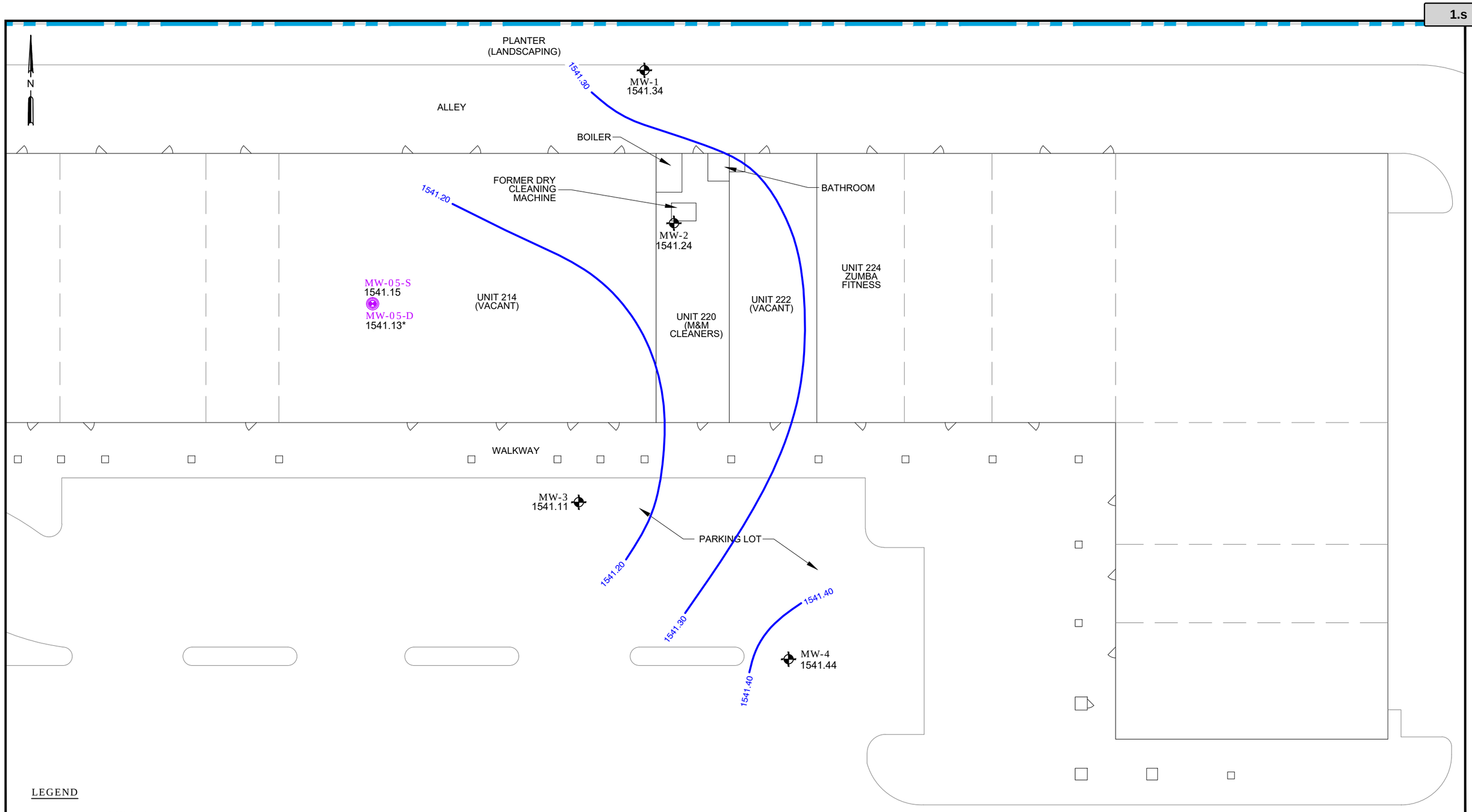
FOR:
M&M CLEANERS
23080 ALESSANDRO BLVD
MORENO VALLEY, CALIFORNIA

SITE MAP WELL LOCATIONS

FIGURE: 2

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185802753	J. RESENDIZ/STA	B. VIGGIANO		07/13/15

FILEPATH:M:_00 OTHER OFFICES\04-REDLANDS\MorenoValley\2015\JULY 2015\FIG 2_MorenoValley_SITE PLAN_07-13-2015.dwg|miramirez|Oct 29, 2015 at 9:22|Layout: 11X17



LEGEND

- PROPERTY LINE
- MW-1 GROUNDWATER MONITORING WELL
- DUAL NESTED MONITORING WELL
- 1541.11 GROUNDWATER ELEVATION (FEET)
- (1541.20) GROUNDWATER ELEVATION CONTOUR (FEET)
- * NOT USED IN CONTOURING-SCREENED IN DEEPER ZONE

0 25 50

APPROXIMATE SCALE IN FEET

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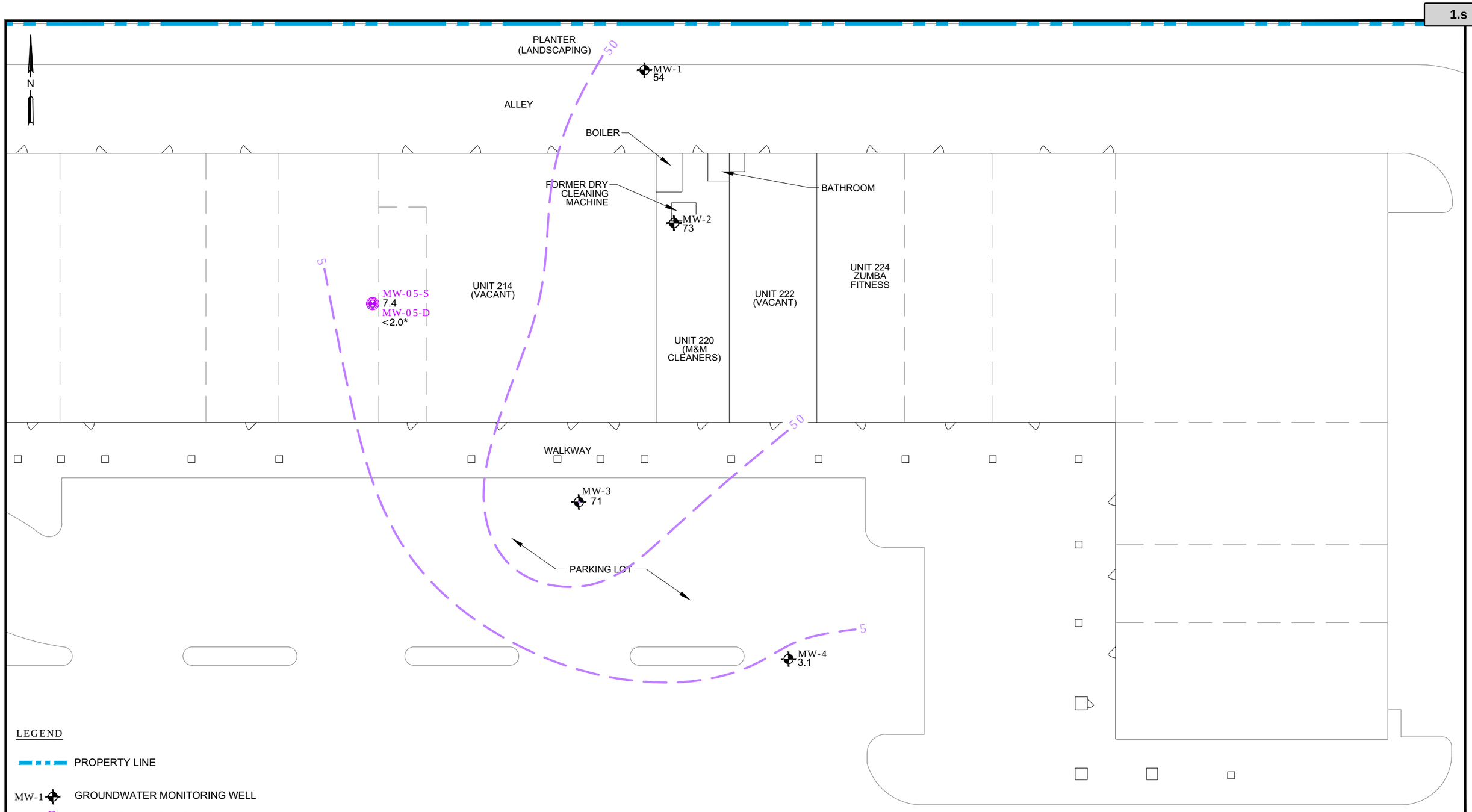
FOR:
M&M CLEANERS
23080 ALESSANDRO BLVD
MORENO VALLEY, CALIFORNIA

GROUNDWATER ELEVATION MAP
SEPTEMBER 29, 2017

FIGURE: 3

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185802753	STA/MDR	MB	BV	10/30/17

FILEPATH:V:\1857\active\Secor\CADD_00 OTHER OFFICES\X04-REDLANDS\MorenoValley\2017\3Qtr\FIG 3_MorenoValley_GW ELEVATION MAP_07-2015.dwg|miramirez|Oct 30, 2017 at 13:30|Layout: 11X17 L



Stantec
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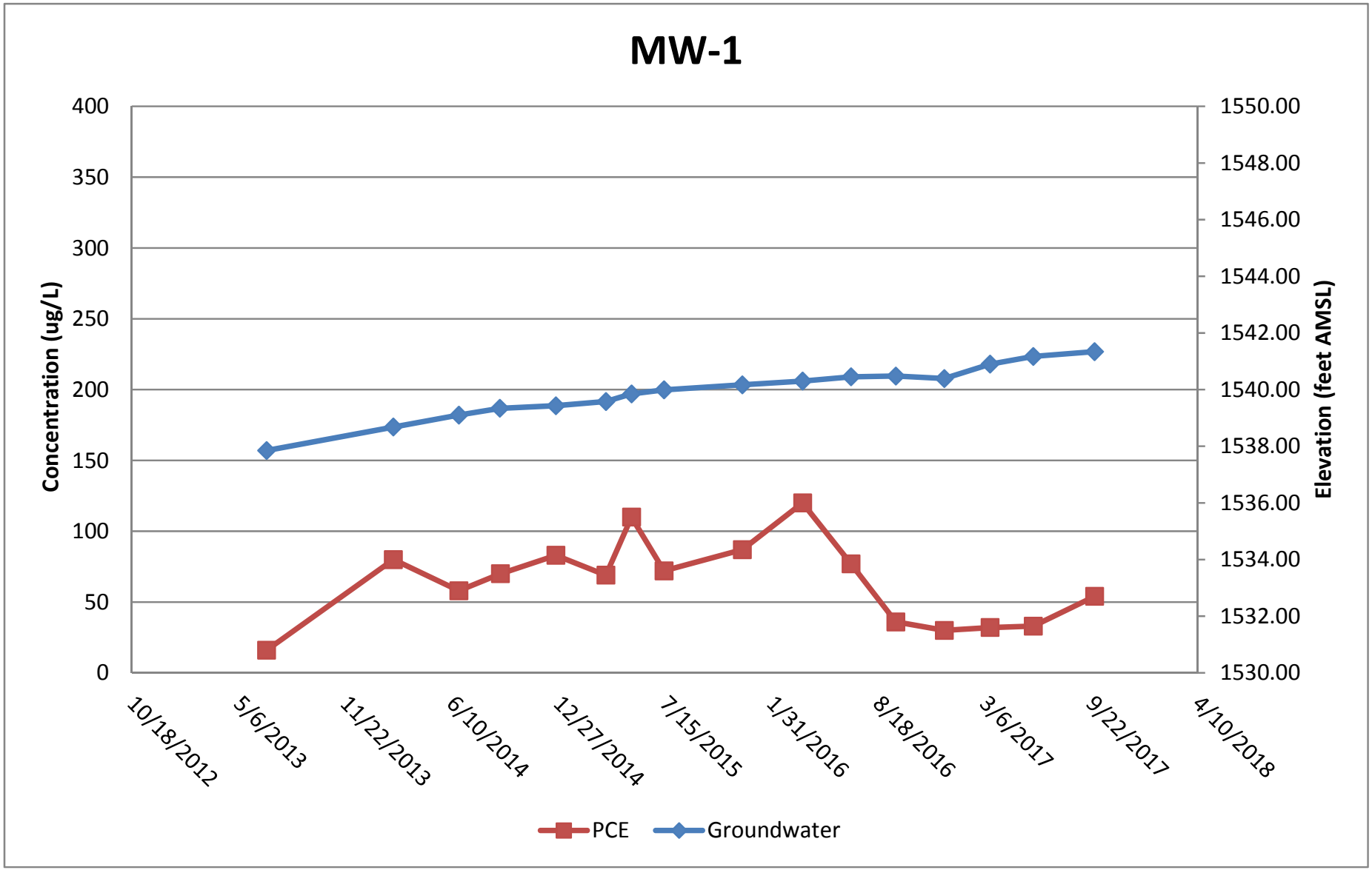
PHONE: (909) 335-6116 FAX: (909) 556-6516

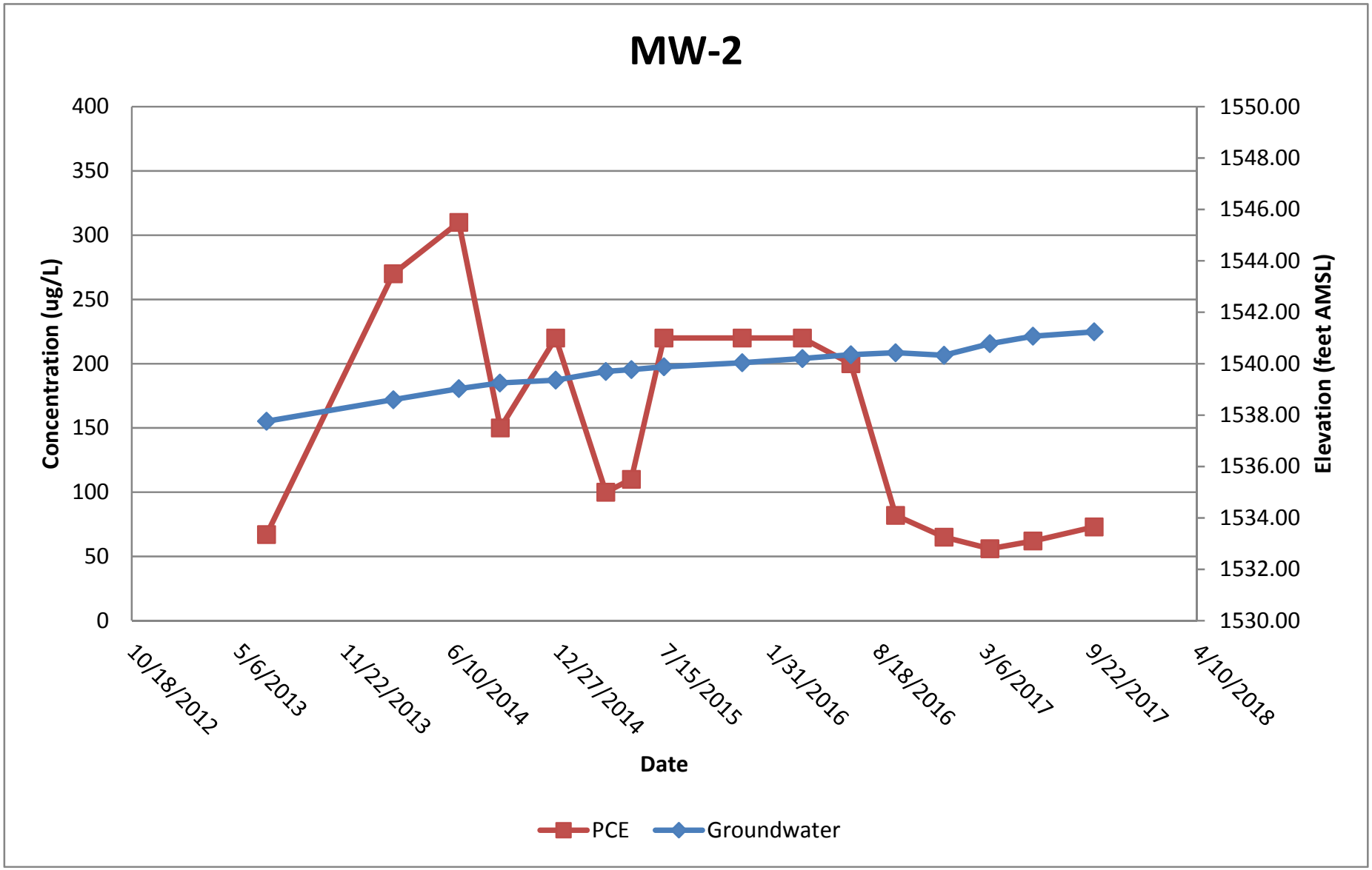
FOR:		FIGURE:
M&M CLEANERS 23080 ALESSANDRO BLVD MORENO VALLEY, CALIFORNIA	PCE ISO-CONCENTRATION MAP SEPTEMBER 29, 2017	4

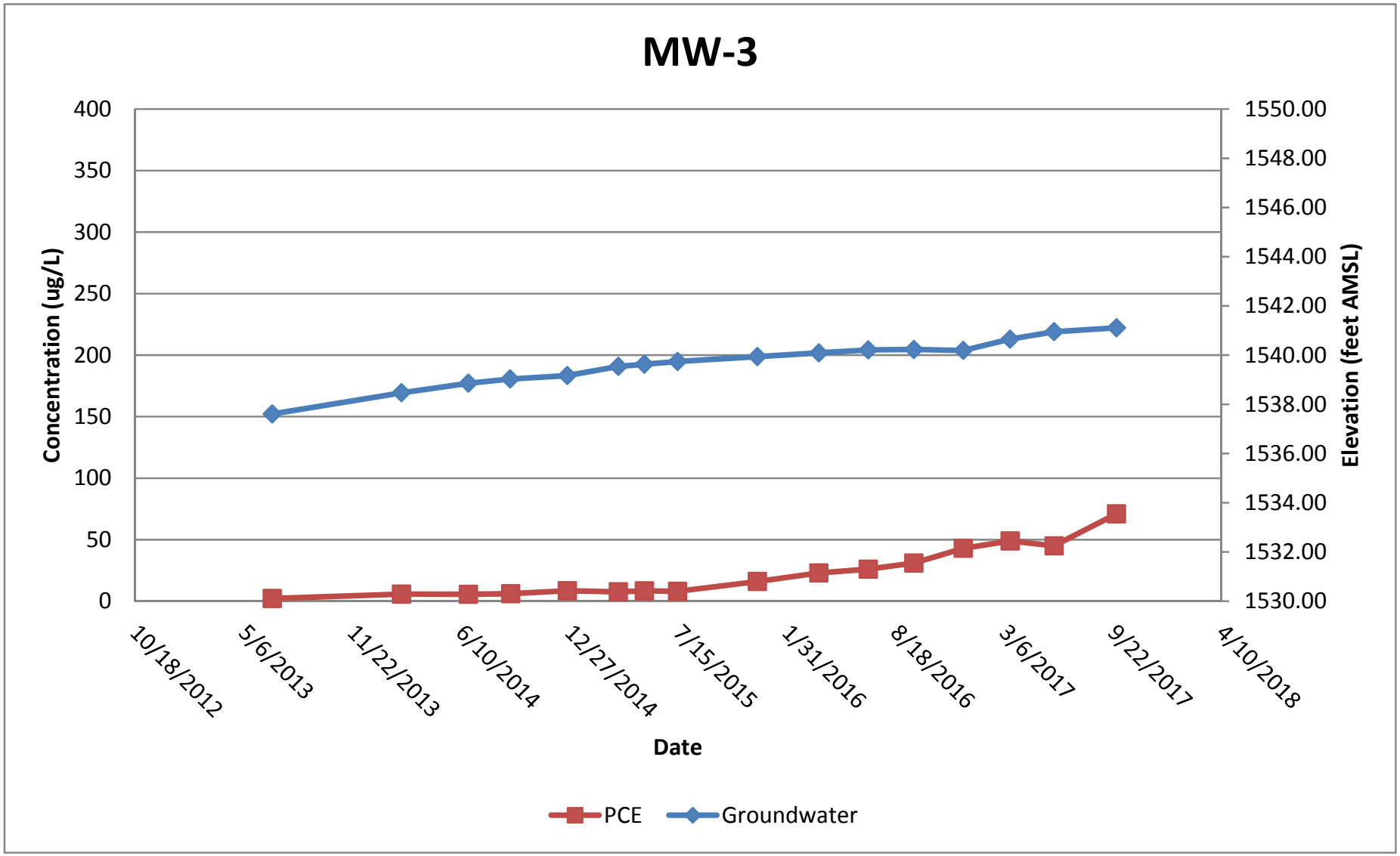
JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185802753	MDR/STA	MB	BV	10/30/17

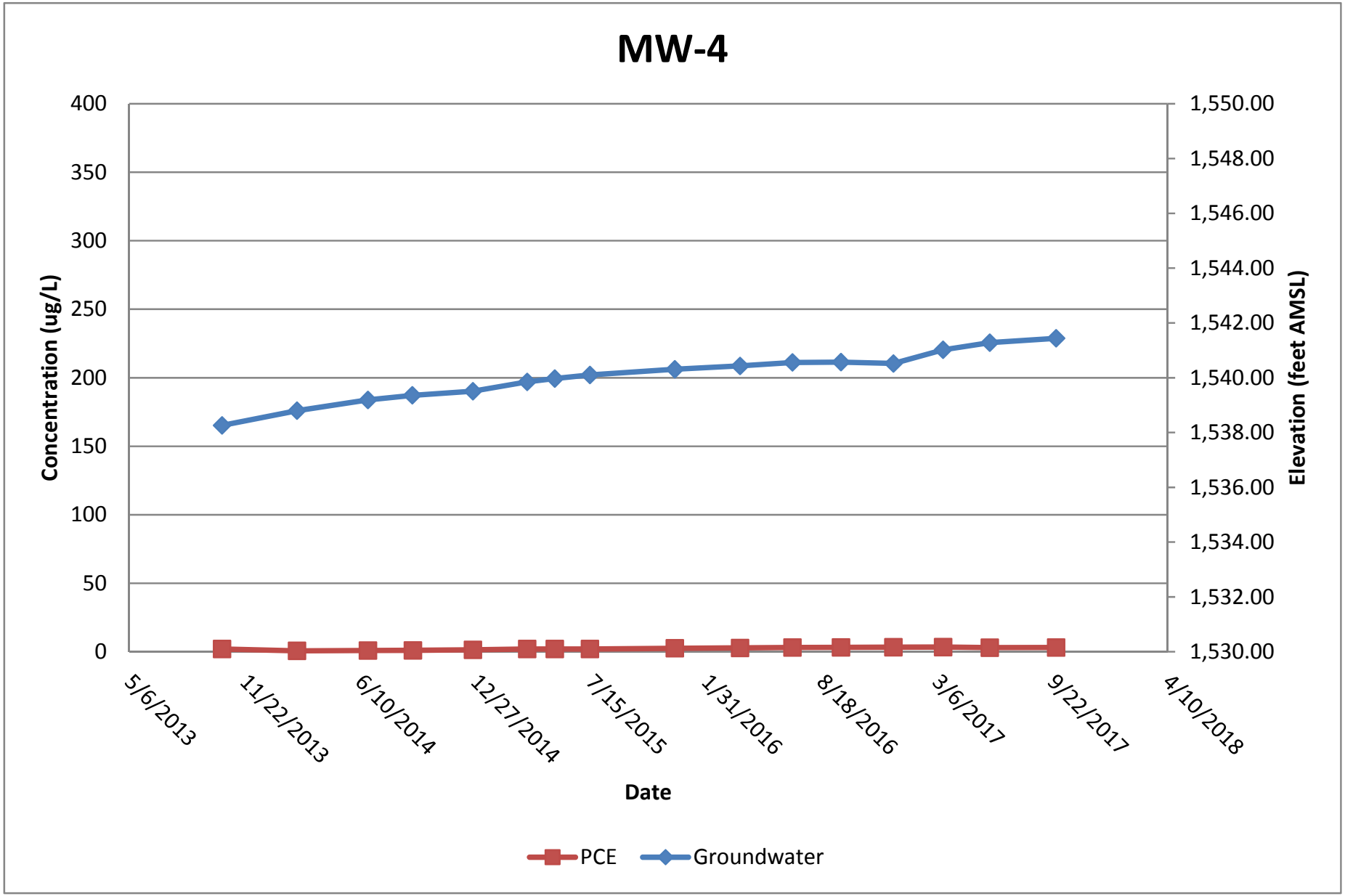
FILEPATH:V:\1857\active\Secor\CADD_00 OTHER OFFICES\X04-REDLANDS\MorenoValley\2017\3Qtr\FIG 4_MorenoValley_PCE ISOCONCENTRATION MAP.dwg|miramirez|Oct 30, 2017 at 13:29|Layout: 11X17 L

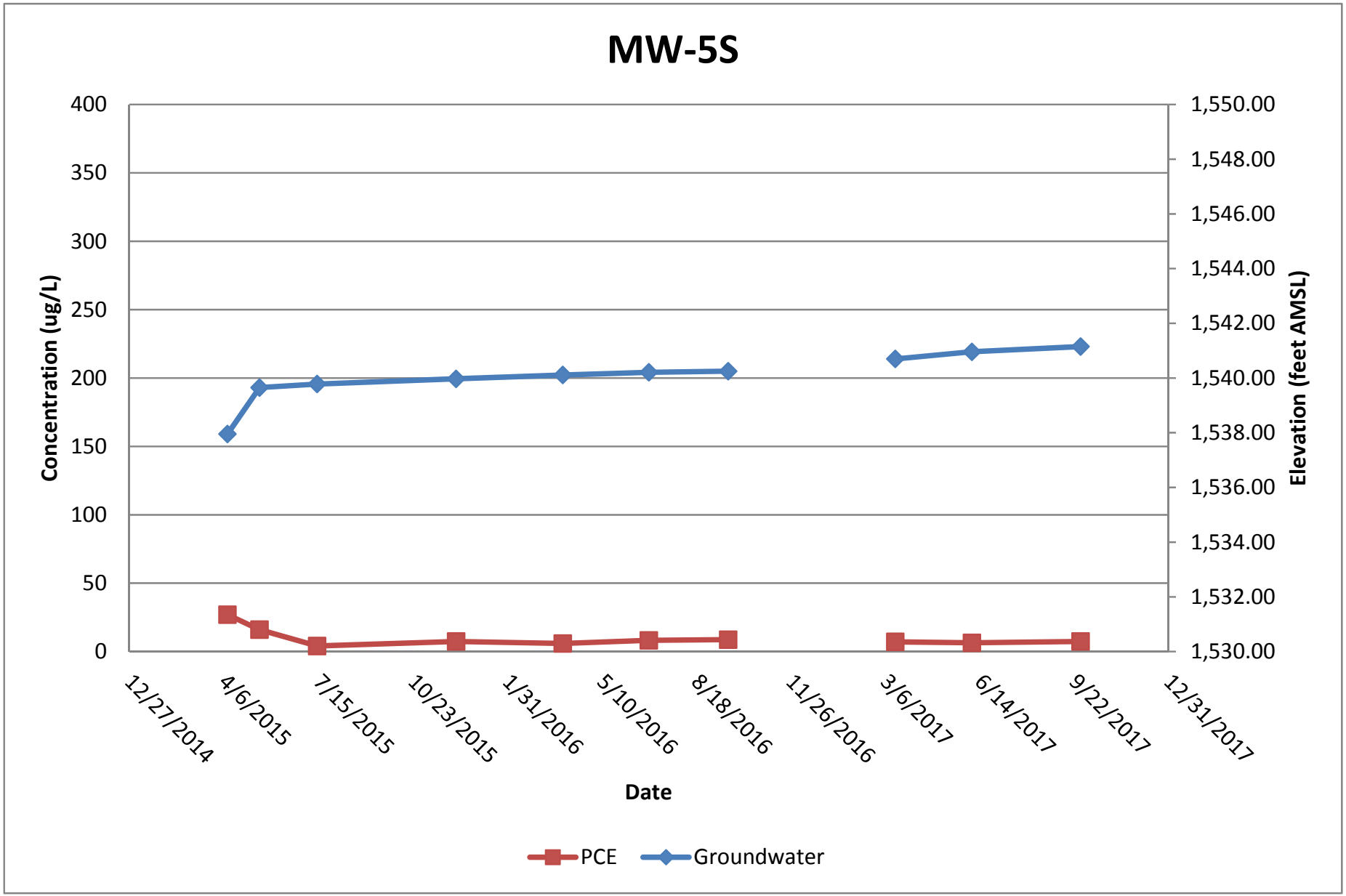
APPENDIX A
HYDROGRAPHS

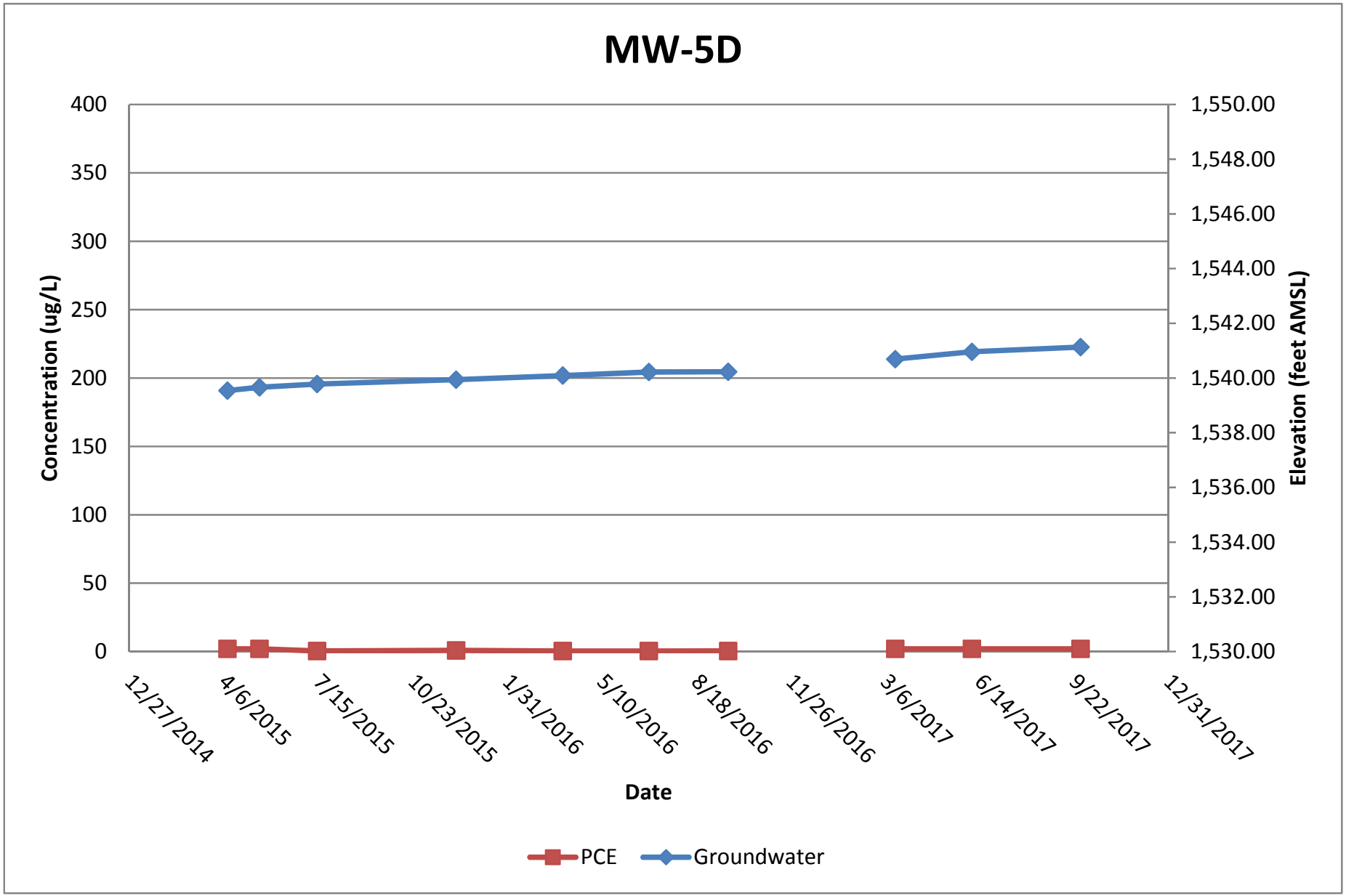












APPENDIX B
STANDARD PROCEDURES FOR GROUNDWATER SAMPLING

MONITORING WELL LOW-FLOW (MINIMAL DRAWDOWN) SAMPLING PROCEDURES

Groundwater sampling activities involve several activities including groundwater and free product depth measurements, well purging, sample collection, waste water disposal, etc. The procedures for conducting these activities are described below.

DEPTH TO GROUNDWATER

Prior to purging each of the wells, the depth to groundwater within each well casing is measured to the nearest 0.01 foot using either an electronic Solinst water level indicator or an electronic oil-water interface probe. Wells with known elevation were measured from the top of each well casing as determined in accordance with previous surveys.

LOW-FLOW (MINIMAL DRAWDOWN) GROUDNWATER SAMPLING

Following depth to groundwater measurement, a low-flow pump is installed at 3 feet below the groundwater table and 3 feet off the bottom of the monitoring well. Tubing connects the pneumatic pump, submerged in the well, to a water flow cell equipped with a calibrated water quality probe. The probe continuously measures water quality parameters including pH, specific conductivity, dissolved oxygen (DO), oxidation-reduction (redox) potential, temperature, and turbidity.

Flow rates of 0.1-0.5 L/min are suggested for purging and sampling, but exact flow rates depend on Site-specific hydrology. Flow rate is adjusted to prevent drawdown from exceeding 0.3 feet. After installing the pneumatic pump, the depth to water meter is reinstalled to monitor drawdown.

Once flow is continuous, water quality parameter measurements are obtained. Measurements for temperature, pH, redox potential, conductivity, DO and turbidity are taken every three to five minutes. Purging continues until all water quality parameters have stabilized for three consecutive readings. Once parameters stabilize, a final reading is recorded and samples are taken.

GROUNDWATER SAMPLE ACQUISITION AND HANDLING

Following purging operations, groundwater samples are collected from the discharge tube of the pneumatic pump. The discharge tube is disconnected from the flow cell prior to sampling. Samples are never taken from the outlet of the flow cell.

Collected water samples are discharged directly into laboratory provided, precleaned, 40 milliliter (ml) glass vials or one liter amber bottles and sealed with Teflon-lined septum, screw-on lids. Labels documenting sample number, well identification, collection date and time, type of sample and type of preservative (if applicable) are affixed to each sample. The samples are then placed into an ice-filled cooler for delivery under chain-of-custody to a laboratory certified to perform the specified tests by the State of California Department of Health Services Environmental Laboratory Accreditation Program.

TRIP BLANKS

To assure the quality of the collected samples and to evaluate the potential for cross contamination during transport to the laboratory, a distilled-water trip blank accompanies the samples in the cooler. The trip blank is analyzed for the presence of volatile organic compounds of concern. For petroleum hydrocarbons and solvent sites, the trip blank is typically analyzed for aromatic volatile organics compounds EPA Test Method 8260B.

CONTAINMENT AND DISPOSAL OF GENERATED WATER

All wastewater and purge water generated during the field activities were retained on-site in appropriate containers (i.e. DOT approved drums) for future disposal. All wastewater will be delivered under appropriate manifest to a facility certified and licensed to receive such waste streams.

APPENDIX C
WATER SAMPLE FIELD DATA SHEETS

Stantec

STANTEC
Field Depth to Water Measurements

SITE: Moreno Center/M&M Cleaners
PROJECT No.: 185802753
Field Personnel: MPB

Date: 9/24/17
Checked By: MEB
Instrument: WLM-100

WELL ID	Depth of Well	Screen Interval	Depth to Water	Casing Diameter	Comments
MW-01	49.70	35-50	36.67	2"	
MW-02	49.50	35-50	37.14	2"	
MW-03	52.50	37-52	36.35	2"	~2' slough
MW-04	50.10	35-50	35.41	2"	~1.5' slough
MW-05S	45.00	35-45	37.30	2"	
MW-05D	60.00	55-60	37.31	2"	

Stantec
Well Sampling Data Sheet

Project No. 185802753 | Well ID MW-01
Purged By MFB | Sample ID MW-01
Sampled By MFB | Client Moreno Center/M&M Cleaners
Location 2380 Allesandro Blvd. Moreno Valley

Type: Groundwater X Other

Casing Diameter (inches)	2	3	4	4.5	6	Other
	X					
Gallons per Linerar Foot	0.163	0.367	0.653	0.826	1.469	

Casing Elevation
Depth to Water 36.67
Elevation of Water
Depth of Well 49.70

Volume in Casing 2.12
Calculated Purge
Actual Purge
Screened Interval 35-50
Depth of Pump (based on middle of saturated screen) 43

Date Purged 9/29/17 Start 0637 End 0653
Date Sampled 9/29/17 Start 0655 End

Field QC Sample(s) Collected at this Well (i.e. FB-1, X-DUP-1, MW-X etc.)

Time	DTW (<0.3')	Volume (gal)	pH (± 0.2)	E.C. (ms/cm³) (± 5%)	Temp (F) (± 0.2)	D.O.(mg/L) (± 0.2)	ORP (± 20)	Color	NTU (± 10%)
0641	36.69	0.2	7.50	1.55	70.8	3.86	143	Tan	451
0645	36.69	0.4	7.50	1.56	71.2	3.16	145	"	374
0649	36.69	0.6	7.51	1.56	71.6	3.13	138	"	337
0653	36.69	0.8	7.57	1.57	71.9	3.59	139	"	307

Length of Water column= (13.03) (0.20)= _____ + Depth to Water = _____ (80% Recharge)

Purging Equipment		Sampling Equipment	
	Dedicated Pump		Dedicated Pump
X	Grundfos/Rediflow	X	Grundfos/Rediflow
	Vac-Truck		Vac-Truck
	Development Rig		Development Rig
	Bailer/Type:		Bailer/Type:
	Other:		Other:

Well Integrity:

Remarks: Collect ____ VOAs for VOC analysis (EPA Method 8260B)

Signature

Page 1 of 1

Stantec
Well Sampling Data Sheet

Project No. 185802753 | Well ID MW-02
Purged By MFH | Sample ID MW-02
Sampled By MFH | Client Moreno Center/M&M Cleaners
Location 2380 Allesandro Blvd. Moreno Valley

Type: Groundwater X Other

Casing Diameter (inches)	2	3	4	4.5	6	Other
	X					
Gallons per Linerar Foot	0.163	0.367	0.653	0.826	1.469	

Casing Elevation
Depth to Water 37.14
Elevation of Water
Depth of Well 49.50

Volume in Casing 2.01
Calculated Purge
Actual Purge
Screened Interval 35-50
Depth of Pump (based on middle of saturated screen) 43

Date Purged 9/29/17 | Start 0922 | End 0938
Date Sampled 9/29/17 | Start 0940 | End

Field QC Sample(s) Collected at this Well (i.e. FB-1, X-DUP-1, MW-X etc.)

Time	DTW (<0.3')	Volume (gal)	pH (± 0.2)	E.C. (ms/cm³) (± 5%)	Temp (F) (± 0.2)	D.O.(mg/L) (± 0.2)	ORP (± 20)	Color	NTU (± 10%)
0926	37.24	0.2	7.98	0.988	75.9	3.03	119	TAN	405
0930	37.22	0.4	7.94	0.993	76.0	2.89	117	"	369
0934	37.21	0.6	7.94	0.989	76.3	2.79	114	"	341
0938	37.20	0.8	7.93	0.989	76.5	2.87	113	"	313

Length of Water column= (12.36) (0.20)= _____ + Depth to Water = _____ (80% Recharge)

Purging Equipment		Sampling Equipment	
	Dedicated Pump		Dedicated Pump
X	Grundfos/Rediflow	X	Grundfos/Rediflow
	Vac-Truck		Vac-Truck
	Development Rig		Development Rig
	Bailer/Type:		Bailer/Type:
	Other:		Other:

Well Integrity:

Remarks: Collect ____ VOAs for VOC analysis (EPA Method 8260B)

Signature

Page 1 of 7

Stantec
Well Sampling Data Sheet

Project No. 185802753 | Well ID MW-03
Purged By MEB | Sample ID MW-03
Sampled By MEB | Client Moreno Center/M&M Cleaners
Location 2380 Allesandro Blvd. Moreno Valley

Type: Groundwater X Other

Casing Diameter (inches)	2	3	4	4.5	6	Other
Gallons per Linerar Foot	X 0.163	0.367	0.653	0.826	1.469	

Casing Elevation
Depth to Water 36.35
Elevation of Water
Depth of Well 52.50

Volume in Casing 2.63
Calculated Purge
Actual Purge
Screened Interval 37.52
Depth of Pump (based on middle of saturated screen) 44

Date Purged 9/29/17 | Start 0558 | End 0614
Date Sampled 9/29/17 | Start 0616 | End

Field QC Sample(s) Collected at this Well (i.e. FB-1, X-DUP-1, MW-X etc.)

Time	DTW (<0.3')	Volume (gal)	pH (± 0.2)	E.C. (ms/cm³) (± 5%)	Temp (F) (± 0.2)	D.O.(mg/L) (± 0.2)	ORP (± 20)	Color	NTU (± 10%)
0602	36.38	0.2	7.41	1.42	72.4	3.68	175	TAN	598
0606	36.38	0.4	7.47	1.46	72.2	3.43	173	"	537
0610	36.38	0.6	7.43	1.48	73.2	3.44	171	"	499
0614	36.38	0.8	7.40	1.47	75.0	3.57	166	"	471

Length of Water column= (16.15) (0.20)=_____ + Depth to Water = _____(80% Recharge)

Purging Equipment		Sampling Equipment	
	Dedicated Pump		Dedicated Pump
X	Grundfos/Rediflow	X	Grundfos/Rediflow
	Vac-Truck		Vac-Truck
	Development Rig		Development Rig
	Bailer/Type:		Bailer/Type:
	Other:		Other:

Well Integrity:

Remarks: Collect ____ VOAs for VOC analysis (EPA Method 8260B)

Signature

Page 1 of 1

Stantec
Well Sampling Data Sheet

Project No. 185802753 | Well ID MW-04
Purged By MFB | Sample ID MW-04 + MW-04 DUP
Sampled By MFB | Client Moreno Center/M&M Cleaners
Location 2380 Allesandro Blvd. Moreno Valley

Type: Groundwater X Other

Casing Diameter (inches)	2	3	4	4.5	6	Other
	X					
Gallons per Linerar Foot	0.163	0.367	0.653	0.826	1.469	

Casing Elevation
Depth to Water 35.41
Elevation of Water
Depth of Well 50.10

Volume in Casing 2.39
Calculated Purge
Actual Purge
Screened Interval 42 35-50
Depth of Pump (based on middle of saturated screen) 42

Date Purged 9/29/17 | Start 0521 | End 0537
Date Sampled 9/29/17 | Start 0539 | End

Field QC Sample(s) Collected at this Well (i.e. FB-1, X-DUP-1, MW-X etc.) MW-04 DUP 0545

Time	DTW (<0.3')	Volume (gal)	pH (± 0.2)	E.C. (ms/cm³) (± 5%)	Temp (F) (± 0.2)	D.O.(mg/L) (± 0.2)	ORP (± 20)	Color	NTU (± 10%)
0525	35.50	0.2	7.39	0.915	73.0	1.38	195	TAN	535
0529	35.49	0.4	7.56	0.914	73.4	1.23	189	"	458
0533	35.48	0.6	7.64	0.922	73.8	1.30	181	"	413
0537	35.46	0.8	7.64	0.927	74.1	1.41	175	"	379

Length of Water column= (14.69) (0.20)= _____ + Depth to Water = _____ (80% Recharge)

Purging Equipment		Sampling Equipment	
	Dedicated Pump		Dedicated Pump
X	Grundfos/Rediflow	X	Grundfos/Rediflow
	Vac-Truck		Vac-Truck
	Development Rig		Development Rig
	Bailer/Type:		Bailer/Type:
	Other:		Other:

Well Integrity:

Remarks: Collect 6 VOAs for VOC analysis (EPA Method 8260B)

Signature _____ Page 1 of 1

Stantec
Well Sampling Data Sheet

Project No. 185802753 | Well ID MW-05S
Purged By MFB | Sample ID MW-05S
Sampled By MFB | Client Moreno Center/M&M Cleaners
Location 2380 Allesandro Blvd. Moreno Valley

Type: Groundwater X Other

Casing Diameter (inches)	2	3	4	4.5	6	Other
	X					
Gallons per Linerar Foot	0.163	0.367	0.653	0.826	1.469	

Casing Elevation
Depth to Water 37.30
Elevation of Water
Depth of Well 46.00

Volume in Casing 1.26
Calculated Purge
Actual Purge
Screened Interval 35 - 45
Depth of Pump (based on middle of saturated screen) 41

Date Purged 8/28/17 Start 0831 End 0847
Date Sampled 8/29/17 Start 0849 End

Field QC Sample(s) Collected at this Well (i.e. FB-1, X-DUP-1, MW-X etc.)

Time	DTW (<0.3')	Volume (gal)	pH (± 0.2)	E.C. (ms/cm³) (± 5%)	Temp (F) (± 0.2)	D.O.(mg/L) (± 0.2)	ORP (± 20)	Color	NTU (± 10%)
0835	37.35	0.1	8.17	1.412	74.6	1.09	101	Tan	282
0839	37.40	0.2	8.19	1.42	74.7	0.80	101	"	235
0843	37.41	0.3	8.19	1.42	75.2	0.82	103	"	215
0847	37.43	0.4	8.19	1.43	76.1	0.84	105	"	196

Length of Water column= (7.7) (0.20)= + Depth to Water = (80% Recharge)

Purging Equipment		Sampling Equipment	
	Dedicated Pump		Dedicated Pump
X	Grundfos/Rediflow	X	Grundfos/Rediflow
	Vac-Truck		Vac-Truck
	Development Rig		Development Rig
	Bailer/Type:		Bailer/Type:
	Other:		Other:

Well Integrity:

Remarks: Collect VOAs for VOC analysis (EPA Method 8260B) ~ 150 ml/min & 100 ml/min

Signature Page 1 of 1

Stantec
Well Sampling Data Sheet

Project No. 185802753 | Well ID MW-05D
Purged By MEB | Sample ID MW-05D
Sampled By MEB | Client Moreno Center/M&M Cleaners
Location 2380 Allesandro Blvd. Moreno Valley

Type: Groundwater X Other

Casing Diameter (inches)	2	3	4	4.5	6	Other
Gallons per Linerar Foot	X 0.163	0.367	0.653	0.826	1.469	

Casing Elevation
Depth to Water 37.31
Elevation of Water
Depth of Well 60.00

Volume in Casing 3.70
Calculated Purge
Actual Purge
Screened Interval 55-60
Depth of Pump (based on middle of saturated screen) 52

Date Purged 9/29/17 | Start 0756 | End 0812
Date Sampled 9/29/17 | Start 0814 | End

Field QC Sample(s) Collected at this Well (i.e. FB-1, X-DUP-1, MW-X etc.)

Time	DTW (<0.3')	Volume (gal)	pH (± 0.2)	E.C. (ms/cm³) (± 5%)	Temp (F) (± 0.2)	D.O.(mg/L) (± 0.2)	ORP (± 20)	Color	NTU (± 10%)
0800	37.32	0.2	7.90	1.01	73.0	2.17	102	Tan	340
0804	37.32	0.4	7.80	1.01	73.3	2.24	105	"	341
0808	37.32	0.6	7.77	1.01	73.6	2.21	107	"	354
0812	37.32	0.8	7.74	1.01	73.8	2.27	111	"	356

Length of Water column= (22.69) (0.20)= + Depth to Water = (80% Recharge)

Purging Equipment		Sampling Equipment	
	Dedicated Pump		Dedicated Pump
X	Grundfos/Rediflow	X	Grundfos/Rediflow
	Vac-Truck		Vac-Truck
	Development Rig		Development Rig
	Bailer/Type:		Bailer/Type:
	Other:		Other:

Well Integrity:

Remarks: Collect ____ VOAs for VOC analysis (EPA Method 8260B)

Signature

APPENDIX D
LAB DATA SHEETS,
QA/QC RESULTS, AND CHAIN OF CUSTODY RECORDS

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-193461-1
Client Project/Site: Moreno Center

For:
Stantec Consulting Corp.
25864-F Business Center Dr.
Redlands, California 92374

Attn: Brian Viggiano

Authorized for release by:
10/10/2017 1:10:41 PM

Lena Davidkova, Project Manager II
(949)261-1022
lena.davidkova@testamericainc.com

Table of Contents

Sample Summary

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-193461-1	MW-01	Water	09/29/17 06:55	10/04/17 13:0(
440-193461-2	MW-02	Water	09/29/17 09:40	10/04/17 13:0(
440-193461-3	MW-03	Water	09/29/17 06:16	10/04/17 13:0(
440-193461-4	MW-04	Water	09/29/17 05:39	10/04/17 13:0(
440-193461-5	MW-04 DUP	Water	09/29/17 05:45	10/04/17 13:0(
440-193461-6	MW-05S	Water	09/29/17 08:49	10/04/17 13:0(
440-193461-7	MW-05D	Water	09/29/17 08:14	10/04/17 13:0(
440-193461-8	Trip Blank	Water	09/29/17 00:01	10/04/17 13:0(

Case Narrative

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Job ID: 440-193461-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-193461-1

Comments
No additional comments.

Receipt
The samples were received on 10/4/2017 1:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0º C.

Receipt Exceptions

The following sample was received at the laboratory without a sample collection date and time documented on the chain of custody: Trip Blank (440-193461-8). The field was crossed out by the sampler so the default time of 9/29/17, 00:01 were used for login.

GC/MS VOA
Method(s) 8260B: The method blank for analytical batch 440-433948 contained Methylene Chloride above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-01
Date Collected: 09/29/17 06:55
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
Styrene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
cis-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
trans-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
N-Propylbenzene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
n-Butylbenzene	ND		5.0	0.40	ug/L			10/09/17 19:55	1
4-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 19:55	1
1,4-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,2-Dibromoethane (EDB)	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,2-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,3,5-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
Bromobenzene	ND		5.0	0.25	ug/L			10/09/17 19:55	1
Toluene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
Chlorobenzene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,2,4-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 19:55	1
Dibromochloromethane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
Tetrachloroethene	**54**		2.0	0.25	ug/L			10/09/17 19:55	1
sec-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 19:55	1
m,p-Xylene	ND		2.0	0.50	ug/L			10/09/17 19:55	1
1,3-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
cis-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,3-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
Carbon tetrachloride	ND		5.0	0.25	ug/L			10/09/17 19:55	1
1,1-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
2,2-Dichloropropane	ND		2.0	0.40	ug/L			10/09/17 19:55	1
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			10/09/17 19:55	1
Chloroform	**0.41**	**J**	2.0	0.25	ug/L			10/09/17 19:55	1
Benzene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,1,1-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
Bromomethane	ND		5.0	0.25	ug/L			10/09/17 19:55	1
Chloromethane	ND		5.0	0.25	ug/L			10/09/17 19:55	1
Dibromomethane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
Bromochloromethane	ND		5.0	0.25	ug/L			10/09/17 19:55	1
Chloroethane	ND		5.0	0.40	ug/L			10/09/17 19:55	1
Vinyl chloride	ND		5.0	0.25	ug/L			10/09/17 19:55	1
Methylene Chloride	ND		5.0	1.1	ug/L			10/09/17 19:55	1
Bromoform	ND		5.0	0.40	ug/L			10/09/17 19:55	1
Bromodichloromethane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,1-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,1-Dichloroethene	ND		5.0	0.25	ug/L			10/09/17 19:55	1
Trichlorofluoromethane	ND		5.0	0.25	ug/L			10/09/17 19:55	1
Dichlorodifluoromethane	ND		5.0	0.25	ug/L			10/09/17 19:55	1
1,2-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,1,2-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
Trichloroethene	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,1,2,2-Tetrachloroethane	ND		2.0	0.25	ug/L			10/09/17 19:55	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 19:55	1
Hexachlorobutadiene	ND		5.0	0.25	ug/L			10/09/17 19:55	1

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-01

Lab Sample ID: 440-193461-1
Date Collected: 09/29/17 06:55
Matrix: Wate
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		5.0	0.40	ug/L			10/09/17 19:55	
o-Xylene	ND		2.0	0.25	ug/L			10/09/17 19:55	
2-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 19:55	
1,2-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 19:55	
1,2,4-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 19:55	
1,2-Dibromo-3-Chloropropane	ND		5.0	0.50	ug/L			10/09/17 19:55	
1,2,3-Trichloropropane	ND		10	0.25	ug/L			10/09/17 19:55	
tert-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 19:55	
Isopropylbenzene	ND		2.0	0.25	ug/L			10/09/17 19:55	
p-Isopropyltoluene	ND		2.0	0.25	ug/L			10/09/17 19:55	

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*107*		*80 - 128*		*10/09/17 19:55*	
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*10/09/17 19:55*	
Dibromofluoromethane (Surr)	*99*		*76 - 132*		*10/09/17 19:55*	

Client Sample ID: MW-02

Lab Sample ID: 440-193461-2
Date Collected: 09/29/17 09:40
Matrix: Wate
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
Styrene	ND		2.0	0.25	ug/L			10/09/17 21:25	
cis-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 21:25	
trans-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 21:25	
N-Propylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
n-Butylbenzene	ND		5.0	0.40	ug/L			10/09/17 21:25	
4-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 21:25	
1,4-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,2-Dibromoethane (EDB)	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,2-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,3,5-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
Bromobenzene	ND		5.0	0.25	ug/L			10/09/17 21:25	
Toluene	ND		2.0	0.25	ug/L			10/09/17 21:25	
Chlorobenzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,2,4-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 21:25	
Dibromochloromethane	ND		2.0	0.25	ug/L			10/09/17 21:25	
Tetrachloroethene	**73**		2.0	0.25	ug/L			10/09/17 21:25	
sec-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 21:25	
m,p-Xylene	ND		2.0	0.50	ug/L			10/09/17 21:25	
1,3-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 21:25	
cis-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 21:25	
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,3-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
Carbon tetrachloride	ND		5.0	0.25	ug/L			10/09/17 21:25	
1,1-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 21:25	
2,2-Dichloropropane	ND		2.0	0.40	ug/L			10/09/17 21:25	
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			10/09/17 21:25	
Chloroform	**0.52**	**J**	2.0	0.25	ug/L			10/09/17 21:25	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-02

Lab Sample ID: 440-193461-2
Date Collected: 09/29/17 09:40
Matrix: Wate
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,1,1-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 21:25	
Bromomethane	ND		5.0	0.25	ug/L			10/09/17 21:25	
Chloromethane	ND		5.0	0.25	ug/L			10/09/17 21:25	
Dibromomethane	ND		2.0	0.25	ug/L			10/09/17 21:25	
Bromochloromethane	ND		5.0	0.25	ug/L			10/09/17 21:25	
Chloroethane	ND		5.0	0.40	ug/L			10/09/17 21:25	
Vinyl chloride	ND		5.0	0.25	ug/L			10/09/17 21:25	
Methylene Chloride	ND		5.0	1.1	ug/L			10/09/17 21:25	
Bromoform	ND		5.0	0.40	ug/L			10/09/17 21:25	
Bromodichloromethane	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,1-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,1-Dichloroethene	ND		5.0	0.25	ug/L			10/09/17 21:25	
Trichlorofluoromethane	ND		5.0	0.25	ug/L			10/09/17 21:25	
Dichlorodifluoromethane	ND		5.0	0.25	ug/L			10/09/17 21:25	
1,2-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,1,2-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 21:25	
Trichloroethene	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,1,2,2-Tetrachloroethane	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 21:25	
Hexachlorobutadiene	ND		5.0	0.25	ug/L			10/09/17 21:25	
Naphthalene	ND		5.0	0.40	ug/L			10/09/17 21:25	
o-Xylene	ND		2.0	0.25	ug/L			10/09/17 21:25	
2-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 21:25	
1,2-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,2,4-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
1,2-Dibromo-3-Chloropropane	ND		5.0	0.50	ug/L			10/09/17 21:25	
1,2,3-Trichloropropane	ND		10	0.25	ug/L			10/09/17 21:25	
tert-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 21:25	
Isopropylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:25	
p-Isopropyltoluene	ND		2.0	0.25	ug/L			10/09/17 21:25	

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 128*		*10/09/17 21:25*	
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*10/09/17 21:25*	
Dibromofluoromethane (Surr)	*101*		*76 - 132*		*10/09/17 21:25*	

Client Sample ID: MW-03

Lab Sample ID: 440-193461-3
Date Collected: 09/29/17 06:16
Matrix: Wate
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
Styrene	ND		2.0	0.25	ug/L			10/09/17 21:55	
cis-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 21:55	
trans-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 21:55	
N-Propylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
n-Butylbenzene	ND		5.0	0.40	ug/L			10/09/17 21:55	
4-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 21:55	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-03
Date Collected: 09/29/17 06:16
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-3
Matrix: Wate

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,2-Dibromoethane (EDB)	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,2-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,3,5-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
Bromobenzene	ND		5.0	0.25	ug/L			10/09/17 21:55	
Toluene	ND		2.0	0.25	ug/L			10/09/17 21:55	
Chlorobenzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,2,4-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 21:55	
Dibromochloromethane	ND		2.0	0.25	ug/L			10/09/17 21:55	
Tetrachloroethene	**71**		2.0	0.25	ug/L			10/09/17 21:55	
sec-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 21:55	
m,p-Xylene	ND		2.0	0.50	ug/L			10/09/17 21:55	
1,3-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 21:55	
cis-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 21:55	
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,3-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
Carbon tetrachloride	ND		5.0	0.25	ug/L			10/09/17 21:55	
1,1-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 21:55	
2,2-Dichloropropane	ND		2.0	0.40	ug/L			10/09/17 21:55	
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			10/09/17 21:55	
Chloroform	**2.0**		2.0	0.25	ug/L			10/09/17 21:55	
Benzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,1,1-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 21:55	
Bromomethane	ND		5.0	0.25	ug/L			10/09/17 21:55	
Chloromethane	ND		5.0	0.25	ug/L			10/09/17 21:55	
Dibromomethane	ND		2.0	0.25	ug/L			10/09/17 21:55	
Bromochloromethane	ND		5.0	0.25	ug/L			10/09/17 21:55	
Chloroethane	ND		5.0	0.40	ug/L			10/09/17 21:55	
Vinyl chloride	ND		5.0	0.25	ug/L			10/09/17 21:55	
Methylene Chloride	ND		5.0	1.1	ug/L			10/09/17 21:55	
Bromoform	ND		5.0	0.40	ug/L			10/09/17 21:55	
Bromodichloromethane	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,1-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,1-Dichloroethene	ND		5.0	0.25	ug/L			10/09/17 21:55	
Trichlorofluoromethane	ND		5.0	0.25	ug/L			10/09/17 21:55	
Dichlorodifluoromethane	ND		5.0	0.25	ug/L			10/09/17 21:55	
1,2-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,1,2-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 21:55	
Trichloroethene	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,1,2,2-Tetrachloroethane	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 21:55	
Hexachlorobutadiene	ND		5.0	0.25	ug/L			10/09/17 21:55	
Naphthalene	ND		5.0	0.40	ug/L			10/09/17 21:55	
o-Xylene	ND		2.0	0.25	ug/L			10/09/17 21:55	
2-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 21:55	
1,2-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,2,4-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
1,2-Dibromo-3-Chloropropane	ND		5.0	0.50	ug/L			10/09/17 21:55	
1,2,3-Trichloropropane	ND		10	0.25	ug/L			10/09/17 21:55	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-03

Lab Sample ID: 440-193461-3
Date Collected: 09/29/17 06:16
Matrix: Wate
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 21:55	
Isopropylbenzene	ND		2.0	0.25	ug/L			10/09/17 21:55	
p-Isopropyltoluene	ND		2.0	0.25	ug/L			10/09/17 21:55	

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*109*		*80 - 128*		*10/09/17 21:55*	
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*10/09/17 21:55*	
Dibromofluoromethane (Surr)	*104*		*76 - 132*		*10/09/17 21:55*	

Client Sample ID: MW-04

Lab Sample ID: 440-193461-4
Date Collected: 09/29/17 05:39
Matrix: Wate
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
Styrene	ND		2.0	0.25	ug/L			10/09/17 22:24	
cis-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 22:24	
trans-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 22:24	
N-Propylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
n-Butylbenzene	ND		5.0	0.40	ug/L			10/09/17 22:24	
4-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 22:24	
1,4-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,2-Dibromoethane (EDB)	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,2-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,3,5-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
Bromobenzene	ND		5.0	0.25	ug/L			10/09/17 22:24	
Toluene	ND		2.0	0.25	ug/L			10/09/17 22:24	
Chlorobenzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,2,4-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 22:24	
Dibromochloromethane	ND		2.0	0.25	ug/L			10/09/17 22:24	
Tetrachloroethene	**3.1**		2.0	0.25	ug/L			10/09/17 22:24	
sec-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 22:24	
m,p-Xylene	ND		2.0	0.50	ug/L			10/09/17 22:24	
1,3-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 22:24	
cis-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 22:24	
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,3-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
Carbon tetrachloride	ND		5.0	0.25	ug/L			10/09/17 22:24	
1,1-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 22:24	
2,2-Dichloropropane	ND		2.0	0.40	ug/L			10/09/17 22:24	
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			10/09/17 22:24	
Chloroform	**0.45**	**J**	2.0	0.25	ug/L			10/09/17 22:24	
Benzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,1,1-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 22:24	
Bromomethane	ND		5.0	0.25	ug/L			10/09/17 22:24	
Chloromethane	ND		5.0	0.25	ug/L			10/09/17 22:24	
Dibromomethane	ND		2.0	0.25	ug/L			10/09/17 22:24	
Bromochloromethane	ND		5.0	0.25	ug/L			10/09/17 22:24	
Chloroethane	ND		5.0	0.40	ug/L			10/09/17 22:24	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-04

Lab Sample ID: 440-193461-4
Matrix: Wate
Date Collected: 09/29/17 05:39
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		5.0	0.25	ug/L			10/09/17 22:24	
Methylene Chloride	ND		5.0	1.1	ug/L			10/09/17 22:24	
Bromoform	ND		5.0	0.40	ug/L			10/09/17 22:24	
Bromodichloromethane	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,1-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,1-Dichloroethene	ND		5.0	0.25	ug/L			10/09/17 22:24	
Trichlorofluoromethane	ND		5.0	0.25	ug/L			10/09/17 22:24	
Dichlorodifluoromethane	ND		5.0	0.25	ug/L			10/09/17 22:24	
1,2-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,1,2-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 22:24	
Trichloroethene	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,1,2,2-Tetrachloroethane	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 22:24	
Hexachlorobutadiene	ND		5.0	0.25	ug/L			10/09/17 22:24	
Naphthalene	ND		5.0	0.40	ug/L			10/09/17 22:24	
o-Xylene	ND		2.0	0.25	ug/L			10/09/17 22:24	
2-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 22:24	
1,2-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,2,4-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
1,2-Dibromo-3-Chloropropane	ND		5.0	0.50	ug/L			10/09/17 22:24	
1,2,3-Trichloropropane	ND		10	0.25	ug/L			10/09/17 22:24	
tert-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 22:24	
Isopropylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:24	
p-Isopropyltoluene	ND		2.0	0.25	ug/L			10/09/17 22:24	

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 128*		*10/09/17 22:24*	
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*10/09/17 22:24*	
Dibromofluoromethane (Surr)	*105*		*76 - 132*		*10/09/17 22:24*	

Client Sample ID: MW-04 DUP

Lab Sample ID: 440-193461-5
Matrix: Wate
Date Collected: 09/29/17 05:45
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:54	
Styrene	ND		2.0	0.25	ug/L			10/09/17 22:54	
cis-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 22:54	
trans-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 22:54	
N-Propylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:54	
n-Butylbenzene	ND		5.0	0.40	ug/L			10/09/17 22:54	
4-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 22:54	
1,4-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,2-Dibromoethane (EDB)	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,2-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,3,5-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:54	
Bromobenzene	ND		5.0	0.25	ug/L			10/09/17 22:54	
Toluene	ND		2.0	0.25	ug/L			10/09/17 22:54	
Chlorobenzene	ND		2.0	0.25	ug/L			10/09/17 22:54	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-04 DUP
Date Collected: 09/29/17 05:45
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 22:54	
Dibromochloromethane	ND		2.0	0.25	ug/L			10/09/17 22:54	
Tetrachloroethene	**3.5**		2.0	0.25	ug/L			10/09/17 22:54	
sec-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 22:54	
m,p-Xylene	ND		2.0	0.50	ug/L			10/09/17 22:54	
1,3-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 22:54	
cis-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 22:54	
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,3-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 22:54	
Carbon tetrachloride	ND		5.0	0.25	ug/L			10/09/17 22:54	
1,1-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 22:54	
2,2-Dichloropropane	ND		2.0	0.40	ug/L			10/09/17 22:54	
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			10/09/17 22:54	
Chloroform	**0.46**	**J**	2.0	0.25	ug/L			10/09/17 22:54	
Benzene	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,1,1-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 22:54	
Bromomethane	ND		5.0	0.25	ug/L			10/09/17 22:54	
Chloromethane	ND		5.0	0.25	ug/L			10/09/17 22:54	
Dibromomethane	ND		2.0	0.25	ug/L			10/09/17 22:54	
Bromochloromethane	ND		5.0	0.25	ug/L			10/09/17 22:54	
Chloroethane	ND		5.0	0.40	ug/L			10/09/17 22:54	
Vinyl chloride	ND		5.0	0.25	ug/L			10/09/17 22:54	
Methylene Chloride	ND		5.0	1.1	ug/L			10/09/17 22:54	
Bromoform	ND		5.0	0.40	ug/L			10/09/17 22:54	
Bromodichloromethane	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,1-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,1-Dichloroethene	ND		5.0	0.25	ug/L			10/09/17 22:54	
Trichlorofluoromethane	ND		5.0	0.25	ug/L			10/09/17 22:54	
Dichlorodifluoromethane	ND		5.0	0.25	ug/L			10/09/17 22:54	
1,2-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,1,2-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 22:54	
Trichloroethene	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,1,2,2-Tetrachloroethane	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 22:54	
Hexachlorobutadiene	ND		5.0	0.25	ug/L			10/09/17 22:54	
Naphthalene	ND		5.0	0.40	ug/L			10/09/17 22:54	
o-Xylene	ND		2.0	0.25	ug/L			10/09/17 22:54	
2-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 22:54	
1,2-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,2,4-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:54	
1,2-Dibromo-3-Chloropropane	ND		5.0	0.50	ug/L			10/09/17 22:54	
1,2,3-Trichloropropane	ND		10	0.25	ug/L			10/09/17 22:54	
tert-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 22:54	
Isopropylbenzene	ND		2.0	0.25	ug/L			10/09/17 22:54	
p-Isopropyltoluene	ND		2.0	0.25	ug/L			10/09/17 22:54	

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*111*		*80 - 128*		*10/09/17 22:54*	
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*10/09/17 22:54*	
Dibromofluoromethane (Surr)	*99*		*76 - 132*		*10/09/17 22:54*	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-05S
Date Collected: 09/29/17 08:49
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
Styrene	ND		2.0	0.25	ug/L			10/09/17 23:24	
cis-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 23:24	
trans-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 23:24	
N-Propylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
n-Butylbenzene	ND		5.0	0.40	ug/L			10/09/17 23:24	
4-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 23:24	
1,4-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,2-Dibromoethane (EDB)	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,2-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,3,5-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
Bromobenzene	ND		5.0	0.25	ug/L			10/09/17 23:24	
Toluene	ND		2.0	0.25	ug/L			10/09/17 23:24	
Chlorobenzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,2,4-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 23:24	
Dibromochloromethane	ND		2.0	0.25	ug/L			10/09/17 23:24	
Tetrachloroethene	**7.4**		2.0	0.25	ug/L			10/09/17 23:24	
sec-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 23:24	
m,p-Xylene	ND		2.0	0.50	ug/L			10/09/17 23:24	
1,3-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 23:24	
cis-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 23:24	
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,3-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
Carbon tetrachloride	ND		5.0	0.25	ug/L			10/09/17 23:24	
1,1-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 23:24	
2,2-Dichloropropane	ND		2.0	0.40	ug/L			10/09/17 23:24	
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			10/09/17 23:24	
Chloroform	**0.25**	**J**	2.0	0.25	ug/L			10/09/17 23:24	
Benzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,1,1-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 23:24	
Bromomethane	ND		5.0	0.25	ug/L			10/09/17 23:24	
Chloromethane	ND		5.0	0.25	ug/L			10/09/17 23:24	
Dibromomethane	ND		2.0	0.25	ug/L			10/09/17 23:24	
Bromochloromethane	ND		5.0	0.25	ug/L			10/09/17 23:24	
Chloroethane	ND		5.0	0.40	ug/L			10/09/17 23:24	
Vinyl chloride	ND		5.0	0.25	ug/L			10/09/17 23:24	
Methylene Chloride	ND		5.0	1.1	ug/L			10/09/17 23:24	
Bromoform	ND		5.0	0.40	ug/L			10/09/17 23:24	
Bromodichloromethane	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,1-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,1-Dichloroethene	ND		5.0	0.25	ug/L			10/09/17 23:24	
Trichlorofluoromethane	ND		5.0	0.25	ug/L			10/09/17 23:24	
Dichlorodifluoromethane	ND		5.0	0.25	ug/L			10/09/17 23:24	
1,2-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,1,2-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 23:24	
Trichloroethene	**0.58**	**J**	2.0	0.25	ug/L			10/09/17 23:24	
1,1,2,2-Tetrachloroethane	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 23:24	
Hexachlorobutadiene	ND		5.0	0.25	ug/L			10/09/17 23:24	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-05S

Lab Sample ID: 440-193461-6
Matrix: Wate
Date Collected: 09/29/17 08:49
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		5.0	0.40	ug/L			10/09/17 23:24	
o-Xylene	ND		2.0	0.25	ug/L			10/09/17 23:24	
2-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 23:24	
1,2-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,2,4-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
1,2-Dibromo-3-Chloropropane	ND		5.0	0.50	ug/L			10/09/17 23:24	
1,2,3-Trichloropropane	ND		10	0.25	ug/L			10/09/17 23:24	
tert-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 23:24	
Isopropylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:24	
p-Isopropyltoluene	ND		2.0	0.25	ug/L			10/09/17 23:24	

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 128*		*10/09/17 23:24*	
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*10/09/17 23:24*	
Dibromofluoromethane (Surr)	*100*		*76 - 132*		*10/09/17 23:24*	

Client Sample ID: MW-05D

Lab Sample ID: 440-193461-7
Matrix: Wate
Date Collected: 09/29/17 08:14
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
Styrene	ND		2.0	0.25	ug/L			10/09/17 23:53	
cis-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 23:53	
trans-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 23:53	
N-Propylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
n-Butylbenzene	ND		5.0	0.40	ug/L			10/09/17 23:53	
4-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 23:53	
1,4-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,2-Dibromoethane (EDB)	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,2-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,3,5-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
Bromobenzene	ND		5.0	0.25	ug/L			10/09/17 23:53	
Toluene	ND		2.0	0.25	ug/L			10/09/17 23:53	
Chlorobenzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,2,4-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 23:53	
Dibromochloromethane	ND		2.0	0.25	ug/L			10/09/17 23:53	
Tetrachloroethene	ND		2.0	0.25	ug/L			10/09/17 23:53	
sec-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 23:53	
m,p-Xylene	ND		2.0	0.50	ug/L			10/09/17 23:53	
1,3-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 23:53	
cis-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 23:53	
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,3-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
Carbon tetrachloride	ND		5.0	0.25	ug/L			10/09/17 23:53	
1,1-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 23:53	
2,2-Dichloropropane	ND		2.0	0.40	ug/L			10/09/17 23:53	
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			10/09/17 23:53	
Chloroform	**0.59**	**J**	2.0	0.25	ug/L			10/09/17 23:53	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-05D

Lab Sample ID: 440-193461-7
Matrix: Wate
Date Collected: 09/29/17 08:14
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,1,1-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 23:53	
Bromomethane	ND		5.0	0.25	ug/L			10/09/17 23:53	
Chloromethane	ND		5.0	0.25	ug/L			10/09/17 23:53	
Dibromomethane	ND		2.0	0.25	ug/L			10/09/17 23:53	
Bromochloromethane	ND		5.0	0.25	ug/L			10/09/17 23:53	
Chloroethane	ND		5.0	0.40	ug/L			10/09/17 23:53	
Vinyl chloride	ND		5.0	0.25	ug/L			10/09/17 23:53	
Methylene Chloride	ND		5.0	1.1	ug/L			10/09/17 23:53	
Bromoform	ND		5.0	0.40	ug/L			10/09/17 23:53	
Bromodichloromethane	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,1-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,1-Dichloroethene	ND		5.0	0.25	ug/L			10/09/17 23:53	
Trichlorofluoromethane	ND		5.0	0.25	ug/L			10/09/17 23:53	
Dichlorodifluoromethane	ND		5.0	0.25	ug/L			10/09/17 23:53	
1,2-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,1,2-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 23:53	
Trichloroethene	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,1,2,2-Tetrachloroethane	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 23:53	
Hexachlorobutadiene	ND		5.0	0.25	ug/L			10/09/17 23:53	
Naphthalene	ND		5.0	0.40	ug/L			10/09/17 23:53	
o-Xylene	ND		2.0	0.25	ug/L			10/09/17 23:53	
2-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 23:53	
1,2-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,2,4-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
1,2-Dibromo-3-Chloropropane	ND		5.0	0.50	ug/L			10/09/17 23:53	
1,2,3-Trichloropropane	ND		10	0.25	ug/L			10/09/17 23:53	
tert-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 23:53	
Isopropylbenzene	ND		2.0	0.25	ug/L			10/09/17 23:53	
p-Isopropyltoluene	ND		2.0	0.25	ug/L			10/09/17 23:53	

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 128*		*10/09/17 23:53*	
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*		*10/09/17 23:53*	
Dibromofluoromethane (Surr)	*102*		*76 - 132*		*10/09/17 23:53*	

Client Sample ID: Trip Blank

Lab Sample ID: 440-193461-8
Matrix: Wate
Date Collected: 09/29/17 00:01
Date Received: 10/04/17 13:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		2.0	0.25	ug/L			10/10/17 00:23	
Styrene	ND		2.0	0.25	ug/L			10/10/17 00:23	
cis-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/10/17 00:23	
trans-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/10/17 00:23	
N-Propylbenzene	ND		2.0	0.25	ug/L			10/10/17 00:23	
n-Butylbenzene	ND		5.0	0.40	ug/L			10/10/17 00:23	
4-Chlorotoluene	ND		5.0	0.25	ug/L			10/10/17 00:23	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: Trip Blank
Date Collected: 09/29/17 00:01
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-8
Matrix: Wate

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,2-Dibromoethane (EDB)	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,2-Dichloroethane	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,3,5-Trimethylbenzene	ND		2.0	0.25	ug/L			10/10/17 00:23	
Bromobenzene	ND		5.0	0.25	ug/L			10/10/17 00:23	
Toluene	ND		2.0	0.25	ug/L			10/10/17 00:23	
Chlorobenzene	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,2,4-Trichlorobenzene	ND		5.0	0.40	ug/L			10/10/17 00:23	
Dibromochloromethane	ND		2.0	0.25	ug/L			10/10/17 00:23	
Tetrachloroethene	ND		2.0	0.25	ug/L			10/10/17 00:23	
sec-Butylbenzene	ND		5.0	0.25	ug/L			10/10/17 00:23	
m,p-Xylene	ND		2.0	0.50	ug/L			10/10/17 00:23	
1,3-Dichloropropane	ND		2.0	0.25	ug/L			10/10/17 00:23	
cis-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/10/17 00:23	
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,3-Dichlorobenzene	ND		2.0	0.25	ug/L			10/10/17 00:23	
Carbon tetrachloride	ND		5.0	0.25	ug/L			10/10/17 00:23	
1,1-Dichloropropene	ND		2.0	0.25	ug/L			10/10/17 00:23	
2,2-Dichloropropane	ND		2.0	0.40	ug/L			10/10/17 00:23	
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			10/10/17 00:23	
Chloroform	ND		2.0	0.25	ug/L			10/10/17 00:23	
Benzene	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,1,1-Trichloroethane	ND		2.0	0.25	ug/L			10/10/17 00:23	
Bromomethane	ND		5.0	0.25	ug/L			10/10/17 00:23	
Chloromethane	ND		5.0	0.25	ug/L			10/10/17 00:23	
Dibromomethane	ND		2.0	0.25	ug/L			10/10/17 00:23	
Bromochloromethane	ND		5.0	0.25	ug/L			10/10/17 00:23	
Chloroethane	ND		5.0	0.40	ug/L			10/10/17 00:23	
Vinyl chloride	ND		5.0	0.25	ug/L			10/10/17 00:23	
Methylene Chloride	ND		5.0	1.1	ug/L			10/10/17 00:23	
Bromoform	ND		5.0	0.40	ug/L			10/10/17 00:23	
Bromodichloromethane	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,1-Dichloroethane	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,1-Dichloroethene	ND		5.0	0.25	ug/L			10/10/17 00:23	
Trichlorofluoromethane	ND		5.0	0.25	ug/L			10/10/17 00:23	
Dichlorodifluoromethane	ND		5.0	0.25	ug/L			10/10/17 00:23	
1,2-Dichloropropane	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,1,2-Trichloroethane	ND		2.0	0.25	ug/L			10/10/17 00:23	
Trichloroethene	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,1,2,2-Tetrachloroethane	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			10/10/17 00:23	
Hexachlorobutadiene	ND		5.0	0.25	ug/L			10/10/17 00:23	
Naphthalene	ND		5.0	0.40	ug/L			10/10/17 00:23	
o-Xylene	ND		2.0	0.25	ug/L			10/10/17 00:23	
2-Chlorotoluene	ND		5.0	0.25	ug/L			10/10/17 00:23	
1,2-Dichlorobenzene	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,2,4-Trimethylbenzene	ND		2.0	0.25	ug/L			10/10/17 00:23	
1,2-Dibromo-3-Chloropropane	ND		5.0	0.50	ug/L			10/10/17 00:23	
1,2,3-Trichloropropane	ND		10	0.25	ug/L			10/10/17 00:23	

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: Trip Blank
Date Collected: 09/29/17 00:01
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-8
Matrix: Wate

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	ND		5.0	0.25	ug/L			10/10/17 00:23	1
Isopropylbenzene	ND		2.0	0.25	ug/L			10/10/17 00:23	1
p-Isopropyltoluene	ND		2.0	0.25	ug/L			10/10/17 00:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*107*		*80 - 128*		*10/10/17 00:23*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*10/10/17 00:23*	*1*
Dibromofluoromethane (Surr)	*106*		*76 - 132*		*10/10/17 00:23*	*1*

Method Summary

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-01
Date Collected: 09/29/17 06:55
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	433948	10/09/17 19:55	OH1	TAL IRV

Client Sample ID: MW-02
Date Collected: 09/29/17 09:40
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	433948	10/09/17 21:25	OH1	TAL IRV

Client Sample ID: MW-03
Date Collected: 09/29/17 06:16
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	433948	10/09/17 21:55	OH1	TAL IRV

Client Sample ID: MW-04
Date Collected: 09/29/17 05:39
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	433948	10/09/17 22:24	OH1	TAL IRV

Client Sample ID: MW-04 DUP
Date Collected: 09/29/17 05:45
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	433948	10/09/17 22:54	OH1	TAL IRV

Client Sample ID: MW-05S
Date Collected: 09/29/17 08:49
Date Received: 10/04/17 13:00

Lab Sample ID: 440-193461-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	433948	10/09/17 23:24	OH1	TAL IRV

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Client Sample ID: MW-05D

Lab Sample ID: 440-193461-7

Date Collected: 09/29/17 08:14

Matrix: Wate

Date Received: 10/04/17 13:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	433948	10/09/17 23:53	OH1	TAL IRV

Client Sample ID: Trip Blank

Lab Sample ID: 440-193461-8

Date Collected: 09/29/17 00:01

Matrix: Wate

Date Received: 10/04/17 13:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	433948	10/10/17 00:23	OH1	TAL IRV

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

QC Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 440-433948/3
Matrix: Water
Analysis Batch: 433948

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
Styrene	ND		2.0	0.25	ug/L			10/09/17 18:55	
cis-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 18:55	
trans-1,3-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 18:55	
N-Propylbenzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
n-Butylbenzene	ND		5.0	0.40	ug/L			10/09/17 18:55	
4-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 18:55	
1,4-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,2-Dibromoethane (EDB)	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,2-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,3,5-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
Bromobenzene	ND		5.0	0.25	ug/L			10/09/17 18:55	
Toluene	ND		2.0	0.25	ug/L			10/09/17 18:55	
Chlorobenzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,2,4-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 18:55	
Dibromochloromethane	ND		2.0	0.25	ug/L			10/09/17 18:55	
Tetrachloroethene	ND		2.0	0.25	ug/L			10/09/17 18:55	
sec-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 18:55	
m,p-Xylene	ND		2.0	0.50	ug/L			10/09/17 18:55	
1,3-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 18:55	
cis-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 18:55	
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,3-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
Carbon tetrachloride	ND		5.0	0.25	ug/L			10/09/17 18:55	
1,1-Dichloropropene	ND		2.0	0.25	ug/L			10/09/17 18:55	
2,2-Dichloropropane	ND		2.0	0.40	ug/L			10/09/17 18:55	
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			10/09/17 18:55	
Chloroform	ND		2.0	0.25	ug/L			10/09/17 18:55	
Benzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,1,1-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 18:55	
Bromomethane	ND		5.0	0.25	ug/L			10/09/17 18:55	
Chloromethane	ND		5.0	0.25	ug/L			10/09/17 18:55	
Dibromomethane	ND		2.0	0.25	ug/L			10/09/17 18:55	
Bromochloromethane	ND		5.0	0.25	ug/L			10/09/17 18:55	
Chloroethane	ND		5.0	0.40	ug/L			10/09/17 18:55	
Vinyl chloride	ND		5.0	0.25	ug/L			10/09/17 18:55	
Methylene Chloride	2.48	J	5.0	1.1	ug/L			10/09/17 18:55	
Bromoform	ND		5.0	0.40	ug/L			10/09/17 18:55	
Bromodichloromethane	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,1-Dichloroethane	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,1-Dichloroethene	ND		5.0	0.25	ug/L			10/09/17 18:55	
Trichlorofluoromethane	ND		5.0	0.25	ug/L			10/09/17 18:55	
Dichlorodifluoromethane	ND		5.0	0.25	ug/L			10/09/17 18:55	
1,2-Dichloropropane	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,1,2-Trichloroethane	ND		2.0	0.25	ug/L			10/09/17 18:55	
Trichloroethene	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,1,2,2-Tetrachloroethane	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			10/09/17 18:55	

QC Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 440-433948/3
Matrix: Water
Analysis Batch: 433948

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachlorobutadiene	ND		5.0	0.25	ug/L			10/09/17 18:55	
Naphthalene	ND		5.0	0.40	ug/L			10/09/17 18:55	
o-Xylene	ND		2.0	0.25	ug/L			10/09/17 18:55	
2-Chlorotoluene	ND		5.0	0.25	ug/L			10/09/17 18:55	
1,2-Dichlorobenzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,2,4-Trimethylbenzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
1,2-Dibromo-3-Chloropropane	ND		5.0	0.50	ug/L			10/09/17 18:55	
1,2,3-Trichloropropane	ND		10	0.25	ug/L			10/09/17 18:55	
tert-Butylbenzene	ND		5.0	0.25	ug/L			10/09/17 18:55	
Isopropylbenzene	ND		2.0	0.25	ug/L			10/09/17 18:55	
p-Isopropyltoluene	ND		2.0	0.25	ug/L			10/09/17 18:55	

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*110*		*80 - 128*		*10/09/17 18:55*	
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*		*10/09/17 18:55*	
Dibromofluoromethane (Surr)	*101*		*76 - 132*		*10/09/17 18:55*	

Lab Sample ID: LCS 440-433948/4
Matrix: Water
Analysis Batch: 433948

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethylbenzene	25.0	28.0		ug/L		112	70 - 130
Styrene	25.0	25.9		ug/L		104	70 - 134
cis-1,3-Dichloropropene	25.0	27.2		ug/L		109	70 - 133
trans-1,3-Dichloropropene	25.0	27.0		ug/L		108	70 - 132
N-Propylbenzene	25.0	28.1		ug/L		113	67 - 139
n-Butylbenzene	25.0	28.8		ug/L		115	65 - 150
4-Chlorotoluene	25.0	26.9		ug/L		108	70 - 130
1,4-Dichlorobenzene	25.0	24.4		ug/L		98	70 - 130
1,2-Dibromoethane (EDB)	25.0	26.0		ug/L		104	70 - 130
1,2-Dichloroethane	25.0	25.8		ug/L		103	57 - 138
1,3,5-Trimethylbenzene	25.0	25.6		ug/L		102	70 - 136
Bromobenzene	25.0	26.5		ug/L		106	70 - 130
Toluene	25.0	28.3		ug/L		113	70 - 130
Chlorobenzene	25.0	25.8		ug/L		103	70 - 130
1,2,4-Trichlorobenzene	25.0	27.9		ug/L		112	60 - 140
Dibromochloromethane	25.0	25.8		ug/L		103	69 - 145
Tetrachloroethene	25.0	25.5		ug/L		102	70 - 130
sec-Butylbenzene	25.0	28.2		ug/L		113	70 - 138
m,p-Xylene	25.0	28.7		ug/L		115	70 - 130
1,3-Dichloropropane	25.0	26.0		ug/L		104	70 - 130
cis-1,2-Dichloroethene	25.0	26.9		ug/L		107	70 - 133
trans-1,2-Dichloroethene	25.0	25.8		ug/L		103	70 - 130
1,3-Dichlorobenzene	25.0	25.1		ug/L		100	70 - 130
Carbon tetrachloride	25.0	26.6		ug/L		106	60 - 150
1,1-Dichloropropene	25.0	29.3		ug/L		117	70 - 130
2,2-Dichloropropane	25.0	27.0		ug/L		108	68 - 141

QC Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-433948/4
Matrix: Water
Analysis Batch: 433948

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	25.0	26.0		ug/L		104	60 - 141
Chloroform	25.0	25.6		ug/L		102	70 - 130
Benzene	25.0	26.2		ug/L		105	68 - 130
1,1,1-Trichloroethane	25.0	26.1		ug/L		105	70 - 130
Bromomethane	25.0	23.5		ug/L		94	64 - 139
Chloromethane	25.0	22.3		ug/L		89	47 - 140
Dibromomethane	25.0	26.7		ug/L		107	70 - 130
Bromochloromethane	25.0	25.8		ug/L		103	70 - 130
Chloroethane	25.0	25.4		ug/L		102	64 - 135
Vinyl chloride	25.0	27.4		ug/L		110	59 - 133
Methylene Chloride	25.0	28.2		ug/L		113	52 - 130
Bromoform	25.0	26.2		ug/L		105	60 - 148
Bromodichloromethane	25.0	26.9		ug/L		108	70 - 132
1,1-Dichloroethane	25.0	24.8		ug/L		99	64 - 130
1,1-Dichloroethene	25.0	25.5		ug/L		102	70 - 130
Trichlorofluoromethane	25.0	25.9		ug/L		103	60 - 150
Dichlorodifluoromethane	25.0	20.9		ug/L		83	29 - 150
1,2-Dichloropropane	25.0	26.7		ug/L		107	67 - 130
1,1,2-Trichloroethane	25.0	25.8		ug/L		103	70 - 130
Trichloroethene	25.0	28.5		ug/L		114	70 - 130
1,1,2,2-Tetrachloroethane	25.0	23.6		ug/L		94	63 - 130
1,2,3-Trichlorobenzene	25.0	26.6		ug/L		106	60 - 140
Hexachlorobutadiene	25.0	27.1		ug/L		109	10 - 150
Naphthalene	25.0	26.7		ug/L		107	60 - 140
o-Xylene	25.0	26.6		ug/L		106	70 - 130
2-Chlorotoluene	25.0	25.0		ug/L		100	70 - 130
1,2-Dichlorobenzene	25.0	25.4		ug/L		101	70 - 130
1,2,4-Trimethylbenzene	25.0	25.6		ug/L		103	70 - 135
1,2-Dibromo-3-Chloropropane	25.0	25.6		ug/L		103	52 - 140
1,2,3-Trichloropropane	25.0	24.1		ug/L		96	63 - 130
tert-Butylbenzene	25.0	27.4		ug/L		109	70 - 130
Isopropylbenzene	25.0	30.2		ug/L		121	70 - 136
p-Isopropyltoluene	25.0	26.7		ug/L		107	70 - 132

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*80 - 128*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*76 - 132*

Lab Sample ID: 440-193461-1 MS
Matrix: Water
Analysis Batch: 433948

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethylbenzene	ND		25.0	29.7		ug/L		119	70 - 130
Styrene	ND		25.0	25.4		ug/L		101	29 - 150
cis-1,3-Dichloropropene	ND		25.0	29.0		ug/L		116	70 - 133
trans-1,3-Dichloropropene	ND		25.0	27.1		ug/L		108	70 - 138

QC Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-193461-1 MS
Matrix: Water
Analysis Batch: 433948

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
N-Propylbenzene	ND		25.0	28.8		ug/L		115	66 - 135
n-Butylbenzene	ND		25.0	29.6		ug/L		118	61 - 149
4-Chlorotoluene	ND		25.0	27.5		ug/L		110	70 - 130
1,4-Dichlorobenzene	ND		25.0	24.8		ug/L		99	70 - 130
1,2-Dibromoethane (EDB)	ND		25.0	26.7		ug/L		107	70 - 131
1,2-Dichloroethane	ND		25.0	25.1		ug/L		100	56 - 146
1,3,5-Trimethylbenzene	ND		25.0	26.3		ug/L		105	70 - 130
Bromobenzene	ND		25.0	25.9		ug/L		104	70 - 130
Toluene	ND		25.0	29.2		ug/L		117	70 - 130
Chlorobenzene	ND		25.0	26.1		ug/L		104	70 - 130
1,2,4-Trichlorobenzene	ND		25.0	28.1		ug/L		113	60 - 140
Dibromochloromethane	ND		25.0	26.4		ug/L		105	70 - 148
Tetrachloroethene	54		25.0	76.9		ug/L		90	70 - 137
sec-Butylbenzene	ND		25.0	29.3		ug/L		117	67 - 134
m,p-Xylene	ND		25.0	29.9		ug/L		120	70 - 133
1,3-Dichloropropane	ND		25.0	25.9		ug/L		104	70 - 130
cis-1,2-Dichloroethene	ND		25.0	26.6		ug/L		107	70 - 130
trans-1,2-Dichloroethene	ND		25.0	25.4		ug/L		101	70 - 130
1,3-Dichlorobenzene	ND		25.0	25.6		ug/L		103	70 - 130
Carbon tetrachloride	ND		25.0	27.4		ug/L		110	60 - 150
1,1-Dichloropropene	ND		25.0	29.4		ug/L		117	64 - 130
2,2-Dichloropropane	ND		25.0	28.7		ug/L		115	69 - 138
1,1,1,2-Tetrachloroethane	ND		25.0	27.5		ug/L		110	60 - 149
Chloroform	0.41	J	25.0	25.9		ug/L		102	70 - 130
Benzene	ND		25.0	26.2		ug/L		105	66 - 130
1,1,1-Trichloroethane	ND		25.0	26.5		ug/L		106	70 - 130
Bromomethane	ND		25.0	22.9		ug/L		92	62 - 131
Chloromethane	ND		25.0	24.3		ug/L		97	39 - 144
Dibromomethane	ND		25.0	25.1		ug/L		100	70 - 130
Bromochloromethane	ND		25.0	24.5		ug/L		98	70 - 130
Chloroethane	ND		25.0	23.0		ug/L		92	68 - 130
Vinyl chloride	ND		25.0	28.6		ug/L		114	50 - 137
Methylene Chloride	ND		25.0	24.3		ug/L		97	52 - 130
Bromoform	ND		25.0	27.3		ug/L		109	59 - 150
Bromodichloromethane	ND		25.0	26.6		ug/L		106	70 - 138
1,1-Dichloroethane	ND		25.0	24.8		ug/L		99	65 - 130
1,1-Dichloroethene	ND		25.0	27.3		ug/L		109	70 - 130
Trichlorofluoromethane	ND		25.0	27.2		ug/L		109	60 - 150
Dichlorodifluoromethane	ND		25.0	22.3		ug/L		89	25 - 142
1,2-Dichloropropane	ND		25.0	24.7		ug/L		99	69 - 130
1,1,2-Trichloroethane	ND		25.0	26.4		ug/L		106	70 - 130
Trichloroethene	ND		25.0	26.7		ug/L		107	70 - 130
1,1,2,2-Tetrachloroethane	ND		25.0	24.6		ug/L		98	63 - 130
1,2,3-Trichlorobenzene	ND		25.0	27.6		ug/L		110	60 - 140
Hexachlorobutadiene	ND		25.0	29.1		ug/L		116	10 - 150
Naphthalene	ND		25.0	27.3		ug/L		109	60 - 140
o-Xylene	ND		25.0	28.0		ug/L		112	70 - 133
2-Chlorotoluene	ND		25.0	26.0		ug/L		104	70 - 130

QC Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-193461-1 MS
Matrix: Water
Analysis Batch: 433948

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichlorobenzene	ND		25.0	25.4		ug/L		102	70 - 130
1,2,4-Trimethylbenzene	ND		25.0	25.7		ug/L		103	70 - 130
1,2-Dibromo-3-Chloropropane	ND		25.0	27.3		ug/L		109	48 - 140
1,2,3-Trichloropropane	ND		25.0	24.1		ug/L		97	60 - 130
tert-Butylbenzene	ND		25.0	28.3		ug/L		113	70 - 130
Isopropylbenzene	ND		25.0	32.2		ug/L		129	70 - 132
p-Isopropyltoluene	ND		25.0	28.3		ug/L		113	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*106*		*80 - 128*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*
Dibromofluoromethane (Surr)	*94*		*76 - 132*

Lab Sample ID: 440-193461-1 MSD
Matrix: Water
Analysis Batch: 433948

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limi
Ethylbenzene	ND		25.0	29.6		ug/L		118	70 - 130	0	20
Styrene	ND		25.0	24.9		ug/L		100	29 - 150	2	35
cis-1,3-Dichloropropene	ND		25.0	27.6		ug/L		110	70 - 133	5	20
trans-1,3-Dichloropropene	ND		25.0	27.3		ug/L		109	70 - 138	1	25
N-Propylbenzene	ND		25.0	30.1		ug/L		120	66 - 135	4	20
n-Butylbenzene	ND		25.0	29.7		ug/L		119	61 - 149	0	20
4-Chlorotoluene	ND		25.0	28.2		ug/L		113	70 - 130	3	20
1,4-Dichlorobenzene	ND		25.0	24.4		ug/L		98	70 - 130	2	20
1,2-Dibromoethane (EDB)	ND		25.0	27.0		ug/L		108	70 - 131	1	25
1,2-Dichloroethane	ND		25.0	26.4		ug/L		106	56 - 146	5	20
1,3,5-Trimethylbenzene	ND		25.0	27.3		ug/L		109	70 - 130	4	20
Bromobenzene	ND		25.0	27.5		ug/L		110	70 - 130	6	20
Toluene	ND		25.0	29.4		ug/L		118	70 - 130	1	20
Chlorobenzene	ND		25.0	26.7		ug/L		107	70 - 130	2	20
1,2,4-Trichlorobenzene	ND		25.0	28.1		ug/L		112	60 - 140	0	20
Dibromochloromethane	ND		25.0	26.2		ug/L		105	70 - 148	0	25
Tetrachloroethene	54		25.0	74.3		ug/L		80	70 - 137	4	20
sec-Butylbenzene	ND		25.0	29.3		ug/L		117	67 - 134	0	20
m,p-Xylene	ND		25.0	30.8		ug/L		123	70 - 133	3	25
1,3-Dichloropropane	ND		25.0	26.8		ug/L		107	70 - 130	3	25
cis-1,2-Dichloroethene	ND		25.0	27.5		ug/L		110	70 - 130	3	20
trans-1,2-Dichloroethene	ND		25.0	26.7		ug/L		107	70 - 130	5	20
1,3-Dichlorobenzene	ND		25.0	26.2		ug/L		105	70 - 130	2	20
Carbon tetrachloride	ND		25.0	28.5		ug/L		114	60 - 150	4	25
1,1-Dichloropropene	ND		25.0	30.5		ug/L		122	64 - 130	4	20
2,2-Dichloropropane	ND		25.0	29.2		ug/L		117	69 - 138	2	25
1,1,1,2-Tetrachloroethane	ND		25.0	27.0		ug/L		108	60 - 149	2	20
Chloroform	0.41	J	25.0	27.0		ug/L		106	70 - 130	4	20
Benzene	ND		25.0	27.2		ug/L		109	66 - 130	4	20
1,1,1-Trichloroethane	ND		25.0	27.6		ug/L		111	70 - 130	4	20

QC Sample Results

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-193461-1 MSD
Matrix: Water
Analysis Batch: 433948

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limi
Bromomethane	ND		25.0	23.4		ug/L		94	62 - 131	2	25
Chloromethane	ND		25.0	25.2		ug/L		101	39 - 144	3	25
Dibromomethane	ND		25.0	26.3		ug/L		105	70 - 130	5	25
Bromochloromethane	ND		25.0	26.0		ug/L		104	70 - 130	6	25
Chloroethane	ND		25.0	23.0		ug/L		92	68 - 130	0	25
Vinyl chloride	ND		25.0	28.6		ug/L		115	50 - 137	0	30
Methylene Chloride	ND		25.0	24.6		ug/L		98	52 - 130	1	20
Bromoform	ND		25.0	27.9		ug/L		112	59 - 150	3	25
Bromodichloromethane	ND		25.0	27.8		ug/L		111	70 - 138	4	20
1,1-Dichloroethane	ND		25.0	25.6		ug/L		102	65 - 130	3	20
1,1-Dichloroethene	ND		25.0	26.0		ug/L		104	70 - 130	5	20
Trichlorofluoromethane	ND		25.0	27.7		ug/L		111	60 - 150	1	25
Dichlorodifluoromethane	ND		25.0	23.7		ug/L		95	25 - 142	6	30
1,2-Dichloropropane	ND		25.0	26.1		ug/L		104	69 - 130	5	20
1,1,2-Trichloroethane	ND		25.0	26.1		ug/L		105	70 - 130	1	25
Trichloroethene	ND		25.0	29.0		ug/L		116	70 - 130	8	20
1,1,2,2-Tetrachloroethane	ND		25.0	24.6		ug/L		98	63 - 130	0	30
1,2,3-Trichlorobenzene	ND		25.0	28.7		ug/L		115	60 - 140	4	20
Hexachlorobutadiene	ND		25.0	29.2		ug/L		117	10 - 150	0	20
Naphthalene	ND		25.0	27.2		ug/L		109	60 - 140	0	30
o-Xylene	ND		25.0	28.2		ug/L		113	70 - 133	1	20
2-Chlorotoluene	ND		25.0	27.1		ug/L		108	70 - 130	4	20
1,2-Dichlorobenzene	ND		25.0	25.7		ug/L		103	70 - 130	1	20
1,2,4-Trimethylbenzene	ND		25.0	26.0		ug/L		104	70 - 130	1	25
1,2-Dibromo-3-Chloropropane	ND		25.0	27.9		ug/L		112	48 - 140	2	30
1,2,3-Trichloropropane	ND		25.0	24.4		ug/L		97	60 - 130	1	30
tert-Butylbenzene	ND		25.0	28.5		ug/L		114	70 - 130	1	20
Isopropylbenzene	ND		25.0	32.0		ug/L		128	70 - 132	1	20
p-Isopropyltoluene	ND		25.0	28.8		ug/L		115	70 - 130	2	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*107*		*80 - 128*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*
Dibromofluoromethane (Surr)	*99*		*76 - 132*

QC Association Summary

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

GC/MS VOA

Analysis Batch: 433948

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-193461-1	MW-01	Total/NA	Water	8260B	
440-193461-2	MW-02	Total/NA	Water	8260B	
440-193461-3	MW-03	Total/NA	Water	8260B	
440-193461-4	MW-04	Total/NA	Water	8260B	
440-193461-5	MW-04 DUP	Total/NA	Water	8260B	
440-193461-6	MW-05S	Total/NA	Water	8260B	
440-193461-7	MW-05D	Total/NA	Water	8260B	
440-193461-8	Trip Blank	Total/NA	Water	8260B	
MB 440-433948/3	Method Blank	Total/NA	Water	8260B	
LCS 440-433948/4	Lab Control Sample	Total/NA	Water	8260B	
440-193461-1 MS	MW-01	Total/NA	Water	8260B	
440-193461-1 MSD	MW-01	Total/NA	Water	8260B	

Definitions/Glossary

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: Stantec Consulting Corp.
Project/Site: Moreno Center

TestAmerica Job ID: 440-193461-1

Laboratory: TestAmerica Irvine

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	CA01531	06-30-18
Arizona	State Program	9	AZ0671	10-14-17 *
California	LA Cty Sanitation Districts	9	10256	06-30-18
California	State Program	9	CA ELAP 2706	06-30-18
Guam	State Program	9	Cert. No. 17-003R	01-23-18
Hawaii	State Program	9	N/A	01-29-18
Kansas	NELAP Secondary AB	7	E-10420	07-31-18
Nevada	State Program	9	CA015312018-1	07-31-18
New Mexico	State Program	6	N/A	01-29-18 *
Northern Mariana Islands	State Program	9	MP0002	01-29-17 *
Oregon	NELAP	10	4028	01-29-18
USDA	Federal		P330-15-00184	07-08-18
Washington	State Program	10	C900	09-03-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Stantec

CHAIN OF CUSTODY

Laboratory Project Number: _____

Page 1 of 1

Client Name/Address:	Project Manager:	Analysis Required	Turn Around Time:
Stantec Consulting Services 25864-F Business Center Drive Redlands, CA 92374	**Brian Viggiano** E-Mail Address: **brian.viggiano@stantec.com** Sampler Name: Stantec Project Number: **185802753** Project: **Moreno Center**		Normal TAT: X 72 Hour: 48 Hour 24 Hour Same Day: Other:
Laboratory (circle): ~~Cal Science - 714-895-5494~~ ~~ATL - 800-499-4388~~ TAL - 949-261-1022 ~~Jones Environmental - 714-449-9937~~			Sample Temp °C: _____

Sample Description/Identification	Sample Matrix	Preservative (see below)	# of Cont.	Sample Date	Sample Time	Filtered Sample	8260B - VOC	Special Instructions
MW-01	water	1,2	3	9/29/17	0655		X	
MW-02	water	1,2	3		0940		X	
MW-03	water	1,2	3		0616		X	
MW-04	water	1,2	3		0539		X	
MW-04 DUP	water	1,2	3		0545		X	
MW-05S	water	1,2	3		0849		X	
MW-05D	water	1,2	3	9/29/17	0814		X	
TRIP BLANK	water	1,2	3				X	

440-193461 Chain of Custody

10/4/17

Sample Preservative: 1=ICE - 2=HCl - 3=H_2SO_4 - 4=HNO_3 - 5=NaOH - 6=Other: _____

Special Instructions:

1-3

Relinquished By:	Date	Time	Received By + Company Name:	Date	Time
	9/29/17	11:00AM.	Corey Pace / Stantec	9/29/17	11:00
Relinquished By + Company Name: Corey Pace / Stantec	Date 10/4/17	Time 11:30AM.	Received By + Company Name: Wilfredo Rivera TAI	Date 10/4/17	Time 1130
Relinquished By + Company Name: Wilfredo Rivera TAI	Date 10/4/17	Time 1300	Received By + Company Name:	Date 10/4/17	Time 13:00

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 440-193461-1

Login Number: 193461
List Number: 1
Creator: Soderblom, Tim

List Source: TestAmerica Irvine

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	Default login info for TB
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ARCADIS Design & Consultancy for natural and built assets

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Jackson B. Smith
Newcastle Partners
4740 Green River Road, Suite 118
Corona, CA 92880

ENVIRONMENT

Subject: Limited Phase II Investigation Report for Undeveloped Land located at the NEC of the Intersection of Brodiaea Avenue and Frederick Street, Moreno Valley, California

Date:
February 12, 2018

Contact:
Janet Holtz

Phone:
714.508.2618

Email:
Janet.Holtz@arcadis.com

Our ref:
CM011971.0001

Dear Mr. Smith:

Arcadis U.S., Inc. (Arcadis) was retained by Newcastle Partners to conduct a Limited Phase II Investigation for the above-referenced site (the Site, Figures 1 and 2). The Site consists of 8.78 acres of undeveloped land and does not have an assigned street address. There are no features onsite and the ground surface has been disked. In December 2017, Arcadis performed a Phase I Environmental Site Assessment (ESA) of the Site in conformance with the scope and limitations of ASTM International (ASTM) Practice E1527-13 for Phase I ESAs. No onsite concerns were identified during the Phase I ESA site inspection. However, regulatory records reviewed for the Phase I ESA identified the site to be located within March Field, an open but inactive case with the Department of Toxic Substances Control (DTSC). March Field encompasses an area of 53.3-acres and was historically used by March Air Force Base as a small arms firing range. Contaminants of concern above regulatory screening criteria identified in March Field are arsenic, lead, and select polycyclic aromatic hydrocarbons (PAHs). As a result, the Phase I ESA identified the Site's location within March Field as a Recognized Environmental Condition (REC) in connection with the Site as select metals and PAHs may be present in near-surface soil above regulatory screening criteria. Arcadis recommended baseline soil sampling for metals and PAHs. To address the REC identified above, Arcadis conducted a limited Phase II investigation at the Site. This report discusses our Phase II findings for the Site.

Pre-Field Activities

Arcadis field personnel performing the sampling coordinated with the project manager for Site access. In addition, Underground Service Alert was notified a minimum of 48 hours prior to commencement of the field activities, per State law. Dig

Alert ticket No. A180171022 was in place for all intrusive activities at the Site. Available drawings and plans for the Site were reviewed prior to initiating field work.

Additionally, Pacific Coast Locators, Inc., a subcontracted private utility locating firm, was used to perform clearance at the proposed boring locations at the Site on January 19, 2018, prior to initiating any intrusive activities. Soil boring and soil sampling locations were marked in white paint or with stakes prior to conducting utility clearance. All sample locations were cleared and borings were advanced in the originally selected locations.

Field Sampling Activities

Sample locations were selected based on the REC identified for the Site and are shown on Figure 2. Three soil borings, SB-1 through SB-3, were advanced throughout the Site in order to collect representative soil samples to assess for impact from historical small arms firing range use. The boring locations were identified with Global Positioning System (GPS) coordinates so that the borings could later be located should there be a need for remediation. On January 22, 2018, Arcadis and BC2 Environmental (BC2), a State-licensed drilling subcontractor located in Orange, California, collected three soil samples from each boring using direct-push technology (DPT) at depths of 1-foot, 2-feet, and 5-feet below ground surface (bgs) for a total of nine samples. All soil samples were collected in acetate sleeves. The shallow soil samples collected at 1-foot bgs were analyzed for arsenic, lead, and PAHs as follows:

Sample Number	Analysis
SB-1-1’	Arsenic and lead (U.S. Environmental Protection Agency [EPA] 6010B), PAHs (EPA 8270C)
SB-2-1’	Arsenic and lead (U.S. EPA 6010B), PAHs (EPA 8270C)
SB-3-1’	Arsenic and lead (U.S. EPA 6010B), PAHs (EPA 8270C)

The soil samples that were collected at depths of 2-feet and 5-feet bgs were held by the laboratory pending the results of the samples initially analyzed. Based on the laboratory results, held samples were not analyzed and are not included in the above table.

Soil samples were collected in new acetate sleeves and capped with Teflon® squares and polyethylene end caps. As soil samples were collected, the sample containers were uniquely labeled with the project name, name of sampler, sample location, sample depth, sample identification, sampling date, and sampling time. Soil samples were stored in an ice-chilled cooler pending transport and then transported under chain-of-custody (COC) documentation to SunStar Laboratories, Inc. (SunStar), a California Environmental Laboratory Accreditation Program (ELAP) certified laboratory located in Lake Forest, California for chemical analysis. COC procedures were utilized to maintain control and validity of sample data ensuring effective interpretation of the data. As documented on the COC, the samples were received by the laboratory in chilled conditions.

Quality Assurance/Quality Control (QA/QC) performed for the data includes standard laboratory QC, such as matrix spike/matrix spike duplicate (MS/MSD), surrogate recovery, and method blank samples, was performed. Arcadis reviewed the laboratory analytical data and verified that the laboratory's internal QC were within specified limits and that the data sets were valid. Batch samples including Method Blanks, Laboratory Control Samples (LCS), LCS duplicates, Matrix Spikes, and Matrix Spike duplicate analytical results were examined for qualifiers that could potentially bias the analytical results. No qualifiers were reported.

Decontamination of the DPT sampler, any hand tools, core bits, drill bits, chisels, and other reusable sampling equipment were performed prior to sampling and between sample locations to prevent the introduction of extraneous chemicals into samples and to prevent cross-contamination between samples. Hand tools, such as pipe cutters, hacksaws, and knives that contact soil, were cleaned after each sample. All sampling equipment was decontaminated on site prior to use by dry brushing and washing with a non-phosphate detergent (e.g., Alconox™), rinsing in potable water, and then rinsing in distilled water. The following steps were followed for decontamination of the non-disposable sampling equipment: remove solids, wash with non-phosphate detergent and water solution, rinse with potable water, and rinse with distilled water.

All sampling and related activities were conducted in accordance with USEPA publication SW-846, entitled Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods, including QA and QC protocols (USEPA, 2013).

Soil Sampling Analytical Results

Arcadis compared detected analyte concentrations with the USEPA Region IX Regional Screening Levels (RSLs) for commercial/industrial use (November 2017) as modified by the Department of Toxic Substances Control (DTSC, August 2017) or the California Human Health Screening Levels for Commercial/Industrial Use (CHHSL-I) (California EPA, 2010), whichever is more conservative. However, due to the elevated background concentrations of arsenic in soil, the DTSC uses 12 milligrams per kilogram (mg/kg) as the arsenic screening level for school sites.

Lead was detected in the soil sample collected at 1-foot bgs from SB-3 at a concentration of 13 milligrams per kilogram (mg/kg). Lead was not detected above its CHHSL and DTSC-Screening Level Non-Cancer soil screening level of 320 mg/kg. Lead was not detected above the laboratory method detection limits in the other samples collected at the Site. Arsenic and PAHs were not detected above the laboratory method detection limit in the samples collected from the Site. As no compounds were detected above the applicable soil screening criteria in the shallow samples collected from the Site, the deeper soil samples were not analyzed. Any impact from historical small arms fire training activities would be expected to be found in near surface soil, as occurred on nearby properties.

The SunStar laboratory analytical report has been included as Attachment A.

Conclusions

Soil analytical results were compared to the applicable soil screening criteria. No compounds were detected above the applicable soil screening criteria in the samples collected from the areas investigated at the Site. No further investigation is recommended at this time. Based on the findings of this limited Phase II investigation, the REC has been addressed and no longer represents a REC for the Site.

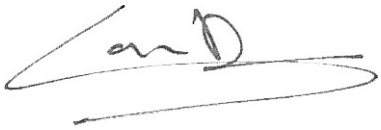
However, Arcadis recommends future site development contractors be made aware of the Site's location within a former military firing range.

Mr. Jackson Smith
February 12, 2018

Arcadis appreciates the opportunity to present you with these findings. Please call us if you have questions or would like to discuss the report.

Sincerely,

Arcadis U.S., Inc.



Maryline Laugier-Diamond, P.E.
Project Engineer

Janet Holtz
Principal Scientist

Att. Figure 1 – Site Location Map

Figure 2 – Site Plan with Sample Locations

Attachment A – Laboratory Report

FIGURES

MAP SOURCE: Google Earth Pro 2017, 33°54'55.71"N, 117°15'35.63"W

0 2,500' 5,000'

GRAPHIC SCALE

CENTREPOINTE - UNDEVELOPED LAND
NEC BRODIAEA AVENUE AND FREDERICK STREET
MORENO VALLEY, CALIFORNIA

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: IRVINE, CA DIV/GROUP:ENVCAD DB: E. MURESAN PIC: J. HOLTZ
C:\Users\emuresa\OneDrive - ARCADIS\BIM 360 Docs\Newcastle Partners INC\CM0011971.0000 – Nwcstle PHI ESA\Prpsed Centerpointe Prj\00001 - Phase I ESA\01-DWG\Centrepointe Site plan.dwg LAYOUT: 2 (2) SAVED: 1/23/2018 8:22 AM PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 1/23/2018 8:22 AM BY: MURESAN, ELENA

MAP SOURCE: Google Earth Pro 2017, 33°54'55.71"N, 117°15'35.63"W

LEGEND:

PROPERTY BOUNDARY

W/D WAREHOUSE DISTRIBUTION

SOIL BORING

0 400' 800'

GRAPHIC SCALE

CENTREPOINTE - UNDEVELOPED LAND
NEC BRODIAEA AVENUE AND FREDERICK STREET
MORENO VALLEY, CALIFORNIA

SITE PLAN WITH SAMPLE LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

ATTACHMENT A

Laboratory Report

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

30 January 2018

Janet Holtz
ARCADIS -- Irvine
320 Commerce, Suite 200
Irvine, CA 92602

RE: Centerpointe

Enclosed are the results of analyses for samples received by the laboratory on 01/22/18 18:56. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rose Fasheh
Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Driv
Lake Forest, California 9263
949.297.5020 Phon
949.297.5027 Fa

ARCADIS -- Irvine	Project: Centerpointe	
320 Commerce, Suite 200	Project Number: CM011971.0001	**Reported:**
Irvine CA, 92602	Project Manager: Janet Holtz	01/30/18 15:33

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-1-1.0'	T180257-01	Soil	01/22/18 09:24	01/22/18 18:56
SB-2-1.0'	T180257-04	Soil	01/22/18 09:41	01/22/18 18:56
SB-3-1.0'	T180257-07	Soil	01/22/18 09:59	01/22/18 18:56

SunStar Laboratories, Inc.

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Rose Fasheh, Project Manager

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ARCADIS -- Irvine	Project: Centerpointe	
320 Commerce, Suite 200	Project Number: CM011971.0001	**Reported:**
Irvine CA, 92602	Project Manager: Janet Holtz	01/30/18 15:33

DETECTIONS SUMMARY

Sample ID: SB-1-1.0' **Laboratory ID:** T180257-01

No Results Detected

Sample ID: SB-2-1.0' **Laboratory ID:** T180257-04

No Results Detected

Sample ID: SB-3-1.0' **Laboratory ID:** T180257-07

Analyte	Result	Reporting Limit	Units	Method	Notes
Lead	**13**	3.0	mg/kg	EPA 6010b	

SunStar Laboratories, Inc.

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Rose Fasheh, Project Manager

SunStar Laboratories, Inc.
Providing Quality Analytical Services Nationwide

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ARCADIS -- Irvine	Project: Centerpointe	
320 Commerce, Suite 200	Project Number: CM011971.0001	**Reported:**
Irvine CA, 92602	Project Manager: Janet Holtz	01/30/18 15:33

SB-1-1.0'

T180257-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Metals by EPA 6010B									
Arsenic	ND	5.0	mg/kg	1	8012419	01/24/18	01/26/18	EPA 6010b	
Lead	ND	3.0	"	"	"	"	"	"	
PAH compounds by Semivolatile GCMS									
Acenaphthene	ND	300	ug/kg	1	8012911	01/29/18	01/29/18	EPA 8270C	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Surrogate: Terphenyl-dl4		*106 %*	*29.1-130*		"	"	"	"	

SunStar Laboratories, Inc.

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Rose Fasheh, Project Manager

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Providing Quality Analytical Services Nationwide

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ARCADIS -- Irvine	Project: Centerpointe	
320 Commerce, Suite 200	Project Number: CM011971.0001	**Reported:**
Irvine CA, 92602	Project Manager: Janet Holtz	01/30/18 15:33

SB-2-1.0'

T180257-04 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Metals by EPA 6010B									
Arsenic	ND	5.0	mg/kg	1	8012419	01/24/18	01/26/18	EPA 6010b	
Lead	ND	3.0	"	"	"	"	"	"	
PAH compounds by Semivolatile GCMS									
Acenaphthene	ND	300	ug/kg	1	8012911	01/29/18	01/29/18	EPA 8270C	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Surrogate: Terphenyl-dl4		*99.1 %*		*29.1-130*	"	"	"	"	

SunStar Laboratories, Inc.

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Rose Fasheh, Project Manager

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949.297.5027 Fa

ARCADIS -- Irvine	Project: Centerpointe	
320 Commerce, Suite 200	Project Number: CM011971.0001	**Reported:**
Irvine CA, 92602	Project Manager: Janet Holtz	01/30/18 15:33

SB-3-1.0'

T180257-07 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Metals by EPA 6010B									
Arsenic	ND	5.0	mg/kg	1	8012419	01/24/18	01/26/18	EPA 6010b	
Lead	**13**	3.0	"	"	"	"	"	"	
PAH compounds by Semivolatile GCMS									
Acenaphthene	ND	300	ug/kg	1	8012911	01/29/18	01/29/18	EPA 8270C	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Surrogate: Terphenyl-dl4		*102 %*		*29.1-130*	"	"	"	"	

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Rose Fasheh, Project Manager

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ARCADIS -- Irvine	Project: Centerpointe	
320 Commerce, Suite 200	Project Number: CM011971.0001	**Reported:**
Irvine CA, 92602	Project Manager: Janet Holtz	01/30/18 15:33

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8012419 - EPA 3050B										
Blank (8012419-BLK1)				Prepared: 01/24/18 Analyzed: 01/26/18						
Arsenic	ND	5.0	mg/kg							
Copper	ND	1.0	"							
Lead	ND	3.0	"							
Molybdenum	ND	5.0	"							
Nickel	ND	2.0	"							
Selenium	ND	5.0	"							
Silver	ND	2.0	"							
Thallium	ND	2.0	"							
Vanadium	ND	5.0	"							
Zinc	ND	1.0	"							
LCS (8012419-BS1)				Prepared: 01/24/18 Analyzed: 01/26/18						
Arsenic	115	5.0	mg/kg	100		115	75-125			
Copper	111	1.0	"	100		111	75-125			
Lead	113	3.0	"	100		113	75-125			
Matrix Spike (8012419-MS1)	**Source: T180210-01**			Prepared: 01/24/18 Analyzed: 01/26/18						
Arsenic	88.4	5.0	mg/kg	92.6	1.92	93.4	75-125			
Copper	96.2	1.0	"	92.6	10.5	92.5	0-200			
Lead	92.0	3.0	"	92.6	7.18	91.6	75-125			
Matrix Spike Dup (8012419-MSD1)	**Source: T180210-01**			Prepared: 01/24/18 Analyzed: 01/26/18						
Arsenic	96.4	5.0	mg/kg	96.2	1.92	98.2	75-125	8.65	20	
Copper	109	1.0	"	96.2	10.5	103	0-200	12.8	200	
Lead	105	3.0	"	96.2	7.18	102	75-125	13.4	20	

SunStar Laboratories, Inc.

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ARCADIS -- Irvine	Project: Centerpointe	
320 Commerce, Suite 200	Project Number: CM011971.0001	**Reported:**
Irvine CA, 92602	Project Manager: Janet Holtz	01/30/18 15:33

PAH compounds by Semivolatile GCMS - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8012911 - EPA 3550 ECD/GCMS										
Blank (8012911-BLK1)				Prepared & Analyzed: 01/29/18						
Acenaphthene	ND	300	ug/kg							
Acenaphthylene	ND	300	"							
Anthracene	ND	300	"							
Benzo (a) anthracene	ND	300	"							
Benzo (b) fluoranthene	ND	300	"							
Benzo (k) fluoranthene	ND	300	"							
Benzo (g,h,i) perylene	ND	1000	"							
Benzo (a) pyrene	ND	300	"							
Chrysene	ND	300	"							
Dibenz (a,h) anthracene	ND	300	"							
Fluoranthene	ND	300	"							
Fluorene	ND	300	"							
Indeno (1,2,3-cd) pyrene	ND	300	"							
Naphthalene	ND	300	"							
Phenanthrene	ND	300	"							
Pyrene	ND	300	"							
Surrogate: Terphenyl-dl4	*3520*		*"*	*3340*		*105*	*29.1-130*			
LCS (8012911-BS1)				Prepared & Analyzed: 01/29/18						
Acenaphthene	2570	300	ug/kg	3390		75.8	50-130			
Pyrene	2180	300	"	3390		64.4	50-130			
Surrogate: Terphenyl-dl4	*3430*		*"*	*3390*		*101*	*29.1-130*			
LCS Dup (8012911-BSD1)				Prepared & Analyzed: 01/29/18						
Acenaphthene	2590	300	ug/kg	3330		77.8	50-130	0.897	31	
Pyrene	2240	300	"	3330		67.2	50-130	2.54	31	
Surrogate: Terphenyl-dl4	*3490*		*"*	*3330*		*105*	*29.1-130*			

SunStar Laboratories, Inc.

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Rose Fasheh, Project Manager

SunStar Laboratories, Inc.
Providing Quality Analytical Services Nationwide

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Lake Forest, California 9263
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949.297.5027 Fa

ARCADIS -- Irvine	Project: Centerpointe	
320 Commerce, Suite 200	Project Number: CM011971.0001	**Reported:**
Irvine CA, 92602	Project Manager: Janet Holtz	01/30/18 15:33

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

SunStar Laboratories, Inc.

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Rose Fasheh, Project Manager

SunStar Laboratories, Inc.
25712 Commercentre Dr
Lake Forest, CA 92630
949-297-5020

Chain of Custody Record

Client: Arcadis US Inc.
Address: 320 Commerce #200, Irvine, CA 92602
Phone: 714-730-9052 Fax:
Project Manager: Janet Holtz

Date: 1/22/18 Page: 1 Of 1
Project Name: Centerpointe
Collector: A. Scavo Client Project #: CM011971.0001
Batch #: T180257 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	~~8260~~	~~8260 + OXY~~	~~8260 BTEX, OXY only~~	(8270) PAHs	~~8021 BTEX~~	~~8015M (gasoline)~~	~~8015M (diesel)~~	~~8015M Ext./Carbon Chain~~	~~6010/7000 Title 22 Metals~~	Arsenic & Lead (6010B)		Hold	Laboratory ID #	Comments/Preservative	Total # of containers
SB-1 - 1.0'	1/22/18	0924	Soil	Sleeve				X						X			01		1
SB-1 - 2.0'		0925						X						X			02		1
SB-1 - 5.0'		0926						X						X			03		1
SB-2 - 1.0'		0941														X	04		1
SB-2 - 2.0'		0942														X	05		1
SB-2 - 5.0'		0947														X	06		1
SB-3 - 1.0'		0959														X	07		1
SB-3 - 20.'		1000														X	08		1
SB-3 - 5.0'		1004														X	09		1

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
A. Scavo	1/22/18/1617		1-22-18 1631
	1-22-18 1856	Jeanny Hunh	01/22/18 18:56

Total # of containers: 9
Chain of Custody seals Y/N/NA
Seals intact? Y/N/NA
Received good condition/cold: 2.6°

Turn around time: Standard

Notes
Please send email confirmation & lab report to:
Maryline.Laugier@arcadis.com
Janet.Holtz@arcadis.com

Sample disposal Instructions: Disposal @ $2.00 each ____ Return to client ____ Pickup ____

COC 131510

SunStar Laboratories — Celebrating 20 Years!

SAMPLE RECEIVING REVIEW SHEET

Batch/Work Order #: T180257

Client Name: Arcadis Project: Centerpointe

Delivered by: ☐ Client ☒ SunStar Courier ☐ GSO ☐ FedEx ☐ Other

If Courier, Received by: Dan Date/Time Courier Received: 1/22/18 16:31

Lab Received by: Jeanny Date/Time Lab Received: 1/22/18 18:36

Total number of coolers received: 0

Temperature:	Cooler #1 2.8	°C +/- the CF (- 0.2°C) = 2.6	°C corrected temperature
Temperature:	Cooler #2	°C +/- the CF (- 0.2°C) =	°C corrected temperature
Temperature:	Cooler #3	°C +/- the CF (- 0.2°C) =	°C corrected temperature

Temperature criteria = ≤ 6°C (no frozen containers)	Within criteria?	☒ **Yes** ☐ **No**
If NO:		
Samples received on ice?	☐ Yes	☐ **No → Complete Non-Conformance Sheet**
If on ice, samples received same day collected?	☐ Yes → Acceptable	☐ **No → Complete Non-Conformance Sheet**

Custody seals intact on cooler/sample	☐ Yes	☐ No*	☒ N/A
Sample containers intact	☒ Yes	☐ No*	
Sample labels match Chain of Custody IDs	☒ Yes	☐ No*	
Total number of containers received match COC	☒ Yes	☐ No*	
Proper containers received for analyses requested on COC	☒ Yes	☐ No*	
Proper preservative indicated on COC/containers for analyses requested	☐ Yes	☐ No*	☒ N/A
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times	☒ **Yes**	☐ **No***	

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date: BC 1/23/18

Comments:

(949) 297-5020 ■ www.sunstarlabs.com ■ 25712 Commercentre Drive ■ Lake Forest, CA 92630

Rose Fasheh

From: Laugier-Diamond, Maryline [Maryline.Laugier@arcadis.com]
Sent: Tuesday, January 23, 2018 1:53 PM
To: Rose Fasheh; Holtz, Janet
Subject: RE: Work Order Confirmation for Centerpointe (T180257)
Attachments: SCA09P1218012314560.pdf

Hi Rose,
Please see corrections to COC for this job.
Thank you,

Maryline Laugier-Diamond | maryline.laugier@arcadis.com
Arcadis | M. +1 510 388 9035
www.arcadis.com

From: Rose Fasheh [mailto:Rose@sunstarlabs.com]
Sent: Tuesday, January 23, 2018 1:16 PM
To: Holtz, Janet <Janet.Holtz@arcadis.com>; Laugier-Diamond, Maryline <Maryline.Laugier@arcadis.com>
Subject: Work Order Confirmation for Centerpointe (T180257)

Hello Janet and Maryline,

Please see the attached chain-of-custody and work order for samples we received yesterday:

Project: Centerpointe
Project Number: CM011971.0001

Please carefully review and if you have any questions or concerns, please feel free to contact me. Thank you for choosing SunStar Labs.

Rose Fasheh
Project Manager

SunStar 20 Laboratories

25712 Commercentre Dr., Lake Forest, CA 92630
Office: (949) 297-5020 | Fax: (949) 297-5027
CA ELAP Certification: 2250 | CA Small Business Certification: 31511

SunStar Laboratories, Inc.
25712 Commercentre Dr
Lake Forest, CA 92630
949-297-5020

Chain of Custody Record

Client: Arcadis US Inc.
Address: 320 Commerce #200, Irvine, CA 92602
Phone: 714-730-9052 Fax:
Project Manager: Janet Holtz

Date: 1/22/18 Page: 1 Of 1
Project Name: Centerpointe
Collector: A. Scavo Client Project #: CM011971.0001
Batch #: T180257 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	~~8260~~	~~8260 + OXY~~	~~8260 BTEX, OXY only~~	(8270) PAHs	~~8021 BTEX~~	~~8015M (gasoline)~~	~~8015M (diesel)~~	~~8015M Ext./Carbon Chain~~	~~6010/7000 Title 22 Metals~~	Arsenic & Lead (6010B)		Hold	Laboratory ID #	Comments/Preservative	Total # of containers
SB-1 - 1.0'	1/22/18	0924	Soil	Sleeve				X						X			01		1
SB-1 - 2.0' Hold		0925						X						X		X	02		1
SB-1 - 5.0' Hold		0986						X						X		X	03		1
SB-2 - 1.0'		0941						X						X		X	04	analyze	1
SB-2 - 2.0' Hold		0942														X	05		1
SB-2 - 5.0' Hold		0947														X	06		1
SB-3 - 1.0'		0959						X						X		X	07	analyze	1
SB-3 - 20.' Hold		1000														X	08		1
SB-3 - 5.0' Hold		1004														X	09		1

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
	1/22/18 1617		1-22-18 1631
Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
	1-22-18 1856		01/22/18 18:56
Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time

Total # of containers: 9
Chain of Custody seals Y/N/NA:
Seals intact? Y/N/NA:
Received good condition/cold: 2.6°

Turn around time: Standard

Notes
Please send email confirmation & lab report to:
Maryline.Laugier@arcadis.com
Janet.Holtz@arcadis.com

Sample disposal Instructions: Disposal @ $2.00 each ___ Return to client ___ Pickup ___

COC 131510

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T180257

Client: ARCADIS -- Irvine
Project: Centerpointe
Project Manager: Rose Fasheh
Project Number: CM011971.0001

Report To:
ARCADIS -- Irvine
Janet Holtz
320 Commerce, Suite 200
Irvine, CA 92602

Date Due: 01/30/18 17:00 (5 day TAT)
Received By: Jeanny Huynh
Date Received: 01/22/18 18:56
Logged In By: Brian Charon
Date Logged In: 01/23/18 07:40

Samples Received at: **2.6°C**
Custody Seals No Received On Ice Yes
Containers Intact Yes
COC/Labels Agree Yes
Preservation Confir No

Analysis	Due	TAT	Expires	Comments
T180257-01 SB-1-1.0' [Soil] Sampled 01/22/18 09:24 (GMT-08:00) Pacific Time (US &				
6010 Individual Metals	01/30/18 15:00	5	07/21/18 09:24	As and Pb only
8270C PAH	01/30/18 15:00	5	02/05/18 09:24	
T180257-02 SB-1-2.0' [Soil] Sampled 01/22/18 09:25 (GMT-08:00) Pacific Time (US &				
6010 Individual Metals	01/30/18 15:00	5	07/21/18 09:25	As and Pb only
8270C PAH	01/30/18 15:00	5	02/05/18 09:25	
T180257-03 SB-1-5.0' [Soil] Sampled 01/22/18 09:26 (GMT-08:00) Pacific Time (US &				
6010 Individual Metals	01/30/18 15:00	5	07/21/18 09:26	As and Pb only
8270C PAH	01/30/18 15:00	5	02/05/18 09:26	
T180257-04 SB-2-1.0' [Soil] Sampled 01/22/18 09:41 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				
T180257-05 SB-2-2.0' [Soil] Sampled 01/22/18 09:42 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				
T180257-06 SB-2-5.0' [Soil] Sampled 01/22/18 09:47 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T180257

Client: ARCADIS -- Irvine
Project: Centerpointe
Project Manager: Rose Fasheh
Project Number: CM011971.0001

Analysis	Due	TAT	Expires	Comments
T180257-07 SB-3-1.0' [Soil] Sampled 01/22/18 09:59 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				
T180257-08 SB-3-2.0' [Soil] Sampled 01/22/18 10:00 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				
T180257-09 SB-3-5.0' [Soil] Sampled 01/22/18 10:04 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				

Reviewed By

Date

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T180257

Client: ARCADIS -- Irvine
Project: Centerpointe
Project Manager: Rose Fasheh
Project Number: CM011971.0001

Report To:
ARCADIS -- Irvine
Janet Holtz
320 Commerce, Suite 200
Irvine, CA 92602

Date Due: 01/30/18 17:00 (5 day TAT)
Received By: Jeanny Huynh
Date Received: 01/22/18 18:56
Logged In By: Brian Charon
Date Logged In: 01/23/18 07:30

Samples Received at: **2.6°C**
Custody Seals No Received On Ice Yes
Containers Intact Yes
COC/Labels Agree Yes
Preservation Confir No

Analysis	Due	TAT	Expires	Comments
T180257-01 SB-1-1.0' [Soil] Sampled 01/22/18 09:24 (GMT-08:00) Pacific Time (US &				
6010 Individual Metals	01/30/18 15:00	5	07/21/18 09:24	As & Pb only
8270C PAH	01/30/18 15:00	5	02/05/18 09:24	
T180257-02 SB-1-2.0' [Soil] Sampled 01/22/18 09:25 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				
T180257-03 SB-1-5.0' [Soil] Sampled 01/22/18 09:26 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				
T180257-04 SB-2-1.0' [Soil] Sampled 01/22/18 09:41 (GMT-08:00) Pacific Time (US &				
6010 Individual Metals	01/30/18 15:00	5	07/21/18 09:41	As & Pb only
8270C PAH	01/30/18 15:00	5	02/05/18 09:41	
T180257-05 SB-2-2.0' [Soil] Sampled 01/22/18 09:42 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				
T180257-06 SB-2-5.0' [Soil] Sampled 01/22/18 09:47 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T180257

Client: ARCADIS -- Irvine
Project: Centerpointe
Project Manager: Rose Fasheh
Project Number: CM011971.0001

Analysis	Due	TAT	Expires	Comments
T180257-07 SB-3-1.0' [Soil] Sampled 01/22/18 09:59 (GMT-08:00) Pacific Time (US &				
6010 Individual Metals	01/30/18 15:00	5	07/21/18 09:59	As & Pb only
8270C PAH	01/30/18 15:00	5	02/05/18 09:59	
T180257-08 SB-3-2.0' [Soil] Sampled 01/22/18 10:00 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				
T180257-09 SB-3-5.0' [Soil] Sampled 01/22/18 10:04 (GMT-08:00) Pacific Time (US &				**HOLD**
[NO ANALYSES]				

Reviewed By

Date

ARCADIS Design & Consultancy for natural and built assets

Arcadis U.S., Inc.

320 Commerce

Suite 200

Irvine, California 92602

Tel 714 730 9052

Fax 714 730 9345

www.arcadis.com

DRAINAGE STUDY

For

CENTERPOINTE INDUSTRIAL

NWC OF FREDERICK STREET AND BRODIAEA AVENUE
MORENO VALLEY, CA 92557

Prepared for:

Newcastle Partners
4740 Green River Road, Suite 118
Corona, Ca 92880

Prepared by:

R·E·C
Consultants, Inc.

Luis A. Magallon Bejarano, PE
REC Consultants, Inc
2442 Second Avenue
San Diego, CA 92101
Telephone: 619-232-9200

Report Prepared:

REGISTERED PROFESSIONAL ENGINEER
LUIS ALEJANDRO MAGALLON BEJARANO
No. 88820
EXP. 6/30/20
CIVIL
STATE OF CALIFORNIA

January 30, 2018
Revised April 5, 2018
Updated May 30, 2018

Table of Contents

List of Tables

EXECUTIVE SUMMARY

Introduction

The purpose of this report is to demonstrate the results of a rational method analysis for both the existing and post development project conditions. The project is tying into two (2) existing storm drains, West and East, along Brodiaea Aveune. The existing storm drains have a capacity per City of Moreno Valley As-Built Drawing 4-888. As such, the report will also demonstrate that the project runoff will not exceed the capacity of the eastern receiving system. Developed conditions' runoff from the northern-adjacent parcel is to be conveyed thru the western portion of the Centerpointe project site. Thus this report will also demonstrate that the offsite runoff will not exceed the capacity of the western receiving system.

Detailed hydraulic design calculations are provided in Appendix 4 of this report.

Project Description

The Centerpointe project is an industrial development project that will be constructed at the intersection Frederick Street and Brodiaea Avenue. The project includes the construction of a new building, parking lot and other amenities.

Existing and Proposed Conditions

The existing project site is an undeveloped vacant lot. The site currently sheet flows in a southwesterly direction to one (1) of two (2) inlets which then confluence in the existing stormdrain beneath Brodiaea Avenue. As mentioned previously, both inlets have a receiving capacity per City of Moreno Valley As-Built Drawing 4-888.

In the proposed condition the site will add one new building, parking lot, and associated landscaping. The site will also preserve the southern sheet flow drainage pattern. Low flows (i.e. water quality and HMP) will be conveyed into a bioretention area or underground system with pumps to be detained and treated onsite. Please refer to the project WQMP and HMP study for analysis and results as these are outside the scope of this report.

High flows (i.e. Q100) are to be conveyed directly to the receiving inlets via combination of overland flow and stormdrain. Note that no detention/routing is necessary as the receiving laterals have sufficient capacity to convey the unmitigated runoff.

For the purpose of this study, the total area will be analyzed as two areas in existing and proposed conditions using the Rational Method as explained in the Riverside County Flood Control and Water Conservation District (RCFCWCD) Hydrology Manual (HM). These areas correspond to the tributary areas to the receving storm drains. Information about the method is included in the appendices. A proposed condition's maps can be seen in Appendix 1.

General Hydrologic Considerations

Rainfall intensities have been obtained from the Hydrology Manual (HM) Plate D-4.1, see Table 1.

TABLE 1 – HYDROLOGY MANUAL PRECIPITATION VALUES

Event	P (inch/hr)	Source
10-yr, 1-hr	0.82	Plate D-4.1
100-yr, 1-hr	1.20	Plate D-4.1

Existing Conditions Hydrology

As previously mentioned, the City of Moreno Valley As-Built Drawing 4-888 shows the receving capacity for both storm drain inlets that the project will tie into. See Table 2 below. Please see the approved As-Built provided in Appendix 1.

TABLE 2 – EXISTING CONDITIONS HYDROLOGY

Receiving Storm Drain Location	Capacity (cfs)*
West	22.1
East	21.7

*Note: Values are per City of Moreno Valley Approved As-Built Drawing 4-888. See Appendix 1.

Proposed Conditions Hydrology

The application of the Rational Method for the post-development tributary areas to the receving storm drains allows for the determination of peak flows for the storms indicated. Results for the proposed conditions-unmitigated flows are shown in Table 3. Note that routing is not necessary as the receiving storm drain has sufficient capacity to convey the undetained runoff. The project area was divided into two areas. The peak flows were then calculated and conservatively summed at Inlet East.

TABLE 3 – PROPOSED CONDITIONS HYDROLOGY – UNMITIGATED

DMA	10-Year, 1-hr	100-Year, 1-hr
	Peak (cfs)	Peak (cfs)
West	7.6	11.3
East	7.0	10.3
Total	**14.6**	**21.6***

*Note: The capacity of Inlet East is 22.1cfs as per City of Moreno Valley As-Built Drawing 4-888. Routing of onsite flows is not necessary.

Offsite flows

As previously mentioned, there is an adjacent parcel to the north of the project site. The parcel's runoff, both existing and proposed, is to be conveyed thru the western porton of the Centerpointe project site to the receiving western storm drain. The Centerpointe project will provide a means to convey such flows through the project site.

A preliminary rational method analsysis assuming similar characteristics to the Centerpointe project was performed for the adjacent parcel. Results can be seen in Table 4 below.

TABLE 4 – OFFSITE PROPOSED CONDITIONS HYDROLOGY – UNMITIGATED

Offsite Location	10-Year, 1-hr	100-Year, 1-hr
	Peak (cfs)	Peak (cfs)
North	13.5	19.9

It should be noted that the proposed project analyzed here is providing one (1) 24" stormdrain to receive and convey the future runoff from the northern property.

Conclusion

The existing western and eastern inlets have sufficient capacity to convey the unmitigated offsite (west) and onsite (east) post development 100-yr peak flows. Therefore no mitigation is necessary. Additionally, the project provides a means to convey offsite project flows thru the project site into inlet west.

APPENDIX LIST

Appendix 1: Maps

Appendix 2: RCFCWCD-Hydrology Manual

Appendix 3: Post-Development Rational Method Calculations

Appendix 4: Hydraulic Calculations

APPENDIX 1: MAPS

NOTE:
CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE PROPOSED STORM DRAIN UNLESS OTHERWISE NOTED.

PROFILE SCALE
VERTICAL: 1"=4'
HORIZONTAL: 1"=40'

FINISHED SURFACE OVER CL PIPE
EXISTING GROUND OVER CL PIPE
PRIVATELY MAINTAINED
(TO BE MAINTAINED BY CITY OF MORENO VALLEY)

STA.11+86.22 CL MANHOLE RIM=1555.56*
STA.12+73.92 CL MANHOLE RIM=1556.08*
STA.14+13.57 CL MANHOLE RIM=1556.03*
STA.16+92.16 CL MANHOLE RIM=1558.99
STA.19+18.09 CL MANHOLE RIM=1557.96

1-4" ELEC. CONDUIT & 1-2" ELEC. CONDUIT PROTECT IN PLACE
1-4" ELEC. CONDUIT PROTECT IN PLACE
7" WATER
6" WATER
12" W
EX. 30" GAS*
EX. 21" SEWER
8" SEWER
CONCRETE ENCASEMENT
FLARED END SECTION (2 EA)
R/W

HGL100
LAT P-2 1554.72
LAT P-1 1553.18

HYDRAULIC DATA
V100 = 4.6 FPS
Q100 = 44.2 CFS
85.04 LF 42" RCP (1800 -D)

HYDRAULIC DATA
V100 = 6.1 FPS
Q100 = 44.2 CFS
80.21 LF 5'x1.5" RCB

HYDRAULIC DATA
V100 = 6.6 FPS
Q100 = 44.2 CFS

HYDRAULIC DATA
V100 = 3.3 FPS
Q100 = 23.2 CFS
144.83 LF 36" RCP (1800 -D)

HYDRAULIC DATA
V100 = 3.3 FPS
Q100 = 23.2 CFS
220.43 LF 36" RCP (1800 -D)

HYDRAULIC DATA
V100 = 13.2 FPS
Q100 = 22.8 CFS
6.46 LF 36" RCP (2000 -D)
24.48 LF 3-12" D.I.P.
HYDRAULIC DATA
V100 = 9.7 FPS
Q100 = 22.8 CFS

38.75 LF 42" RCP (1800 -D)
HYDRAULIC DATA
V100 = 4.6 FPS
Q100 = 44.2 CFS

38.79 LF 36" RCP (1800 -D)
HYDRAULIC DATA
V100 = 6.3 FPS
Q100 = 44.2 CFS

6.00 LF 5'x2' RCB
HYDRAULIC DATA
V100 = 4.5 FPS
Q100 = 44.2 CFS

4.00 LF 36" RCP (1800 -D)
HYDRAULIC DATA
V100 = 4.6 FPS
Q100 = 44.2 CFS

12.09 LF 2-15" RCP (CLASS IV, 2000-D)

1+36.38 1554.15
HYDRAULIC DATA
V100 = 0.1 FPS
Q100 = 0.4 CFS
30.84 LF 24" RCP CL IV (2000-D)

1+08.54 EL. R=1554.24 1+01.54 EL. S=1553.18

1+60.30 1552.72
HYDRAULIC DATA
V100 = 11.4 FPS
Q100 = 221.1 CFS
61.79 LF 24" RCP (CLASS IV, 2000-D)

1+63.69 1554.92

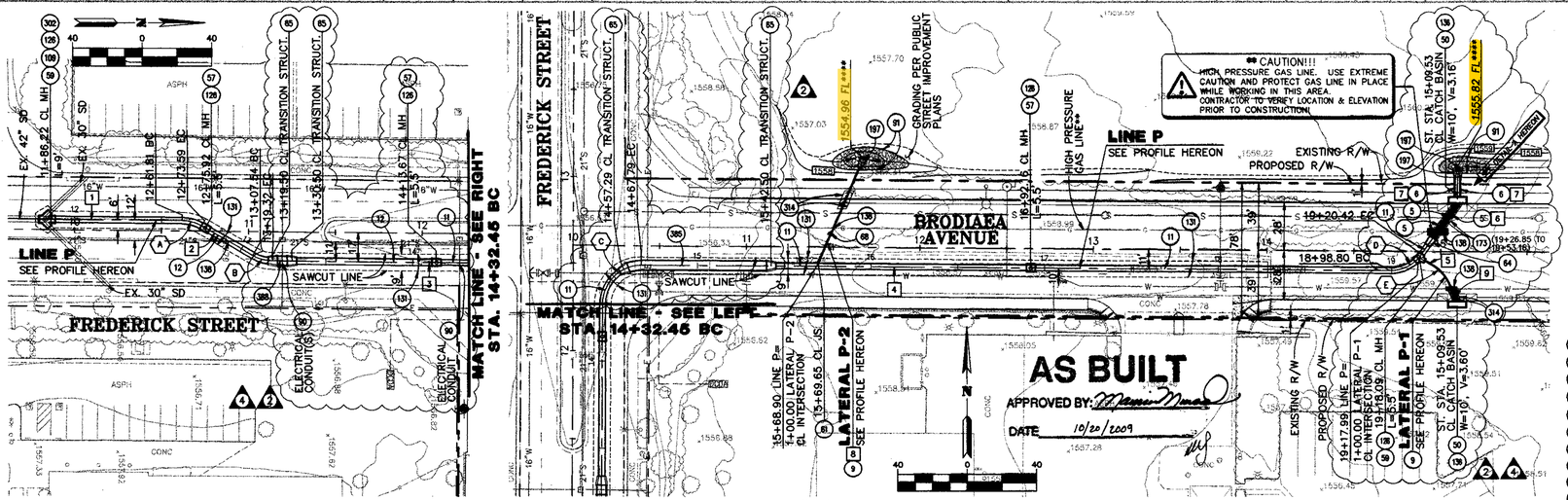
LINE P
(TO BE MAINTAINED BY CITY OF MORENO VALLEY)

LATERAL P-1
(TO BE MAINTAINED BY CITY OF MORENO VALLEY)

LATERAL P-2

**** NOTE:
WORK OUTSIDE OF PUBLIC RIGHT-OF-WAY CANNOT COMMENCE UNTIL LETTER OF CONSENT HAS BEEN OBTAINED. PLUG PIPE AT RIGHT-OF-WAY, ON PUBLIC SIDE.

** CAUTION!!!
HIGH PRESSURE GAS LINE. USE EXTREME CAUTION AND PROTECT GAS LINE IN PLACE WHILE WORKING IN THIS AREA. CONTRACTOR TO VERIFY LOCATION & ELEVATION PRIOR TO CONSTRUCTION.

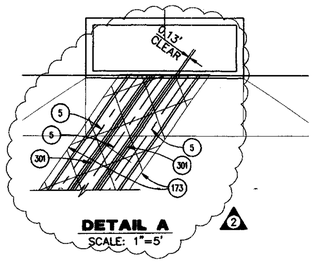


COURSE DATA

	BEARING	DISTANCE
1	N00°25'44"E	75.50'
2	N30°25'44"E	33.94'
3	N00°25'44"E	113.13'
4	N89°34'09"W	431.01'
5	N60°03'39"W	5.65'
6	N35°21'27"E	35.93'
7	N00°25'51"E	13.33'
8	N23°27'25"E	62.69
9	N24°39'43"W	11.28'

CURVE DATA

	Δ	R	L	T
A	30°00'00"	22.50'	11.78'	6.03'
B	30°00'00"	22.50'	11.78'	6.03'
C	90°00'07"	22.50'	35.34'	22.50'
D	55°04'23"	22.50'	21.63'	11.73'
E	35°23'55"	22.50'	13.90'	7.18'



NOTE:
LATERAL P-1, P-2 TO BE MAINTAINED BY THE CITY OF MORENO VALLEY WITHIN PUBLIC RIGHT OF WAY. STORM DRAIN OUTSIDE PUBLIC R/W TO BE PRIVATELY MAINTAINED.

* NOTE:
HORIZONTAL AND VERTICAL LOCATIONS TO BE VERIFIED IN THE FIELD AND ENGINEER NOTIFIED OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

MANHOLE & JUNCTION STRUCTURE DATA TABLE

S.D. MAINLINE STA.	STRUCTURE TYPE	LATERAL	ANGLE "A"	B	C	D1	D2	EL. S	EL. R
11+86.22	MH	EX.	45°00'00"	30"	3.5'	42"	42"	1548.03	*
15+69.65	IS	P-2	96°36'28"	24"	-	36"	36"	1550.28	-
19+18.09	MH	P-1	78°22'38"	24"	2	36"	36"	1553.18	1553.24

CONSTRUCTION NOTES
(5) INSTALL 12" DUCTILE IRON PIPE (PROFILE AS SHOWN ON PLANS)
(6) INSTALL 15" RCP (CLASS IV, 2000-D), PROFILE AS SHOWN ON PLANS
(9) INSTALL 24" RCP (CLASS IV, 2000-D), PROFILE AS SHOWN ON PLANS
(11) INSTALL 36" RCP (D-LOAD AND PROFILE AS SHOWN ON PLANS)
(12) INSTALL 42" RCP (D-LOAD AND PROFILE AS SHOWN ON PLANS)

CONSTRUCTION NOTES CONT'D
(91) INSTALL RIP-RAP PER CALTRANS SPECIFICATIONS AND RIP-RAP DATA TABLE
(105) REMOVE EXISTING MANHOLE STRUCTURE
(106) ADJUST MANHOLE RIM TO GRADE AFTER FINAL SURFACE HAS BEEN INSTALLED
(131) REPLACE PAVEMENT SECTION PER DETAIL ON SHEET 21
(135) FOR CONSTRUCTION OF LOCAL DEPRESSION SEE PUBLIC STREET IMPROVEMENT PLANS
(136) CONSTRUCT BLANKET PROTECTION PER APWA STD. PLAN 225-1
(173) CONSTRUCT CONCRETE ENCASEMENT FOR STORM DRAIN PIPE PER DETAIL ON SHEET 22
(197) INSTALL FLARED END SECTION PER CALTRANS STD. PLAN D94
(301) INSTALL CONCRETE SLURRY BETWEEN PIPES
(302) PROTECT EXISTING LATERALS AND MAINLINE PIPING IN PLACE
(314) PROVIDE FULL DEPTH AC OVER MIN. 3" CONCRETE SLURRY OVER PIPE
(385) CONSTRUCT 5'x1.5' RCB PER CALTRANS STD. PLAN D80
(386) CONSTRUCT 5'x2' RCB PER CALTRANS STD. PLAN D80

(50) CONSTRUCT CATCH BASIN PER R.C.F.C. & WCD STD. PLAN CB100 (WIDTH & V-DEPTH PER PLAN)
(57) CONSTRUCT MANHOLE No.2 PER R.C.F.C. & WCD STD. PLAN MH252
(59) CONSTRUCT MANHOLE No.4 PER R.C.F.C. & WCD STD. PLAN MH254
(64) CONSTRUCT TRANSITION STRUCTURE PIPE TO PIPE PER R.C.F.C. & WCD STD. PLAN TS303
(65) CONSTRUCT TRANSITION STRUCTURE No.1 PER R.C.F.C. & WCD STD. PLAN TS301
(68) CONSTRUCT CONCRETE COLLAR FOR RCP PER R.C.F.C. & WCD STD. PLAN M803

CITY OF MORENO VALLEY APPROVALS
LINE P

PREM KUMAR
DEPT. PUBLIC WORKS DIR./ASST. CITY ENGINEER
R.C.E. NO. C52463
DATE 10/20/11

CHRIS V. VOGT
PUBLIC WORKS DIRECTOR/CITY ENGINEER
R.C.E. NO. C44250
DATE 10/20/11

DIGALERT
DIAL TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

REGISTERED PROFESSIONAL ENGINEER MAURICE H. MURAD NO. 33366 EXPIRATION 6-30-2010 CIVIL STATE OF CALIFORNIA

HUITT-ZOLLARS
Huitt-Zollars, Inc. Ontario
3990 CONCOURS, SUITE 450 * ONTARIO, CALIFORNIA 91764 * (909) 941-7799
PREPARED UNDER THE SUPERVISION OF: MAURICE H. MURAD
R.C.E. 33366 EXPIRES 6-30-10 DATE 10/20/09

PERMANENT BENCH MARK
B.M. NO. M-61-69 ELEV. 1569.963
LOCATION:
AT THE NORTHWEST CORNER OF FREDERICK STREET AND ALESSANDRO BLVD. 175 FEET WEST OF FREDERICK STREET, 46 FEET NORTH OF ALESSANDRO BLVD. 4 FEET SOUTHWEST OF A GAS STATION LIGHT STANCHION AT THE SOUTH END AND INSIDE OF A 4 INCH HIGH CONCRETE PLANTER SET A BRASS DISK MARKED M-61-69 IN THE TOP OF A CONCRETE POST "NO MARKER POST SET"

REVISIONS

REF.	DESCRIPTION	APPR.	DATE
1	AS BUILT/RECORD DRAWING		10/20/11
2	REVISED STORM DRAIN TO CLEAR EXISTING UTILITY LINE		

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

DESIGNED BY: M.H.M.
DRAWN BY: H-Z STAFF
DATE DRAWN: 7-2008
CHECKED BY: M.H.M.

RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

LINE P
STA. 11+88.55 TO STA. 19+73.36
LATERALS P-1 & P-2

PROJECT NO. 4-0-00737
DRAWING NO. 4-888
SHEET NO. 15A OF 22

OCT. 15, 2009 16:45 M:\PROJ\1002400\12RHS.DWG

AREA OFFSITE = 8.9AC	
EVENT	PEAK (CFS)
10-YR, 1-HR	13.50
100-YR, 1-HR	19.90
FLOWS TO BE DIRECTED TO RECEIVING INLET LOCATED NEAR THE NORTHWEST CORNER OF THE CENTERPOINTE PROJECT SITE FOR CONVEYANCE TO THE WESTERN-RECEIVING INLET. CAPACITY OF RECEIVING INLET IS 21.7CFS	

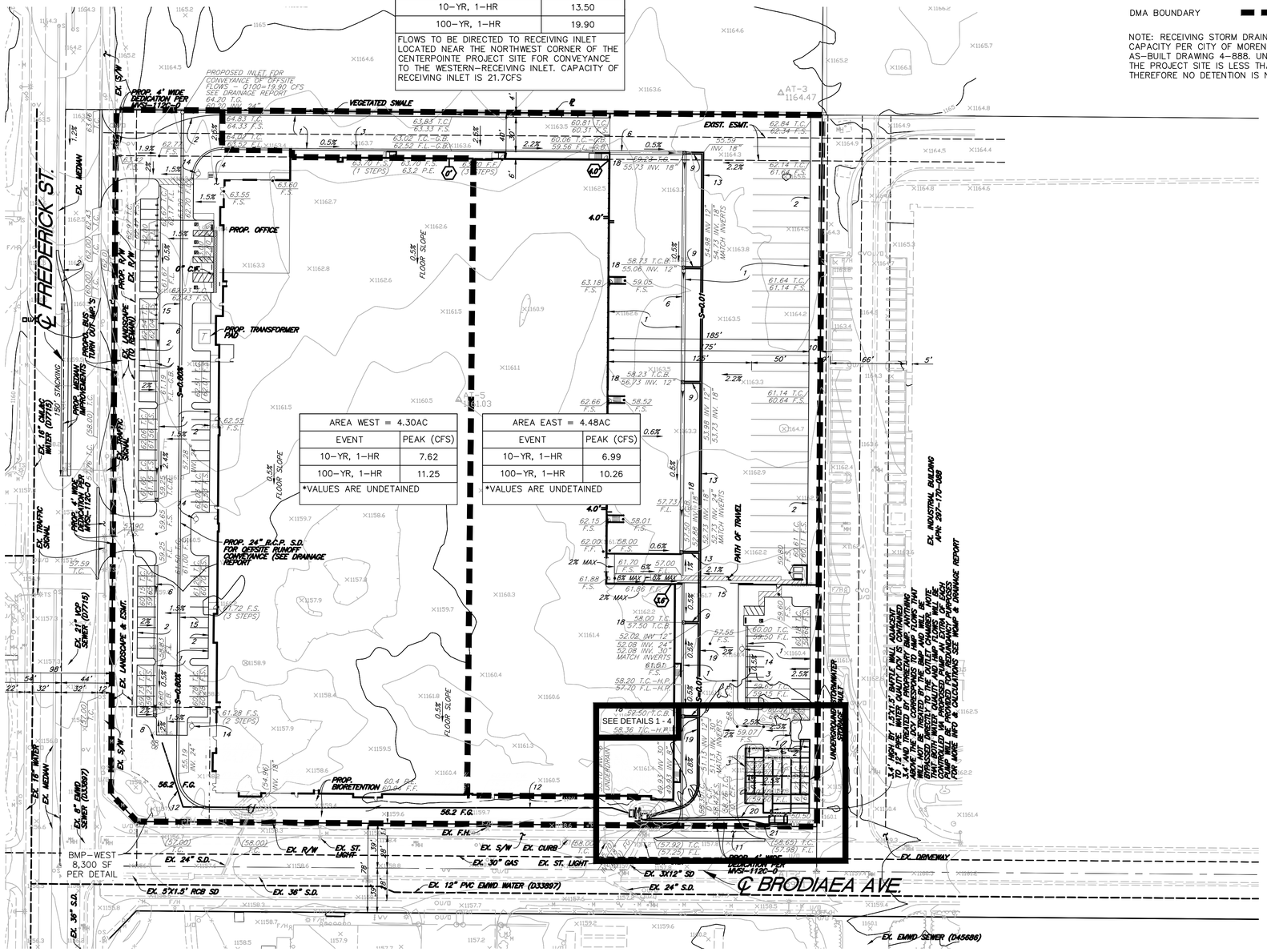
AREA WEST = 4.30AC	
EVENT	PEAK (CFS)
10-YR, 1-HR	7.62
100-YR, 1-HR	11.25
*VALUES ARE UNDETAINED	

AREA EAST = 4.48AC	
EVENT	PEAK (CFS)
10-YR, 1-HR	6.99
100-YR, 1-HR	10.26
*VALUES ARE UNDETAINED	

LEGEND

DMA BOUNDARY

NOTE: RECEIVING STORM DRAINS HAVE A SPECIFIED CAPACITY PER CITY OF MORENO VALLEY APPROVED AS-BUILT DRAWING 4-888. UNMITIGATED RUNOFF FROM THE PROJECT SITE IS LESS THAN THE CAPACITY THEREFORE NO DETENTION IS NECESSARY.



SCALE: 1" = 50'

REVISIONS			
NO.	DESCRIPTION	DATE	APP'D

R·E·C Consultants, Inc.
Civil Engineering · Environmental
Land Surveying
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

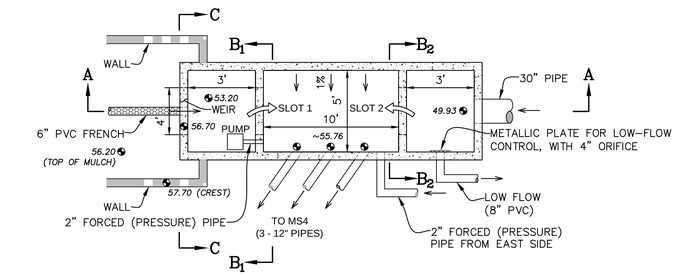
DATE: 02/05/18
SCALE: 1" = 20'
DRAWN: J.M.W.
CHECKED: B.A.R.

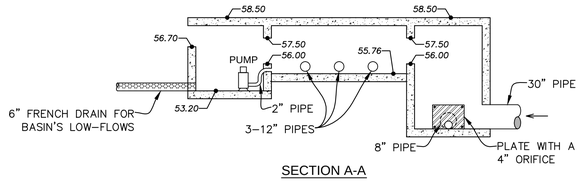
SHEET TITLE: PROPOSED HYDROLOGY

PROJECT: CENTERPOINTE INDUSTRIAL
FREDERICK ST. AND BRODIAEA AVE.
MORENO VALLEY, CA 92557

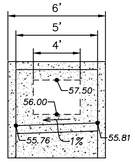
SHEET 1 OF 2 SHEETS

SAVE DATE: 6/11/2018 ~ PLOT DATE: 6/12/2018 ~ FILE NAME: P:\Acad\1379 SDH --- Newcastle Centerpointe\Reports\WQMP\180328_1379-Drainage --- Standard\180328_1379-Drainage.dwg

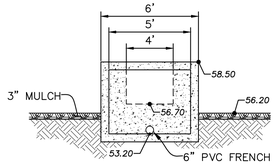




SECTION A-A

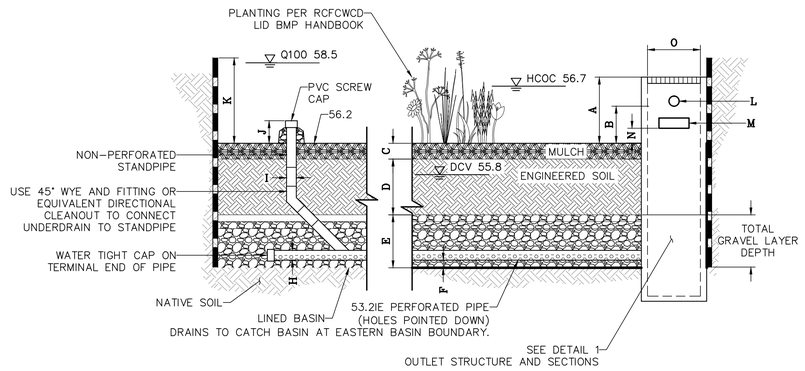


SECTION B1-B1 SLOT DETAILS
(SLOT 1 = SLOT 2) = SECTION B2-B2



SECTION C-C

NOTE:
FOR MODULAR WETLAND, UNDERGROUND SYSTEM & PRESSURE SYSTEM FOR EAST SIDE, SEE DETAIL 2.



TABULATED DATA
BASIN WEST

A	9"
B	N/A"
C	3"
D	24"
E	12"
F	3"
G	N/A
H	6"
I	6"
J	6"
K	4.3'
L	SEE DETAIL 1
M	N/A
N	N/A
O	SEE DETAIL 1
P	N/A

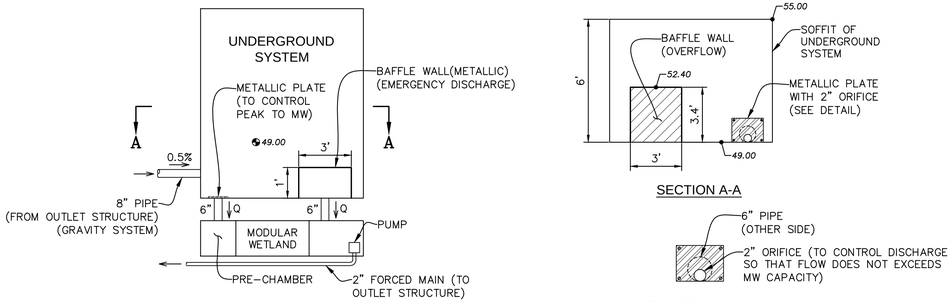
NOTE: ALL SPECIFICATIONS PER LID BMP MANUAL FACT SHEET FOR BIORETENTION BMP

BMP TABLE

BMP #	TYPE	SIZE (SqFt)	ORIFICE SIZE
WEST	BIORETENTION BASIN	8,300	N/A

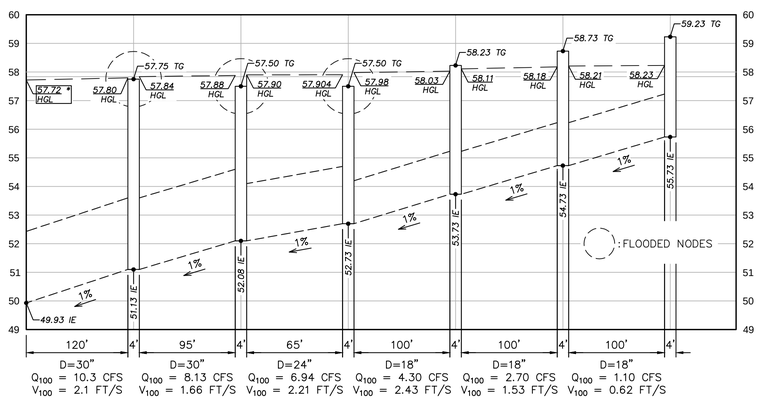
1 OUTLET & SECTIONS
NOT TO SCALE

3 BMP WEST (BIORETENTION)
NOT TO SCALE



SECTION A-A

ORIFICE DETAIL



* – HGL (HYDRAULIC GRADIENT LINE) SET PER CITY OF MORENO VALLEY APPROVED PLANS (57.60) PLUS ENERGY LOSS TO CONVEY Q_{100} THRU 1.5'x4' RECTANGULAR SLOT (0.12'). HGL VALUES PER WSPG PRINTOUT. SEE PROJECT DRAINAGE STUDY.

2 UNDERGROUND SYSTEM DETAIL
NOT TO SCALE

SITE SPECIFIC DATA

PROJECT NUMBER		7211	
PROJECT NAME		MORENO VALLEY INDUSTRIAL	
PROJECT LOCATION		MORENO VALLEY, CA	
STRUCTURE ID		BASIN B	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
8,575		N/A	
TREATMENT HGL AVAILABLE (FT)			N/A
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	1550.50	PVC	6"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	1550.00	PVC	6"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	1558.00	1558.00	1558.00
SURFACE LOAD	H20 IN-DIRECT	H20 IN-DIRECT	H20 IN-DIRECT
FRAME & COVER	ø30"	30" X 48"	ø24"
WETLANDMEDIA VOLUME (CY)			5.58
WETLANDMEDIA DELIVERY METHOD			PER CONTRACT
ORIFICE SIZE (DIA. INCHES)			ø1.03"

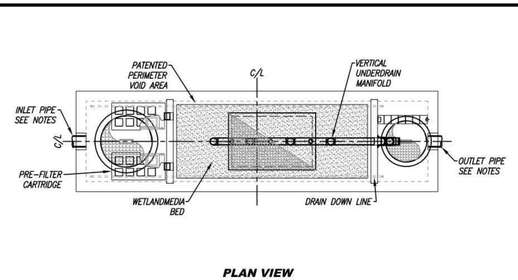
NOTES: PRELIMINARY; NOT FOR CONSTRUCTION. ENGINEER TO SET UPSTREAM BYPASS AT 1553.48.

INSTALLATION NOTES

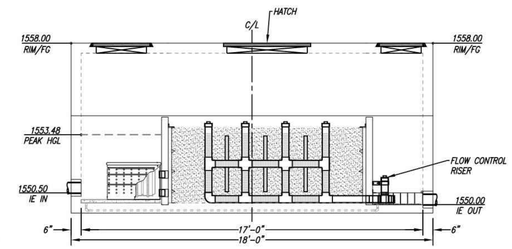
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS' CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS' STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING MODULAR WETLANDS FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A MODULAR WETLANDS REPRESENTATIVE.

GENERAL NOTES

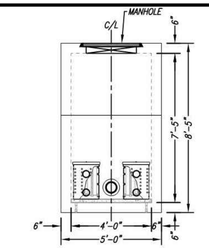
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.



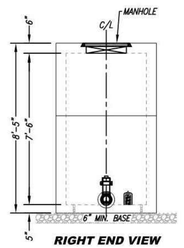
PLAN VIEW



ELEVATION VIEW



LEFT END VIEW



RIGHT END VIEW

REQUIRED TREATMENT VOLUME (CF)	8575
DRAINDOWN DURATION (HOURS)	46
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	23.34
OPERATING HEAD (FT)	3.4
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	OR 0.26

THE PRODUCT DESCRIBED MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MODULAR WETLANDS SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MODULAR WETLANDS SYSTEMS IS PROHIBITED.

Bio Clean — A Forterra Company

MWS-L-4-17-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

4 MODULAR WETLAND
NOT TO SCALE

REVISIONS

NO.	DESCRIPTION	DATE	APP'D

R·E·C Consultants, Inc.
Civil Engineering · Environmental
Land Surveying
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

DATE: 02/05/18
SCALE: 1" = 20'
DRAWN: J.M.W.
CHECKED: B.A.R.

SHEET TITLE: DETAILS

PROJECT: CENTERPOINTE INDUSTRIAL
FREDERICK ST. AND BRODIAEA AVE.
MORENO VALLEY, CA 92557

SHEET 2 OF 2 SHEETS

SAVE DATE: 6/11/2018 ~ PLOT DATE: 6/12/2018 ~ FILE NAME: P:\Acad\1379 SDH — Newcastle Centerpointe\Reports\WQMP\180328_1379-Drainage — Standard\180328_1379-Drainage.dwg

APPENDIX 2: HM RATIONAL METHOD - METHODOLOGY

INSTRUCTIONS FOR RATIONAL METHOD HYDROLOGY CALCULATIONS

(Based on the Rational Formula, Q = CIA)

1. On map of drainage area, draw drainage system and block off subareas tributary to it.

2. Determine the initial time of concentration, "T", using Plate D-3. The initial area should be less than 10 acres, have a flow path of less than 1,000 feet, and be the most upstream subarea.

3. Using the time of concentration, determine "I", intensity of rainfall in inches per hour, from the appropriate intensity-duration curve for the particular area under study. For areas where standard curves are available, use Plates D-4.1 and D-4.2 to reproduce the standard curve. For areas where curves have not been published by the District, use Plates D-4.3 through D-4.7 to develop a suitable intensity-duration curve.

4. Determine "C", the coefficient of runoff, using the runoff coefficient curve which corresponds as closely as possible with the soil, cover type and development of the drainage area. Standard curves (Plates D-5.1 through D-5.4) have been developed by the District for the common case of urban landscaping type cover. Where these curves are not applicable, curves may be developed using Plates D-5.5 through D-5.8.

5. Determine "A", the area of the subarea in acres.

6. Compute Q = CIA for the subarea.

7. Measure the length of flow to the point of inflow of the next subarea downstream. Determine the velocity of flow in this reach for the peak Q in the type of conveyance being considered (natural channel, street, pipe, or open channel), using the tabling aids on Plates D-6 through D-9.

   Using the reach length and velocity determined above, compute the travel time, and add this time to the time of concentration for the previous subarea to determine a new time of concentration.

8. Calculate Q for the new subarea, using steps 3 through 6 and the new time of concentration. Determine "Q_p", the peak Q for all subareas tributary to the system to this point by adding Q for the new subarea to the summation of Q for all upstream subareas. Determine the time of concentration for the next subarea downstream using Step 7. Continue tabling downstream in similar fashion until a junction with a lateral drain is reached.

RCFC & WCD
HYDROLOGY MANUAL

RATIONAL METHOD
INSTRUCTIONS

PLATE D-1 (1 of 2)

9. Start at the upper end of the lateral and table its Q down to the junction with the main line, using the methods outlined in the previous steps.

10. Compute the peak Q at the junction. Let Q_A, T_A, I_A correspond to the tributary area with the longer time of concentration, and Q_B, T_B, I_B correspond to the tributary area with the shorter time of concentration and Q_p, T_p correspond to the peak Q and time of concentration.

a. If the tributary areas have the same time of concentration, the tributary Q's are added directly to obtain the combined peak Q.

$$Q_p = Q_A + Q_B \qquad T_p = T_A = T_B$$

b. If the tributary areas have different times of concentration, the smaller of the tributary Q's must be corrected as follows:

(1) The usual case is where the tributary area with the longer time of concentration has the larger Q. In this case, the smaller Q is corrected by a ratio of the intensities and added to the larger Q to obtain the combined peak Q. The tabling is then continued downstream using the longer time of concentration.

$$Q_p = Q_A + Q_B \frac{I_A}{I_B} \qquad T_p = T_A$$

(2) In some cases, the tributary area with the shorter time of concentration has the larger Q. In this case, the smaller Q is corrected by a ratio of the times of concentration and added to the larger Q to obtain the combined peak Q. The tabling is then continued downsteam using the shorter time of concentration.

$$Q_p = Q_B + Q_A \frac{T_B}{T_A} \qquad T_p = T_B$$

RCFC & WCD
HYDROLOGY MANUAL

RATIONAL METHOD
INSTRUCTIONS

PLATE D-1 (2 of 2)

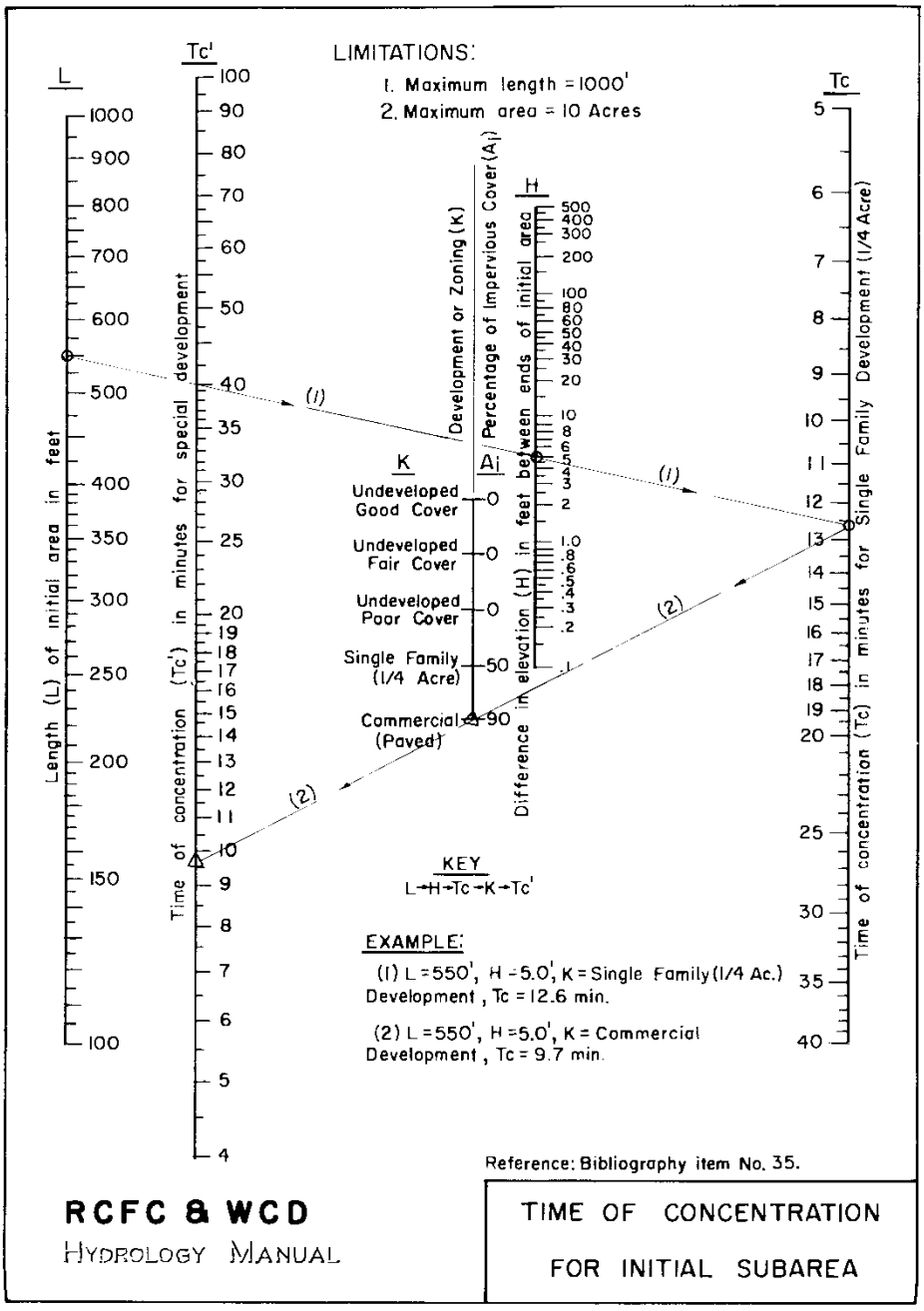


PLATE D-3

DMA WEST: L=600FT, H=8.0FT, K= COMMERCIAL DEVELOPMENT, TC=9.7MIN

DMA EAST: L=950FT, H=6.0FT, K= COMMERCIAL DEVELOPMENT, TC=13MIN

OFFSITE: L=750 FT, H=5.0FT, K= COMMERCIAL DEVELOPMENT, TC=11.5MIN

RAINFALL INTENSITY—INCHES PER HOUR

SUNNYMEAD - MORENO

DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	2.84	4.16
6	2.59	3.79
7	2.40	3.51
8	2.25	3.29
9	2.12	3.10
10	2.01	2.94
11	1.92	2.80
12	1.83	2.68
13	1.76	2.58
14	1.70	2.48
15	1.64	2.40
16	1.59	2.32
17	1.54	2.25
18	1.50	2.19
19	1.46	2.13
20	1.42	2.08
22	1.35	1.98
24	1.30	1.90
26	1.25	1.82
28	1.20	1.76
30	1.16	1.70
32	1.12	1.64
34	1.09	1.59
36	1.06	1.55
38	1.03	1.51
40	1.00	1.47
45	.95	1.39
50	.90	1.31
55	.86	1.25
60	.82	1.20
65	.79	1.15
70	.76	1.11
75	.73	1.07
80	.71	1.04
85	.69	1.01

SLOPE = .500

WOODCREST

DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	3.37	5.30
6	3.05	4.79
7	2.80	4.40
8	2.60	4.09
9	2.44	3.83
10	2.30	3.62
11	2.19	3.43
12	2.08	3.27
13	1.99	3.13
14	1.91	3.01
15	1.84	2.89
16	1.78	2.79
17	1.72	2.70
18	1.67	2.62
19	1.62	2.54
20	1.57	2.47
22	1.49	2.34
24	1.42	2.23
26	1.36	2.14
28	1.31	2.05
30	1.26	1.98
32	1.22	1.91
34	1.18	1.85
36	1.14	1.79
38	1.11	1.74
40	1.07	1.69
45	1.01	1.58
50	.95	1.49
55	.90	1.42
60	.86	1.35
65	.82	1.29
70	.79	1.24
75	.76	1.19
80	.73	1.15
85	.71	1.11

SLOPE = .550

RCFC & WCD
HYDROLOGY MANUAL

STANDARD
INTENSITY – DURATION
CURVES DATA

PLATE D-4.1 (6 of 6)

District analysis of all available recording rain gauge records in and near the District. This material is also discussed in Section B of this manual.

Coefficient of Runoff Curves - The coefficient of runoff is intended to account for the many factors which influence peak flow rate. The co-efficient depends on the rainfall intensity, soil type and cover, percentage of impervious area, antecedent moisture condition, etc. To account for the difference between actual and effective impervious area it is assumed the maximum runoff rate which can occur from impervious surfaces is 90-percent of the rainfall rate. The runoff from pervious surfaces is further reduced by infiltration. Runoff coefficient curves can be developed using the relationship:

$$C = 0.9\left[A_i + \frac{I - F_p}{I} A_p\right]$$

where:

C = Runoff coefficient

I = Rainfall intensity - inches/hour

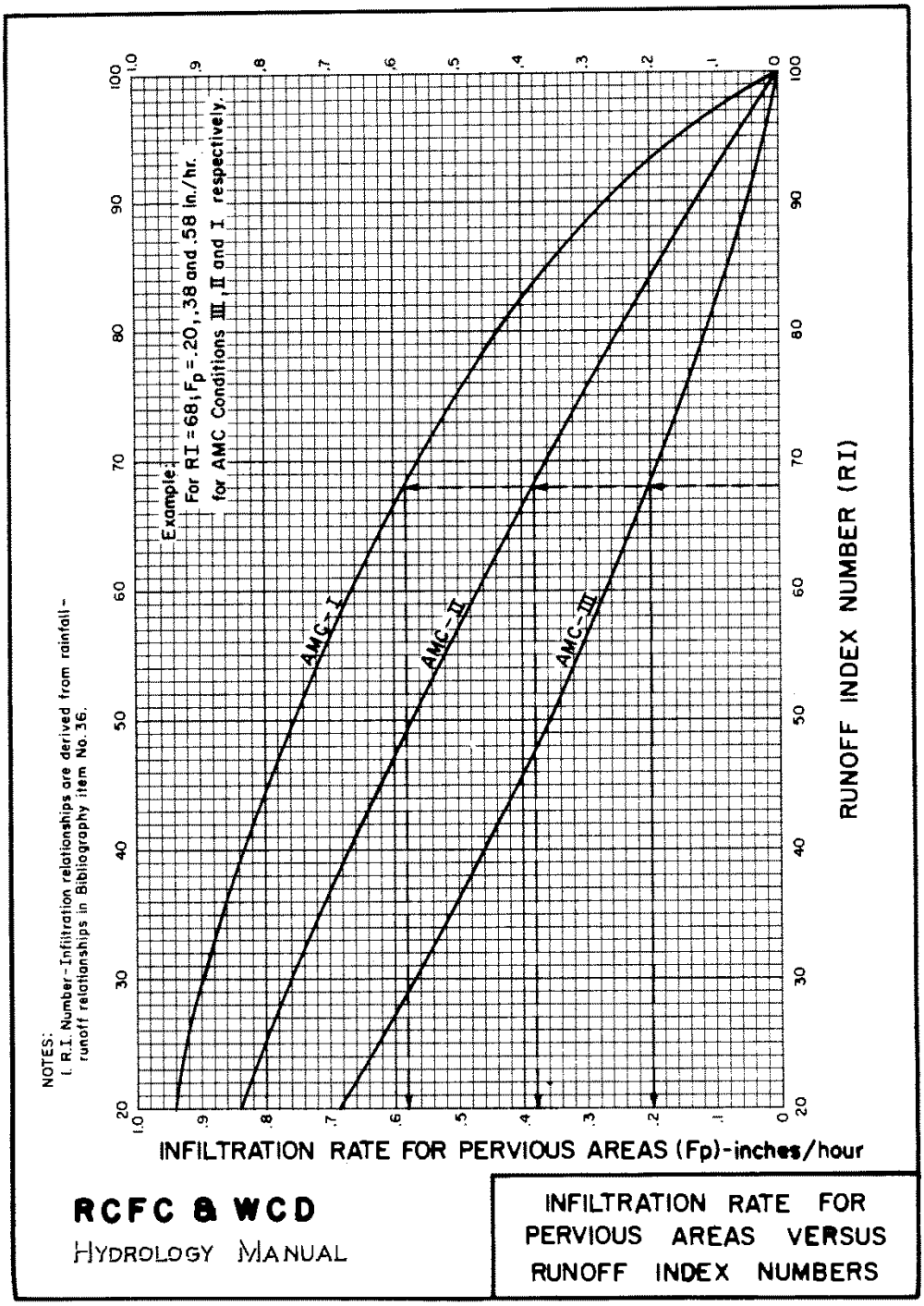
F_p = Infiltration rate for pervious areas - inches/hour

A_i = Impervious area (actual) - decimal percent

A_p = Pervious area (actual) - decimal percent

and $A_p = 1.00 - A_i$

The infiltration rate for pervious areas, "F_p", can be estimated using the methods discussed in Section C of this manual for various combinations of soil type, cover type and antecedent moisture condition (AMC). In practice it is not necessary for the engineer to make these computations, as runoff coefficient curve data has been tabulated by the District on Plate D-5.7 for the working range of runoff index (RI) numbers. Runoff coefficient curves can be developed for any combination of conditions by simply plotting the data from Plate D-5.7 on Plate D-5.8.



APPENDIX 3: POST DEVELOPMENT RATIONAL METHOD CALCULATIONS

10-year-1hr-WEST			Reference
C	0.869		Plate D-5.3
tc	9.7	min	Plate D-3
i	2.04	in/hr	Plate D-4.1
a	4.30	ac	
Q	7.62	cfs	

10-year-1hr-EAST			Reference
C	0.885		Plate D-5.3
tc	13	min	Plate D-3
i	1.76	in/hr	Plate D-4.1
a	4.48	ac	
Q	6.99	cfs	

10-year-1hr-SUM 14.61 CFS

100-year-1hr-WEST			Reference
C	0.879		Plate D-5.3
tc	9.7	min	Plate D-3
i	2.98	in/hr	Plate D-4.1
a	4.30	ac	
Q	11.25	cfs	

100-year-1hr-EAST			Reference
C	0.890		Plate D-5.3
tc	13	min	Plate D-3
i	2.57	in/hr	Plate D-4.1
a	4.48	ac	
Q	10.26	cfs	

100-year-1hr-SUM 21.51 CFS

10-year-1hr-OFFSITE			Reference
C	0.871		Plate D-5.3
tc	13.3	min	Plate D-3
i	1.74	in/hr	Plate D-4.1
a	8.90	ac	
Q	13.5	cfs	

100-year-1hr-OFFSITE			Reference
C	0.880		Plate D-5.3
tc	13.3	min	Plate D-3
i	2.54	in/hr	Plate D-4.1
a	8.90	ac	
Q	19.9	cfs	

APPENDIX 4: HYDRAULIC CALCULATIONS

Grate inlet calculations based on weir formula

Inlet 1 (2'x2' box) Grated Inlet		
c	3.1	
L	4	ft (include Safety Factor of 2)
H	0.20	
Q	1.10	cfs

Inlet 2 (2'x2' box) Grated Inlet		
c	3.1	
L	4	ft (include Safety Factor of 2)
H	0.26	
Q	1.60	cfs

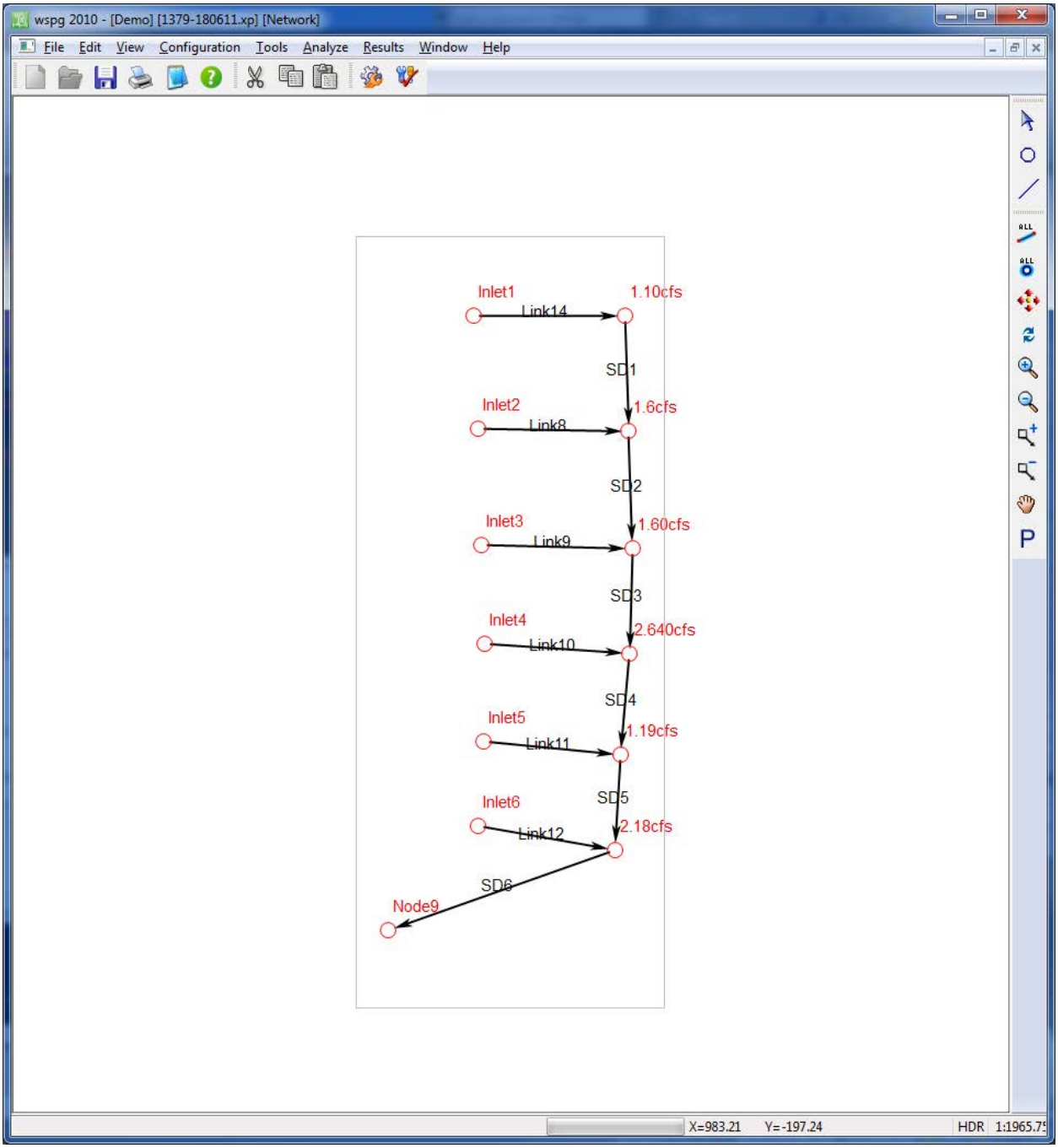
Inlet 3 (2'x2' box) Grated Inlet		
c	3.1	
L	4	ft (include Safety Factor of 2)
H	0.26	
Q	1.60	cfs

Inlet 4 (3'x3' box) Grated Inlet		
c	3.1	
L	6	ft (include Safety Factor of 2)
H	0.27	
Q	2.64	cfs

Inlet 5 (3'x3' box) Grated Inlet		
c	3.1	
L	6	ft (include Safety Factor of 2)
H	0.16	
Q	1.19	cfs

Inlet 6 (3'x3' box) Grated Inlet		
c	3.1	
L	4	ft (include Safety Factor of 2)
H	0.31	
Q	2.14	cfs

Storm Drain Analysis to obtain WSE performed with WSPG



```
************************************
Water Surface Profile Gradient (WSPG)
XP WSPG
Engine Version 1.3         06/09/2010
XP Software        www.xpsoftware.com
************************************

INPUT FILE
************************************
C:\XPS\wspg2010\Samples\1379-180611.wsx
Computed  06/12/18  09:13:54

TITLE INFORMATION
************************************

WARNING SUMMARY
************************************
 WARNING 48: Manning's n for pipe flow of element 1.6cfs not in recommended range 0.010 - 0.015.
 WARNING 48: Manning's n for pipe flow of element 1.60cfs not in recommended range 0.010 - 0.015.
 WARNING 48: Manning's n for pipe flow of element 2.640cfs not in recommended range 0.010 - 0.015.
 WARNING 48: Manning's n for pipe flow of element 1.19cfs not in recommended range 0.010 - 0.015.
 WARNING 48: Manning's n for pipe flow of element 2.18cfs not in recommended range 0.010 - 0.015.
 WARNING 36: D/S processing stopped in junction 1.10cfs because critical momentum is greater than maximum momentum.
 WARNING 36: D/S processing stopped in junction 1.6cfs because critical momentum is greater than maximum momentum.
 WARNING 36: D/S processing stopped in junction 1.60cfs because critical momentum is greater than maximum momentum.
 WARNING 36: D/S processing stopped in junction 2.640cfs because critical momentum is greater than maximum momentum.
 WARNING 36: D/S processing stopped in junction 1.19cfs because critical momentum is greater than maximum momentum.
 WARNING 36: D/S processing stopped in junction 2.18cfs because critical momentum is greater than maximum momentum.

RESULTS
************************************

================================================================
   Main Line
================================================================

 Composite Profile:

ELEMENT     TYPE        STATION     INVERT    GROUND    W.S.      DEPTH     Q         VELOC.    VELOC.    ENERGY     SUPER     CRITICAL  FROUDE    SLOPE     NORMAL    CROSS
NAME                                ELEV      ELEV      ELEV                                    HEAD      GRADE LN   ELEV      DEPTH     NUMBER                DEPTH     SECTION
----------  ----------  ----------  --------  --------  --------  --------  --------  -------   ------    ----------  ------    --------  ------    --------  ------    ---------
###
"Node9"     Outlet      0.00        49.93     58.00     57.720    7.790     10.31     2.10      0.07      57.79       0.000     1.073     0.000     0.00000   0.000     Pipe
"SD6"       Reach       120.00      51.13     57.75     *57.796   6.666     10.31     2.10      0.07      57.86       0.000     1.073     0.000     0.01000   0.854     Pipe
"2.18cfs"   Join        120.00      51.13     57.75     *57.842   6.712     8.13      1.66      0.04      57.88       0.000     0.948     0.000     0.00000   0.000     Pipe
"SD5"       Reach       215.00      52.08     57.50     *57.879   5.799     8.13      1.66      0.04      57.92       0.000     0.948     0.000     0.01000   0.755     Pipe
"1.19cfs"   Join        215.00      52.08     57.50     *57.900   5.820     6.94      1.41      0.03      57.93       0.000     0.874     0.000     0.00000   0.000     Pipe
"SD4"       Transition  280.00      52.73     57.50     *57.904   5.174     6.94      2.21      0.08      57.98       0.000     0.934     0.000     0.01000   0.000     Pipe
"2.640cfs"  Join        280.00      52.73     57.50     *57.976   5.246     4.30      1.37      0.03      58.00       0.000     0.728     0.000     0.00000   0.000     Pipe
"SD3"       Transition  380.00      53.73     58.23     58.027    4.297     4.30      2.43      0.09      58.12       0.000     0.795     0.000     0.01000   0.000     Pipe
"1.60cfs"   Join        380.00      53.73     58.23     58.113    4.383     2.70      1.53      0.04      58.15       0.000     0.623     0.000     0.00000   0.000     Pipe
"SD2"       Reach       480.00      54.73     58.73     58.179    3.449     2.70      1.53      0.04      58.22       0.000     0.623     0.000     0.01000   0.519     Pipe
"1.6cfs"    Join        480.00      54.73     58.73     58.214    3.484     1.10      0.62      0.01      58.22       0.000     0.392     0.000     0.00000   0.000     Pipe
"SD1"       Reach       580.00      55.59     59.23     58.225    2.635     1.10      0.62      0.01      58.23       0.000     0.392     0.000     0.00860   0.340     Pipe
"1.10cfs"   Junction    583.00      55.59     59.23     58.226    2.636     1.10      0.62      0.01      58.23       0.000     0.392     0.000     0.00000   0.000     Pipe
"Link14"    Reach       598.00      55.73     59.23     58.227    2.497     1.10      0.62      0.01      58.23       0.000     0.392     0.000     0.00933   0.333     Pipe
"Inlet1"    Headwrk     598.00      55.73     59.23     58.227    2.497     1.10      0.62      0.01      58.23       0.000     0.392     0.000     0.00000   0.000     Pipe

 *) in the W.S.ELEV column indicates flooding, it is set whenever W.S.ELEV > GROUND ELEV
    i.p. = intermediate point processing results for reaches
```

==========
1.6cfs_Link8
==========

Composite Profile:

ELEMENT NAME	TYPE	STATION	INVERT ELEV	GROUND ELEV	W.S. ELEV	DEPTH	Q	VELOC.	VELOC. HEAD	ENERGY GRADE LN	SUPER ELEV	CRITICAL DEPTH	FROUDE NUMBER	SLOPE	NORMAL DEPTH	CROSS SECTION
###																
"Outlet/1"	Outlet	480.00	54.73	58.73	58.197	3.467	1.60	0.91	0.01	58.21	0.000	0.475	0.000	0.00000	0.000	Pipe
"Link8"	Transition	495.00	55.06	58.73	58.172	3.112	1.60	2.04	0.06	58.24	0.000	0.536	0.000	0.02200	0.000	Pipe
"Inlet2"	Headwrk	495.00	55.06	58.73	58.172	3.112	1.60	2.04	0.06	58.24	0.000	0.536	0.000	0.00000	0.000	Pipe

*) in the W.S.ELEV column indicates flooding, it is set whenever W.S.ELEV > GROUND ELEV
i.p. = intermediate point processing results for reaches

==========
1.60cfs_Branch2
==========

Composite Profile:

ELEMENT NAME	TYPE	STATION	INVERT ELEV	GROUND ELEV	W.S. ELEV	DEPTH	Q	VELOC.	VELOC. HEAD	ENERGY GRADE LN	SUPER ELEV	CRITICAL DEPTH	FROUDE NUMBER	SLOPE	NORMAL DEPTH	CROSS SECTION
###																
"Outlet/1"	Outlet	380.00	53.73	58.23	58.070	4.340	1.60	0.91	0.01	58.08	0.000	0.475	0.000	0.00000	0.000	Pipe
"Link9"	Transition	395.00	56.73	58.23	58.046	1.316	1.60	2.04	0.06	58.11	0.000	0.536	0.000	0.20000	0.000	Pipe
"Inlet3"	Headwrk	395.00	56.73	58.23	58.046	1.316	1.60	2.04	0.06	58.11	0.000	0.536	0.000	0.00000	0.000	Pipe

*) in the W.S.ELEV column indicates flooding, it is set whenever W.S.ELEV > GROUND ELEV
i.p. = intermediate point processing results for reaches

==========
2.640cfs_Branch1
==========

Composite Profile:

ELEMENT NAME	TYPE	STATION	INVERT ELEV	GROUND ELEV	W.S. ELEV	DEPTH	Q	VELOC.	VELOC. HEAD	ENERGY GRADE LN	SUPER ELEV	CRITICAL DEPTH	FROUDE NUMBER	SLOPE	NORMAL DEPTH	CROSS SECTION
###																
"Outlet/2"	Outlet	280.00	52.73	57.50	*57.940	5.210	2.64	0.84	0.01	57.95	0.000	0.566	0.000	0.00000	0.000	Pipe
"Link10"	Transition	295.00	52.88	57.50	*57.927	5.047	2.64	1.49	0.03	57.96	0.000	0.616	0.000	0.01000	0.000	Pipe
"Inlet4"	Headwrk	295.00	52.88	57.50	*57.927	5.047	2.64	1.49	0.03	57.96	0.000	0.616	0.000	0.00000	0.000	Pipe

*) in the W.S.ELEV column indicates flooding, it is set whenever W.S.ELEV > GROUND ELEV
i.p. = intermediate point processing results for reaches

==========
1.19cfs_Branch1
==========

Composite Profile:

ELEMENT NAME	TYPE	STATION	INVERT ELEV	GROUND ELEV	W.S. ELEV	DEPTH	Q	VELOC.	VELOC. HEAD	ENERGY GRADE LN	SUPER ELEV	CRITICAL DEPTH	FROUDE NUMBER	SLOPE	NORMAL DEPTH	CROSS SECTION

```
###
"Outlet/1" Outlet     215.00     52.08    57.50    *57.889   5.809    1.19     0.24    0.00   57.89      0.000   0.354    0.000   0.00000  0.000    Pipe
"Link11"   Transition 227.00     55.50    57.50    *57.868   2.368    1.19     1.52    0.04   57.90      0.000   0.459    0.000   0.28500  0.000    Pipe
"Inlet5"   Headwrk    227.00     55.50    57.50    *57.868   2.368    1.19     1.52    0.04   57.90      0.000   0.459    0.000   0.00000  0.000    Pipe

 *) in the W.S.ELEV column indicates flooding, it is set whenever W.S.ELEV > GROUND ELEV
    i.p. = intermediate point processing results for reaches


============================================================
   2.18cfs_Branch1
============================================================

 Composite Profile:

ELEMENT    TYPE       STATION    INVERT   GROUND   W.S.      DEPTH    Q        VELOC.  VELOC.  ENERGY     SUPER   CRITICAL FROUDE  SLOPE    NORMAL   CROSS
NAME                             ELEV     ELEV     ELEV                         HEAD    GRADE LN   ELEV    DEPTH    NUMBER           DEPTH    SECTION
---------- ---------- ---------- -------- -------- --------  -------- -------- ------- ------ ---------- ------  -------- ------  -------  ------   ---------
###
"Outlet/2" Outlet     120.00     51.13    57.75    *57.819   6.689    2.18     0.44    0.00   57.82      0.000   0.482    0.000   0.00000  0.000    Pipe
 HYDRAULIC JUMP  at  129.83  of length  0.00
          jump data U/S processing: 129.83     64.77    71.39    64.880    0.111    2.18     45.57   32.24  97.12      0.000   0.630    33.934  1.38700  0.000    Pipe
          jump data D/S processing: 129.83     64.77    71.39    65.390    0.621    2.18     4.25    0.28   65.67      0.000   0.630    1.355   1.38700  0.000    Pipe
"Link12"   Transition 130.00     65.00    70.00    65.629    0.629    2.18     4.19    0.27   65.90      0.000   0.630    1.005   1.38700  0.000    Pipe
"Inlet6"   Headwrk    130.00     65.00    70.00    65.630    0.630    2.18     4.18    0.27   65.90      0.000   0.630    0.000   0.00000  0.000    Pipe

 *) in the W.S.ELEV column indicates flooding, it is set whenever W.S.ELEV > GROUND ELEV
    i.p. = intermediate point processing results for reaches
```

Detail 1: Outlet Structure and Sections

Runoff from DMA-West will be conveyed via street flow to the proposed bioretention basin. For Q100 purposes, the runoff will pond to an elevation greater than 56.70 at which point it will begin to spillover a 4-ft weir into a proposed box with a floor elevation of 53.20. Water will then pond to an elevation of 56.0 at which point it will spillover a proposed slot 4ft x 1.5ft into an adjacent box. The adjacent box contains the 3-12" diameter existing laterals (55.76 ie) which will receive and convey onsite runoff. Once the water level receeds to below 56.0, flows will be conveyed to the adjacent box via pump.

The aforementioned weir and slot were sized to convey the unmitigated Q100 runoff (11.3cfs) from DMA-West. The weir was sized per the weir formula. Due to the anticipated water level in the slot, the slot was sized using the orifice formula.

DMA-West

Weir			Slot		
			h:	1.5	ft
c	3.1		Q:	11.3	cfs
L	4	ft	cg:	0.61	
h	0.94	ft	Ah:	0.148	ft
Q	11.3				
			W:	4.00	ft

Runoff from DMA-East will be conveyed via street flow and storm drain to another proposed box with a floor elevation of 49.93. For Q100 purposes, the water will then pond to an elevation of 56.0 at which point it will spillover a proposed slot 4ft x 1.5ft into the aforementioned box containing the existing latereals. Once the water level receeds to below 56.0, flows will be conveyed to a proposed underground detention system via stormdrain. The flows will then pass through or bypass directly into the outlet chamber of a proposed proprietary BMP. The outlet chamber contains a pump which will pump the flows to the box containing the laterals.

The aforementioned slot was sized to convey the unmitigated Q100 runoff (10.3cfs) from DMA-West. Due to the anticipated water level in the slot, the slot was sized using the orifice formula.

DMA-East

Slot

h:	1.5	ft
Q:	10.3	cfs
cg:	0.61	
Ah:	0.123	ft
Q	10.3	
W:	4.00	ft

It is important to understand the following:

Under the occurrence of Q100 conditions, most of the flow will be conveyed out of the drainage system by gravity as water will overflow into the chamber that contains the 3 – 12" existing pipes. Once the storm ends, water will drain out of the central chamber to the zero level, and will be ponding all over the drainage system to the slot level (56.0 ft). Therefore, all ponding water will be discharged via pumps as the existing drainage system receiving the peak flows is not deep enough to allow full gravity drainage.

Nonetheless, as the peak flows are draining by gravity, the pumps do not need to be designed for conveyance of the Q100, but rather for conveyance of the 10% Q2 criteria associated with hydromodification conditions.

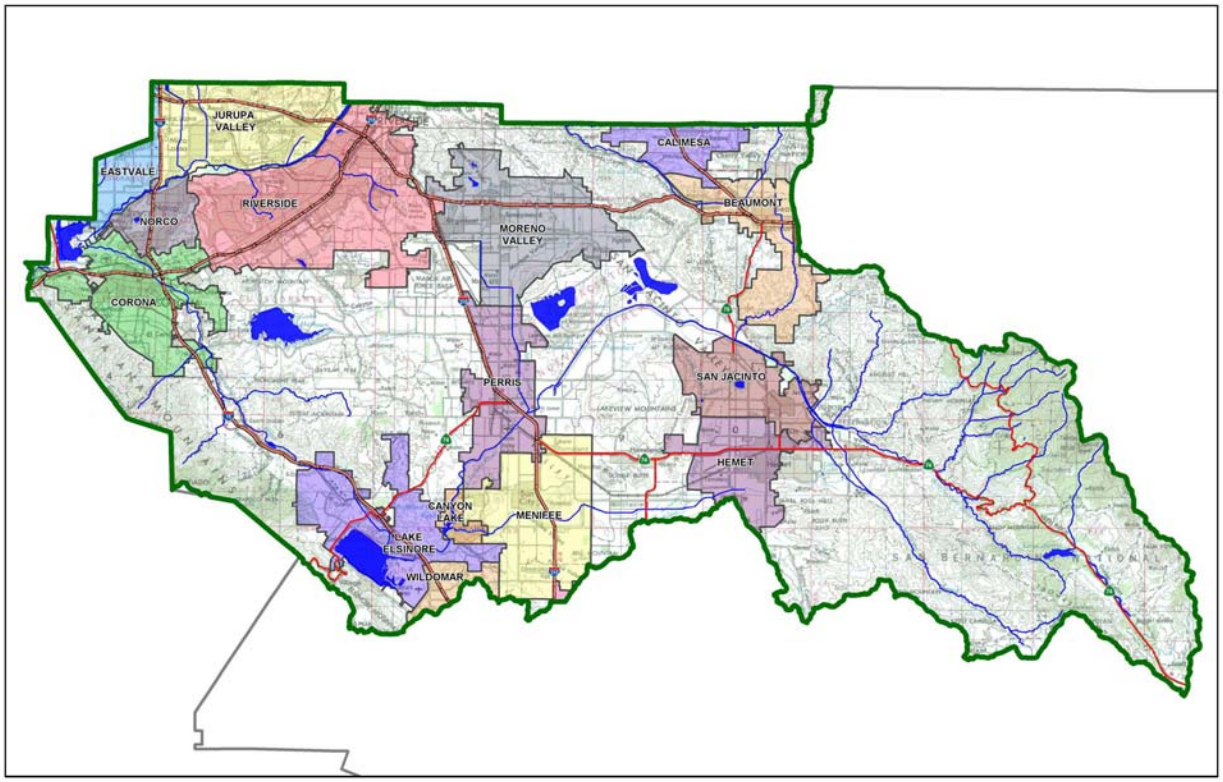
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Centerpointe Industrial Warehouse

Development No: Insert text here

Design Review/Case No: PEN18-0023/LWQ18-0004



Contact Information:

Prepared for: Dane Sommers
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(951) 683-3691

Prepared by: Jason Evans, PE
Director of Water Quality
REC Consultants, Inc.
2442 Second Avenue San Diego CA 92101
(619) 326-6026

☒ **Preliminary**
☐ **Final**

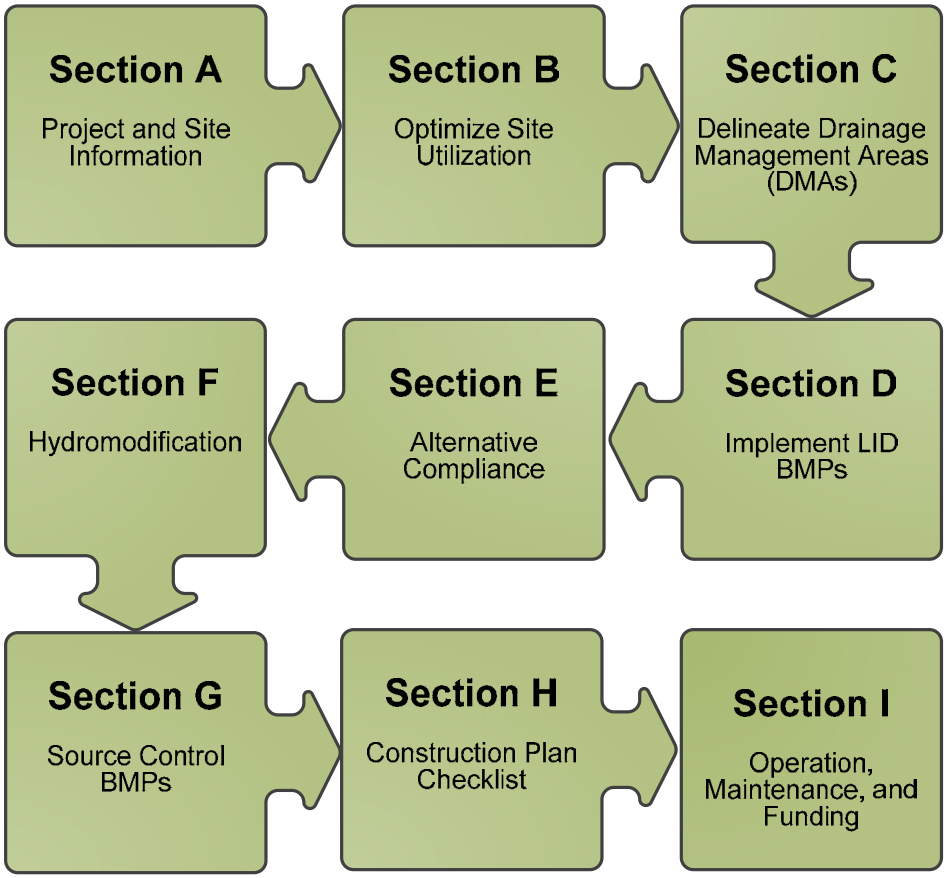
Original Date Prepared: 1-31-2018

Revision Date(s): 4/9/2018 5/30/2018

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Newcastle Partners by REC Consultants, Inc. for the Centerpointe Industrial Warehouse project.

This WQMP is intended to comply with the requirements of City of Moreno Valley for Ordinance No. 827 § 2.1, 2011 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under City of Moreno Valley Water Quality Ordinance (Municipal Code Section8.10).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	5/31/18 Date
Jason Evans, PE Preparer's Printed Name	Director of Water Quality Preparer's Title/Position

Preparer's Licensure: C74792 (exp. 12-31-19)

Table of Contents

List of Tables

List of Appendices

Section A: Project and Site Information

The proposed project is an industrial warehouse development and encompasses a building and associated parking and landscape. Runoff from the western portion of the project is to be treated by a proposed bioretention basin. Runoff from the eastern portion of the project is to be treated by a proprietary BMP which is downstream of a proposed underground detention system.

PROJECT INFORMATION		
Type of Project:	Industrial Warehouse with associated parking lot, sidewalks, and landscape.	
Planning Area:	Vacant Land (VAC)	
Community Name:	TBD	
Development Name:	Centerpointe Industrial Warehouse	
PROJECT LOCATION		
Latitude & Longitude (DMS): 33°54'51.52 N and 117°15'36.82"		
Project Watershed and Sub-Watershed: Santa Ana Watershed (801), San Jacinto Valley Hydrologic Unit (802.00), and Perris Valley Hydrologic Sub-Area (802.11)		
APN(s): 297-170-029		
Map Book and Page No.: The Thomas Guide California Road Atlas (2001) -- Page 285, Grid A-6		
PROJECT CHARACTERISTICS		
Proposed or Potential Land Use(s)	Industrial Warhouse (specific use TBD depending on future occupant)	
Proposed or Potential SIC Code(s)	4225 (specific SIC code TBD depending on future occupant)	
Area of Impervious Project Footprint (SF)		343,636 sq-ft
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement		343,636 sq-ft
Does the project consist of offsite road improvements?		☐ Y ☒ N
Does the project propose to construct unpaved roads?		☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?		☐ Y ☒ N
EXISTING SITE CHARACTERISTICS		
Total area of existing Impervious Surfaces within the project limits (SF)		O sq-ft
Is the project located within any MSHCP Criteria Cell?		☐ Y ☒ N
If so, identify the Cell number:		N/A
Are there any natural hydrologic features on the project site?		☐ Y ☒ N
Is a Geotechnical Report attached?		☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)		N/A
What is the Water Quality Design Storm Depth for the project?		0.63

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
City of Moreno Valley Public Storm Drain	None Listed	None Listed	Not Designated As Rare
Perris Valley Storm Drain	None Listed	None Listed	Not Designated As Rare
San Jacinto River Reach 3 (H.U. No. 802.11)	None Listed	AGR, GWR, REC1, REC 2, WARM, WILD	Not Designated As RARE[A]
Canyon Lake (H.U. No. 802.11 ((802.12)	Nutrients and Pathogens	MUN, AGR, GWR, REC1, REC 2, WARM, WILD	Not Designated As RARE[A]
San Jacinto River Reach 1 (H.U. No. 802.32)	None Listed	MUN, AGR, GWR, REC1, REC 2, WARM, WILD	Not Designated As RARE[A]
Lake Elsinore (H.U. No. 802.31)	Nutrients, Organic Enrichment/Low Dissolved Oxygen, Polychlorinated Biphenyls (PCBs) Sediment Toxicity and Unknown Toxicity	REC 1, REC 2, WARM, WILD	Not Designated As RARE[A]

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☒ Y	☐ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* • *City of Moreno Valley Grading Permit* • *City of Moreno Valley Building Permit*	 ☒ Y ☒ Y	 ☐ N ☐ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, constraints might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. Opportunities might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

Yes -- in existing conditions the site drains from north to south and connects to the public storm drain system via 2 existing inlets located along the southern edge of the site. Site topography will be altered to in order to grade in the building pad but the drainage pattern will more or less be maintained by the proposed development. The modifications will be the replacement of overland flow on permeable surfaces with flows directed by impervious curbs, gutters and swales. Runoff will be directed to onsite BMPs designed to address post-development water quality, hydromodification and flood control. These stormwater BMPs have been designed to utilize the existing lateral connections to convey treated flows and overflows from the site to the public storm drain system in the same manner as in pre-development conditions (furthermore the outlet structures have been designed such that post-development peak flows will not exceed pre-development peak flow rates.

Did you identify and protect existing vegetation? If so, how? If not, why?

Yes – the site has been designed to preserve the vegetation (landscaping) along its western edge (Frederick Street frontage). The remainder of the site has been previously graded and contains only limited vegetation (i.e. no significant mature trees or shrubs) which will not be preserved as part of the development.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

No – according to the Updated Geotechnical Engineering Investigation prepared by NorCal Engineering (December, 2017) included under WQMP Appendix 3, soils onsite infiltrate relatively poorly (rates measured at 0.12-and-0.22 in/hr). This rate is well below what the County deems acceptable for implementing infiltration-based BMPs so the project has not attempted to maintain the soils natural infiltration capacity.

Did you identify and minimize impervious area? If so, how? If not, why?

Yes – impervious areas (including # of parking spaces, width of parking spaces, width of drive aisles, building size, etc.) have minimized as much as practical while still meeting the needs of the proposed site usage and maintaining compliance with the City of Moreno Valley design requirements.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes – the site has been designed to direct runoff from impervious surfaces to permeable BMPs to address post-development water quality. A traditional Bioretention Basin has been incorporated near the southwest corner to treat runoff from the western portion of the project site. Similarly, a proprietary Bioretention BMP (combined with underground storage vaults) has been designed near the southeast corner to treat runoff from the eastern portion of the project site.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
DMA East	Roofs, Concrete or Asphalt & Ornamental Landscaping	Total = 195,288 sq-ft -Impervious = 180,086 sq-ft -Pervious = 15,220 sq-ft	Type D (Area Draining to BMP)
DMA West	Concrete or Asphalt & Ornamental Landscaping	Total = 187,170sq-ft -Impervious = 152,256 sq-ft -Pervious = 34,914 sq-ft	Type D (Area Draining to BMP)

[1] *Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
N/A	N/A	N/A	N/A

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]
N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet) [A]	Post-project surface type	Runoff factor [B]	Product [C] = [A] x [B]	DMA name /ID	Area (square feet) [D]	Ratio [C]/[D]
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA East	BMP East (Proprietary Bioretention BMP combined with underground vault)
DMA West	BMP West (Bioretention Basin)

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☒ Y ☐ N

If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: All (DMA East and DMA West)		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: 1.10 acres

Type of Landscaping (Conservation Design or Active Turf): Native and/or drought tolerant vegetation

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 7.68 acres

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: 0.95 ac/ac

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: 7.27 acres

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
7.27 acres	1.10 acres

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: TBD -- asuumed to be 30 Users (exact value depends on future occupant use)

Project Type: Industrial

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 7.68 acres

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: 180 Users/imp acre

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: 1381 Users

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
1381 Users	30 Users

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

TBD -- Potentail industiral uses for non-potable water may be applicable to future uses at the site depending on the future occupant.

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: TBD -- asuumed to be 2500 gpd (exact value depends on future occupant use)

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as

a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 7.68 acres

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3: 990 gpd/imp acre

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: 7600 gpd

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
7600 gpd	2500 gpd

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

The feasibility analysis above demonstrates that the anticipated demands related to irrigation, toilets and other (industrial) uses are less than the applicable minimum values. Since neither Infiltration nor Harvest and Use BMPs are feasible, Bioretention and Biotreatment BMPs are evaluated in WQMP Section D.3, below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

The Updated Geotechnical Engineering Investigation prepared by NorCal Engineering (December, 2017) includes percolation testing with onsite infiltration rates ranging between 0.12-and-0.22 in/hr. The infiltration rates measured onsite are less than the 0.3 in/hr minimum threshold required for Bioretention BMPs, therefore Biotreatment BMPs have been implemented to treat post-development stormwater runoff.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA East	☐	☐	☒	☐	☐
DMA West	☐	☐	☒	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

Please note that DMA West will be treated by a traditional Bioretention BMP (basin) and DMA East will be treated by a proprietary Bioretention BMP (Modular Wetland Model No. MWS L-8-15 or equal). Based on the information provided in the WQMP Guidance Document, the proprietary Bioretention BMP is considered an alternative compliance and thus requires approval by the City of Moreno Valley prior to implementation.

Treated flows from proposed BMPs will be conveyed via pump (one in each BMP) to an existing storm drain located near the eastern entrance to the project. Note that the pumps have been designed to comply with both City and County water quality and hydromodification requirements.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First, calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* **BMP-West**		
	[A]		[B]	[C]	[A] x [C]			
DMA West (Imperv.)	*152,256*	*Concrete & Asphalt*	*1.0*	*0.89*	*135812.4*	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA West (Perv.)	*34914*	*Ornamental Landscaping*	*0.1*	*0.11*	*3856.5*			
	187170				*139668.9*	*0.63*	*7,379.2*	***14,525***

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document
14.325814,358[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Table D.4 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* **BMP-East**		
	[A]		[B]	[C]	[A] x [C]			
DMA East (Imperv.)	*180068*	*Roofs, Concrete & Asphalt*	*1.0*	*0.89*	*269,154*	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA East (Perv.)	*15220*	*Ornamental Landscaping*	*0.1*	*0.11*	*2599*			
	195,288				*162,301.9*	*0.63*	*8,575*	***8578****

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6
**** = According to the manufacturer (Bio Clean Environmental), the selected Modular Wetland Unit (Model No. MWS L-4-17) is capable of treating 8,984 cu-ft of runoff using biofiltration technics and a 48-hour drawdown period. Note that the volume in the storage vaults has been divided such that the DCV is treated and any volume above the DCV (I.e. HMP) bypasses treatment and goes directly to the outlet chamber of the BMP to be pumped out.***

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

Please note that DMA West will be treated by a traditional Biotreatment BMP (basin) and DMA East will be treated by a proprietary Biotreatment BMP (Modular Wetland Model No. MWS L-8-12). All of the treated flows from both Biotreatment BMPs and the overflows from DMA East will be directed to an underground vault designed to comply with City and County hydromodification management and flood control detention requirements.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P[(2)]
☒ Commercial/Industrial Development	P[(3)]	P	P[(1)]	P[(1)]	P[(5)]	P[(1)]	P	P
☐ Automotive Repair Shops	N	P	N	N	P[(4, 5)]	N	P	P
☐ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☒ Parking Lots (>5,000 ft^2)	P[(6)]	P	P[(1)]	P[(1)]	P[(4)]	P[(1)]	P	P
☐ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☐	☐	☒	☒	☒	☒	☐	☐

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
N/A	N/A
Total Credit Percentage[1]	

[1] *Cannot Exceed 50%*
[2] *Obtain corresponding data from Table 3-8 in the WQMP Guidance Document*

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Area x Runoff Factor**		***Enter BMP Name / Identifier Here***		
	[A]		[B]	[C]	[A] x [C]				
N/A	N/A	N/A	N/A	N/A	N/A	*Design Storm Depth (in)*	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	N/A				N/A	N/A	N/A	N/A	N/A

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12
[H] is from the Total Credit Percentage as Calculated from Table E.2 above
[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
N/A	N/A	N/A

[1] *Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.*
[2] *Cross Reference Table E.1 above to populate this column.*
[3] *As documented in a Co-Permittee Approved Study and provided in Appendix 6.*

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	N/A	N/A	N/A
Volume (Cubic Feet)	N/A	N/A	N/A

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

N/A

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

The subject development is not seeking any of the aforementioned Hydrologic Conditions of Concern (HCOC) exemptions. The proposed BMPs and storm drain system have been designed to mitigate the HCOC conditions by matching (or reducing) the flowrates within the pre-development hydrograph with the post-development hydrograph peak rates, for the 2-yr, 24-hr storm event. For further details, please refer to the hydromodification management documentation included under WQMP Appendix 7.

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On site storm drain inlets	*Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.*	*Maintain and periodically repaint or replace inlet markings.* *Provide stormwater pollution prevention information to new site owners, lessees, or operators.* *See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com* *Include the following in lease*

		agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drain."
Interior floor drains	*Interior floor drains shall be plumbed to sanitary sewer.*	*Inspect and maintain drains to prevent blockages and overflow.*
Need for future indoor & structural pest control	*Building design features including sealants barriers and fully closing windows and doors have been included to discourage entry of pests.*	*Integrated Pest Management information to be provided to owners, lessees, and operators.*
Landscape/outdoor pesticide use	*Final Landscape Plans will accomplish the following:* *Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.* *Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.* *Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.* *Consider using pest-resistant plants, especially adjacent to hardscape.* *To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.*	*Maintain landscaping using minimum or no pesticides.* *Prevent erosion of slopes by planting fast-growing, dense ground covering plants.* *Plant native vegetation to reduce the amount of water, fertilizers, and pesticides applied to the landscape.* *Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro-spray systems. Periodically inspect and fix leaks and misdirected sprinklers.* *Do not rake or blow leaves, clippings, or pruning waste into the street, gutter, or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your City's program.* *Integrated Pest Management information to be provided to owners, lessees, and operators.*
Refuse areas	*Site design features dumpster enclosures.* *Signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.*	*Periodic inspections for leaky, overfilled, uncovered, or other problematic conditions will occur. Corrective action will be made upon detection, as circumstances permit.* *Dumping of liquid or hazardous wastes will be prohibited.* *Spill control materials will be available on-site.*

		All wastes to properly stored and disposed of in accordance with all applicable Local, State and Federal regulations
Industrial Processes	*All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.*	*All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.* *See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com* *See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/*
Loading Docks	*Maintain in a clean and orderly fashion*	*Move loaded and unloaded items indoors as soon as possible.* *See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com*
Fire Sprinkler Test Water	*Provide a means to drain fire sprinkler test water to the sanitary sewer.*	*See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com*
Miscellaneous Drain or Wash Water or Other Sources *Boiler drain lines Condensate drain lines Rooftop equipment Drainage sumps Roofing, gutters, and trim.* *Other sources*	*Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.* *Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain* *Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary* *Any drainage sumps on-site shall feature a sediment sump to reduce pumped water.*	*Inspect periodically to verify that equipment is not leaking or discharging to the storm drain system*

	Roofing, gutters, and trim made out of unprotected metals that may leach into runoff have been avoided.	
Plazas, Sidewalks, and Parking Lots	*Maintain in a clean and orderly fashion*	*Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to the storm drain.*

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)
Biotreatment 1	Biotreatment BMP (basin) located near the southwest corner of the subject development	Grading Plan Sheet 2 (prepared by SDH & Associates)
Biotreatment 2	Biotreatment BMP (proprietary Modular Wetland Model No. MWS L-8-12) located near the southeast corner of the site	Grading Plan Sheet 2 (prepared by SDH & Associates)

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: Property Owner assumes maintenance responsibilities for all onsite stormwater features and drainage infrastructure

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☐ Y ☒ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

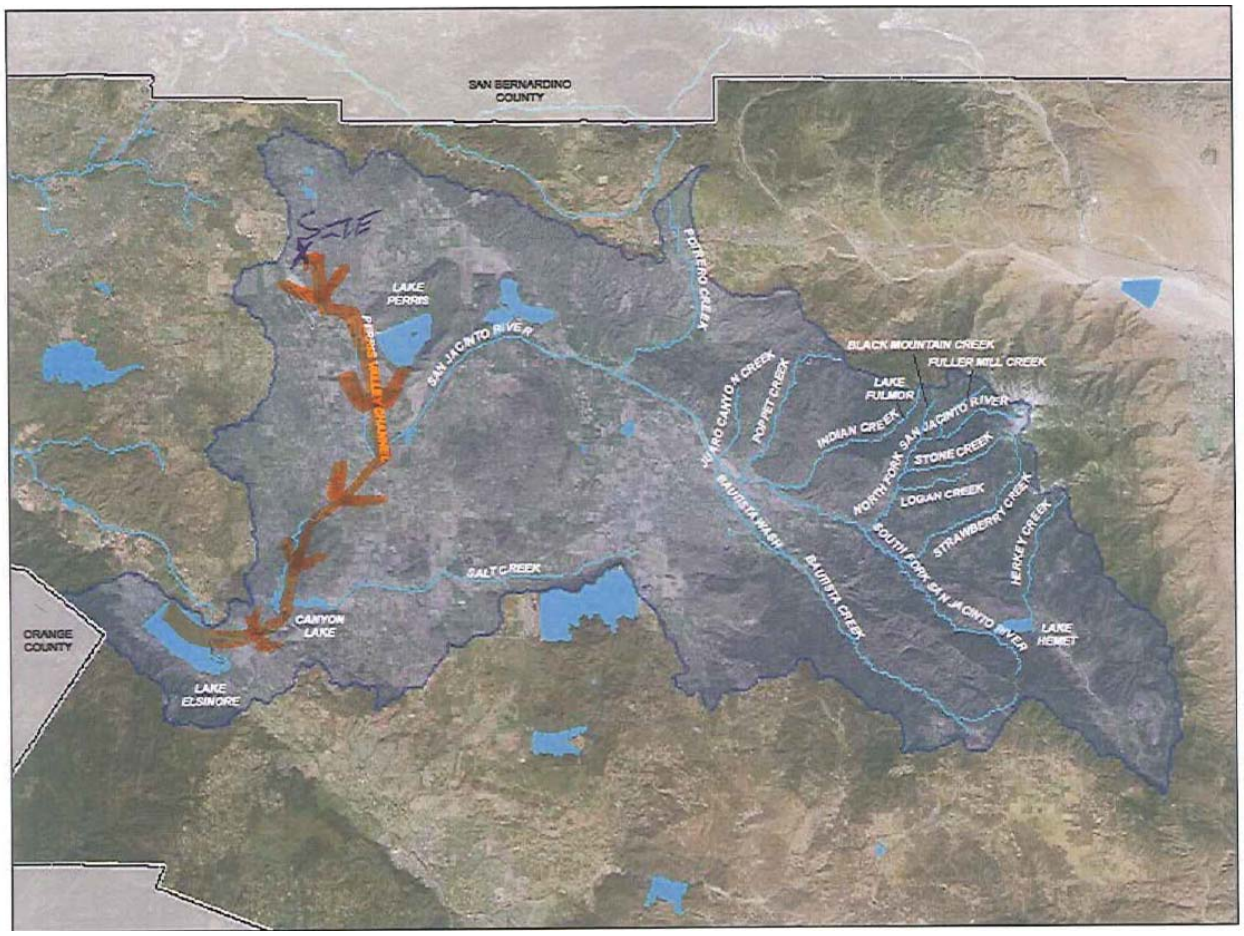
Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

LOCATION MAP

Source: Google Earth

RECEIVING WATERS MAP



Source: Santa Ana Regional Water Quality Control Board (SA RWQCB) -- San Jacinto River Watershed Fact Sheet

NOTE:
CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE PROPOSED STORM DRAIN UNLESS OTHERWISE NOTED.

PROFILE SCALE
VERTICAL: 1"=4'
HORIZONTAL: 1"=40'

LINE P
(TO BE MAINTAINED BY CITY OF MORENO VALLEY)

LATERAL P-1
(TO BE MAINTAINED BY CITY OF MORENO VALLEY)

LATERAL P-2
(TO BE MAINTAINED BY CITY OF MORENO VALLEY)

PRIVATELY MAINTAINED

FINISHED SURFACE OVER CL PIPE

EXISTING GROUND OVER CL PIPE

HYDRAULIC DATA
V_{100} = 4.6 FPS
Q_{100} = 44.2 CFS
85.04 LF 42" RCP
(1800 –D)

HYDRAULIC DATA
V_{100} = 6.1 FPS
Q_{100} = 44.2 CFS
80.21 LF
5'x1.5" RCB

HYDRAULIC DATA
V_{100} = 6.6 FPS
Q_{100} = 44.2 CFS

HYDRAULIC DATA
V_{100} = 3.3 FPS
Q_{100} = 23.2 CFS
144.83 LF 36" RCP
(1800 –D)

HYDRAULIC DATA
V_{100} = 3.3 FPS
Q_{100} = 23.2 CFS
220.43 LF 36" RCP
(1800 –D)

HYDRAULIC DATA
V_{100} = 13.2 FPS
Q_{100} = 22.8 CFS
6.46 LF 36" RCP
(2000 –D)
24.48 LF 3-12" D.I.P.
HYDRAULIC DATA
V_{100} = 9.7 FPS
Q_{100} = 22.8 CFS

HYDRAULIC DATA
V_{100} = 9.0 FPS
Q_{100} = 22.1 CFS
12.09 LF 2-15" RCP
(CLASS IV, 2000-D)

HYDRAULIC DATA
V_{100} = 0.1 FPS
Q_{100} = 0.4 CFS
30.84 LF 24" RCP
CL IV (2000-D)

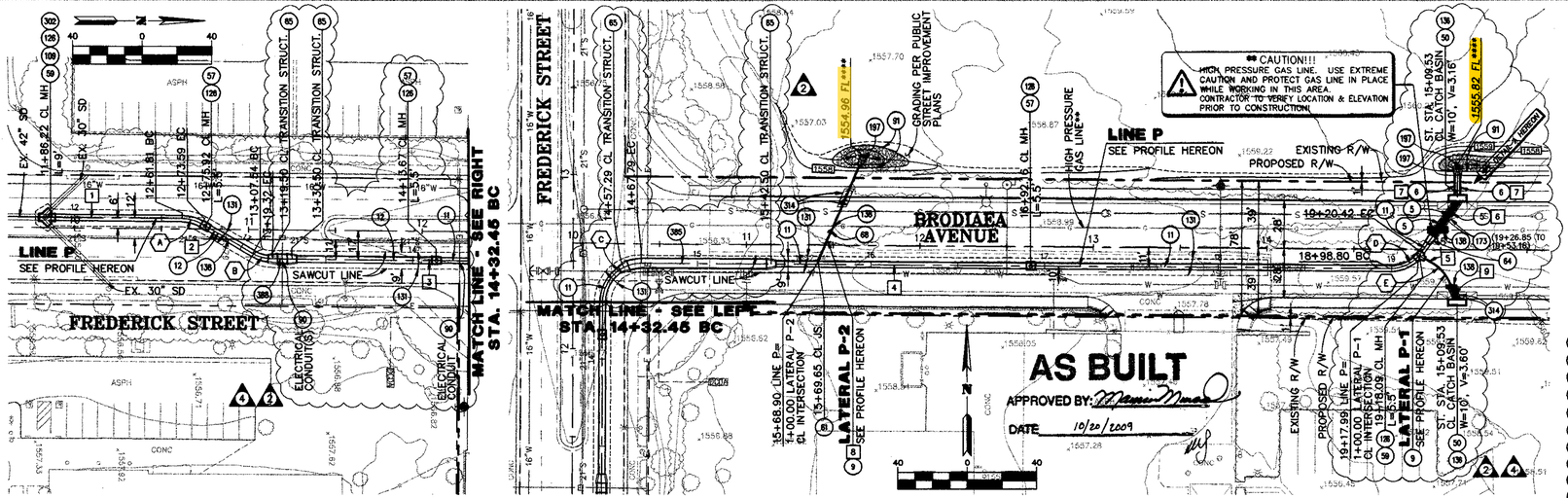
HYDRAULIC DATA
V_{100} = 11.4 FPS
Q_{100} = 21.2 CFS
61.79 LF 24" RCP
(CLASS IV, 2000-D)

HYDRAULIC DATA
V_{100} = 4.5 FPS
Q_{100} = 44.2 CFS
38.75 LF 42" RCP
(1800 –D)

HYDRAULIC DATA
V_{100} = 4.5 FPS
Q_{100} = 44.2 CFS
6.00 LF 5'x2' RCB

HYDRAULIC DATA
V_{100} = 4.6 FPS
Q_{100} = 44.2 CFS
4.00 LF 36" RCP
(1800 –D)

HYDRAULIC DATA
V_{100} = 6.3 FPS
Q_{100} = 44.2 CFS
38.79 LF 36" RCP
(1800 –D)



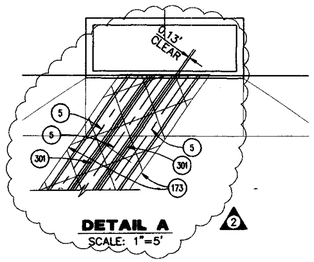
**** NOTE:
WORK OUTSIDE OF PUBLIC RIGHT-OF-WAY CANNOT COMMENCE UNTIL LETTER OF CONSENT HAS BEEN OBTAINED. PLUG PIPE AT RIGHT-OF-WAY, ON PUBLIC SIDE.

COURSE DATA

	BEARING	DISTANCE
1	N00°25'44"E	75.50'
2	N30°25'44"E	33.94'
3	N00°25'44"E	113.13'
4	N89°34'09"W	431.01'
5	N60°03'39"W	5.65'
6	N35°21'27"E	35.93'
7	N00°25'51"E	13.33'
8	N23°27'25"E	62.69
9	N24°39'43"W	11.28'

CURVE DATA

	Δ	R	L	T
A	30°00'00"	22.50'	11.78'	6.03'
B	30°00'00"	22.50'	11.78'	6.03'
C	90°00'07"	22.50'	35.34'	22.50'
D	55°04'23"	22.50'	21.63'	11.73'
E	35°23'55"	22.50'	13.90'	7.18'



NOTE:
LATERAL P-1, P-2 TO BE MAINTAINED BY THE CITY OF MORENO VALLEY WITHIN PUBLIC RIGHT OF WAY. STORM DRAIN OUTSIDE PUBLIC R/W TO BE PRIVATELY MAINTAINED.

* NOTE:
HORIZONTAL AND VERTICAL LOCATIONS TO BE VERIFIED IN THE FIELD AND ENGINEER NOTIFIED OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

MANHOLE & JUNCTION STRUCTURE DATA TABLE

S.D. MAINLINE STA.	STRUCTURE TYPE	LATERAL	ANGLE "A"	B	C	D1	D2	EL. S	EL. R
11+86.22	MH	EX.	45°00'00"	30"	3.5'	42"	42"	1548.03	*
15+69.65	IS	P-2	96°56'28"	24"	–	36"	36"	1550.28	–
19+18.09	MH	P-1	78°22'38"	24"	2'	36"	36"	1553.18	1553.24

CONSTRUCTION NOTES
(2) (5) INSTALL 12" DUCTILE IRON PIPE (PROFILE AS SHOWN ON PLANS)
(6) INSTALL 15" RCP (CLASS IV, 2000-D), PROFILE AS SHOWN ON PLANS
(9) INSTALL 24" RCP (CLASS IV, 2000-D), PROFILE AS SHOWN ON PLANS
(11) INSTALL 36" RCP (D-LOAD AND PROFILE AS SHOWN ON PLANS)
(12) INSTALL 42" RCP (D-LOAD AND PROFILE AS SHOWN ON PLANS)

CONSTRUCTION NOTES CONT'D
(50) CONSTRUCT CATCH BASIN PER R.C.F.C. & WCD STD. PLAN CB100 (WIDTH & V-DEPTH PER PLAN)
(57) CONSTRUCT MANHOLE No.2 PER R.C.F.C. & WCD STD. PLAN MH252
(59) CONSTRUCT MANHOLE No.4 PER R.C.F.C. & WCD STD. PLAN MH254
(64) CONSTRUCT TRANSITION STRUCTURE PIPE TO PIPE PER R.C.F.C. & WCD STD. PLAN TS303
(65) CONSTRUCT TRANSITION STRUCTURE No.1 PER R.C.F.C. & WCD STD. PLAN TS301
(68) CONSTRUCT CONCRETE COLLAR FOR RCP PER R.C.F.C. & WCD STD. PLAN M803
(91) INSTALL RIP-RAP PER CALTRANS SPECIFICATIONS AND RIP-RAP DATA TABLE
(105) REMOVE EXISTING MANHOLE STRUCTURE
(106) ADJUST MANHOLE RIM TO GRADE AFTER FINAL SURFACE HAS BEEN INSTALLED
(131) REPLACE PAVEMENT SECTION PER DETAIL ON SHEET 21
(135) FOR CONSTRUCTION OF LOCAL DEPRESSION SEE PUBLIC STREET IMPROVEMENT PLANS
(138) CONSTRUCT BLANKET PROTECTION PER APWA STD. PLAN 225-1
(173) CONSTRUCT CONCRETE ENCASEMENT FOR STORM DRAIN PIPE PER DETAIL ON SHEET 22
(197) INSTALL FLARED END SECTION PER CALTRANS STD. PLAN D94
(301) INSTALL CONCRETE SLURRY BETWEEN PIPES
(302) PROTECT EXISTING LATERALS AND MAINLINE PIPING IN PLACE
(314) PROVIDE FULL DEPTH AC OVER MIN. 3" CONCRETE SLURRY OVER PIPE
(385) CONSTRUCT 5'x1.5' RCB PER CALTRANS STD. PLAN D80
(386) CONSTRUCT 5'x2' RCB PER CALTRANS STD. PLAN D80

CITY OF MORENO VALLEY APPROVALS
LINE P

PREM KUMAR
DEPT. PUBLIC WORKS DIR./ASST. CITY ENGINEER
R.C.E. NO. C52463
DATE 10/20/11

CHRIS N. VOGT
PUBLIC WORKS DIRECTOR/CITY ENGINEER
R.C.E. NO. C44250
DATE 10/20/11

DIGALERT
DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

REGISTERED PROFESSIONAL ENGINEER MAURICE H. MURAD NO. 33366 EXPIRATION 6-30-2010 CIVIL STATE OF CALIFORNIA

HUITT-ZOLLARS
Huitt-Zollars, Inc. Ontario
3990 CONCOURS, SUITE 450 * ONTARIO, CALIFORNIA 91764 * (909) 941-7799
PREPARED UNDER THE SUPERVISION OF: MAURICE H. MURAD
R.C.E. 33366 EXPIRES 6-30-10 DATE 10/20/09

PERMANENT BENCH MARK
B.M. NO. M-61-69 ELEV. 1569.963
LOCATION:
AT THE NORTHWEST CORNER OF FREDERICK STREET AND ALESSANDRO BLVD. 175 FEET WEST OF FREDERICK STREET, 46 FEET NORTH OF ALESSANDRO BLVD. 4 FEET SOUTHWEST OF A GAS STATION LIGHT STANCHION AT THE SOUTH END AND INSIDE OF A 4 INCH HIGH CONCRETE PLANTER SET A BRASS DISK MARKED M-61-69 IN THE TOP OF A CONCRETE POST "NO MARKER POST SET"

REVISIONS			
REF.	DESCRIPTION	APPR.	DATE
1	AS BUILT/RECORD DRAWING		10/20/11
2	REVISED STORM DRAIN TO CLEAR EXISTING UTILITY LINE		

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

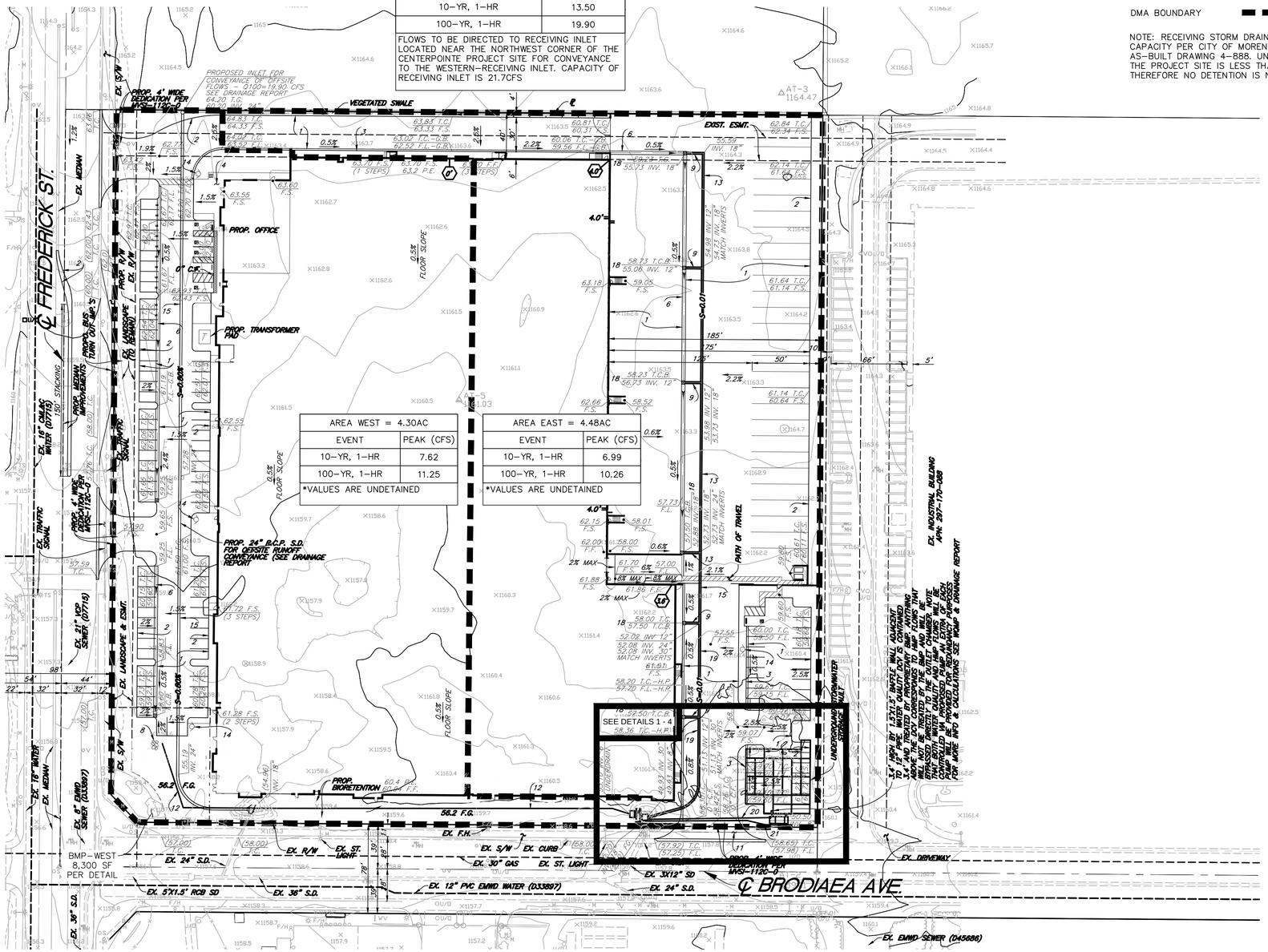
DESIGNED BY:	M.H.M.
DRAWN BY:	H-Z STAFF
DATE DRAWN:	7-2008
CHECKED BY:	M.H.M.

RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

LINE P
STA. 11+88.55 TO STA. 19+73.36
LATERALS P-1 & P-2

PROJECT NO. 4-0-00737
DRAWING NO. 4-888
SHEET NO. 15A OF 22

OCT. 15, 2009 16:45 H:\PROJ\1002400\1DRW15.DWG



LEGEND

DMA BOUNDARY ▬ ▬ ▬

NOTE: RECEIVING STORM DRAINS HAVE A SPECIFIED CAPACITY PER CITY OF MORENO VALLEY APPROVED AS-BUILT DRAWING 4-888. UNMITIGATED RUNOFF FROM THE PROJECT SITE IS LESS THAN THE CAPACITY THEREFORE NO DETENTION IS NECESSARY.

AREA OFFSITE = 8.9AC	
EVENT	PEAK (CFS)
10-YR, 1-HR	13.50
100-YR, 1-HR	19.90

FLOWS TO BE DIRECTED TO RECEIVING INLET LOCATED NEAR THE NORTHWEST CORNER OF THE CENTERPOINTE PROJECT SITE FOR CONVEYANCE TO THE WESTERN-RECEIVING INLET. CAPACITY OF RECEIVING INLET IS 21.7CFS

AREA WEST = 4.30AC	
EVENT	PEAK (CFS)
10-YR, 1-HR	7.62
100-YR, 1-HR	11.25

*VALUES ARE UNDETAINED

AREA EAST = 4.48AC	
EVENT	PEAK (CFS)
10-YR, 1-HR	6.99
100-YR, 1-HR	10.26

*VALUES ARE UNDETAINED

NO.	REVISIONS DESCRIPTION	DATE	APP'D

R·E·C Consultants, Inc.

Civil Engineering · Environmental
Land Surveying

2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

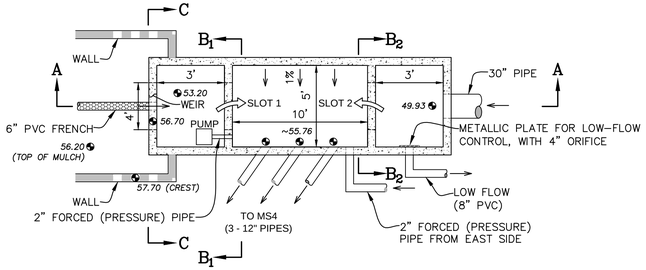
DATE: 02/05/18
SCALE: 1" = 20'
DRAWN: J.M.W.
CHECKED: B.A.R.

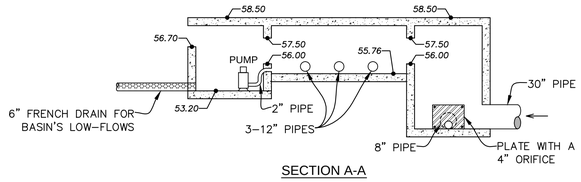
SHEET TITLE: PROPOSED HYDROLOGY

PROJECT: CENTERPOINTE INDUSIATRIAL
FREDERICK ST. AND BRODIAEA AVE.
MORENO VALLEY, CA 92557

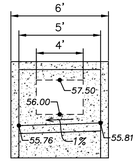
SHEET 1 OF 2 SHEETS

SAVE DATE: 6/11/2018 ~ PLOT DATE: 6/12/2018 ~ FILE NAME: P:\Acad\1379 SDH -- Newcastle Centerpointe\Reports\WQMP\180328_1379-Drainage - Standard\180328_1379-Drainage.dwg

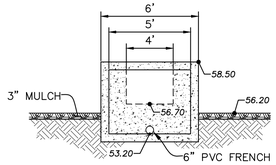




SECTION A-A

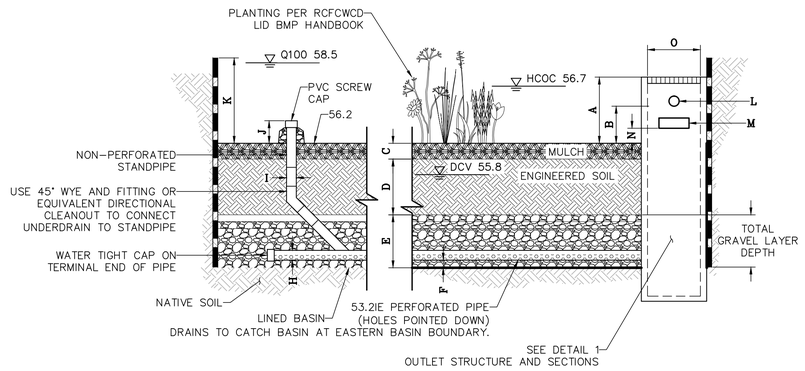


SECTION B1-B1 SLOT DETAILS
(SLOT 1 = SLOT 2) = SECTION B2-B2



SECTION C-C

NOTE:
FOR MODULAR WETLAND, UNDERGROUND SYSTEM & PRESSURE SYSTEM FOR EAST SIDE, SEE DETAIL 2.



BMP TABLE			
BMP #	TYPE	SIZE (SqFt)	ORIFICE SIZE
WEST	BIORETENTION BASIN	8,300	N/A

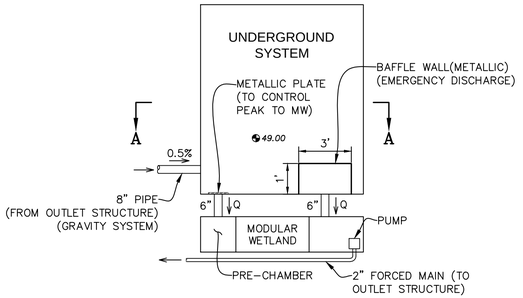
TABULATED DATA
BASIN WEST

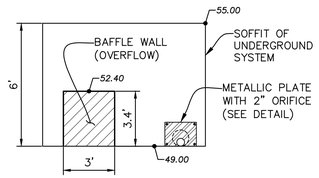
A	9"
B	N/A"
C	3"
D	24"
E	12"
F	3"
G	N/A
H	6"
I	6"
J	6"
K	4.3'
L	SEE DETAIL 1
M	N/A
N	N/A
O	SEE DETAIL 1
P	N/A

NOTE: ALL SPECIFICATIONS PER LID BMP MANUAL FACT SHEET FOR BIORETENTION BMP

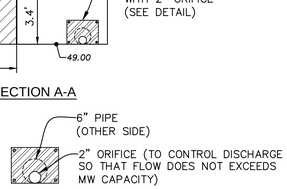
1 OUTLET & SECTIONS
NOT TO SCALE

3 BMP WEST (BIORETENTION)
NOT TO SCALE

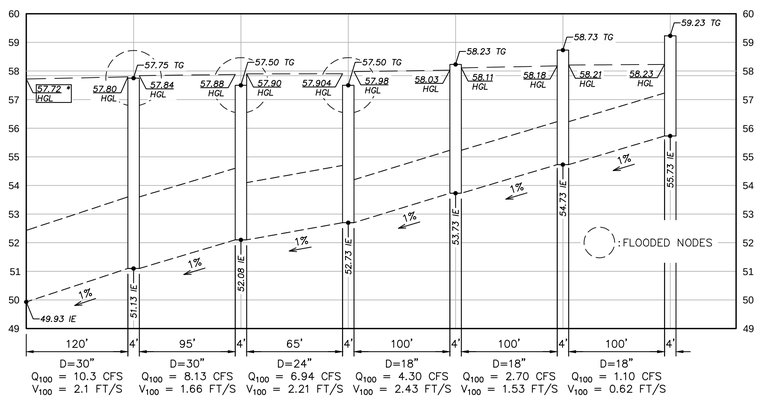




SECTION A-A



ORIFICE DETAIL



* – HGL (HYDRAULIC GRADIENT LINE) SET PER CITY OF MORENO VALLEY APPROVED PLANS (57.60) PLUS ENERGY LOSS TO CONVEY Q_{100} THRU 1.5'x4' RECTANGULAR SLOT (0.12'). HGL VALUES PER WSPG PRINTOUT. SEE PROJECT DRAINAGE STUDY.

2 UNDERGROUND SYSTEM DETAIL
NOT TO SCALE

SITE SPECIFIC DATA			
PROJECT NUMBER	7211		
PROJECT NAME	MORENO VALLEY INDUSTRIAL		
PROJECT LOCATION	MORENO VALLEY, CA		
STRUCTURE ID	BASIN B		
TREATMENT REQUIRED			
VOLUME BASED (CF)	FLOW BASED (CFS)		
8,575	N/A		
TREATMENT HGL AVAILABLE (FT)		N/A	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE		OFFLINE	
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	1550.50	PVC	6"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	1550.00	PVC	6"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	1558.00	1558.00	1558.00
SURFACE LOAD	H20 IN-DIRECT	H20 IN-DIRECT	H20 IN-DIRECT
FRAME & COVER	ø30"	30" X 48"	ø24"
WETLANDMEDIA VOLUME (CY)			5.58
WETLANDMEDIA DELIVERY METHOD			PER CONTRACT
ORIFICE SIZE (DIA. INCHES)			ø1.03"

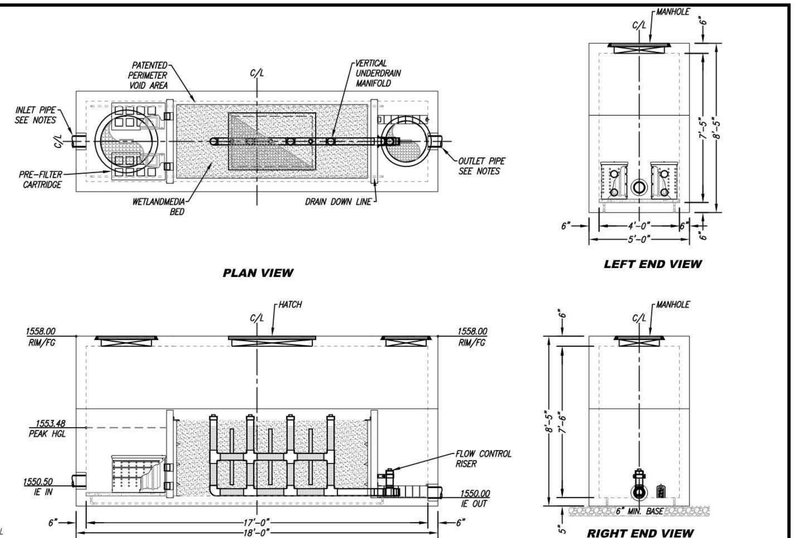
NOTES: PRELIMINARY; NOT FOR CONSTRUCTION. ENGINEER TO SET UPSTREAM BYPASS AT 1553.48.

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING MODULAR WETLANDS FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A MODULAR WETLANDS REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.



REQUIRED TREATMENT VOLUME (CF)	8575
DRAINDOWN DURATION (HOURS)	46
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	23.34
OPERATING HEAD (FT)	3.4
WETLANDMEDIA INFILTRATION RATE (IN/HR) OR	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

Bio Clean — A Forterra Company

MWS-L-4-17-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

4 MODULAR WETLAND
NOT TO SCALE

REVISIONS

NO.	DESCRIPTION	DATE	APP'D

R·E·C Consultants, Inc.
Civil Engineering · Environmental
Land Surveying
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

DETAILS

PROJECT: CENTERPOINTE INDUSTRIAL
FREDERICK ST. AND BRODIAEA AVE.
MORENO VALLEY, CA 92557

SHEET TITLE

DATE: 02/05/18
SCALE: 1" = 20'
DRAWN: J.M.W.
CHECKED: B.A.R.

SHEET 2 OF 2 SHEETS

SAVE DATE: 6/11/2018 ~ PLOT DATE: 6/12/2018 ~ FILE NAME: P:\Acad\1379 SDH — Newcastle Centerpointe\Reports\WQMP\180328_1379-Drainage — Standard\180328_1379-Drainage.dwg

Appendix 2: Construction Plans

Grading and Drainage Plans

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

Updated Geotechnical Engineering Investigation

Proposed Industrial Warehouse Development
NWC of Frederick Street and Brodiaea Avenue
Moreno Valley, California

Newcastle Partners
4740 Green River Road, Suite 118
Corona, California 92880

Attn.: Mr. Brett Anderson

Project Number 20083-17
December 19, 2017

NorCal Engineering
Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(562) 799-9469 Fax (562) 799-9459

December 19, 2017 Project Number 20083-17

Newcastle Partners
4740 Green River Road, Suite 118
Corona, California 92880

Attn.: Mr. Brett Anderson

RE: **Updated Geotechnical Engineering Investigation** - Proposed Industrial Warehouse Development - Located at the Northwest Corner of Frederick Street and Brodiaea Avenue, in the City of Moreno Valley, California

Dear Mr. Anderson:

Pursuant to your request, this firm has performed a Geotechnical Engineering Investigation for the above referenced project in accordance to our signed proposal dated November 22, 2017. The purpose of this investigation is to evaluate the subsurface conditions of the subject site and to provide recommendations for the proposed industrial warehouse development.

The scope of work included the following: 1) site reconnaissance; 2) subsurface geotechnical exploration and sampling; 3) laboratory testing; 4) engineering analysis of field and laboratory data; 5) and preparation of a geotechnical engineering report. It is the opinion of this firm that the proposed development is feasible from a geotechnical standpoint provided that the recommendations presented in this report are followed in the design and construction of the project.

1.0 Project Description

It is proposed to construct an industrial warehouse development consisting of a concrete tilt-up building totaling 203,285 square feet as shown on the attached Site Plan. The proposed building will be supported by a conventional slab-on-grade foundation system with perimeter-spread footings and isolated interior footings. Other improvements will consist of concrete and/or asphalt pavement and hardscape. It is assumed that the proposed grading for the development will include minor cut and fill procedures. Final building plans shall be reviewed by this firm prior to submittal for city approval to determine the need for any additional study and revised recommendations pertinent to the proposed development, if necessary.

2.0 Site Description

The 8.94-acre property is located at the northeast corner of Frederick Street and Brodiaea Avenue, in the City of Moreno Valley. The generally square-shaped parcel is relatively level with topography descending gradually from north to south on the order of a few feet. The site is currently an undeveloped land covered with a low growth of vegetation cover consisting of natural grasses and weeds.

3.0 Site Exploration

Our field investigation consisted of the placement of two (2) subsurface exploratory borings by a truck-mounted drill rig to a depth of 20 and 50 feet and nine (9) subsurface exploratory trenches to depths ranging between 5 and 15 feet below current ground elevations. All explorations were visually classified and logged by a field engineer with locations of the subsurface explorations shown on the attached Site Plan. The exploratory borings and trenches revealed the existing earth materials to consist of a fill and natural soil. A detailed description of the subsurface conditions is listed on the excavation logs in Appendix A.

Fill: A surficial fill and/or disturbed top soil classifying as brown clayey SAND was encountered to a depth of 1 to 2½ feet. These soils were noted to be loose and damp.

Natural: An undisturbed alluvium soil classifying as a brown, clayey SAND was encountered directly beneath the fill and observed to be dense to very dense and damp to moist. Deeper soils consisted of silty sands and sandy silts which were noted to be very dense and stiff and damp to moist.

The overall engineering characteristics of the earth material were relatively uniform with each excavation. Groundwater was encountered at the depth of 30 feet below ground surface and no caving occurred.

4.0 Laboratory Tests

Relatively undisturbed samples of the subsurface soils were obtained to perform laboratory testing and analysis for direct shear, consolidation tests, and to determine in-place moisture/densities. These relatively undisturbed ring samples were obtained by driving a thin-walled steel sampler lined with one inch long brass rings with an inside diameter of 2.42 inches into the undisturbed soils.

Standard penetration tests were obtained by driving an unlined steel sampler with an inside diameter of 1.5 inches into the soils. This standard penetrometer sampler was driven a total of eighteen inches with blow counts tallied every six inches. Blow count data is given on the Boring Logs in Appendix A.

Bulk bag samples were obtained in the upper soils for expansion index tests and maximum density tests. All test results are included in Appendix B, unless otherwise noted.

4.1 **Field moisture content** (ASTM: D 2216) and the dry density of the ring samples were determined in the laboratory. This data is listed on the logs of explorations.

4.2 **Sieve analyses** (ASTM: D 422) and the percent by weight of soil finer than the No. 200 sieve (ASTM: 1140) were performed on selected soil samples. These results are shown later within the body of this report.

4.3 **Maximum density tests** (ASTM: D-1557) were performed on typical samples of the upper soils. Results of these tests are shown on Table I.

4.4 **Expansion index tests** (ASTM: D 4829) were performed on remolded samples of the upper soils. Results of these tests are provided on Table II.

4.5 **Atterberg Limits** (ASTM: D 4318) consisting of liquid limit, plastic limit and plasticity index were performed on representative soil samples. Results are shown on Table III.

4.6 **Corrosion tests** consisting of sulfate, pH, resistivity and chloride analysis to determine potential corrosive effects of soils on concrete and underground utilities. Test results are provided on Table IV.

4.7 **R-Value test** per California Test Method 301 was performed on a representative sample, which may be anticipated to be near subgrade to determine pavement design. Result provided within pavement section design section of report.

4.8 **Direct Shear tests** (ASTM: D 3080) were performed on undisturbed and disturbed samples of the subsurface soils. The test is performed under saturated conditions at loads of 1,000 lbs./sq.ft., 2,000 lbs./sq.ft., and 3,000 lbs./sq.ft. with results shown on Plates A and B.

4.9 **Consolidation tests** (ASTM: D-2435) were performed on undisturbed samples to determine the differential and total settlement which may be anticipated based upon the proposed loads. Water was added to the samples at a surcharge of one KSF and the settlement curves are plotted on Plates C and D.

5.0 Infiltration Characteristics

Infiltration tests within the site were performed to provide preliminary infiltration rates for the purpose of planning and design of an on-site water disposal system. The infiltration tests consisted of the double ring infiltration test per ASTM Method D 3385. Based upon the results of our testing, the soils encountered in the planned on-site drainage disposal system area exhibit the following infiltration rates. The field infiltration rate is listed below for two exploratory trenches at a depth of 5 and 10 feet measured from existing ground surface with our calculations given in Appendix C. .

Test No.	Depth	Infiltration Rate
T-1	5'	0.22 in/hr
T-2	10'	0.12 in/hr

The correction factors CF_t, CF_v and CF_s are given below based on soils in the upper 10 feet from our field tests.

a) $CF_t = R_f = 1.0$ for our double ring infiltration test holes.

b) $CF_v = 1.0$ based on uniform soils encountered in two trenches for infiltration tests.

c) $CF_s = 3.0$ for long-term siltation, plugging and maintenance. The subsurface soils are likely to have some plugging and regular maintenance of storm water discharge devices is required.

Based upon the results of our testing, the subsurface soils encountered in the proposed on-site drainage disposal system to a depth of 10 feet shall utilize a design infiltration rate of 0.05 in/hr in the upper 10 feet below existing grade. These fine grained soils have a very low permeability for use in a disposal system. All systems must meet the latest city and/or county specifications and California Regional Water Quality Control Board (CRWQCB) requirements.

All systems must meet the latest city and/or county specifications and California Regional Water Quality Control Board (CRWQCB) requirements. Foundations shall be set back a minimum distance of 10 feet from the drainage disposal system and the bottom of footing shall be a minimum of 10 feet from the expected zone of saturation. The boundary of the zone of saturation may be assumed to project downward from the top of the permeable portion of the disposal system at an inclination of 1 to 1 or flatter, as determined by the soils engineer.

6.0 Seismicity Evaluation

There are no known active or potentially active faults trending toward or through the site. The proposed development lies outside of any Alquist Priolo Special Studies Zone and the potential for damage due to direct fault rupture is considered very remote. The site is located in an area of high regional seismicity and the San Jacinto fault is located about 8 kilometers from the site. Ground shaking originating from earthquakes along other active faults in the region is expected to induce lower horizontal accelerations due to smaller anticipated earthquakes and/or greater distances to other faults.

The seismic design of the project has been updated to the latest 2010 ASCE 7-10 (with July 2013 errata) standards and the mapped seismic ground motions were provided by using the Java based program available from the United States Geological Survey (USGS) website: http://geohazards.usgs.gov/designmaps/us/application.php. The earthquake design parameters are listed below.

Seismic Design Parameters

Site Location	Latitude	33.915°
	Longitude	-117.225°
Site Class		D
Risk Category		I/II/III
Maximum Spectral Response Acceleration	S_S	1.566g
	S_1	0.678g
Adjusted Maximum Acceleration	S_{MS}	1.566g
	S_{M1}	1.017g
Design Spectral Response Acceleration Parameters	S_{DS}	1.044g
	S_{D1}	0.678g

7.0 Liquefaction Evaluation

The site is expected to experience ground shaking and earthquake activity that is typical of Southern California area. It is during severe ground shaking that loose, granular soils below the groundwater table can liquefy. A review of the exploratory boring log and the laboratory test results on selected soil samples obtained indicate the following soil classifications, field blowcounts and amounts of fines passing through the No. 200 sieve.

Field Blowcount and Gradation Data

Location	Classification	Blowcounts (blows/ft)	Relative Density	% Passing No. 200 Sieve
B-1 @ 5'	SC	45	Very Dense	36
B-1 @ 10'	SM	54	Very Dense	21
B-1 @ 15'	ML	47	Very Stiff	51
B-1 @ 20'	SM	42	Very Stiff	12
B-1 @ 25'	ML	37	Very Dense	52
B-1 @ 30'	SM	32	Dense	17
B-1 @ 35'	SM	41	Dense	27
B-1 @ 40'	SW	38	Dense	5
B-1 @ 45'	SM	61	Very Dense	30
B-1 @ 50'	SM	57	Very Dense	14

Our analysis indicates the potential for liquefaction at this site is considered to be very low due to stiff and dense subsurface soils with a groundwater depth of 30 feet. Thus, the design of the proposed construction in conformance with the latest Building Code provisions for earthquake design is expected to provide mitigation of ground shaking hazards that are typical to Southern California.

8.0 Conclusions and Recommendations

Based upon our evaluations, the proposed development is acceptable from a geotechnical engineering standpoint. By following the recommendations and guidelines set forth in our report, the structures will be safe from excessive settlements under the anticipated design loadings and conditions. The proposed development shall meet all requirements of the City Building Ordinance and will not impose any adverse effect on existing adjacent structures.

The following recommendations are based upon geotechnical conditions encountered in our field investigation and laboratory data. Therefore, these surface and subsurface conditions could vary across the site. Variations in these conditions may not become evident until the commencement of grading operations and any unusual conditions which may be encountered in the course of the project development may require the need for additional study and revised recommendations.

It is recommended that site inspections be performed by a representative of this firm during all grading and construction of the development to verify the findings and recommendations documented in this report. The following sections present a discussion of geotechnical related requirements for specific design recommendations of different aspects of the project.

8.1 Site Grading Recommendations

Any vegetation and or demolition debris shall be removed and hauled from proposed grading areas prior to the start of grading operations. Existing vegetation shall not be mixed or disced into the soils. Any removed soils may be reutilized as compacted fill once any deleterious material or oversized materials (in excess of eight inches) is removed. Grading operations shall be performed in accordance with the attached "Specifications for Compacted Fill Operations".

8.1.1 Removal and Recompaction Recommendations

All disturbed soils and/or fill (about 1 to 2½ feet) shall be removed to competent native material, the exposed surface scarified to a depth of 12 inches, brought to within 2% of optimum moisture content and compacted to a minimum of 90% of the laboratory standard (ASTM: D-1557) prior to placement of any additional compacted fill soils, foundations, slabs-on-grade and pavement. Grading shall extend a minimum of five horizontal feet outside the edges of foundations or equidistant to the depth of fill placed, whichever is greater.

It is possible that isolated areas of undiscovered fill not described in this report are present on site. If found, these areas should be treated as discussed earlier. A diligent search shall also be conducted during grading operations in an effort to uncover any underground structures, irrigation or utility lines. If encountered, these structures and lines shall be either removed or properly abandoned prior to the proposed construction.

Any imported fill material should be preferably soil similar to the upper soils encountered at the subject site. All soils shall be approved by this firm prior to importing at the site and will be subjected to additional laboratory testing to assure concurrence with the recommendations stated in this report.

Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase. Adequate drainage away from the structures, pavement and slopes should be provided at all times.

If placement of slabs-on-grade and pavement is not completed immediately upon completion of grading operations, additional testing and grading of the areas may be necessary prior to continuation of construction operations. Likewise, if adverse weather conditions occur which may damage the subgrade soils, additional assessment by the geotechnical engineer as to the suitability of the supporting soils may be needed.

8.1.2 Fill Blanket Recommendations

In areas of transition between the underlying native material and engineered fill, additional overexcavation of the native material consisting of a depth of two feet below proposed foundations is required to mitigate the potential of differential settlement. This fill shall extend a minimum of five horizontal feet or to the depth of vertical overexcavation, whichever is greater, beyond the outside edge of the perimeter foundation.

7.2 **Shrinkage and Subsidence**

Results of our in-place density tests reveal that the soil shrinkage will be on the order of 5 to 10% due to excavation and recompaction, based upon the assumption that the fill is compacted to 92% of the maximum dry density per ASTM standards. Subsidence should be 0.2 feet due to earthwork operations. The volume change does not include any allowance for vegetation or organic stripping, removal of subsurface improvements or topographic approximations. Although these values are only approximate, they represent our best estimate of lost yardage which will likely occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field testing using the actual equipment and grading techniques should be conducted.

8.3 **Temporary Excavations**

Temporary unsurcharged excavations in the existing site materials less than 4 feet high may be made at a vertical gradient unless cohesionless soils are encountered. In areas where soils with little or no binder are encountered, where adverse geological conditions are exposed, or where excavations are adjacent to existing structures, shoring, slot-cutting, or flatter excavations may be required. The temporary cut slope gradients given do not preclude local raveling and sloughing. All excavations shall be made in accordance with the requirements of CAL-OSHA and other public agencies having jurisdiction. Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase.

8.4 **Foundation Design**

All foundations may be designed utilizing the following safe bearing capacities for an embedded depth of 18 inches into approved fill materials with the corresponding widths:

Allowable Safe Bearing Capacity (psf)

Width (ft)	Continuous Foundation	Isolated Foundation
1.5	2000	2500
2.0	2075	2575
4.0	2375	2875
6.0	2500	3000

The bearing value may be increased by 500 psf for each additional foot of depth in excess of the 18-inch minimum depth, up to a maximum of 4,000 psf. A one third increase may be used when considering short-term loading and seismic forces. All continuous foundations shall be reinforced a minimum of one No. 4 bar, top and bottom. Isolated foundations shall be reinforced per the discretion of the project structural engineer. A representative of this firm shall inspect all foundation excavations prior to pouring concrete.

8.5 Settlement Analysis

Resultant pressure curves for the consolidation tests are shown on Plates C and D. Computations utilizing these curves and the recommended safe bearing capacities reveal that the foundations will experience settlements on the order of 3/4 inch and differential settlements of less than 1/4 inch.

8.6 Lateral Resistance

The following values may be utilized in resisting lateral loads imposed on the structure. Requirements of the California Building Code should be adhered to when the coefficient of friction and passive pressures are combined.

Coefficient of Friction – 0.35

Equivalent Passive Fluid Pressure = 200 lbs./cu.ft.

Maximum Passive Pressure = 2,000 lbs./cu.ft.

The passive pressure recommendations are valid only for approved compacted fill soils.

8.7 Retaining Wall Design Parameters

Active earth pressures against retaining wall will be equal to the pressures developed by the following fluid densities. These values are for **granular backfill material** placed behind the walls at various ground slopes above the walls.

Surface Slope of Retained Materials (Horizontal to Vertical)	Equivalent Fluid Density (lb./cu.ft.)
Level	30
5 to 1	35
4 to 1	38
3 to 1	40
2 to 1	45

Any applicable short-term construction surcharges and seismic forces should be added to the referenced lateral pressure values. An equivalent fluid pressure of 45 pcf may be utilized for the restrained wall condition with a level grade behind the wall.

All walls shall be waterproofed as needed and protected from hydrostatic pressure by a reliable permanent subdrain system. The subsurface drainage system shall consist of 4-inch diameter perforated PVC pipe encased with gravel and wrapped with filter fabric. The granular backfill to be utilized immediately adjacent to the walls shall consist of an approved granular soils with a sand equivalency greater than 30. This backfill zone of free draining material shall consist of a wedge beginning a minimum of one horizontal foot from the base of the wall extending upward at an inclination of no less than 3/4 to 1 (horizontal to vertical).

The seismic-induced lateral soil pressure for walls greater than 6 feet shall be computed using a triangular pressure distribution with the maximum value at the top of the wall. The maximum lateral pressure of (20 pcf) H, where H is the height of the retained soils above the wall footing should be utilized in final design of retaining walls. Sliding resistance values and passive fluid pressures given in our referenced report may be increased by 1/3 during short-term wind and seismic loading conditions.

8.8 Slab Design

All concrete slabs-on-grade shall be at least four inches in office and hardscape areas, six inches in warehouse, both reinforced with No. 3 bars at sixteen inch spacing in each direction and positioned in the center of the slab and placed on approved subgrade soils. Additional reinforcement requirements and an increase in thickness of the slabs-on-grade may be necessary based upon soils expansion potential and proposed loading conditions in the structures and should be evaluated further by the project engineers and/or architect. These slabs shall be placed on approved subgrade soils moisture conditioned to 3% above optimum moisture content to a depth of eighteen inches.

A vapor retarder (10-mil minimum thickness) should be utilized in areas which would be sensitive to the infiltration of moisture. This retarder shall meet requirements of ASTM E 96, *Water Vapor Transmission of Materials* and ASTM E 1745, *Standard Specification for Water Vapor Retarders used in Contact with Soil or Granular Fill Under Concrete Slabs.* The vapor retarder shall be installed in accordance with procedures stated in ASTM E 1643, *Standard practice for Installation of Water Vapor Retarders used in Contact with Earth or Granular Fill Under Concrete Slabs.*

The moisture retarder may be placed directly upon approved subgrade soils, although one to two inches of sand beneath the membrane is desirable. The subgrade upon which the retarder is placed shall be smooth and free of rocks, gravel or other protrusions which may damage the retarder. Use of sand above the retarder is under the purview of the structural engineer; if sand is used over the retarder, it should be placed in a dry condition.

8.9 Pavement Section Design

The table below provides a preliminary pavement design based upon an R-Value of 30 for the proposed pavement areas. Final pavement design may need to be based on R-Value testing of the subgrade soils near the conclusion of rough grading to assure that these soils are consistent with those assumed in this preliminary design.

Type of Traffic	Traffic Index	Asphaltic Concrete (in)	Base Material (in)
Automobile Parking Stalls	4.0	3.0	4.0
Light Vehicle Circulation Areas	5.5	3.5	5.5
Heavy Truck Access Areas (GVW < 90,000 lbs.; 5 axle)	7.0	4.0	10.0

All concrete slabs to be utilized for pavement shall be a minimum of six inches in thickness and placed on approved subgrade soils. Client should submit anticipated traffic loadings, when available, so that pavement sections may be reviewed to determine adequacy to support these loads.

Any approved base material shall consist of a Class II aggregate or equivalent and should be compacted to a minimum of 95% relative compaction. All pavement materials shall conform to the requirements set forth by the City of Moreno Valley. The base material and asphaltic concrete should be tested prior to delivery to the site and during placement to determine conformance with the project specifications. A pavement engineer shall designate the specific asphalt mix design to meet the required project specifications.

All pavement areas shall have positive drainage toward an approved outlet from the site. Drain lines behind curbs and/or adjacent to landscape areas should be considered by client and the appropriate design engineers to prevent water from infiltrating beneath pavement. If such infiltration occurs, damage to pavement, curbs and flow lines, especially on sites with expansive soils, may occur during the life of the project.

8.10 Utility Trench and Excavation Backfill

Trenches from installation of utility lines and other excavations may be backfilled with on-site soils or approved imported soils compacted to a minimum of 90% relative compaction. All utility lines shall be properly bedded with clean sand having a sand equivalency rating of 30 (SE > 30) or more. This bedding material shall be thoroughly water jetted around the pipe structure prior to placement of compacted backfill soils.

8.11 Corrosion Design Criteria

Representative samples of the surficial soils, typical of the subgrade soils expected to be encountered within foundation excavations and underground utilities were tested for corrosion potential. The minimum resistivity value obtained for the samples tested is representative of an environment that may be corrosive to metals. The soil pH value was considered mildly acidic and may have a significant effect on soil corrosivity. Consideration should be given to corrosion protection systems for buried metal such as protective coatings, wrappings or the use of PVC where permitted by local building codes.

According to Table 4.3.1, ACI 318 Building Code and Commentary, these contents revealed negligible levels of sulfate exposure. Therefore, a Type II cement according to latest CBC specifications may be utilized for building foundations at this time. Additional sulfate tests shall be performed at the completion of site grading to assure that these soils are consistent with the recommendations stated in this design. Sulfate test results may be found on the attached Table IV.

8.12 Expansive Soil

Since expansive soils were encountered, special attention should be given to the project design and maintenance. The attached *Expansive Soil Guidelines* should be reviewed by the engineers, architects, owner, maintenance personnel and other interested parties and considered during the design of the project and future property maintenance.

9.0 Closure

The recommendations and conclusions contained in this report are based upon the soil conditions uncovered in our test excavations. No warranty of the soil condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected to unfavorable conditions are encountered during construction phase.

It is the responsibility of the owner to ensure that all information within this report is submitted to the Architect and appropriate Engineers for the project. This firm should have the opportunity to review the final plans to verify that all our recommendations are incorporated. This report and all conclusions are subject to the review of the controlling authorities for the project.

A preconstruction conference should be held between the developer, general contractor, grading contractor, city inspector, architect, and soil engineer to clarify any questions relating to the grading operations and subsequent construction. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied within the field.

This geotechnical investigation has been conducted in a manner consistent with the level of care and skill exercised by members of our profession currently practicing under similar conditions in the Southern California area. No other warranty, expressed or implied is made.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker
Project Engineer
R.G.E. 841

Scott D. Spensiero
Project Manager

SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL

Excavation

Any existing low density soils and/or saturated soils shall be removed to competent natural soil under the inspection of the Soils Engineering Firm. After the exposed surface has been cleansed of debris and/or vegetation, it shall be scarified until it is uniform in consistency, brought to the proper moisture content and compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557).

In any area where a transition between fill and native soil or between bedrock and soil are encountered, additional excavation beneath foundations and slabs will be necessary in order to provide uniform support and avoid differential settlement of the structure.

Material For Fill

The on-site soils or approved import soils may be utilized for the compacted fill provided they are free of any deleterious materials and shall not contain any rocks, brick, asphaltic concrete, concrete or other hard materials greater than eight inches in maximum dimensions. Any import soil must be approved by the Soils Engineering firm a minimum of 24 hours prior to importation of site.

Placement of Compacted Fill Soils

The approved fill soils shall be placed in layers not excess of six inches in thickness. Each lift shall be uniform in thickness and thoroughly blended. The fill soils shall be brought to within 2% of the optimum moisture content, unless otherwise specified by the Soils Engineering firm. Each lift shall be compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557) and approved prior to the placement of the next layer of soil. Compaction tests shall be obtained at the discretion of the Soils Engineering firm but to a minimum of one test for every 500 cubic yards placed and/or for every 2 feet of compacted fill placed.

The minimum relative compaction shall be obtained in accordance with accepted methods in the construction industry. The final grade of the structural areas shall be in a dense and smooth condition prior to placement of slabs-on-grade or pavement areas. No fill soils shall be placed, spread or compacted during unfavorable weather conditions. When the grading is interrupted by heavy rains, compaction operations shall not be resumed until approved by the Soils Engineering firm.

Grading Observations

The controlling governmental agencies should be notified prior to commencement of any grading operations. This firm recommends that the grading operations be conducted under the observation of a Soils Engineering firm as deemed necessary. A 24 hour notice must be provided to this firm prior to the time of our initial inspection.

Observation shall include the clearing and grubbing operations to assure that all unsuitable materials have been properly removed; approve the exposed subgrade in areas to receive fill and in areas where excavation has resulted in the desired finished grade and designate areas of overexcavation; and perform field compaction tests to determine relative compaction achieved during fill placement. In addition, all foundation excavations shall be observed by the Soils Engineering firm to confirm that appropriate bearing materials are present at the design grades and recommend any modifications to construct footings.

Expansive Soil Guidelines

The following expansive soil guidelines are provided for your project. The intent of these guidelines is to inform you, the client, of the importance of proper design and maintenance of projects supported on expansive soils. ***You, as the owner or other interested party, should be warned that you have a duty to provide the information contained in the soil report including these guidelines to your design engineers, architects, landscapers and other design parties in order to enable them to provide a design that takes into consideration expansive soils.***

In addition, you should provide the soil report with these guidelines to any property manager, lessee, property purchaser or other interested party that will have or assume the responsibility of maintaining the development in the future.

Expansive soils are fine-grained silts and clays which are subject to swelling and contracting. The amount of this swelling and contracting is subject to the amount of fine-grained clay materials present in the soils and the amount of moisture either introduced or extracted from the soils. Expansive soils are divided into five categories ranging from "very low" to "very high". Expansion indices are assigned to each classification and are included in the laboratory testing section of this report. *If the expansion index of the soils on your site, as stated in this report, is 21 or higher, you have expansive soils.* The classifications of expansive soils are as follows:

Classification of Expansive Soil*

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

When expansive soils are compacted during site grading operations, care is taken to place the materials at or slightly above optimum moisture levels and perform proper compaction operations. Any subsequent excessive wetting and/or drying of expansive soils will cause the soil materials to expand and/or contract. These actions are likely to cause distress of foundations, structures, slabs-on-grade, sidewalks and pavement over the life of the structure. ***It is therefore imperative that even after construction of improvements, the moisture contents are maintained at relatively constant levels, allowing neither excessive wetting or drying of soils.***

Evidence of excessive wetting of expansive soils may be seen in concrete slabs, both interior and exterior. Slabs may lift at construction joints producing a trip hazard or may crack from the pressure of soil expansion. Wet clays in foundation areas may result in lifting of the structure causing difficulty in the opening and closing of doors and windows, as well as cracking in exterior and interior wall surfaces. In extreme wetting of soils to depth, settlement of the structure may eventually result. Excessive wetting of soils in landscape areas adjacent to concrete or asphaltic pavement areas may also result in expansion of soils beneath pavement and resultant distress to the pavement surface.

Excessive drying of expansive soils is initially evidenced by cracking in the surface of the soils due to contraction. Settlement of structures and on-grade slabs may also eventually result along with problems in the operation of doors and windows.

Projects located in areas of expansive clay soils will be subject to more movement and "hairline" cracking of walls and slabs than similar projects situated on non-expansive sandy soils. There are, however, measures that developers and property owners may take to reduce the amount of movement over the life the development. The following guidelines are provided to assist you in both design and maintenance of projects on expansive soils:

- Drainage away from structures and pavement is essential to prevent excessive wetting of expansive soils. Grades to the latest building code should be designed and maintained to allow flow of irrigation and rain water to approved drainage devices or to the street. Any "ponding" of water adjacent to buildings, slabs and pavement after rains is evidence of poor drainage; the installation of drainage devices or regrading of the area may be required to assure proper drainage. Installation of rain gutters is also recommended to control the introduction of moisture next to buildings. Gutters should discharge into a drainage device or onto pavement which drains to roadways.

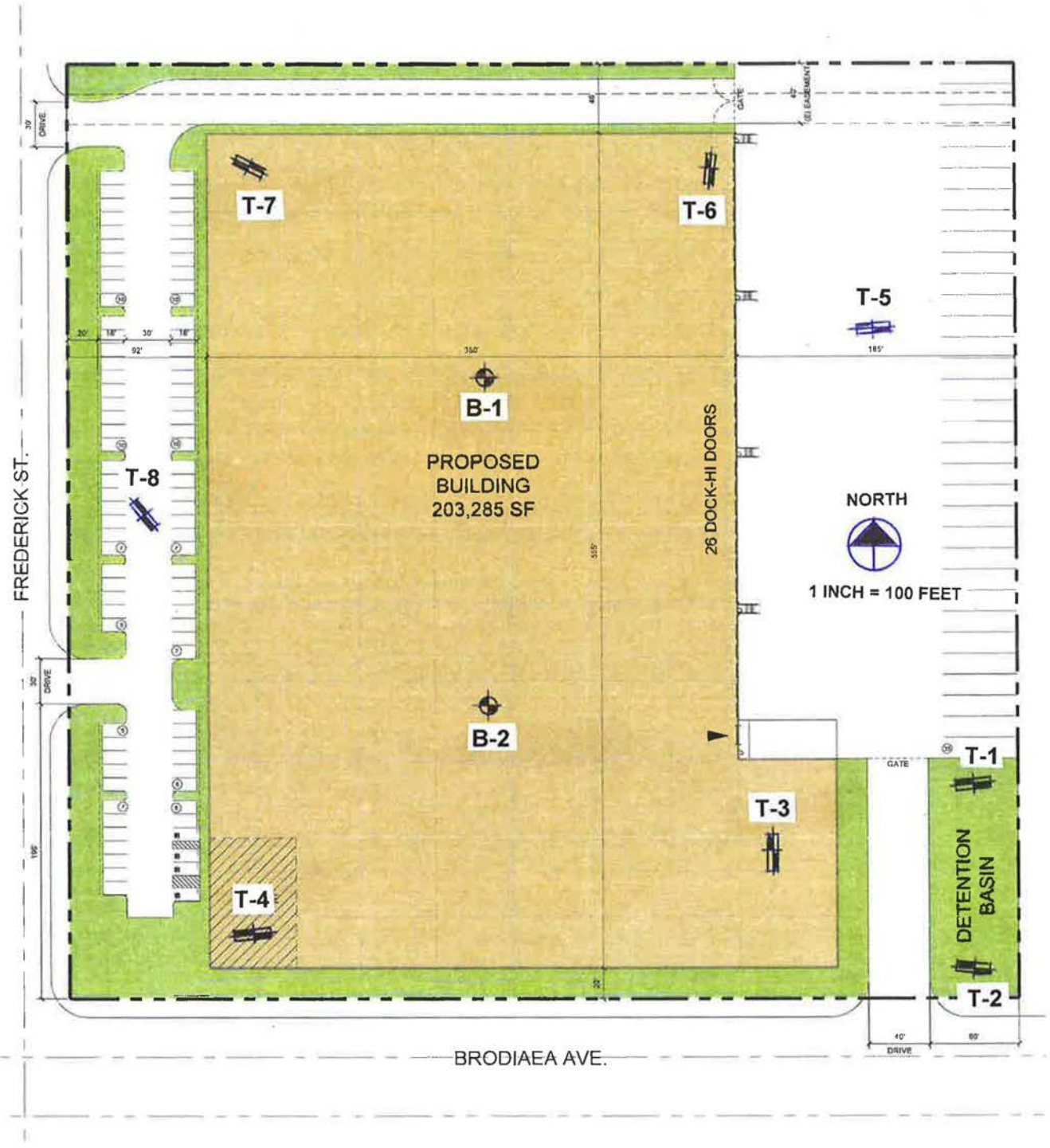
- Irrigation should be strictly controlled around building foundations, slabs and pavement and may need to be adjusted depending upon season. This control is essential to maintain a relatively uniform moisture content in the expansive soils and to prevent swelling and contracting. Over-watering adjacent to improvements may result in damage to those improvements. NorCal Engineering makes no specific recommendations regarding landscape irrigation schedules.

- Planting schemes for landscaping around structures and pavement should be analyzed carefully. Plants (including sod) requiring high amounts of water may result in excessive wetting of soils. Trees and large shrubs may actually extract moisture from the expansive soils, thus causing contraction of the fine-grained soils.

- Thickened edges on exterior slabs will assist in keeping excessive moisture from entering directly beneath the concrete. A six-inch thick or greater deepened edge on slabs may be considered. Underlying interior and exterior slabs with 6 to 12 inches or more of non-expansive soils and providing presaturation of the underlying clayey soils as recommended in the soil report will improve the overall performance of on-grade slabs.

- Increase the amount of steel reinforcing in concrete slabs, foundations and other structures to resist the forces of expansive soils. The precise amount of reinforcing should be determined by the appropriate design engineers and/or architects.

- Recommendations of the soil report should always be followed in the development of the project. Any recommendations regarding presaturation of the upper subgrade soils in slab areas should be performed in the field and verified by the Soil Engineer.



NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

SITE PLAN

PROJECT 20081-17	DATE DECEMBER 2017

List of Appendices
(in order of appearance)

Appendix A - Log of Excavations

- Log of Borings B-1 and B-2
- Log of Trenches T-1 to T-8
-

- **Appendix B - Laboratory Tests**
- Table I - Maximum Dry Density
- Table II – Expansion
- Table III – Atterberg Limits
- Table IV – Corrosion

- Plates A and B - Direct Shear
- Plates C and D – Consolidation

Appendix C – Soil Infiltration Study

- Field Data

Appendix A

MAJOR DIVISION			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL, SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINE (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM

NorCal Engineering

KEY:

- ■ Indicates 2.5-inch Inside Diameter. Ring Sample.
- ⊠ Indicates 2-inch OD Split Spoon Sample (SPT).
- ⧅ Indicates Shelby Tube Sample.
- ◫ Indicates No Recovery.
- ◧ Indicates SPT with 140# Hammer 30 in. Drop.
- ☒ Indicates Bulk Sample.
- ◩ Indicates Small Bag Sample.
- ◨ Indicates Non-Standard
- ⊠ Indicates Core Run.

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace	1 - 5%
Few	5 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5mm) to No. 200 (0.074mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
DAMP	Some perceptible moisture; below optimum
MOIST	No visible water; near optimum moisture content
WET	Visible free water, usually soil is below water table.

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N -VALUE

COHESIONLESS SOILS		COHESIVE SOILS		
Density	N (blows/ft)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	Very Soft	0 to 2	< 250
Loose	4 to 10	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	Very Stiff	15 to 30	2000 - 4000
		Hard	over 30	> 4000

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Log of Boring B-1

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: 30'

Drilling Method: Simco 2800HS

Hammer Weight: 140 lbs | Drop: 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, very dense, damp to moist	X	20/24/21	9.1		3
10		Silty (fine to medium grained) SAND Brown, very dense, moist	X	17/25/29	8.5		2
15		Sandy SILT Grey-brown, stiff, moist	X	20/22/25	11.2		5
20		Silty (fine to coarse grained) SAND Brown, very dense, moist; with occasional gravel and slightly silty	X	18/20/22	8.6		1
25		Sandy SILT Grey-brown, stiff, moist to very moist	X	14/17/20	12.6		5
30		Silty (fine to coarse grained) SAND Brown, dense, wet; slightly silty to silty	X	12/15/17	17.4		1
35							

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Attachment: Water Quality Management Plan (3273 : Centerpointe Commerce Center)

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Log of Boring B-1

Boring Location: Frederick & Brodiaea, Moreno Valley
Date of Drilling: 12/6/17 | Groundwater Depth: 30'
Drilling Method: Simco 2800HS
Hammer Weight: 140 lbs | Drop: 30"
Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
35		Silty (fine to coarse grained) SAND Brown, dense, wet; slightly silty to silty		10/16/25	20.1		2
40		SAND (medium to coarse grained) Yellow-brown, dense, wet		13/17/21	19.3		
45		Silty (fine to coarse grained) SAND Grey-brown, dense, wet; silty to slightly silty		15/29/32	17.2		3
50				14/25/32	17.5		1
		Boring completed at depth of 51.5'					
55							
60							
65							
70							

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Log of Boring B-2

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Simco 2800HS

Hammer Weight: 140 lbs | Drop: 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, very dense, damp to moist	■	35/41	8.8	118.2	
5							
		Silty (fine to medium grained) SAND Brown, very dense, damp	■	30/42	7.7	121.7	
10							
		Sandy SILT Grey-brown, very stiff, moist	■	30/42	12.6	117.0	
15							
		Silty (fine to coarse grained) SAND Brown, very dense, moist; with occasional gravel; slightly silty					
20		Boring completed at depth of 20'	■	22/38	10.3	120.3	
25							
30							
35							

GWT not encountered

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Log of Trench T-1

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, dense, damp					
5		Trench completed at depth of 5'					
10							
15							
20							
25							
30							
35							

GWT not encountered

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Log of Trench T-2

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, dense to very dense, damp					
5		GWT not encountered					
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

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Attachment: Water Quality Management Plan (3273 : Centerpointe Commerce Center)

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Log of Trench T-3

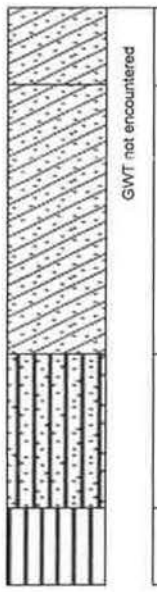
Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured



Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp	■		7.0	114.2	
		NATURAL Clayey SAND Brown, dense, damp	■		9.8	121.1	
10		Silty (fine to medium grained) SAND Brown, very dense, damp	■		6.4	122.9	
		Sandy SILT Grey-brown, stiff, moist					
15		Trench completed at depth of 15'	■		12.1	115.5	
20							
25							
30							
35							

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Log of Trench T-4

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp	■		10.2	115.4	
		NATURAL Clayey SAND Brown, dense, moist					
5		GWT not encountered					
			■		12.5	120.7	
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

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Log of Trench T-5

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp			5.5	120.3	
		NATURAL Clayey SAND Brown, dense, damp					
5		Trench completed at depth of 5'					
10							
15							
20							
25							
30							
35							

GWT not encountered

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Log of Trench T-6

Boring Location: Frederick & Brodiaea, Moreno Valley
Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered
Drilling Method: Backhoe
Hammer Weight: | Drop:
Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, dense, damp to moist					
5		GWT not encountered	■		11.7	117.5	
10		Trench completed at depth of 10'	■		11.1	121.6	
15							
20							
25							
30							
35							

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Log of Trench T-7

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp	■		2.7	116.3	
		NATURAL Clayey SAND Brown, dense, damp	■		5.9	121.7	
10		Silty (fine to medium grained) SAND Brown, very dense, damp	■		8.1	119.5	
		Trench completed at depth of 12'					

GWT not encountered

15 20 25 30 35

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Log of Trench T-8

Boring Location: Frederick & Brodiaea, Moreno Valley

Date of Drilling: 12/6/17 | Groundwater Depth: None Encountered

Drilling Method: Backhoe

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines
0		FILL Clayey SAND Brown, loose, damp					
		NATURAL Clayey SAND Brown, dense, damp					
5		Trench completed at depth of 5'					
10							
15							
20							
25							
30							
35							

GWT not encountered

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Appendix B

December 19, 2017 Project Number 20083-17

TABLE I
MAXIMUM DENSITY TESTS

Sample	Classification	Optimum Moisture	Maximum Dry Density (lbs./cu.ft.)
T-3 @ 2'	Clayey SAND	11.0	128.0

TABLE II
EXPANSION INDEX TESTS

Soil Type	Classification	Expansion Index
T-3 @ 2'	Clayey SAND	15

TABLE III
ATTERBERG LIMITS

Sample	Liquid Limit	Plastic Limit	Plasticity Index
B-1 @ 5'	24	19	5
B-1 @ 10'	20	17	3

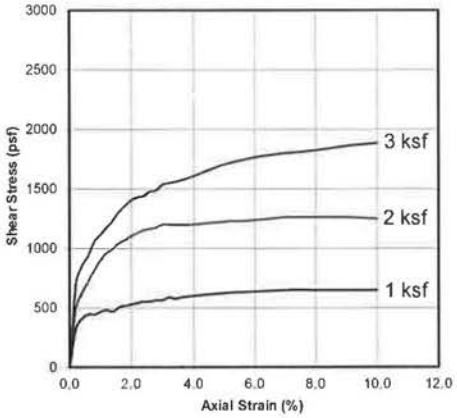
TABLE IV
CORROSION TESTS

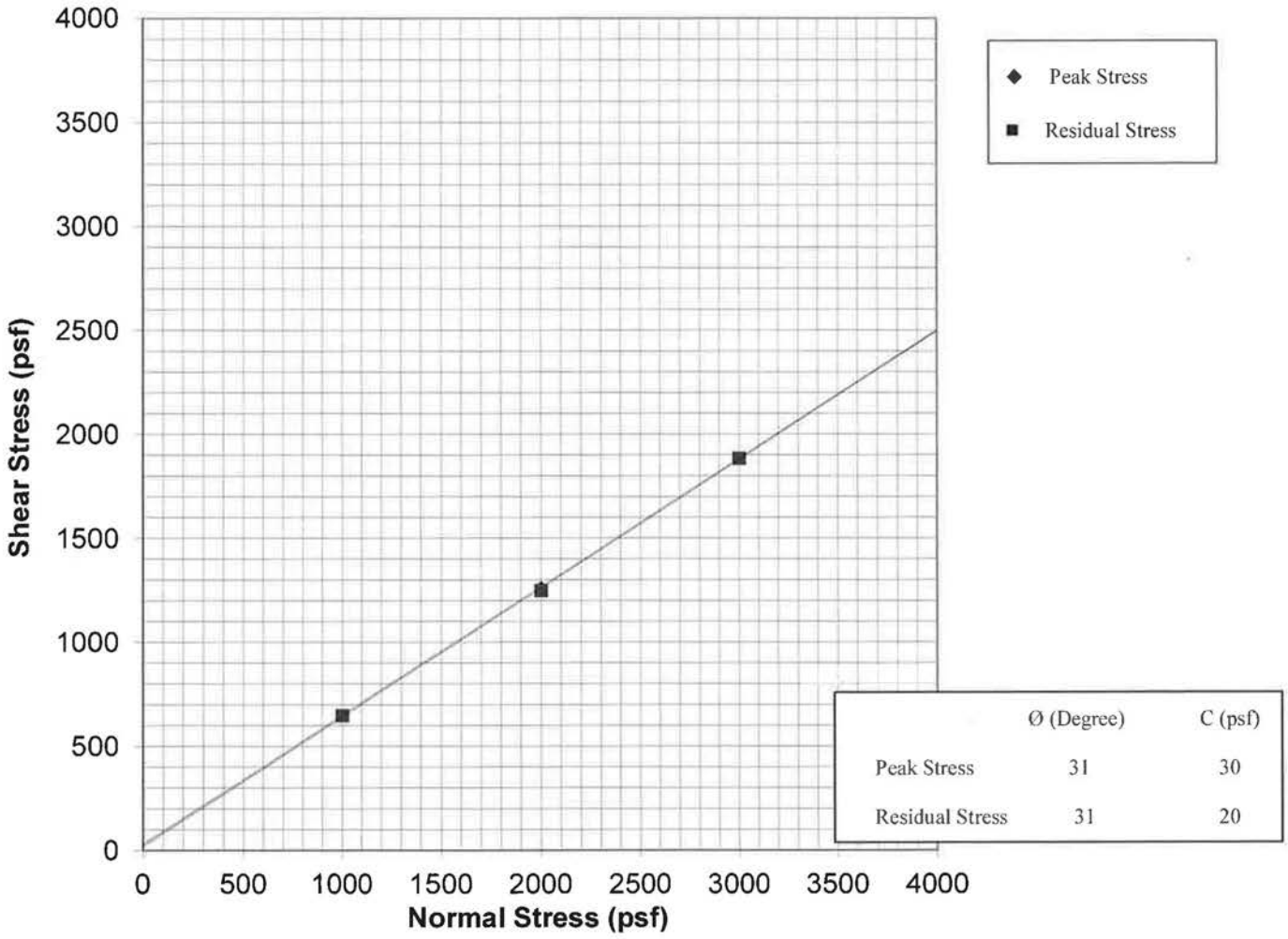
Sample	pH	Electrical Resistivity (ohm-cm)	Sulfate (%)	Chloride (ppm)
T-3 @ 2'	6.8	3,134	0.003	209

ND denotes not detected
% by weight
ppm – mg/kg

Sample No.	T3@2'	
Sample Type:	Undisturbed/Saturated	
Soil Description:	Clayey Sand	

		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	648	1260	1884
Displacement	(in)	0.175	0.175	0.250
Residual Stress	(psf)	648	1248	1884
Displacement	(in.)	0.250	0.250	0.250
In Situ Dry Density	(pcf)	114.2	114.2	114.2
In Situ Water Content	(%)	7.0	7.0	7.0
Saturated Water Content	(%)	17.6	17.6	17.6
Strain Rate	(in/min)	0.020	0.020	0.020





	Ø (Degree)	C (psf)
Peak Stress	31	30
Residual Stress	31	20

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SOILS AND GEOTECHNICAL CONSULTANTS

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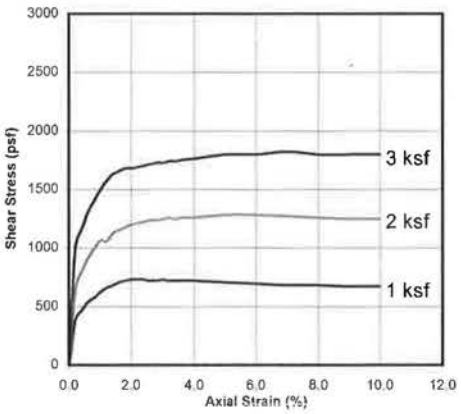
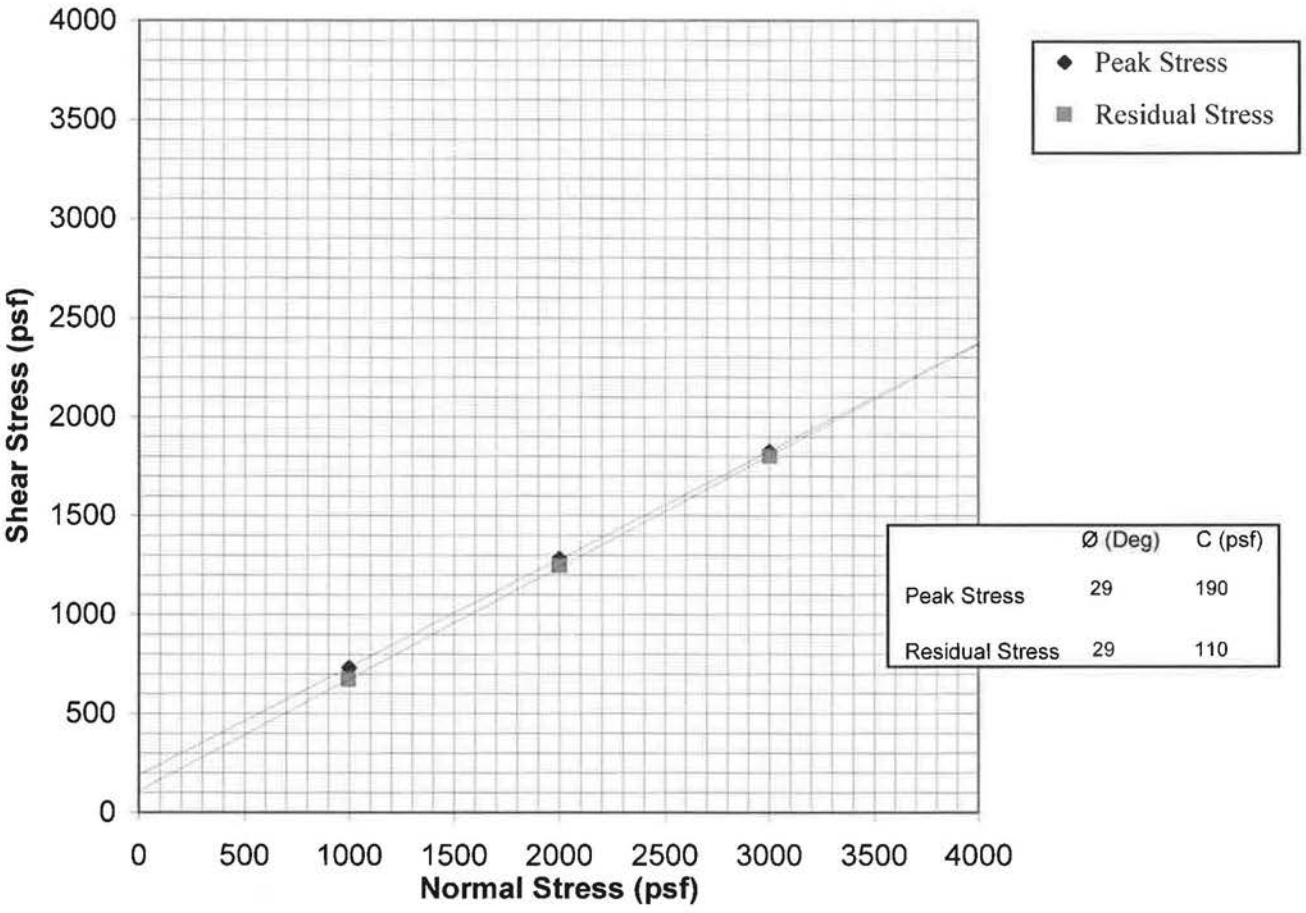
PROJECT NUMBER: 20083-17 DATE: 12/19/2017

DIRECT SHEAR TEST
ASTM D3080
Plate A

Sample No.		T7@2'		
Sample Type:		Undisturbed-Saturated		
Soil Description:		Clayey Sand		
		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	732	1284	1824
Displacement	(in.)	0.050	0.125	0.175
Residual Stress	(psf)	672	1248	1800
Displacement	(in.)	0.250	0.250	0.250
Initial Dry Density	(pcf)	116.3	116.3	116.3
Initial Water Content	(%)	2.7	2.7	2.7
Strain Rate	(in./min.)	0.020	0.020	0.020





NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

Newcastle Partners

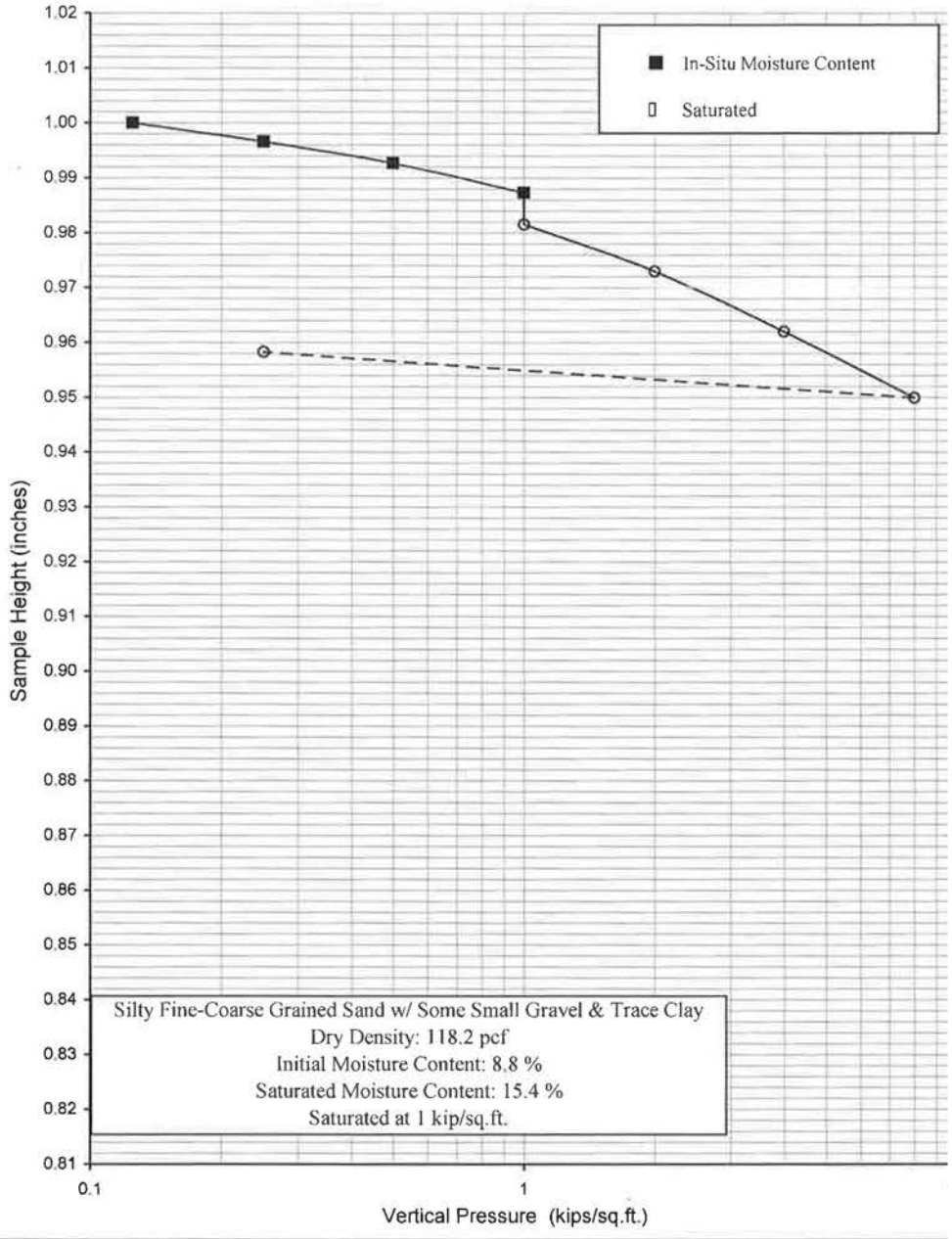
PROJECT NUMBER: 20083-17 DATE: 12/19/2017

DIRECT SHEAR TEST
ASTM D3080
Plate B

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9966	0.3	
0.5	0.9927	0.7	
1	0.9873	1.3	
1	0.9815	1.9	
2	0.9730	2.7	
4	0.9620	3.8	
8	0.9499	5.0	
0.25	0.9583	4.2	Saturated

Date Tested: 12/13/2017
Sample: B2
Depth: 5'

Sample No.	B2	Depth	5'	Date	12/19/2017



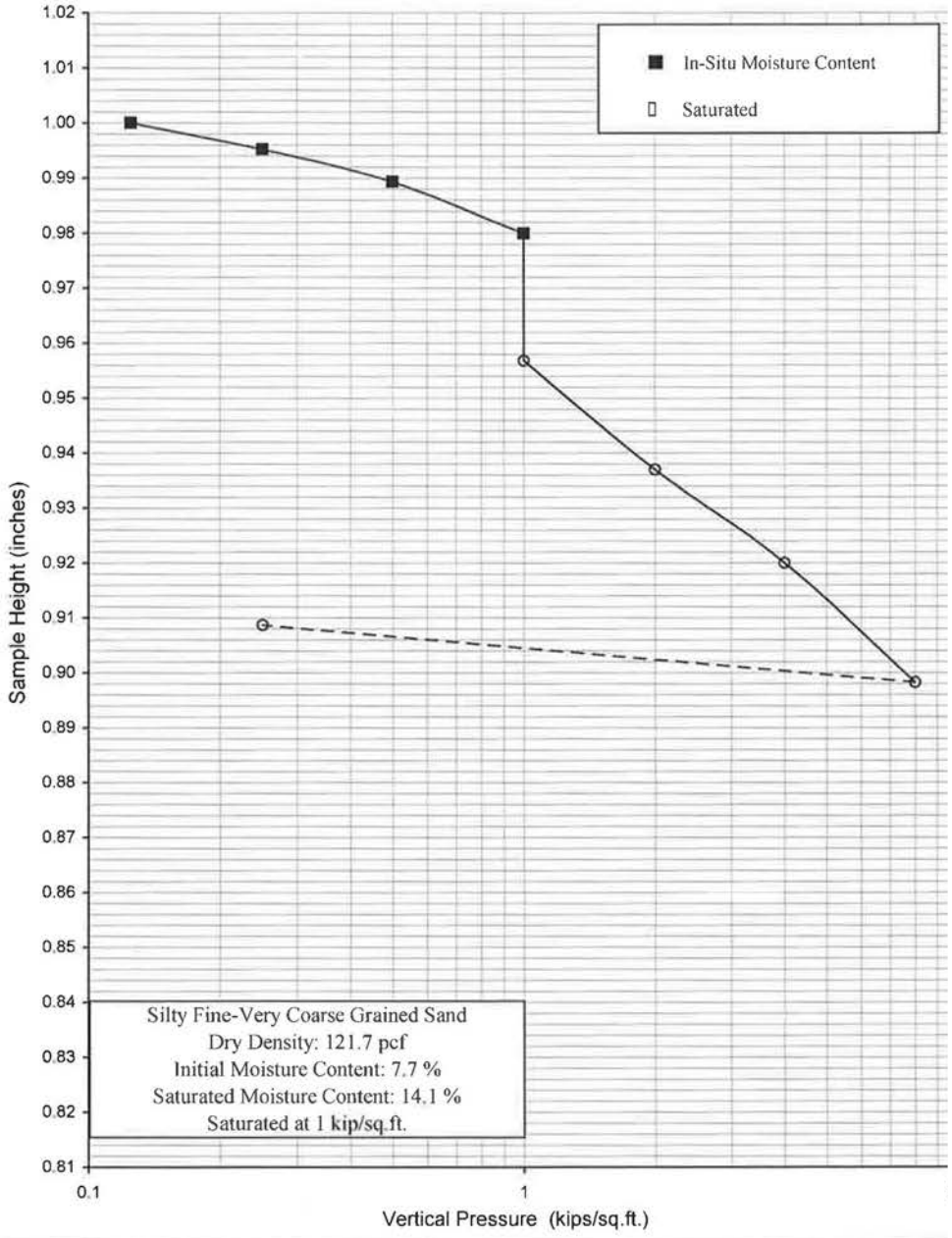
NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS
Newcastle Partners
PROJECT NUMBER: 20083-17 DATE: 12/19/2017

CONSOLIDATION TEST
ASTM D2435
Plate C

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9952	0.5	
0.5	0.9893	1.1	
1	0.9799	2.0	
1	0.9568	4.3	
2	0.9370	6.3	
4	0.9200	8.0	
8	0.8982	10.2	
0.25	0.9087	9.1	Saturated

Date Tested: 12/14/2017
Sample: B2
Depth: 10'

Sample No.	B2	Depth	10'	Date	12/19/2017



NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

Newcastle Partners

PROJECT NUMBER: 20083-17 DATE: 12/19/2017

CONSOLIDATION TEST

ASTM D2435

Plate D

Appendix C

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

Project:	**Newcastle Partners**
Project No:	20083-17
Date:	12/5/17
Test No.	1
Depth:	5'
Tested By:	J.S.

	TIME (hr/min)	CHANGE TIME (min)	CUMULATIVE TIME (min)	INNER RING READING (cm)	INNER RING CHANGE	INNER RING FLOW (cc)	OUTER RING READING (cm)	OUTER RING CHANGE (cm)	OUTER RING FLOW (cc)	INNER RING INF RATE (cm/hr)	OUTER RING INF RATE (cm/hr)	INNER RING INF RATE (ft/hr)
1	9:04			104.5			47.0					
	9:14	10	10	104.6	0.1		47.3	0.3		1.8	1.8	
2	9:14			104.6			47.3					
	9:24	10	20	105.0	0.4		47.6	0.3		1.8	1.8	
3	9:24			105.0			47.6					
	9:34	10	30	105.1	0.1		47.8	0.2		1.2	1.2	
4	9:34			105.1			47.8					
	9:44	10	40	105.2	0.1		47.9	0.1		0.6	0.5	
5	9:44			105.2			47.9					
	9:54	10	50	105.3	0.1		48.1	0.2		1.2	1.2	
6	9:54			105.3			48.1					
	10:04	10	60	105.3	0.0		48.1	0.0		0.0	0.0	
7	10:04			105.3			48.1					
	10:14	10	70	105.3	0.0		48.1	0.0		0.0	0.0	
8	10:14			105.3			48.1					
	10:24	10	80	105.3	0.0		48.1	0.0		0.0	0.0	
9	10:24			105.3			48.1					
	10:34	10	90	105.3	0.0		48.1	0.0		0.0	0.0	
10	10:34			105.3			48.1					
	10:44	10	100	105.3	0.0		48.1	0.0		0.0	0.0	
11	10:44			105.3			48.1					
	10:54	10	110	105.3	0.0		48.1	0.0		0.0	0.0	
12	10:54			105.3			48.1					
	11:04	10	120	105.3	0.0		48.1	0.0		0.0	0.0	

Average = 0.55 / 0.55

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

Project:	**Newcastle Partners**
Project No:	20083-17
Date:	12/5/17
Test No.	2
Depth:	10'
Tested By:	J.S.

	TIME (hr/min)	CHANGE TIME (min)	CUMULATIVE TIME (min)	INNER RING READING (cm)	INNER RING CHANGE	INNER RING FLOW (cc)	OUTER RING READING (cm)	OUTER RING CHANGE (cm)	OUTER RING FLOW (cc)	INNER RING INF RATE (cm/hr)	OUTER RING INF RATE (cm/hr)	INNER RING INF RAT (ft/hr)
1	11:32			106.4			49.6					
	11:42	10	10	106.5	0.1		49.9	0.3		0.6	1.8	
2	11:42			106.5			49.9					
	11:52	10	20	106.5	0.0		50.0	0.1		0.0	0.6	
3	11:52			106.5			50.0					
	12:02	10	30	106.6	0.1		50.0	0.0		0.6	0.0	
4	12:02			106.6			50.0					
	12:12	10	40	106.7	0.1		50.1	0.1		0.6	0.6	
5	12:12			106.7			50.1					
	12:22	10	50	106.7	0.0		50.1	0.0		0.0	0.0	
6	12:22			106.7			50.1					
	12:32	10	60	106.7	0.0		50.1	0.0		0.0	0.0	
7	12:32			106.7			50.1					
	12:42	10	70	106.8	0.1		50.2	0.1		0.6	0.6	
8	12:42			106.8			50.2					
	12:52	10	80	106.8	0.0		50.3	0.1		0.0	0.6	
9	12:52			106.8			50.3					
	1:02	10	90	106.9	0.1		50.4	0.1		0.6	0.6	
10	1:02			106.9			50.4					
	1:12	10	100	106.9	0.0		50.4	0.0		0.0	0.0	
11	1:12			106.9			50.4					
	1:22	10	110	107.0	0.1		50.5	0.1		0.6	0.6	
12	1:22			107.0			50.5					
	1:32	10	120	107.0	0.0		50.5	0.0		0.0	0.0	

Average = 0.3 / 0.4

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

1.v

WQMP Project Report

County of Riverside Stormwater Program

Santa Ana River Watershed Geodatabase

Thursday, January 25, 2018

Note: The information provided in this report and on the Stormwater Geodatabase for the County of Riverside Stormwater Program is intended to provide basic guidance in the preparation of the applicant's Water Quality Management Plan (WQMP) and should not be relied upon without independent verification.

Project Site Parcel Number(s):	297170029, 297170002, 297170064, 297170034
Latitude/Longitude:	33.9146, -117.2599
Thomas Brothers Page:	717
Project Site Acreage:	9.77
Watershed(s):	SANTA ANA
This Project Site Resides in the following Hydrologic Unit (s) (HUC):	**HUC Name** - HUC Number **Moreno Valley** - 180702020304
The HUCs Contribute stormwater to the following 303d listed water bodies and TMDLs which may include drainage from your proposed Project Site:	**WBID Name** - WBID Number **Canyon Lake (Railroad Canyon Reservoir)** - CAL8021100019990208151525 **Elsinore, Lake** - CAL8023100019990208151100
These 303d listed Water bodies and TMDLs have the following Pollutants of Concern (POC):	**Bacterial Indicators** - Pathogens **Nutrients** - Nutrients, Organic Enrichment/Low Dissolved Oxygen **Other Organics** - PCBs (Polychlorinated biphenyls) **Toxicity** - Sediment Toxicity, Unknown Toxicity
Limitations on Infiltration:	**Project Site Onsite Soils Group(s)** - C **Known Groundwater Contamination Plumes within 1000'** - No **Adjacent Water Supply Wells(s)** - No information available please contact your local water agency for more information. Your local contact agency is EASTERN MUNICIPAL W.D.. Your local wholesaler contact agency is METROPOLITAN WATER DISTRICT.
Environmentally Sensitive Areas within 200'(Fish and Wildlife Habitat/Species):	None
Environmentally Sensitive Areas within 200'(CVMSHCP):	None
Environmentally Sensitive Areas within 200'(WRMSHCP):	Burrowing Owl Survey Required Area
Groundwater elevation from Mean Sea Level:	1541
85th Percentile Design Storm Depth (in):	0.634
Groundwater Basin:	Perris-North
MSHCP/CVMSHCP Criteria Cell(s):	No Data
Retention Ordinance Information:	No Data
Studies and Reports Related to Project Site:	Comprehensive Nutrient Reduction Plan IBI Scores - Southern Cal RiversideBasin bulletin118_4-sc water_fact_3_7.11 8039-SAR-Hydromodification Sunnymead MDP West San Jacinto GW Basin Management Plan Sunnymead ADP Map Sunnymead ADP Report

All Ecological Sites -- Rangeland—Western Riverside Area, California
(Centerpointe Industrial Warehouse)

Map Scale: 1:1,480 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

R019XD029CA

Not rated or not available

Soil Rating Lines

R019XD029CA

Not rated or not available

Soil Rating Points

R019XD029CA

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 10, Sep 12, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 14, 2015—Jan 21, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

All Ecological Sites — Rangeland

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
MmB	Monserate sandy loam, 0 to 5 percent slopes	Monserate (85%)	R019XD029CA — LOAMY (1975)	9.2	100.0%
		Greenfield (5%)			
		Hanford (5%)			
		Tujunga (5%)			
Totals for Area of Interest				**9.2**	**100.0%**

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

N/A – PROJECT PROPOSES TO TREAT STORMWATER RUNOFF WITH LID BMPs

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend:	
▨	Required Entries
▨	Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	REC Consultants, Inc.	Date	3/30/2018
Designed by	Jason Evans, PE	Case No	

Company Project Number/Name: 1379 -- SDH Centerpointe Industrial Warehouse

BMP Identification

BMP NAME / ID: BMP WEST

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.63 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
WEST-IMP	*34914*	*Ornamental Landscaping*	*0.1*	*0.11*	*3856.5*			
WEST-PER	*152256*	*Concrete or Asphalt*	*1*	*0.89*	*135812.4*			
	187170	***Total***			**139668.9**	**0.63**	***7379.2***	***14525***

Notes:

Bioretention Facility - Design Procedure	BMP ID	Legend:	Required Entries	
	BMP-WEST		Calculated Cells	

Company Name:	REC-Consultants, Inc	Date:	3/30/2018
Designed by:	Jason Evans, PE	County/City Case No.:	

Design Volume

Enter the area tributary to this feature	A_T=	4.3	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	7,380	ft^3

Type of Bioretention Facility Design

- ○ Side slopes required (parallel to parking spaces or adjacent to walkways)
- ◉ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	2.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	20.0	ft
Total Effective Depth, d_E			
$d_E = [(0.3) \times d_S + (0.4) \times 1] + 0.5$	d_E =	1.50	ft
Minimum Surface Area, A_m			
$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	4,920	ft^2
Proposed Surface Area	A=	8,300	ft^2
Minimum Required Length of Bioretention Facility, L	L =	246.0	ft

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	0	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		1.5	%
6" Check Dam Spacing		25	feet
Describe Vegetation:		Other	

Notes: Landscaping with native and/or drought tolerant vegetation.

Stage-Storage for BMP WEST

Elevation (ft)	Area (ft^2)	Volume (ft^3)	
0.00	8300	**0**	BOTTOM OF GRAVEL LAYER (0.4 Voids)
0.25	8300	830	
0.50	8300	1660	
0.75	8300	2490	
1.00	8300	3320	TOP OF GRAVEL LAYER
1.001	8300	3322	BOTTOM OF AMMENDED SOILS LAYER (0.3 Voids)
1.25	8300	3943	
1.50	8300	4565	
1.75	8300	5188	
2.00	8300	5810	
2.25	8300	6433	
2.50	8300	7055	
2.75	8300	7678	
3.00	8300	8300	TOP OF AMMENDED SOILS LAYER
3.001	8300	8308	BOTTOM OF MULCH
3.25	8300	10375	TOP OF MULCH
3.50	8300	12450	
3.75	8300	14525	SURFACE DISCHARGE(1,2)
4.00	8300	16600	
4.25	8300	18675	
4.50	8300	20750	
4.75	8300	22825	
5.00	8300	24900	
5.25	8300	26975	
5.50	8300	29050	
5.75	8300	31125	

(1): Volume at this elevation coresponds with surface volume for WQ purposes (invert of lowest surface outlet)
(2): This elevation corresponds to the top of the riser elevation and is equal to the invert of the existing-receiving stormdrain located along the southwestern project boundary

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: REC Consultants, Inc. | Date: 3/30/2018

Designed by: Jason Evans, PE | Case No:

Company Project Number/Name: 1379 SDH -- Centerpointe Industrial Warehouse

BMP Identification

BMP NAME / ID: BMP EAST

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.63 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
EAST-IMP	*180068*	*Concrete or Asphalt*	*1*	*0.89*	*160620.7*			
EAST-PER	*15220*	*Ornamental Landscaping*	*0.1*	*0.11*	*1681.2*			
	195288		*Total*		*162301.9*	*0.63*	*8575*	*8578*

Notes:

Dimensions for BMP East

Proposing OldCastle Underground Vaults Model 7x15x6

Dimensions

Length (ft)	Width (ft)	Height (ft)	Number	Area (sf)	Volume (cf)
15	7	6	24	2520	15120

Outside				Footprint
Length (ft)	Width (ft)	Height (ft)	Number	Area (sf)
16	8	6.5	24	3072

Stage-Area for BMP East

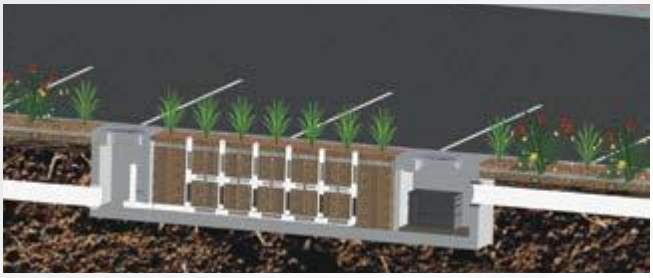
Elevation (ft)	Area (ft^2)	Volume (ft^3)	
0.00	2520	**0**	
1.00	2520	2520	
2.00	2520	5040	
3.00	2520	7560	
3.40	2520	8578	DCV(1,2)
4.00	2520	10080	
5.00	2520	12600	
6.00	2520	15120	

(1): Baffle wall to be set inside the storage system at 3.40' to ensure DCV is treated. Flows that reach above this elevation flow over the baffle wall, bypass treatment, and go directly to outflow chamber

(2): Proprietary BMP selected based on capacity to treat and discharge DCV within 48hours. Proprietary BMP selected is MWS-L-4-17 or equal.

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

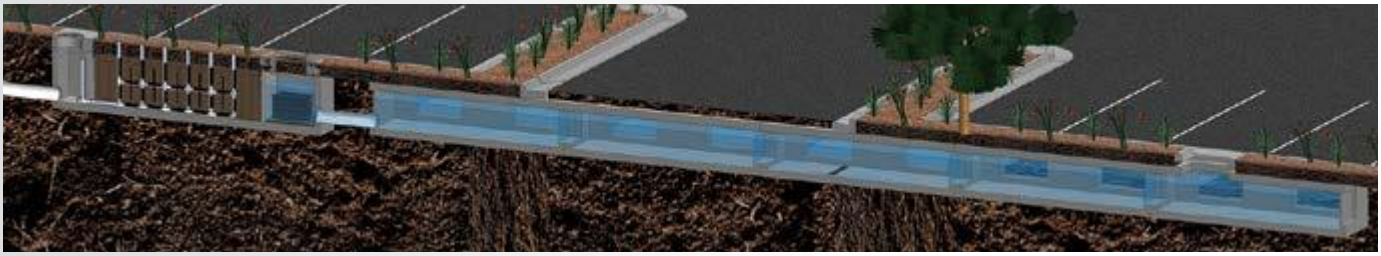


Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

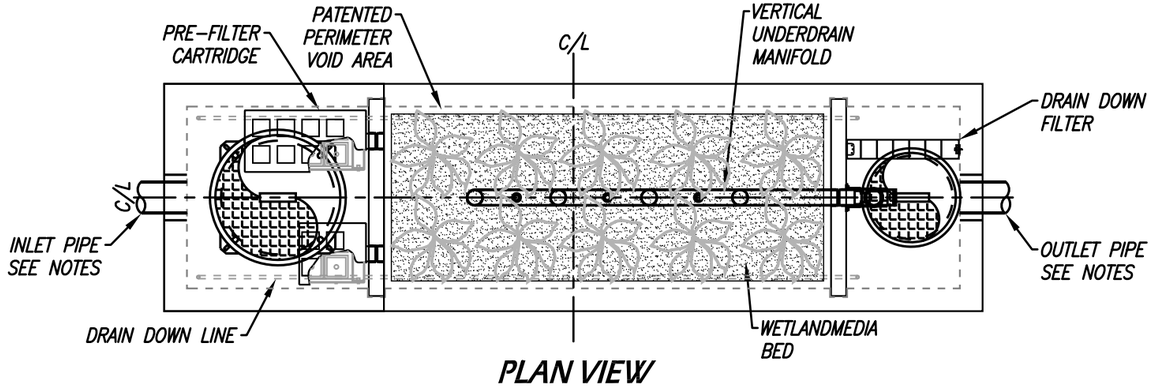
Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.



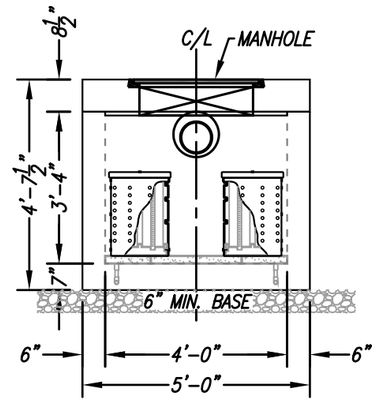
Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

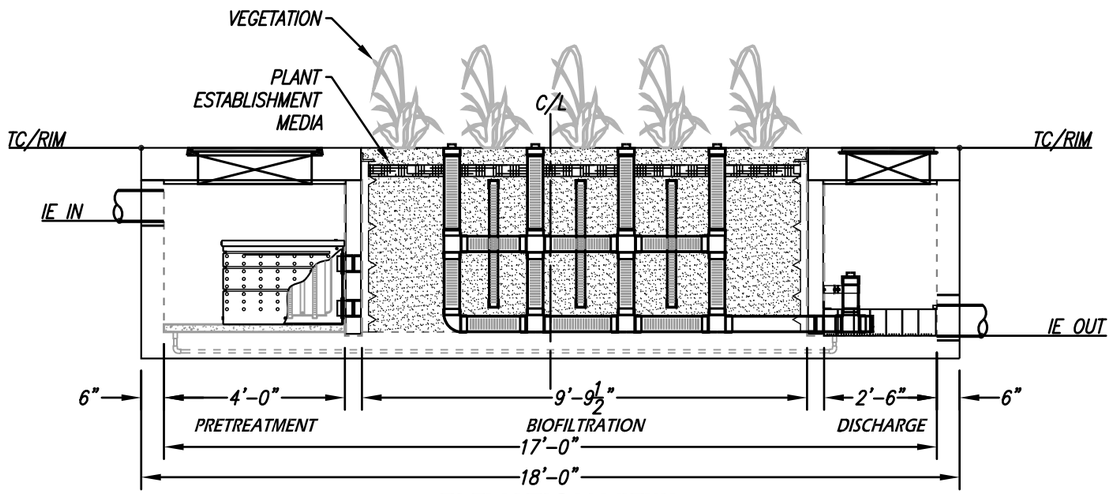
SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			5.41
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø2.05"
MAXIMUM PICK WEIGHT (LBS)			36000
NOTES:			



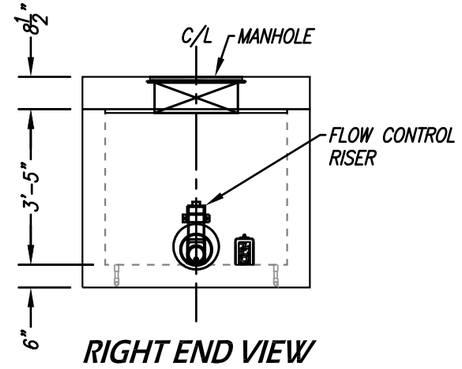
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON–SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.

TREATMENT FLOW (CFS)	0.206
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

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MWS-L-4-17-V
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

Section [_____]
Modular Subsurface Flow Wetland System

PART 1 – GENERAL

01.01.00 Purpose
The purpose of this specification is to establish generally acceptable criteria for Modular Subsurface Flow Wetland Systems used for biofiltration of stormwater runoff including dry weather flows and other contaminated water sources. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description
Modular Subsurface Flow Wetland Systems (MSFWS) are used for filtration of stormwater runoff including dry weather flows. The MSFWS is a pre-engineered biofiltration system composed of a pretreatment chamber containing filtration cartridges, a horizontal flow biofiltration chamber with a peripheral void area and a centralized and vertically extending underdrain, the biofiltration chamber containing a sorptive media mix which does not contain any organic material and a layer of plant establishment media, and a discharge chamber containing an orifice control structure . Treated water flows horizontally in series through the pretreatment chamber cartridges, biofiltration chamber and orifice control structure.

01.03.00 Manufacturer
The manufacturer of the MSFWS shall be one that is regularly engaged in the engineering design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which have a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the MSFWS(s) shall be a filter device Manufactured by Bio Clean Environmental Services, Inc., or Modular Wetland Systems, Inc., or assigned distributors or licensees. Bio Clean Environmental Services Inc., and Modular Wetland Systems, Inc., can be reached at:

Corporate Headquarters:
Bio Clean Environmental Service, Inc.
2972 San Luis Rey Road
Oceanside, CA 92058
Phone: (760) 433-7640
Fax: (760) 433-3176
www.biocleanenvironmental.net

Corporate Headquarters:
Modular Wetland Systems, Inc.
P.O. Box 869
Oceanside, CA 92049
Phone: (760) 433-7650
www.modularwetlands.net

01.04.00 Submittals

01.04.01 Shop drawings are to be submitted with each order to the contractor and consulting engineer.

01.04.02 Shop drawings are to detail the MSFWS and all components required and the sequence for installation, including:

- System configuration with primary dimensions
- Interior components
- Any accessory equipment called out on shop drawings

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of MSFWS.

01.05.02 Manufacturer to supply components of the MSFWS(s):

- Pretreatment chamber components (pre-assembled)
- Concrete Structure(s)
- Biofiltration chamber components (pre-assembled)
- Flow control discharge structure (pre-assembled)

01.06.00 Reference Standards

ASTM C 29	Standard Test Method for Unit Weight and Voids in Aggregate
ASTM C 88	C 88 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C131	C 131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregates by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	C 136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 330	C 330 Standard Specification for Lightweight Aggregate for Structural Concrete
ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft.-lbf/ft3 (600 kN-m/m3)
ASTM D 1621	10 Standard Test Method for Compressive Properties Of Rigid Cellular Plastics
ASTM D 1777	ASTM D1777 - 96(2007) Standard Test Method for Thickness of Textile Materials
ASTM D 4716	Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
AASHTO T 99-01	Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in) Drop
AASHTO T 104	Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T 260	Standard Method of Test for Sampling and Testing for Chloride Ion in Concrete and Concrete Raw Materials.
AASHTO T 288	Standard Method of Test for Determining Minimum Laboratory Soil Resistivity
AASHTO T 289	Standard Method of Test for Determining ph of Soil for Use in Corrosion Testing
AASHTO T 291	Standard Method of Test for Determining Water Soluble Chloride Ion Content in Soil
AASHTO T 290	T 290 Standard Method of Test for Determining Water Soluble Sulfate Ion Content in Soil

PART 2 – COMPONENTS

The Modular Subsurface Flow Wetland Systems (MSFWS) and all of its components shall be self-contained within a concrete structure constructed of concrete with a minimum 28 day compressive strength of 5,000 psi, with reinforcing per ASTM A 615, Grade 60, and supports and H20 loading as indicated by AASHTO. Each Chamber shall have appropriate access hatches for easy maintenance and sized to allow removal of all internal components without disassembly. All water transfer system components shall conform with the following;

- Filter netting shall be 100% Polyester with a number 16 sieve size, and strength tested per ASTM D 3787.
- Drainage cells shall be manufactured of lightweight injection-molded plastic and have a minimum compressive strength test of 6,000 psi and a void area along the surface making contact with the filter media of 75% or greater. The cells shall be at least 2" in thickness and allow water to freely flow in all four directions.

02.01.00 Pretreatment Chamber Components

02.01.01 Filter Cartridges shall operate at a loading rate not to exceed 3 gallons per minute per square foot surface area.

02.01.02 Drain Down System shall include a pervious floor that allows water to drain into the underdrain pipe that is connected to the discharge chamber.

02.02.00 Biofiltration Chamber Components

02.02.01 Media shall consist of ceramic material produced by expanding and vitrifying select material in a rotary kiln. Media must be produced to meet the requirements of ASTM C330, ASTM C331, and AASHTO M195. Aggregates must have a minimum 24-hour water absorption of 10.5% mass. Media shall not contain any organic material. Flow through media shall be horizontal from the outer perimeter of the chamber toward the centralized and vertically extending underdrain. The retention time in the media shall be at least 3 minutes. Downward flow filters are not acceptable alternatives. The thickness of the media shall be at least 19" from influent end to effluent end. The loading rate on the media shall not exceed 1.1 gallons per minute per square foot surface area. Media must be contained within structure that spaces the surface of the media at least 2" from all vertically extending walls of the concrete structure.

02.02.02 Planting shall be native, drought tolerant species recommend by manufacturer and/or landscape architect.

02.02.03 Plant Support Media shall be made of a 3" thick moisture retention cell that is inert and contains no chemicals or fertilizers, is not made of organic material and has an internal void percentage of 80%.

02.03.00 Discharge Chamber

The discharge device shall house a flow control orifice plate that restricts flows greater than designed treatment flow rate. All piping components shall be made of a high-density polyethylene. The discharge chamber shall also contain a drain down filter if specified on the drawing.

PART 3 – PERFORMANCE

03.01.00 General

03.01.01 Function - The MSFWS has no moving internal components and functions based on gravity flow, unless otherwise specified. The MSFWS is composed of a pretreatment chamber, a biofiltration chamber and a discharge chamber. The pretreatment device houses cartridge media filters, which consist of filter media housed in a perforated enclosure. The untreated runoff flows into the system via subsurface piping and or surface inlet. Water entering the system is forced through the filter cartridge enclosures by gravity flow. Then the flow contacts the filter media. The flow through the media is horizontal toward the center of each individual media filter. In the center of the media shall be a round slotted PVC pipe of no greater than 1.5" in diameter. The slotted PVC pipe shall extend downward into the water transfer cavity of the cartridge. The slotted PVC pipe shall be threaded on the bottom to connect to the water transfer cavity. After pollutants have been removed by the filter media the water discharges the pretreatment chamber and flows into the water transfer system and is conveyed to the biofiltration chamber. Once runoff has been filtered by the biofiltration chamber it is collected by the vertical underdrain and conveyed to a discharge chamber equipped with a flow control orifice plate. Finally the treated flow exits the system.

03.01.02 Pollutants - The MSFWS will remove and retain debris, sediments, TSS, dissolved and particulate metals and nutrients including nitrogen and phosphorus species, bacteria, BOD, oxygen demanding substances, organic compounds and hydrocarbons entering the filter during frequent storm events and continuous dry weather flows.

03.01.03 Treatment Flow Rate and Bypass - The MSFWS operates in-line. The MSFWS will treat 100% of the required water quality treatment flow based on a minimum filtration capacities listed in section 03.02.00. The size of the system must match those provided on the drawing to ensure proper performance and hydraulic residence time.

Minimum Treatment Capabilities

• System must be capable of treating flows to the specified treatment flow rate on the drawings. The flow rate shall be controlled by an orifice plate.

PART 4 - EXECUTION

04.01.00 General

The installation of the MSFWS shall conform to all applicable national, state, state highway, municipal and local specifications.

04.02.00 Installation

The Contractor shall furnish all labor, equipment, materials and incidentals required to install the (MSFWS) device(s) and appurtenances in accordance with the drawings and these specifications.

04.02.01 Grading and Excavation site shall be properly surveyed by a registered professional surveyor, and clearly marked with excavation limits and elevations. After site is marked it is the responsibility of the contractor to contact local utility companies and/or DigAlert to check for underground utilities. All grading permits shall be approved by governing agencies before commencement of grading and excavation. Soil conditions shall be tested in accordance with the governing agencies requirements. All earth removed shall be transported, disposed, stored, and handled per governing agencies standards. It is the responsibility of the contractor to install and maintain proper erosion control measures during grading and excavation operations.

04.02.02 Compaction – All soil shall be compacted per registered professional soils engineer's recommendations prior to installation of MSFWS components.

04.02.03 Backfill shall be placed according to a registered professional soils engineer's recommendations, and with a minimum of 6" of gravel under all concrete structures.

04.02.04 Concrete Structures – After backfill has been inspected by the governing agency and approved the concrete structures shall be lifted and placed in proper position per plans.

04.02.05 Subsurface Flow Wetland Media shall be carefully loaded into area so not to damage the Wetland Liner or Water Transfer Systems. The entire wetland area shall be filled to a level 9 inches below finished surface.

04.02.06 Planting layer shall be installed per manufacturer's drawings and consist of a minimum 3" grow enhancement media that ensures greater than 95% plant survival rate, and 6" of wetland media. Planting shall consist of native plants recommended by manufacturer and/or landscape architect. Planting shall be drip irrigated for at least the first 3 months to insure long term plant growth. No chemical herbicides, pesticides, or fertilizers shall be used in the planting or care and maintenance of the planted area.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – MSFWS shall be shipped to the contractor's address or job site, and is the responsibility of the contractor to offload the unit(s) and place in the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the MSFWS and all components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be born by the contractor. The MSFWS(s) and all components shall always be stored indoors and transported inside the original shipping container until the unit(s) are ready to be installed. The MSFWS shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor shall demonstrate that the MSFWS has been properly installed at the correct location(s), elevations, and with appropriate components. All components associated with the MSFWS and its installation shall be subject to inspection by the engineer at the place of installation. In addition, the contractor shall demonstrate that the MSFWS has been installed per the manufacturer's specifications and recommendations. All

components shall be inspected by a qualified person once a year and results of inspection shall be kept in an inspection log.

04.04.02 Maintenance – The manufacturer recommends cleaning and debris removal maintenance of once a year and replacement of the Cartridge Filters as needed. The maintenance shall be performed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information regarding the maintenance of the MSFWS. A Maintenance/Inspection record shall be kept by the maintenance operator. The record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured by the MSFWS shall be transported and disposed of at an approved facility for disposal in accordance with local and state requirements. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURNACE

05.01.00 Warranty

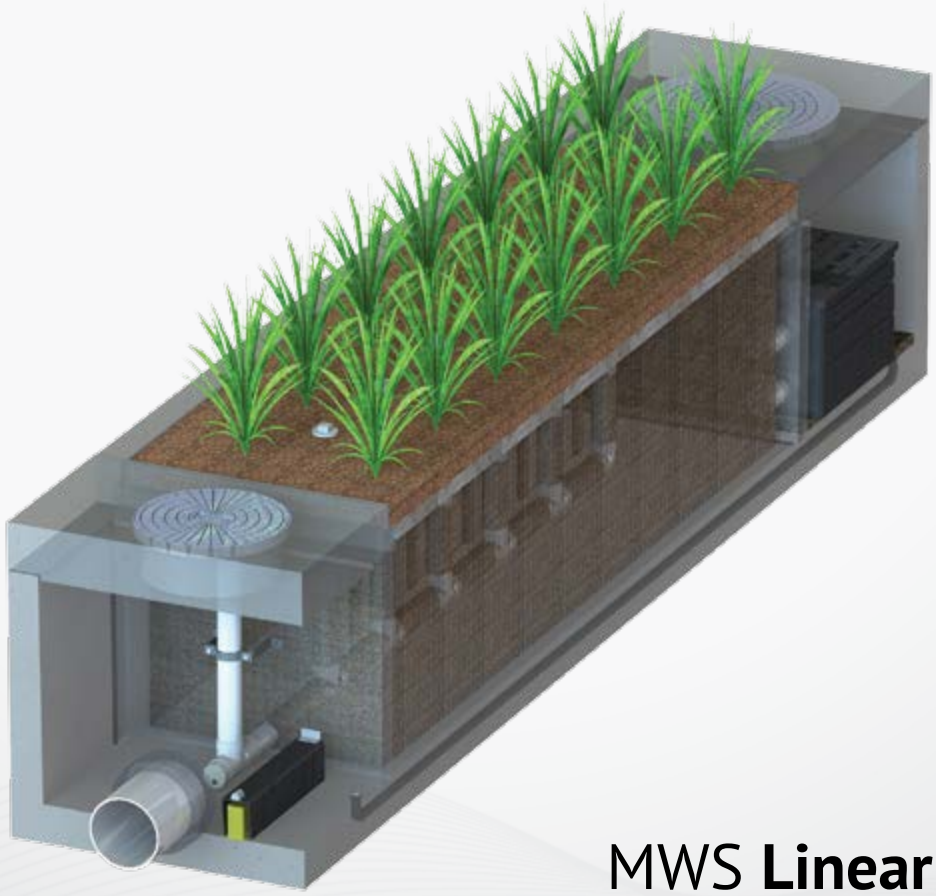
The Manufacturer shall guarantee the MSFWS against all manufacturing defects in materials and workmanship for a period of (5) years from the date of delivery to the _____. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The MSFWS is limited to recommended application for which it was designed.

05.02.00 Performance Certification

The MSFWS manufacturer shall submit to the Engineer of Record a “Manufacturer’s Performance Certificate” certifying the MSFWS is capable of achieving the specified removal efficiency for suspended solids, phosphorous and dissolved metals.

MODULAR WETLANDS™

*Advanced **Stormwater** Biofiltration*



MWS **Linear**

Contents

The Urban Impact

For hundreds of years natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.

Plant A Wetland

Without natural wetlands our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature's presence and rejuvenate water ways in urban areas.

MWS **Linear**

The Modular Wetland System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pre-treatment, the MWS Linear incorporates an advanced pre-treatment chamber that includes separation and pre-filter cartridges. In this chamber sediment and hydrocarbons are removed from runoff before it enters the biofiltration chamber, in turn reducing maintenance costs and improving performance.

Applications

The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.

Industrial

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA mandated effluent limits for dissolved metals and other pollutants.

Residential

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.

Streets

Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.

Parking Lots

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.

Commercial

Compared to bioretention systems, the MWS Linear can treat far more area in less space - meeting treatment and volume control requirements.

Mixed Use

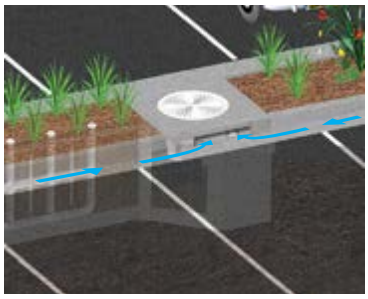
The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications are available on our website: www.ModularWetlands.com/Applications

- Agriculture
- Reuse
- Low Impact Development
- Waste Water

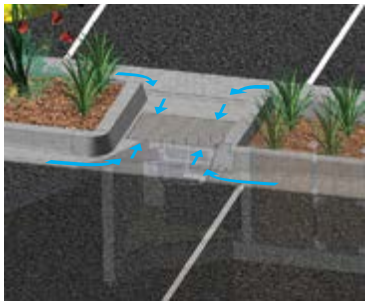
Configurations

The MWS Linear is the preferred biofiltration system of Civil Engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your stormdrain design.



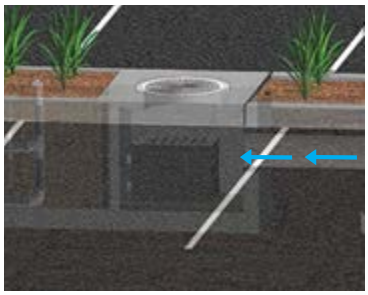
Curb Type

The *Curb Type* configuration accepts sheet flow through a curb opening and is commonly used along road ways and parking lots. It can be used in sump or flow by conditions. Length of curb opening varies based on model and size.



Grate Type

The *Grate Type* configuration offers the same features and benefits as the *Curb Type* but with a grated/drop inlet above the systems pre-treatment chamber. It has the added benefit of allowing for pedestrian access over the inlet. ADA compliant grates are available to assure easy and safe access. The *Grate Type* can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



Vault Type

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pre-treatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretention systems. Another benefit of the "pipe in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.

Downspout Type

The *Downspout Type* is a variation of the *Vault Type* and is designed to accept a vertical downspout pipe from roof top and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

Advantages & Operation

The MWS Linear is the most efficient and versatile biofiltration system on the market, and the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure-1 and Figure-2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

Featured Advantages

- Horizontal Flow Biofiltration
- Greater Filter Surface Area
- Pre-Treatment Chamber
- Patented Perimeter Void Area
- Flow Control
- No Depressed Planter Area

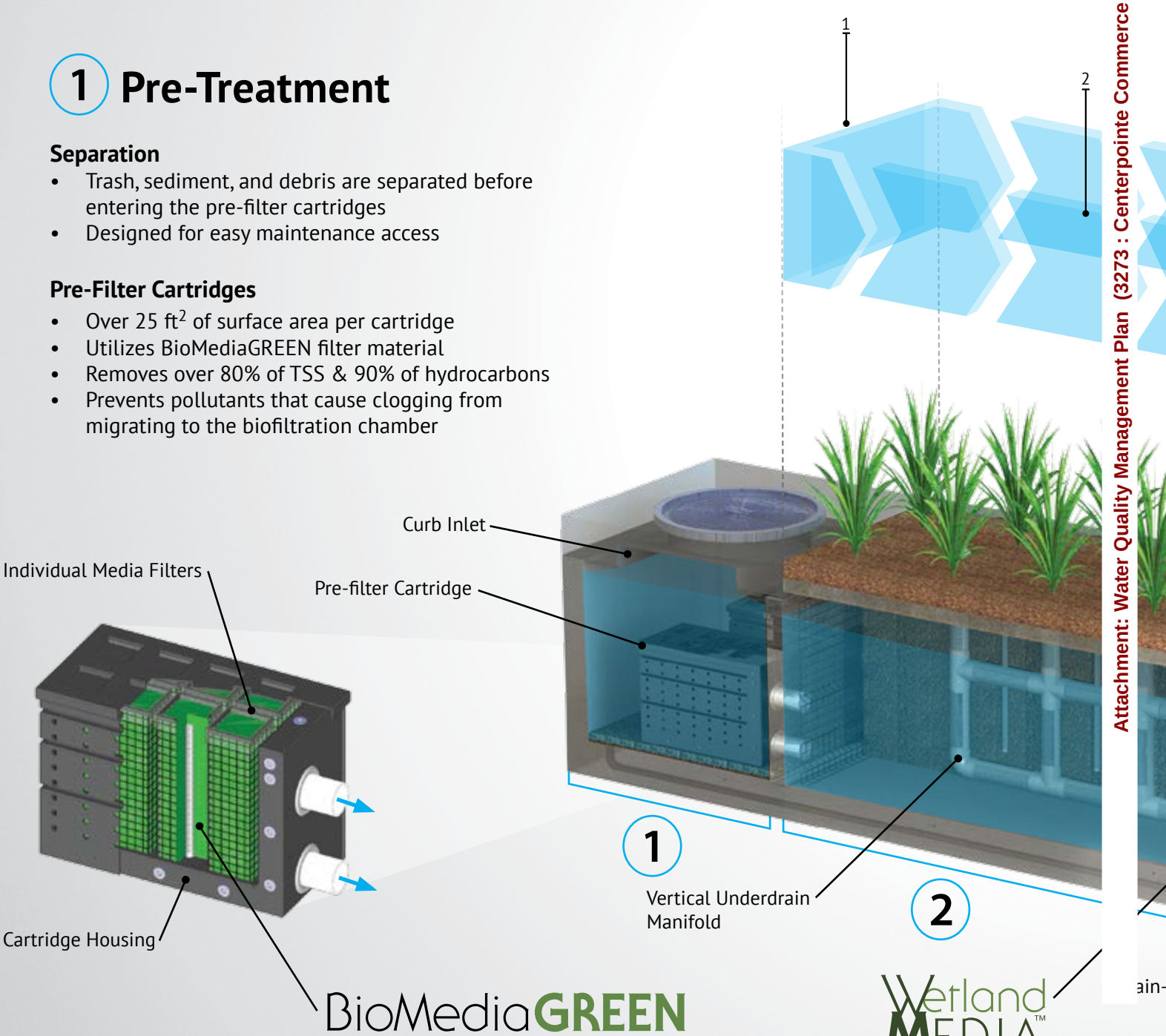
1 Pre-Treatment

Separation

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

Pre-Filter Cartridges

- Over 25 ft^2 of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS & 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber



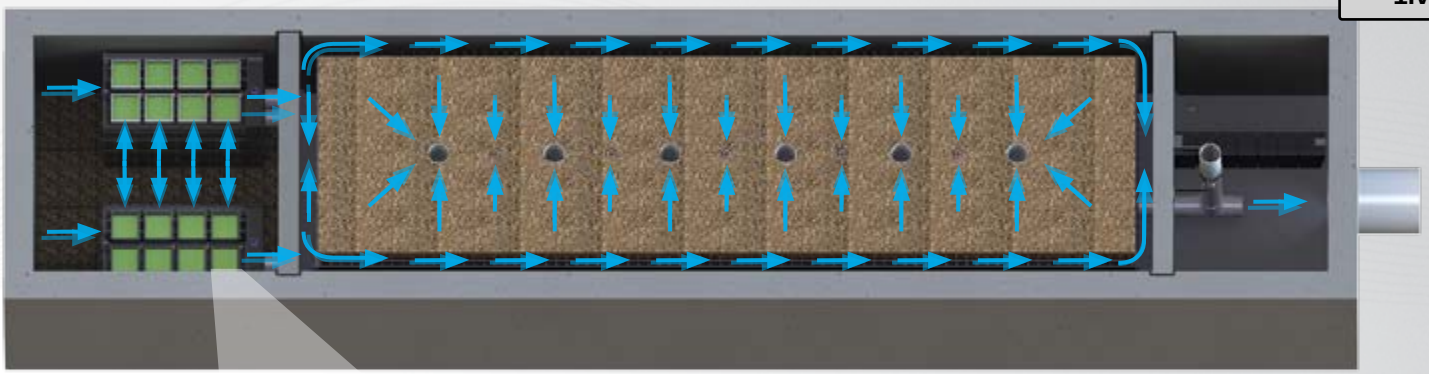


Fig. 2 - Top View

2x to 3x More Surface Area Than Traditional Downward Flow Bioretention Systems.

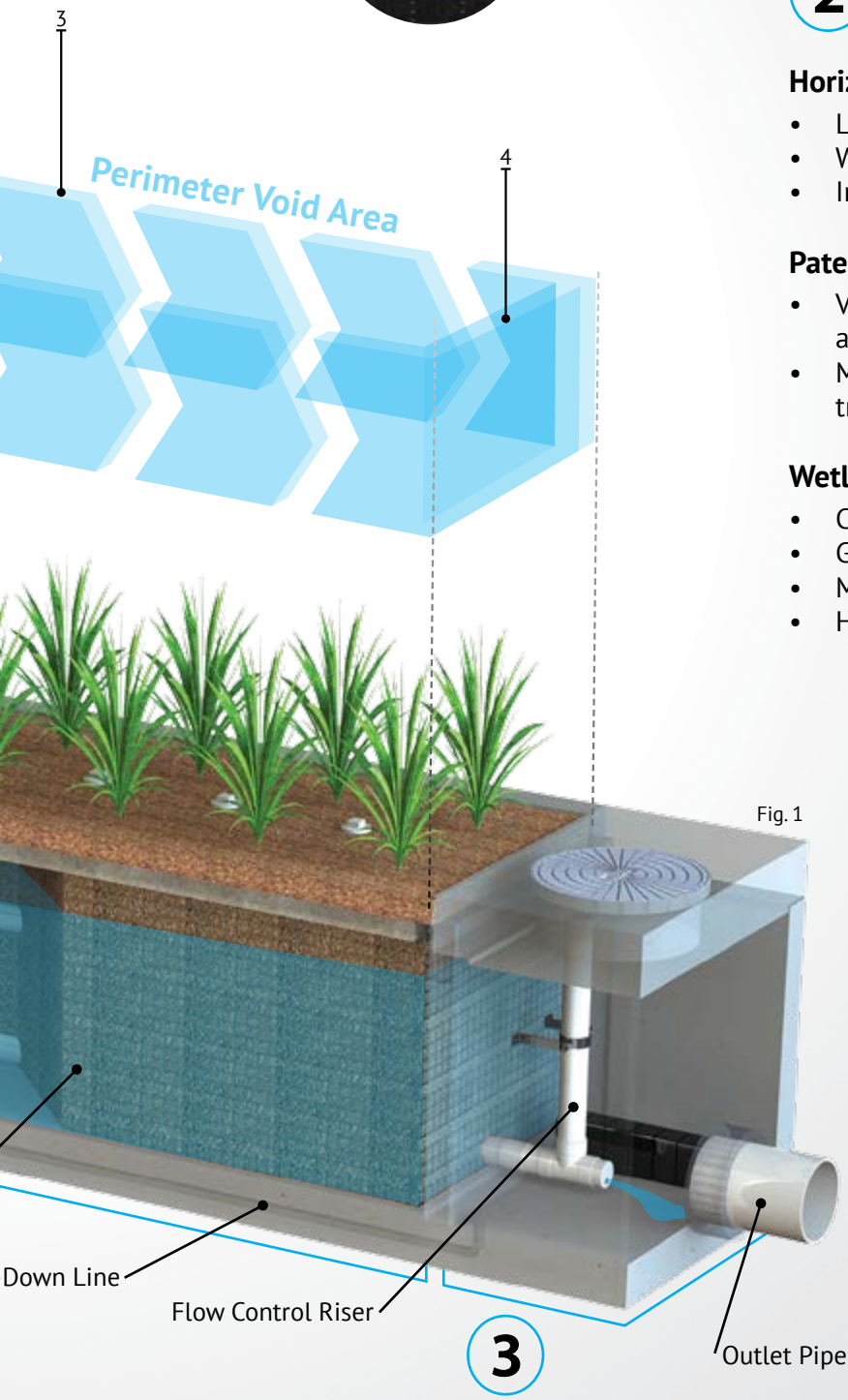


Fig. 1

2 Biofiltration

Horizontal Flow

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

Patented Perimeter Void Area

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides.
- Maximizes surface area of the media for higher treatment capacity

WetlandMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and light weight

3 Discharge

Flow Control

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity.
- Extends the life of the media and improves performance

Drain-Down Filter

- The Drain-Down is an optional feature that completely drains the pre-treatment chamber
- Water that drains from the pre-treatment chamber between storm events will be treated

Orientations

Side-By-Side

The *Side-By-Side* orientation places the pre-treatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.

End-To-End

The *End-To-End* orientation places the pre-treatment and discharge chambers on opposite ends of the biofiltration chamber therefore minimizing the width of the system to 5 ft (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is bypass must be external.

Bypass

Internal Bypass Weir (Side-by-Side Only)

The *Side-By-Side* orientation places the pre-treatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pre-treatment chamber directly to the discharge chamber.

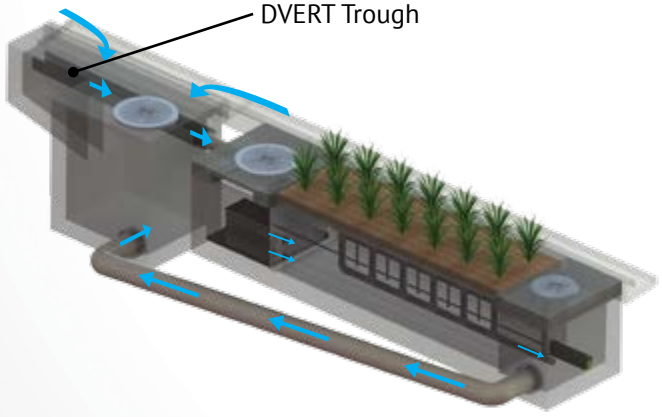
External Diversion Weir Structure

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

Flow By Design

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT Low Flow Diversion



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allows the MWS Linear to be installed anywhere space is available.

Performance

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With it's advanced pre-treatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses natures ability to process, transform, and remove even the most harmful pollutants.

Approvals

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation, and perhaps the world.

Washington State TAPE Approved

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft^2 loading rate. The highest performing BMP on the market for all main pollutant categories.

TSS	Total Phosphorus	Ortho Phosphorus	Nitrogen	Dissolved Zinc	Dissolved Copper	Total Zinc	Total Copper	Motor Oil
85%	64%	67%	45%	66%	38%	69%	50%	95%

DEQ Assignment

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Technical Criteria.

Maryland Department Of The Environment Approved

Granted ESD (Environmental Site Design) status for new construction, redevelopment and retrofitting when designed in accordance with the Design Manual.

MASTEP Evaluation

The University of Massachusetts at Amherst – Water Resources Research Center, issued a technical evaluation report noting removal rates up to 84% TSS, 70% Total Phosphorus, 68.5% Total Zinc, and more.

Rhode Island DEM Approved

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% Pathogens, 30% Total Phosphorus, and 30% Total Nitrogen.

Flow Based Sizing

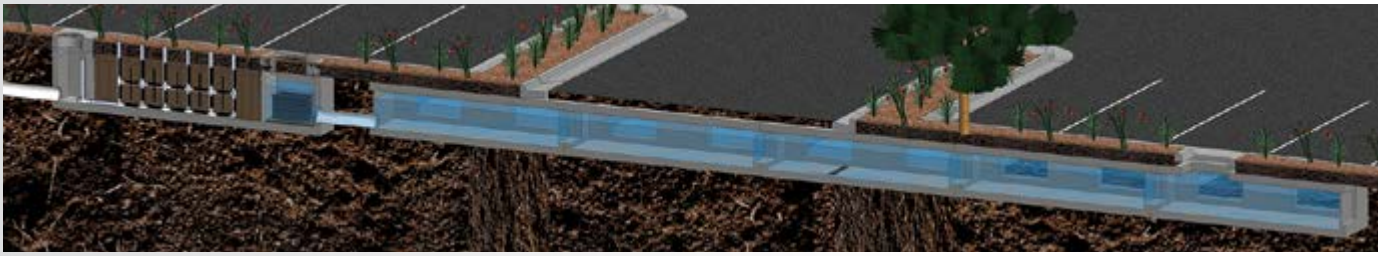
The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.



Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

Installation

The MWS Linear is simple, easy to install, and has a space efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles pre-cast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.

Maintenance

Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pre-treatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pre-treatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pre-treatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pre-treatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long term operation and there is absolutely no need to replace expensive biofiltration media.

Plant Selection

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more "contact time" so that pollutants are more successfully decomposed, volatilized and incorporated into the biomass of The MWS Linear's micro/macro flora and fauna.

A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by selecting the list relative to your project location's hardy zone.

Please visit **www.ModularWetlands.com/Plants** for more information and various plant lists.

3.5 Bioretention Facility

Type of BMP	LID – Bioretention
Treatment Mechanisms	Infiltration, Evapotranspiration, Evaporation, Biofiltration
Maximum Drainage Area	This BMP is intended to be integrated into a project's landscaped area in a distributed manner. Typically, contributing drainage areas to Bioretention Facilities range from less than 1 acre to a maximum of around 10 acres.
Other Names	Rain Garden, Bioretention Cell, Bioretention Basin, Biofiltration Basin, Landscaped Filter Basin, Porous Landscape Detention

Description

Bioretention Facilities are shallow, vegetated basins underlain by an engineered soil media. Healthy plant and biological activity in the root zone maintain and renew the macro-pore space in the soil and maximize plant uptake of pollutants and runoff. This keeps the Best Management Practice (BMP) from becoming clogged and allows more of the soil column to function as both a sponge (retaining water) and a highly effective and self-maintaining biofilter. In most cases, the bottom of a Bioretention Facility is unlined, which also provides an opportunity for infiltration to the extent the underlying onsite soil can accommodate. When the infiltration rate of the underlying soil is exceeded, fully biotreated flows are discharged via underdrains. Bioretention Facilities therefore will inherently achieve the maximum feasible level of infiltration and evapotranspiration and achieve the minimum feasible (but highly biotreated) discharge to the storm drain system.

Siting Considerations

These facilities work best when they are designed in a relatively level area. Unlike other BMPs, Bioretention Facilities can be used in smaller landscaped spaces on the site, such as:

- ✓ Parking islands
- ✓ Medians
- ✓ Site entrances

Landscaped areas on the site (such as may otherwise be required through minimum landscaping ordinances), can often be designed as Bioretention Facilities. This can be accomplished by:

- *Depressing* landscaped areas below adjacent impervious surfaces, rather than elevating those areas
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention Facility, rather than away from the landscaping
- Sizing and designing the depressed landscaped area as a Bioretention Facility as described in this Fact Sheet

Bioretention Facilities should however not be used downstream of areas where large amounts of sediment can clog the system. Placing a Bioretention Facility at the toe of a steep slope should also be avoided due to the potential for clogging the engineered soil media with erosion from the slope, as well as the potential for damaging the vegetation.

Design and Sizing Criteria

The recommended cross section necessary for a Bioretention Facility includes:

- Vegetated area
- 18' minimum depth of engineered soil media
- 12' minimum gravel layer depth with 6' perforated pipes (added flow control features such as orifice plates may be required to mitigate for HCOC conditions)

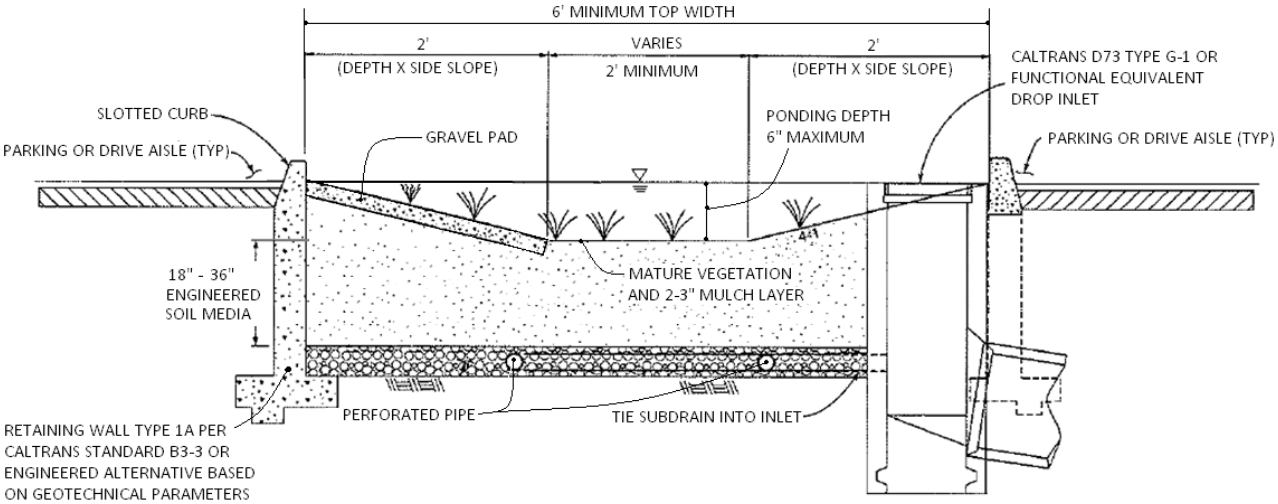


Figure 1: Standard Layout for a Bioretention Facility

While the 18-inch minimum engineered soil media depth can be used in some cases, it is recommended to use 24 inches or a preferred 36 inches to provide an adequate root zone for the chosen plant palate. Such a design also provides for improved removal effectiveness for nutrients. The recommended ponding depth inside of a Bioretention Facility is 6 inches; measured from the flat bottom surface to the top of the water surface as shown in Figure 1.

Because this BMP is filled with an engineered soil media, pore space in the soil and gravel layer is assumed to provide storage volume. However, several considerations must be noted:

- Surcharge storage above the soil surface (6 inches) is important to assure that design flows do not bypass the BMP when runoff exceeds the soil's absorption rate.
- In cases where the Bioretention Facility contains engineered soil media deeper than 36 inches, the pore space within the engineered soil media can only be counted to the 36-inch depth.
- A maximum of 30 percent pore space can be used for the soil media whereas a maximum of 40 percent pore space can be use for the gravel layer.

BIORETENTION FACILITY BMP FACT SHEET

Engineered Soil Media Requirements

The engineered soil media shall be comprised of 85 percent mineral component and 15 percent organic component, by volume, drum mixed prior to placement. The mineral component shall be a Class A sandy loam topsoil that meets the range specified in Table 1 below. The organic component shall be nitrogen stabilized compost[1], such that nitrogen does not leach from the media.

Table 1: Mineral Component Range Requirements

Percent Range	Component
70-80	Sand
15-20	Silt
5-10	Clay

The trip ticket, or certificate of compliance, shall be made available to the inspector to prove the engineered mix meets this specification.

Vegetation Requirements

Vegetative cover is important to minimize erosion and ensure that treatment occurs in the Bioretention Facility. The area should be designed for at least 70 percent mature coverage throughout the Bioretention Facility. To prevent the BMP from being used as walkways, Bioretention Facilities shall be planted with a combination of small trees, densely planted shrubs, and natural grasses. Grasses shall be native or ornamental; preferably ones that do not need to be mowed. The application of fertilizers and pesticides should be minimal. To maintain oxygen levels for the vegetation and promote biodegradation, it is important that vegetation not be completely submerged for any extended period of time. Therefore, a maximum of 6 inches of ponded water shall be used in the design to ensure that plants within the Bioretention Facility remain healthy.

A 2 to 3-inch layer of standard shredded aged hardwood mulch shall be placed as the top layer inside the Bioretention Facility. The 6-inch ponding depth shown in Figure 1 above shall be measured from the top surface of the 2 to 3-inch mulch layer.

Curb Cuts

To allow water to flow into the Bioretention Facility, 1-foot-wide (minimum) curb cuts should be placed approximately every 10 feet around the perimeter of the Bioretention Facility. Figure 2 shows a curb cut in a Bioretention Facility. Curb cut flow lines must be at or above the V_{BMP} water surface level.

[1] For more information on compost, visit the US Composting Council website at: http://compostingcouncil.org/

BIORETENTION FACILITY BMP FACT SHEET

Figure 2: Curb Cut located in a Bioretention Facility

To reduce erosion, a gravel pad shall be placed at each inlet point to the Bioretention Facility. The gravel should be 1- to 1.5-inch diameter in size. The gravel should overlap the curb cut opening a minimum of 6 inches. The gravel pad inside the Bioretention Facility should be flush with the finished surface at the curb cut and extend to the bottom of the slope.

In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet. See Figure 3.

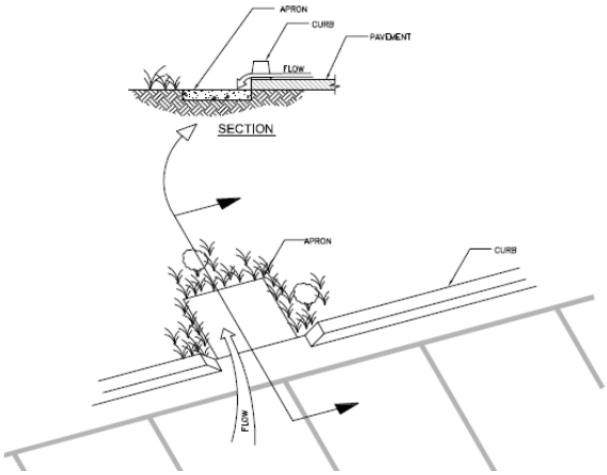


Figure 3: Apron located in a Bioretention Facility

Terracing the Landscaped Filter Basin

It is recommended that Bioretention Facilities be level. In the event the facility site slopes and lacks proper design, water would fill the lowest point of the BMP and then discharge from the basin without being treated. To ensure that the water will be held within the Bioretention Facility on sloped sites, the BMP must be terraced with nonporous check dams to provide the required storage and treatment capacity.

The terraced version of this BMP shall be used on non-flat sites with no more than a 3 percent slope. The surcharge depth cannot exceed 0.5 feet, and side slopes shall not exceed 4:1. Table 2 below shows the spacing of the check dams, and slopes shall be rounded up (i.e., 2.5 percent slope shall use 10' spacing for check dams).

Table 2: Check Dam Spacing

6" Check Dam Spacing	
Slope	**Spacing**
1%	*25'*
2%	*15'*
3%	*10'*

Roof Runoff

Roof downspouts may be directed towards Bioretention Facilities. However, the downspouts must discharge onto a concrete splash block to protect the Bioretention Facility from erosion.

Retaining Walls

It is recommended that Retaining Wall Type 1A, per Caltrans Standard B3-3 or equivalent, be constructed around the entire perimeter of the Bioretention Facility. This practice will protect the sides of the Bioretention Facility from collapsing during construction and maintenance or from high service loads adjacent to the BMP. Where such service loads would not exist adjacent to the BMP, an engineered alternative may be used if signed by a licensed civil engineer.

Side Slope Requirements

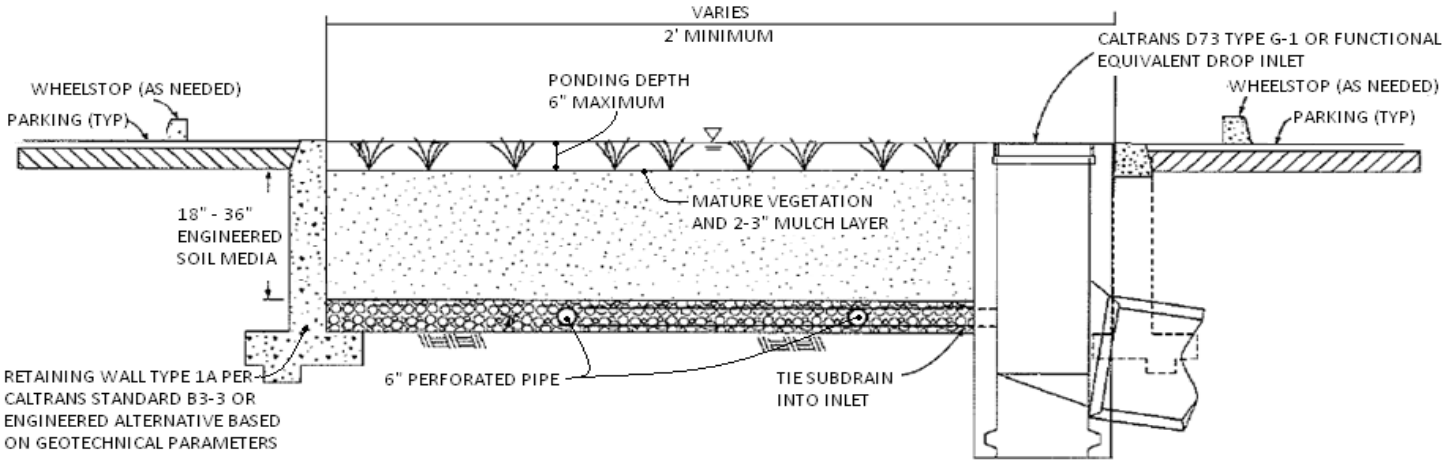
Bioretention Facilities Requiring Side Slopes

The design should assure that the Bioretention Facility does not present a tripping hazard. Bioretention Facilities proposed near pedestrian areas, such as areas parallel to parking spaces or along a walkway, must have a gentle slope to the bottom of the facility. Side slopes inside of a Bioretention Facility shall be 4:1. A typical cross section for the Bioretention Facility is shown in Figure 1.

Bioretention Facilities Not Requiring Side Slopes

Where cars park perpendicular to the Bioretention Facility, side slopes are not required. A 6-inch maximum drop may be used, and the Bioretention Facility must be planted with trees and shrubs to prevent pedestrian access. In this case, a curb is not placed around the Bioretention Facility,

but wheel stops shall be used to prevent vehicles from entering the Bioretention Facility, as shown in Figure 4.



Planter Boxes

Bioretention Facilities can also be placed above ground as planter boxes. Planter boxes must have a minimum width of 2 feet, a maximum surcharge depth of 6 inches, and no side slopes are necessary. Planter boxes must be constructed so as to ensure that the top surface of the engineered soil media will remain level. This option may be constructed of concrete, brick, stone or other stable materials that will not warp or bend. Chemically treated wood or galvanized steel, which has the ability to contaminate stormwater, should not be used. Planter boxes must be lined with an impermeable liner on all sides, including the bottom. Due to the impermeable liner, the inside bottom of the planter box shall be designed and constructed with a cross fall, directing treated flows within the subdrain layer toward the point where subdrain exits the planter box, and subdrains shall be oriented with drain holes oriented down. These provisions will help avoid excessive stagnant water within the gravel underdrain layer. Similar to the in-ground Bioretention Facility versions, this BMP benefits from healthy plants and biological activity in the root zone. Planter boxes should be planted with appropriately selected vegetation.

Figure 5: Planter Box
Source: LA Team Effort

Overflow

An overflow route is needed in the Bioretention Facility design to bypass stored runoff from storm events larger than V_{BMP} or in the event of facility or subdrain clogging. Overflow systems must connect to an acceptable discharge point, such as a downstream conveyance system as shown in Figure 1 and Figure 4. The inlet to the overflow structure shall be elevated inside the Bioretention Facility to be flush with the ponding surface for the design capture volume (V_{BMP}) as shown in Figure 4. This will allow the design capture volume to be fully treated by the Bioretention Facility, and for larger events to safely be conveyed to downstream systems. The overflow inlet shall **not** be located in the entrance of a Bioretention Facility, as shown in Figure 6.

Underdrain Gravel and Pipes

An underdrain gravel layer and pipes shall be provided in accordance with Appendix B – Underdrains.

Figure 6: Incorrect Placement of an Overflow Inlet.

Inspection and Maintenance Schedule

The Bioretention Facility area shall be inspected for erosion, dead vegetation, soggy soils, or standing water. The use of fertilizers and pesticides on the plants inside the Bioretention Facility should be minimized.

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris • Replace damaged grass and/or plants • Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
After storm events	• Inspect areas for ponding
Annually	• Inspect/clean inlets and outlets

Bioretention Facility Design Procedure

1) Enter the area tributary, A_T, to the Bioretention Facility.

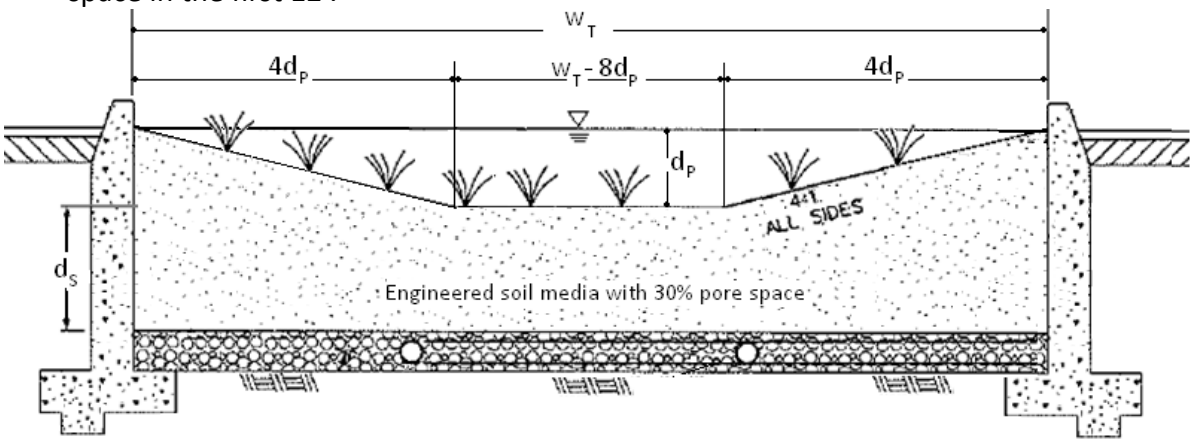
2) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.

3) Select the type of design used. There are two types of Bioretention Facility designs: the standard design used for most project sites that include side slopes, and the modified design used when the BMP is located perpendicular to the parking spaces or with planter boxes that do not use side slopes.

4) Enter the depth of the engineered soil media, d_S. The minimum depth for the engineered soil media can be 18' in limited cases, but it is recommended to use 24' or a preferred 36' to provide an adequate root zone for the chosen plant palette. Engineered soil media deeper than 36' will only get credit for the pore space in the first 36'.

5) Enter the top width of the Bioretention Facility.

6) Calculate the total effective depth, d_E, within the Bioretention Facility. The maximum allowable pore space of the soil media is 30% while the maximum allowable pore space for the gravel layer is 40%. Gravel layer deeper than 12' will only get credit for the pore space in the first 12'.



a. For the design with side slopes the following equation shall be used to determine the total effective depth. Where, d_P is the depth of ponding within the basin.

$$d_E(\text{ft}) = \frac{0.3 \times \left[\left(w_T(\text{ft}) \times d_S(\text{ft})\right) + 4\left(d_P(\text{ft})\right)^2\right] + 0.4 \times 1(\text{ft}) + d_P(\text{ft})\left[4d_P(\text{ft}) + \left(w_T(\text{ft}) - 8d_P(\text{ft})\right)\right]}{w_T(\text{ft})}$$

This above equation can be simplified if the maximum ponding depth of 0.5' is used. The equation below is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = (0.3 \times d_S(\text{ft}) + 0.4 \text{ x } 1(\text{ft})) - \left(\frac{0.7\ (\text{ft}^2)}{w_T(\text{ft})}\right) + 0.5(\text{ft})$$

b. For the design without side slopes the following equation shall be used to determine the total effective depth:

$$d_E(ft) = d_P(ft) + [(0.3) \times d_S(ft) + (0.4) \times 1(ft)]$$

The equation below, using the maximum ponding depth of 0.5', is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(ft) = 0.5\ (ft) + [(0.3) \times d_S(ft) + (0.4) \times 1(ft)]$$

7) Calculate the minimum surface area, A_M, required for the Bioretention Facility. This does not include the curb surrounding the Bioretention Facility or side slopes.

$$A_M(ft^2) = \frac{V_{BMP}(ft^3)}{d_E\ (ft)}$$

8) Enter the proposed surface area. This area shall not be less than the minimum required surface area.

9) Verify that side slopes are no steeper than 4:1 in the standard design, and are not required in the modified design.

10) Provide the diameter, minimum 6 inches, of the perforated underdrain used in the Bioretention Facility. See Appendix B for specific information regarding perforated pipes.

11) Provide the slope of the site around the Bioretention Facility, if used. The maximum slope is 3 percent for a standard design.

12) Provide the check dam spacing, if the site around the Bioretention Facility is sloped.

13) Describe the vegetation used within the Bioretention Facility.

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GOULDS PUMPS

HSU, HSUL & JCU

Submersible Pumps

ITT

ENGINEERED FOR LIFE

HSU, HSUL, JCU

Model HSU

Hydro-solids pumps. Recessed impeller easily accomodates large, stringy and fibrous solids without clogging. Because it is completely submersible, the HSU can be used in virtually any sump application.

- Capacities to 295 m³/h (1,300 USgpm)
- Heads to 27 m (90 feet)
- Temperature Range 90°C (194°F)
- Pressures to 690 kPa (100 PSIG)
- Solids to 152 mm (6 in)

Solids Type

Will handle large, stringy, fibrous and abrasive solids.

Materials

- Cast Iron
- 28% Chrome Iron (HC600)
- CD4MCu
- 316 Stainless Steel

Features

- Recessed Impeller
- Concentric Casing
- Integral Support
- Heavy Duty Adapter
- Integral Discharge Elbow

Materials

- Cast Iron

Model HSUL

Submersible recessed impeller pumps easily handle any solid up to its suction/discharge size. Versatile mounting allows pump to stand or to be mounted on an optional slide rail arrangement.

- Capacities to 636 m³/h (2,800 USgpm)
- Heads to 43 m (140 feet)
- Temperature Range 90°C (194°F)
- Pressures to 690 kPa (100 PSIG)
- Solids to 152 mm (6 in)

Solids Type

Will handle large, stringy, fibrous and abrasive solids.

Materials

- Cast Iron
- 28% Chrome Iron (HC600)
- CD4MCu
- 316 Stainless Steel

Features

- Recessed Impeller
- Concentric Casing
- Flanged Suction and Discharge
- Interchangeability with Horizontal & Vertical Models
- Mounting Flexibility

Model JCU

Submersible pumps for handling tough abrasive slurries. Impeller design offers optimum combination of solids handling ability, wear resistance, and efficiency. Optional slide rail assembly available for ease of maintenance.

- Capacities to 910 m³/h (4,000 USgpm)
- Heads to 67 m (220 feet)
- Temperature Range 90°C (194°F)
- Pressures to 1,380 kPa (200 PSIG)
- Solids to 152 mm (2 in)

Solids Type

Will handle all types of abrasive solids

Materials

- Cast Iron
- 28% Chrome Iron (HC600)
- CD4MCu
- 316 Stainless Steel

Features

- Heavy Duty Slurry Design
- Replaceable Suction Liner
- Integral Strainer
- Mounting Flexibility
- Interchangeability with Horizontal & Vertical Models

HSU

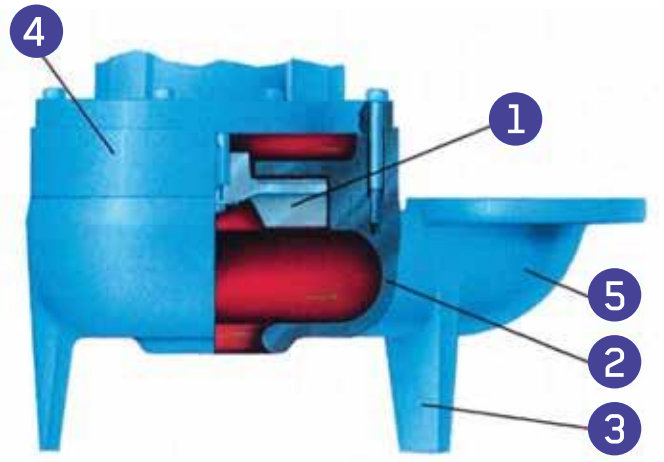
Submersible Hydro-Solids Pumps

Designed to handle large, stringy, fibrous and abrasive solids

Services

- Waste Treatment Plants
- General Service Sumps
- Sewage Wet Wells
- Reclaim Sumps
- Power Plants
- Industrial Waste Sumps
- Sludge Pits
- Drainage Sumps
- Collection Basins
- Wood Yard Sumps

Design Features



1. **Fully Recessed Impeller** Allows large stringy or fibrous material to pass through the pumps without binding or clogging.

2. **Concentric Casing** Concentric design facilitates flow of pumpage and solids through the pump while minimizing loads.

3. **Integral Support** Three cast-in legs provide simple, stable support without additiona parts.

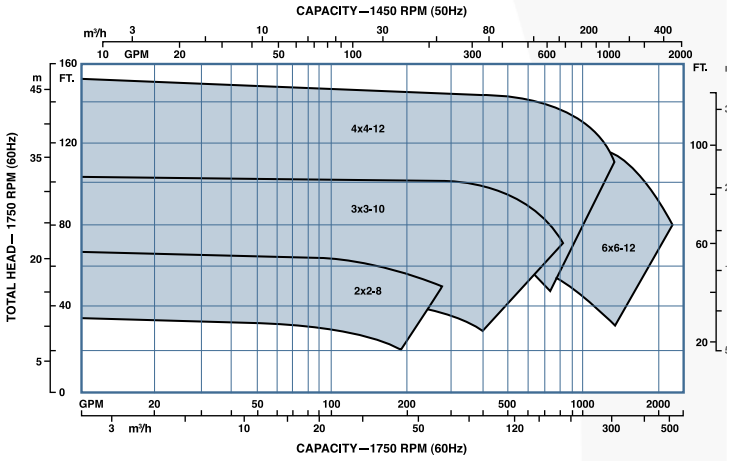
4. **Heavy-Duty Motor Adaptor** Extra thick in critical areas. Extended shroud encircles impeller and protects casing from wear.

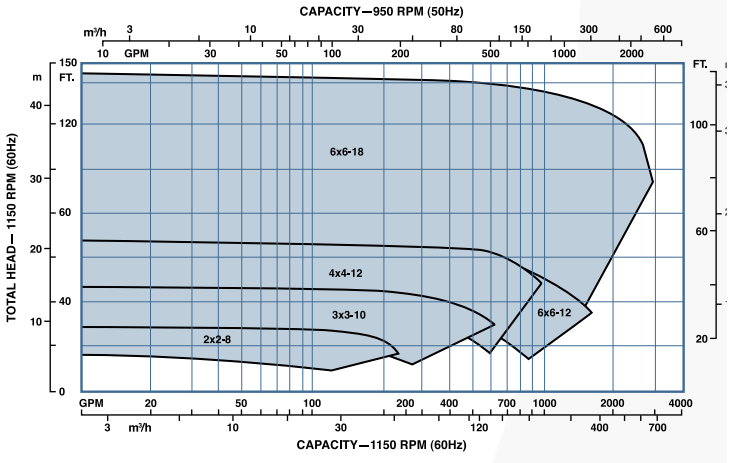
5. **Integral Discharge Elbow** Cast-in elbow reduces parts and allows easy installation.

What Goes In – Goes Out!

Unlike self-priming trash pumps or some other submersibles or vertical pumps, the HSU will pump any solid that enters its suction without clogging. This includes such hard to pump items as rags and string. Avoid costly downtime unplugging your pump with Goulds HSU.

Hydraulic Coverage 50 / 60 Hz





HSUL

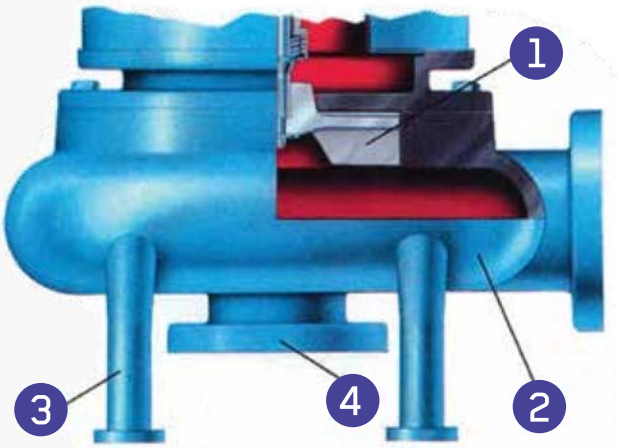
Submersible Hydro-Solids Pumps

Designed to handle large, stringy and abrasive solids

Services

- Waste Treatment Plants
- General Service Sumps
- Sewage Wet Wells
- Reclaim Sumps
- Power Plants
- Industrial Waste Sumps
- Sludge Pits
- Drainage Sumps
- Collection Basins
- Wood Yard Sumps

Design Features



1. **Fully Recessed Impeller** Allows large stringy or fibrous material to pass through the pumps without binding or clogging.

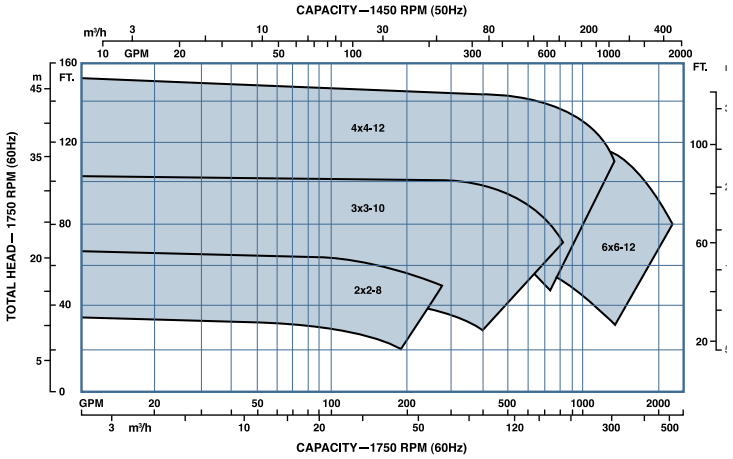
2. **Concentric Casing** Concentric design facilitates flow of pumpage and solids through the pump while minimizing loads.

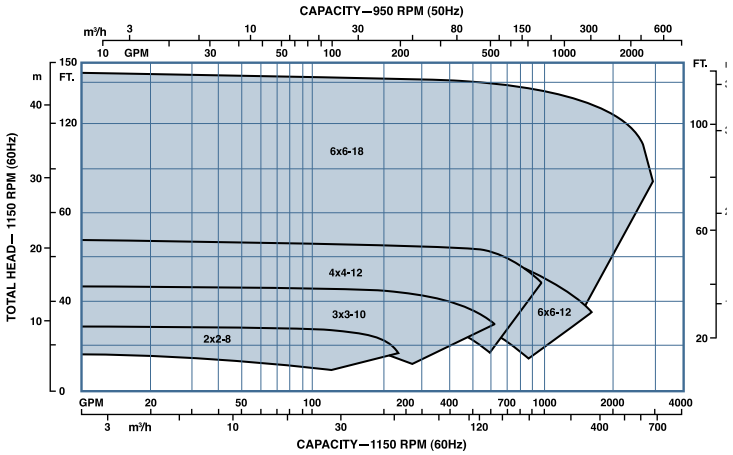
3. **Legs** Bolt-on legs provide stability on sump floor.

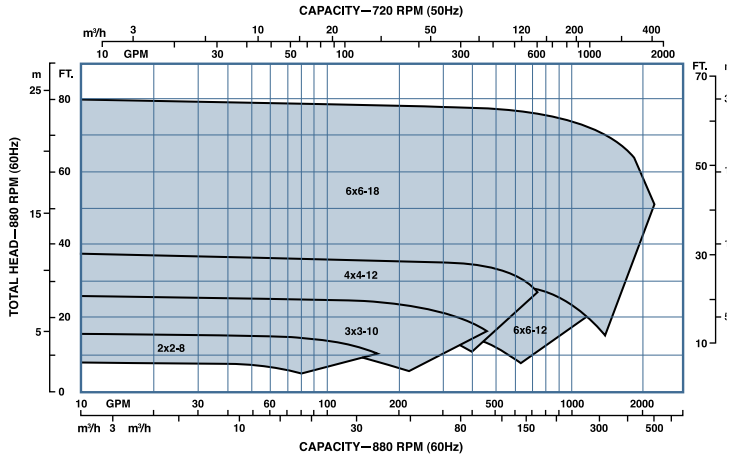
4. **Mounting Flexibility** Flanged suction and horizontal discharge allow pump to stand or be mounted on optional slide rail.

5. **Interchangeability** Reduce inventory by sharing parts with Horizontal HS pumps & Vertical Cantilever VHS pumps.

Hydraulic Coverage 50 / 60 Hz







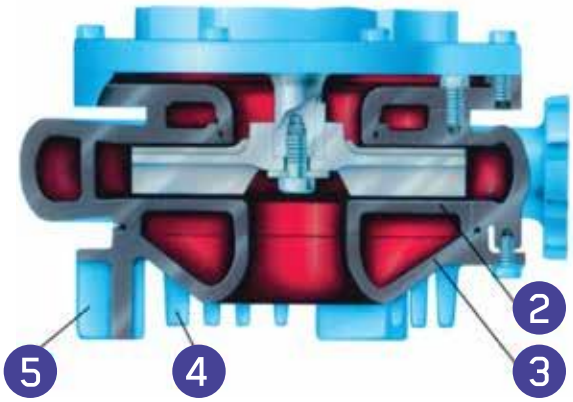
Heavy Duty Submersible Slurry Pumps

Designed to handle abrasive sump applications

Services

- Fly Ash
- Sand and Gravel
- Chemical Waste Sumps
- Dirty Water Sumps
- Foundry Sand
- Bauxite
- Lime Sumps
- Kaolin Clay
- Mill Scale
- Sludge Pits

Design Features



1. **Heavy Duty Design** Extra thick wall sections in high wear areas.

2. **Replaceable Suction Liner** Easy to replace – protects casing from wear.

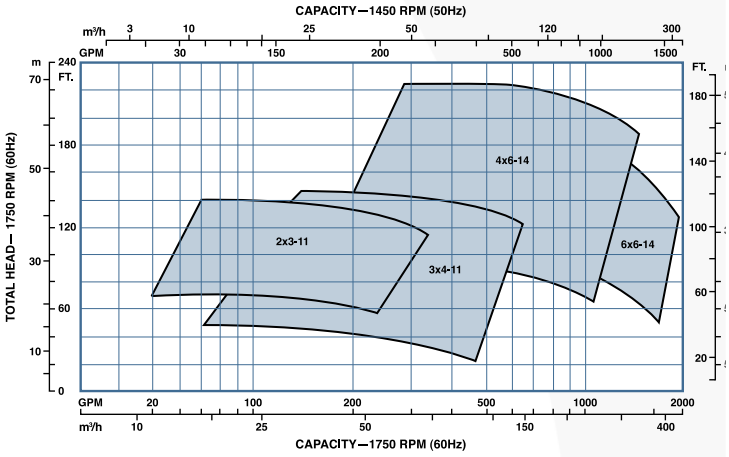
3. **Suction Cover** Bell shaped intake reduces entrance losses and improves suction characteristics.

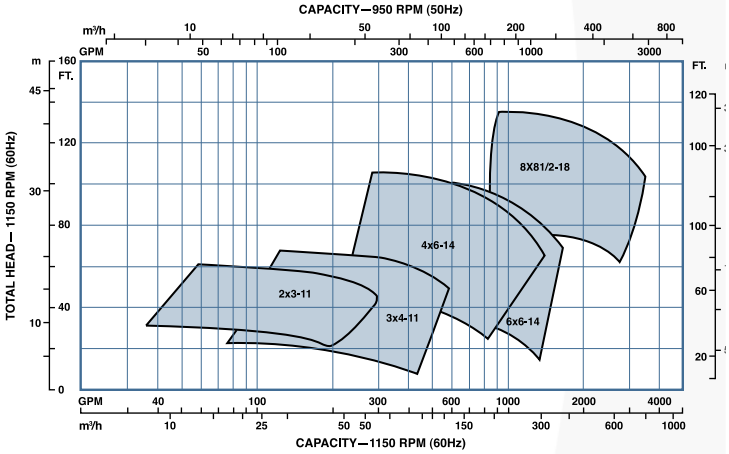
4. **Integral Strainer** Suction cover has cas-on vertical tines to prohibit oversized solids from clogging pump.

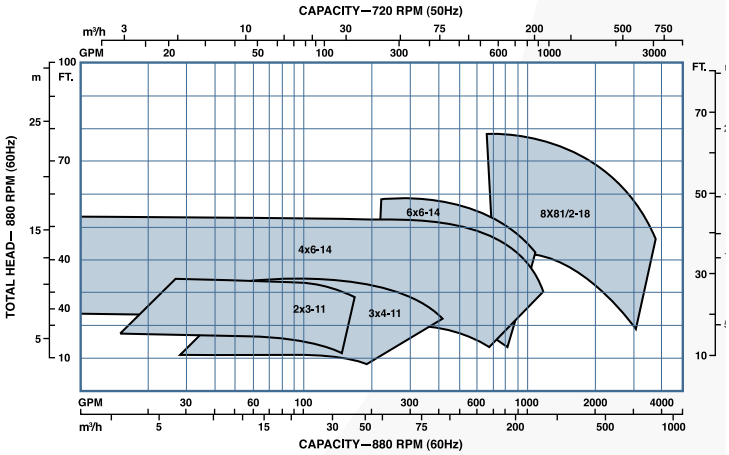
5. **Pump Mounting** Three cast-on legs give excellent support and stability. Optional slide rail also available to permit easy removal from sump.

6. **Maximum Interchangeability** Suction Cover liner and casing are interchangeable with Goulds Models JC (horizontal) and VJC (vertical cantilever) pumps.

Hydraulic Coverage 50 / 60 Hz







Options

For Application Flexibility

Slide Rail System

Available on Models HSUL and JCU, Goulds slide rail system provides easy removal of pump unit without disturbing discharge piping. Unique slurry design utilizes a locking cam action with locator lugs and a large O-ring for positive sealing (no leakage) while allowing a tangential discharge for high efficiency. This is an important feature when pumping slurries; if a tight seal is not achieved, leakage can cause rapid and excessive wear of the mating flanges resulting in reduction of performance as well as increased maintenance costs. Goulds slide rail system meets all requirements for toughest slurry devices.

Moisture Detector

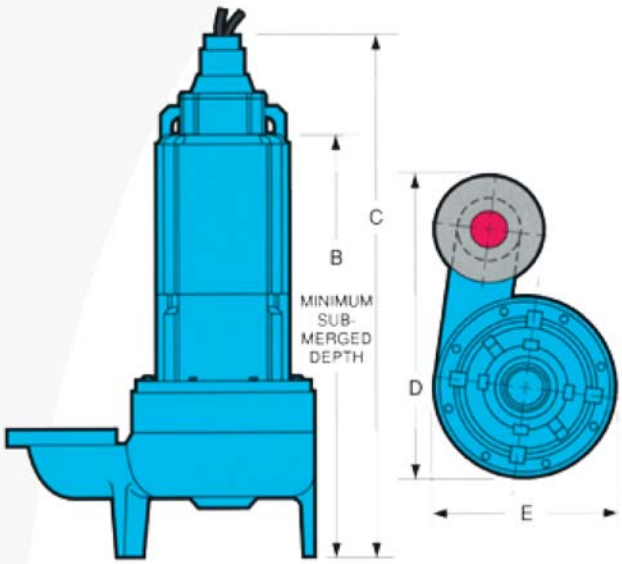
Required on all submersibles for warranty validation. Provides one normally open and two normally closed connection for activating a warning and/or de-energizing the motor.

Submersible Motors

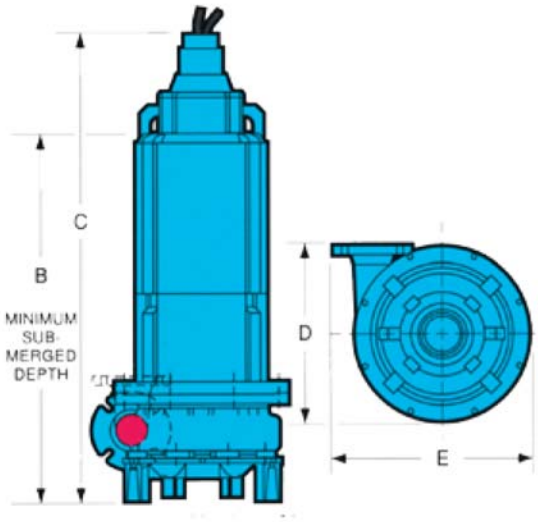
Goulds submersible series motors are designe and built specifically for tough slurry pumping. Heavy-duty design features for reliability include:

- UL and CSA Approved Explosion Proof
- Epoxy encapsulated and butt-spliced cable entry system prevents liquid from entering top of motor and provides non-wicking design.
- Permanently lubricated and sealed ball bearings.
- F Class insulation and 1.15 service factor standard.
- Tandem mechanical seals provide complete protection for motor internals.
- Thermal protection standard.
- Dual moisture probes provide early warning of seal failure.
- Conforms to NEMA, IEEE, ANSI and NEC standards.
- High temperature option allows operation to 90°C (194°F)
- 5-year Pro-Rated Warranty

Dimensions



Model HSU



Model JCU & HSUL

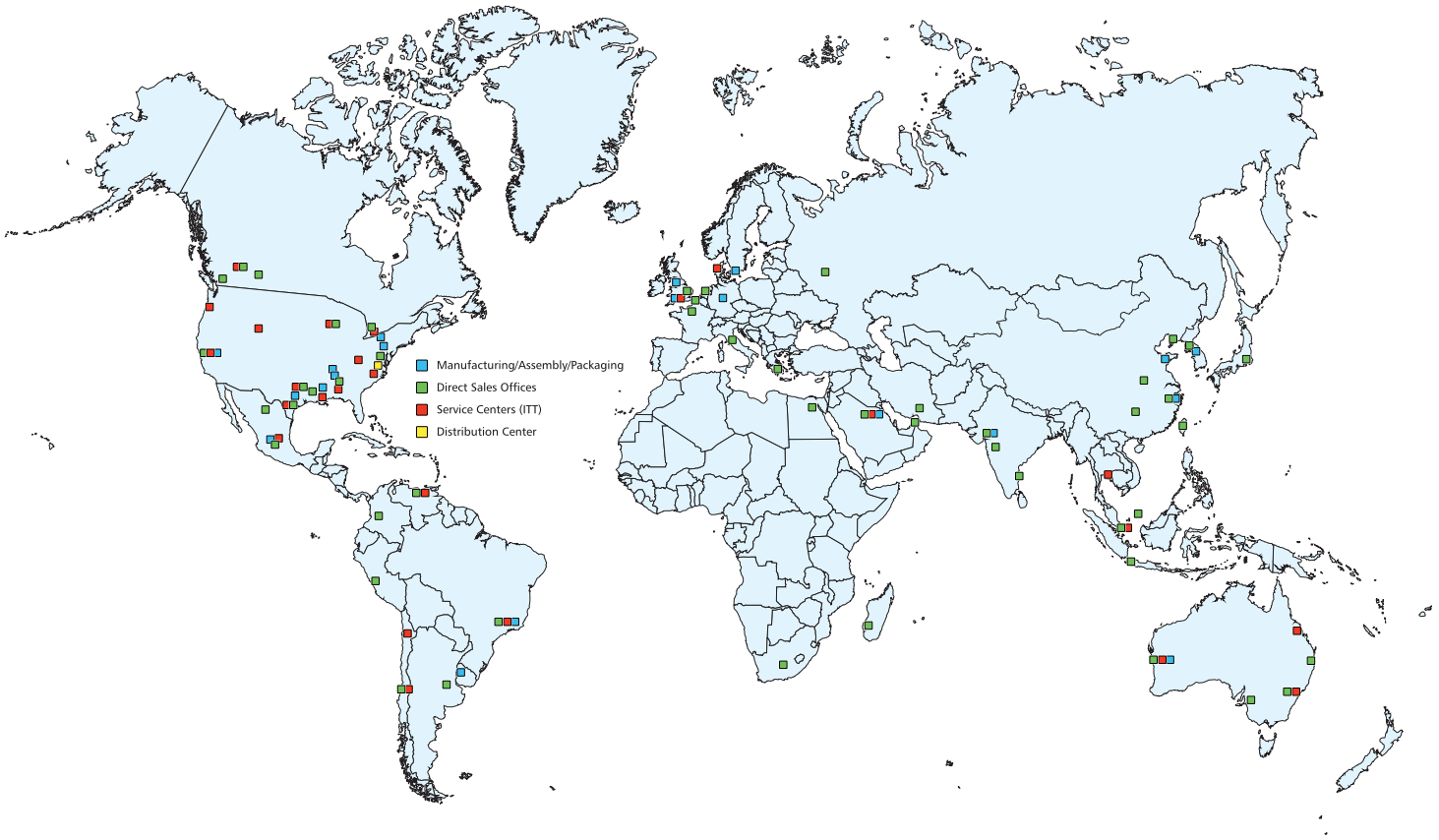
Model	Pump Size	B*	C*	D	E	Weight Lbs. (kg)
HSU	3×3-8	32.3 (821)	39.8 (1010)	22.6 (575)	15.4(391)	470 (213)
	4×4-10	38.3 (972)	48.6 (1235)	28.6 (727)	18.3 (464)	1060 (481)
	6×6-11	45.6 (1159)	53.0 (1346)	32.0 (813)	20.3 (514)	1170 (531)
HSUL	2×2-8	32.0 (813)	40.0 (1016)	14.0 (356)	14.0 (356)	500 (227)
	3×3-10	42.0 (1067)	54.0 (1372)	19.0 (483)	19.0 (483)	1450 (658)
	4×4-12	44.0 (1118)	57.0 (1448)	21.0 (533)	21.0 (533)	1410 (640)
	6×6-12	57.0 (1448)	68.0 (1727)	24.0 (610)	23.0 (584)	1950 (885)
	6×6-18	57.0 (1448)	68.0 (1727)	30.0 (762)	29.0 (737)	2025 (918)
JCU	1×1.5-11	31.1 (790)	39.4 (1000)	19.5 (495)	15.4 (391)	500 (227)
	2×3-11	31.1 (790)	39.4 (1000)	23.1 (587)	17.2 (437)	500 (227)
	2×3-14	36.0 (914)	46.4 (1178)	25.8 (655)	20.3 (514)	900 (408)
	3×4-11	36.0 (914)	46.4 (1178)	26.5 (673)	19.3 (490)	990 (449)
	4×6-14	47.1 (1197)	58.0 (1473)	32.9 (836)	24.2 (614)	1880 (853)
	6×6-14	47.3 (1202)	58.2 (1478)	39.3 (998)	27.3 (692)	2030 (921)
	8×10-18	51.3 (1301)	62.9 (1597)	50.1 (1273)	34.8 (885)	2460 (1116)
	10×12-22	53.6 (1362)	64.5 (1638)	59.0 (1499)	43.1 (1095)	3280 (1488)

*Dimensions based on largest motor available for the given pump size.
All dimensions in inches and (mm). Not to be used for construction.

Notes

Visit our website at
www.gouldspumps.com

Wherever you are, we're there too.

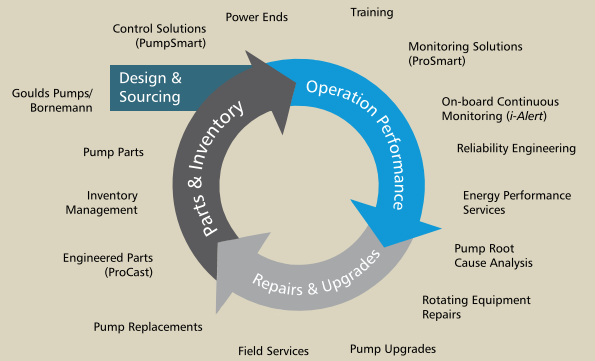


PRO services

Reliability has no quitting time.

Building on over 160 years of Goulds Pumps experience, PRO Services provides an array of services focused on reducing equipment total cost of ownership (TCO) and increasing plant output, including predictive monitoring, maintenance contracts, field service, engineered upgrades, inventory management, and overhauls for pumps and other rotating equipment.

Your Total Solution For Equipment Life Cycle Optimization



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Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

HYDROMODIFICATION STUDY FOR NEWCASTLE CENTERPOINTE

CITY OF MORENO VALLEY, CA.

1. OBJECTIVE

The purpose of this study is to prove that hydromodification conditions are met for the Newcastle Centerpointe project when a bioretention basin and a combination underground detention/proprietary BMP are designed to control the runoff discharge of the post-development conditions. Per the Water Quality Management Plan for the Santa Ana Region of Riverside County, hydromodification conditions are met when: the post-development peak flows for the 24-hour, 2-year storm event are less, equal or do not exceed by more than 10 percent, the peak flows for the pre-development conditions of the same storm.

2. INTRODUCTION

The Newcastle Centerpointe project site is located in the City of Moreno Valley, in the Santa Ana Watershed Region of Riverside County, California. The project area is situated between Frederick Street and Brodiaea Avenue and Indian Street. The total project site is 8.78 acres.

To compare the pre and post-development runoff characteristics, methodologies outlined in the Riverside County Flood Control and Water Conservation District Hydrology Manual (Hydrology Manual) were used.

The underlying hydrologic soil group (HSG) for the project site is “D” type soils per the Web Soil Survey.

The 2 year storm is the design return period for analyzing the hydromodification impacts of the proposed project. This storm event was analyzed for 24-hr duration for both pre-development and post-development conditions.

Runoff from the project site flows in a southern direction onto two (2) discharge location. Points of Discharge West and East are existing inlets located along the southwest and southeast boundary of the project site. These inlets receive water from the entire project site which is then confluenced in the stormdrain beneath Brodiaea Avenue.

Per NOAA precipitation Frequency Data Server (PFDS), the design 2-year, 24 hour rainfall depth for the project site is: 1.83 inches.

The 2010 MS4 Permit, adopted by the Santa Ana Regional Water Quality Control Board, and issued to Riverside County, requires all new development and significant redevelopment projects covered by the Technical Guidance Document for Water Quality Management Plans (2013) to incorporate Low Impact Development (LID) Best Management Practices to the maximum extent practicable (MEP).Treatment of storm water runoff from the site has been addressed in a separate report – the “Water Quality Management Plan for Newcastle Centerpointe” dated April 2018 by REC Consultants.

3. PRE DEVELOPED CONDITIONS

The existing project site is an undeveloped vacant lot. The site currently sheet flows in a southwesterly direction to one (1) of two (2) inlets which then confluence in the existing stormdrain beneath Brodiaea Avenue.

4. POST DEVELOPMENT CONDITIONS

In the proposed condition the site will add one new building, parking lot, and associated landscaping. The site will also preserve the southern sheet flow drainage pattern. Low flows (i.e. water quality and HMP) will be conveyed into a bioretention basin or combination underground system/proprietary BMP for treatment and detention. Note that the discharge of HMP flows from either the bioretention basin or underground/proprietary BMP is to be controlled via pump.

ASSUMPTIONS

This study is complementary to WQMP prepared by REC Consultants.

The following is the list of assumptions for this complementary study:

1) The study will analyze the same area as the project WQMP: the property area of Newcastle Centerpointe. Thus, the analyzed pre development area is equal to the post development area.
2) Discharge location is the same in pre development and post development conditions; it is the confluence of the flows in the existing stormdrain beneath Brodiaea Avenue.
3) The Short Cut Synthetic Hydrograph Method (Plate E-1.2 of the RCFC & WCD Hydrology Manual) will be used as the area is very small (much less than 100 acres, with a lag time lesser than 7-8 minutes, which are the conditions to use this simplified method).
4) The shortest recommended time interval will be used (15 min for duration of 24 hours) to generate the largest possible peak flow according to the precipitation distribution of plate E-5.9 of the RCFC & WCD Hydrology Manual.
5) The curve number used for pervious areas will be AMC-I for 2-year storms, per recommendation of the RCFC & WCD Hydrology Manual.
6) In regards to the Curve Number used (CN), barren, graded land in soil type “D” will be the surface of choice of pervious areas in pre-development conditions (CN = 69), and turf in good conditions in soils Type “D” will be used for landscaped areas in post-development conditions (CN = 69). Impervious areas in pre and post-development conditions will have CN = 90.
7) The infiltration relationship (F_p) value for pervious areas are obtained based on the curve number (CN) per Plate E-6.2 of the RCFC & WCD HM and AMC-I: For pre developed conditions F_p = 0.29, and for post developed conditions F_p = 0.58.
8) A bioretention basin has been proposed to reduce the post development conditions runoff for the western portion of the project site.
9) A combination underground storage/proprietary BMP system has been proposed to reduce the post developed conditions runoff for the eastern portion of the project site.

10) The outlet system will be such that low flows (i.e. 2-yr/24hr) will be pumped out to the existing stormdrain inlets. The pump capacity will be limited by the infiltration capacity of the soil, 5 in/hr.
11) Routing calculations will be performed for each post development area. The results will then be summed in order to demonstrate reduction of the post development peak flows enough to be less than those for pre-development conditions.

Tables 1 and 2 below list the properties of the proposed bioretention basin and combination underground system/proprietary BMP through which post development conditions have been routed. A summary of the proposed outflow pumps in each BMP is provided in Table 3.

Table 1. Summary of Bioretention BMP Dimensions

BMP	DIMENSIONS						
	BMP Area (ft^2)	French Drain (in)	Gravel Depth[4] (in)	Amended Soil Depth (in)	Depth to Riser Invert (ft)[1]	Weir Length[2] (ft)	Total Surface Depth[3] (ft)
WEST	8,300	6	12	24	0.75	12	4.30

Notes: (1) Depth of ponding from top of amended soils layer to top of riser, includes 3" mulch layer
(2) Overflow weir is 3ftx2ft ID riser
(3) Depth of basin from top of amended soils layer to top of perimeter wall

Table 2. Summary of Underground Detention/Proprietary BMP Dimensions

BMP	DIMENSIONS			
	Storage(ft) (LxWxH)	#	Area (ft^2)	Proprietary BMP[1]
EAST	15x7x6	24	2,520	MWS-L-4-15

Notes (1) Or Equal

Table 3. Summary of Pumps

BMP	Rating (cfs)	Activate (ft)	Shut off (ft)	Draindown (hrs)
WEST	0.18	0.50	0.00	46.25
EAST	0.15	0.50	0.00	43.00

5. ROUTING OF HYDROGRAPHS

As previously mentioned, the proposed bioretention basin has been designed such that runoff from the HMP storm is captured and treated within the basin prior to being conveyed to the existing-eastern storm drain inlet. Note that the aforementioned inlet also accepts detained HMP flows from the underground detention/proprietary BMP. Thus the routed-HMP outflow hydrograph from the basin will be summed to the outflow hydrograph for the underground system. The combined flows will then be compared to the existing conditions flow rate for comparison purposes.

Routing in the proposed underground system is controlled by a proposed pump which is to be placed in the outflow chamber of the proposed BMP. Pump 1 was designed and analyzed such that it would strictly address the HMP flows. It is set to activate at 6-inches of ponding depth within the proposed system and discharge at a constant 0.18cfs. The analysis demonstrated that the constant outflow of the pump combined with the constant inflow of runoff from the eastern portion of the project results in the water level in the underground system reaching a maximum elevation of 5.72ft at which point the volume would begin to decrease until eventually reaching zero at which point Pump 1 would shut off.

Routing in the proposed bioretention basin is also controlled by a proposed pump which is to be placed in a box located along the eastern basin boundary. The box receives treated flows which are conveyed via 6-inch diameter underdrain. Pump 2 was also designed and analyzed such that it would strictly address the HMP flows. It is set to activate at 6-inches of ponding depth and discharge at a constant 0.15cfs. The analysis demonstrated that the constant outflow of the pump combined with the constant inflow of runoff from the western portion of the project results in the water level in the bioretention basin reaching a maximum elevation of 3.54ft at which point the volume would begin to decrease until eventually reaching zero at which point Pump 2 would shut off.

Routed hydrographs via the proposed pumps are provided in Appendix 2 of this report. Final pump specifications will be provided in final engineering.

6. SUMMARY OF RESULTS

Table 4 shows the pre-development and post-development (un-routed) peak flows for the total area. Short-Cut hydrographs Tables are shown in Appendix 2. There is 1 Short-Cut Hydrograph Table for pre-development conditions (1 total area, 1 durations, 1 Return Period), and 1 for post-development conditions (1 sub-areas, 1 durations, 1 Return Period). Additionally, Table 5 shows the pre and post-development flow rates once the hydrographs have been routed.

TABLE 4. Peak Flow Results before routing, ft^3/s

DMA	CONDITION	AREA (acres)	PEAK FLOWS (cfs) 24-HR, 2-YR STORM
ENTIRE PROJECT	PRE-DEVELOPMENT	8.78	0.33
	POST-DEVELOPMENT (UNMITIGATED)	8.78	1.77
	DIFFERENCE	-	+1.44

TABLE 5. Peak Flow Results after routing, ft^3/s

DMA	CONDITION	AREA (acres)	PEAK FLOWS (cfs) 24-HR, 2-YR STORM
ENTIRE PROJECT	PRE-DEVELOPMENT	8.78	0.33
	POST-DEVELOPMENT (MITIGATED)	8.78	0.33
	DIFFERENCE	-	0.00

As can be seen, flows remain the same in proposed conditions as in existing conditions.

7. CONCLUSION

The proposed bioretention basin and underground detention/proprietary BMP reduce the proposed conditions peak flows to below pre development peak flows for the 2-yr, 24-hr storm event. Therefore, any hydromodification concerns regarding the proposed Newcastle Centerpointe development have been mitigated, according to According to Water Quality Management Plan for the Santa Ana Region of Riverside County.

APPENDIX LIST

Appendix 1: Soil and Hydrology Supporting Documentation

Appendix 2: Short-Cut Hydrograph Results

Appendix 3: Hydrology Maps

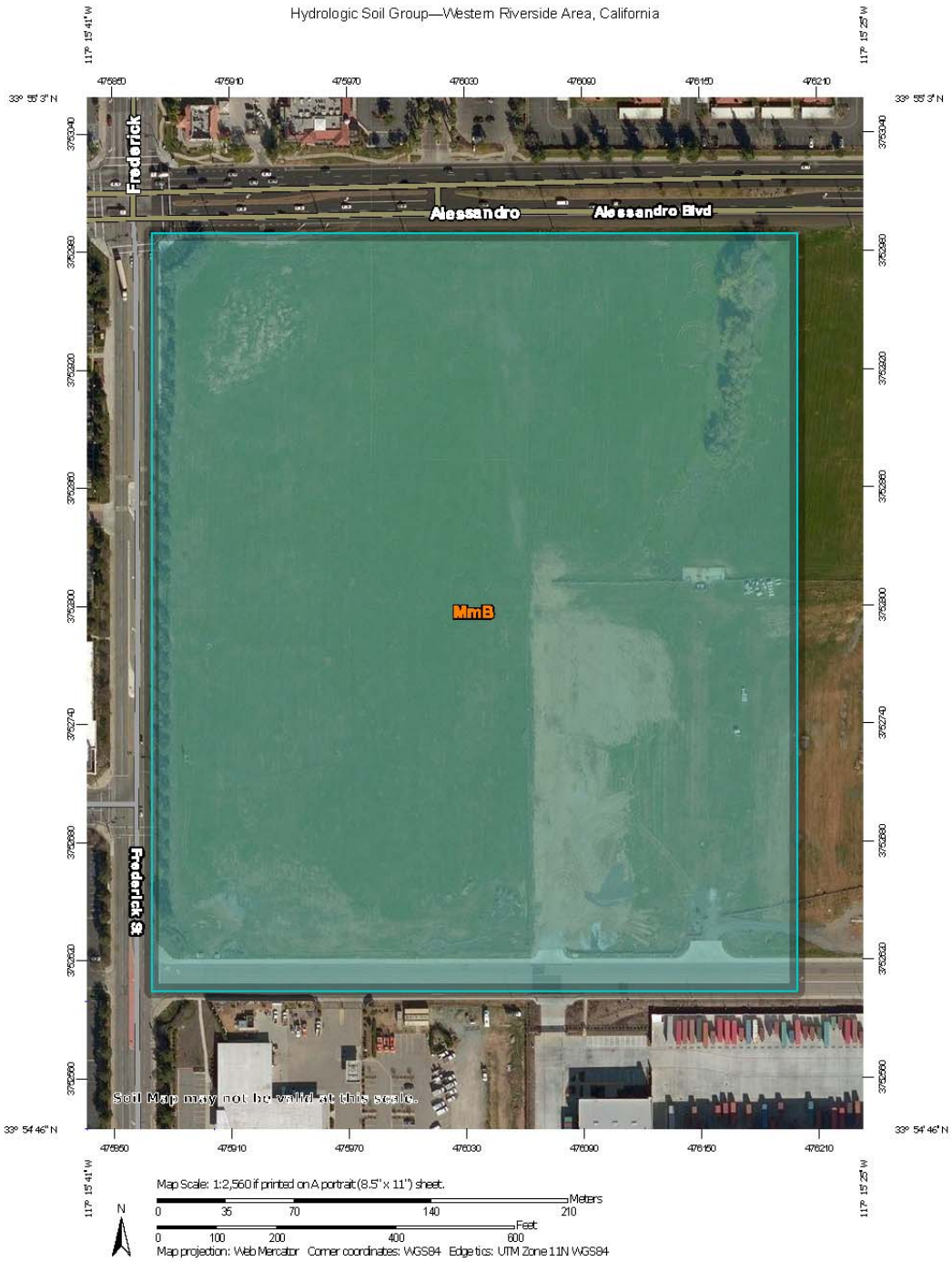
REFERENCES

1. Riverside County Flood Control and Water Conservation District Hydrology Manual. April 1978.

2. Water Quality Management Plan for the Santa Ana Region of Riverside County.

3. "Project Specific Water Quality Management Plan for Newcastle Centerpointe" March 2018 by REC Consultants.

APPENDIX 1: SOIL AND HYDROLOGY SUPPORTING DOCUMENTATION



USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

2/5/2018
Page 1 of 4

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 10, Sep 12, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 14, 2015—Jan 21, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MmB	Monserate sandy loam, 0 to 5 percent slopes	C	31.5	100.0%
Totals for Area of Interest			**31.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

NOAA Atlas 14, Volume 6, Version 2
Location name: Moreno Valley, California, USA*
Latitude: 33.9149°, Longitude: -117.2595°
Elevation: 1564.56 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.088 (0.073-0.106)	0.117 (0.098-0.142)	0.157 (0.131-0.191)	0.191 (0.157-0.234)	0.238 (0.189-0.302)	0.276 (0.215-0.357)	0.315 (0.239-0.419)	0.357 (0.263-0.488)	0.415 (0.294-0.594)	0.463 (0.316-0.686)
10-min	0.126 (0.105-0.153)	0.168 (0.140-0.204)	0.226 (0.188-0.274)	0.274 (0.226-0.335)	0.341 (0.272-0.433)	0.395 (0.308-0.512)	0.451 (0.343-0.600)	0.511 (0.377-0.700)	0.596 (0.421-0.851)	0.663 (0.452-0.983)
15-min	0.152 (0.127-0.184)	0.204 (0.170-0.247)	0.273 (0.227-0.331)	0.331 (0.273-0.405)	0.413 (0.328-0.523)	0.478 (0.372-0.619)	0.546 (0.414-0.726)	0.618 (0.456-0.847)	0.720 (0.509-1.03)	0.802 (0.547-1.19)
30-min	0.239 (0.199-0.289)	0.319 (0.266-0.386)	0.427 (0.355-0.519)	0.518 (0.427-0.635)	0.646 (0.514-0.820)	0.748 (0.583-0.970)	0.855 (0.649-1.14)	0.968 (0.714-1.33)	1.13 (0.797-1.61)	1.26 (0.857-1.86)
60-min	0.336 (0.281-0.407)	0.449 (0.374-0.544)	0.601 (0.500-0.731)	0.730 (0.601-0.894)	0.910 (0.724-1.15)	1.05 (0.820-1.37)	1.20 (0.914-1.60)	1.36 (1.01-1.87)	1.59 (1.12-2.27)	1.77 (1.21-2.62)
2-hr	0.490 (0.409-0.593)	0.639 (0.532-0.774)	0.836 (0.695-1.02)	0.999 (0.824-1.23)	1.23 (0.976-1.56)	1.40 (1.09-1.82)	1.58 (1.20-2.11)	1.77 (1.31-2.43)	2.04 (1.44-2.91)	2.24 (1.53-3.32)
3-hr	0.601 (0.501-0.727)	0.776 (0.647-0.940)	1.01 (0.838-1.22)	1.20 (0.968-1.47)	1.46 (1.16-1.85)	1.66 (1.30-2.16)	1.87 (1.42-2.49)	2.09 (1.54-2.86)	2.38 (1.68-3.41)	2.62 (1.78-3.88)
6-hr	0.829 (0.692-1.00)	1.07 (0.888-1.29)	1.38 (1.14-1.67)	1.63 (1.34-2.00)	1.97 (1.57-2.50)	2.24 (1.74-2.90)	2.51 (1.91-3.34)	2.79 (2.06-3.82)	3.17 (2.24-4.52)	3.46 (2.36-5.12)
12-hr	1.07 (0.896-1.30)	1.39 (1.16-1.69)	1.81 (1.50-2.20)	2.15 (1.77-2.63)	2.61 (2.08-3.31)	2.96 (2.31-3.84)	3.32 (2.52-4.41)	3.68 (2.72-5.05)	4.18 (2.95-5.97)	4.56 (3.11-6.76)
24-hr	1.39 (1.23-1.60)	1.83 (1.62-2.12)	2.41 (2.13-2.79)	2.88 (2.52-3.37)	3.52 (2.98-4.25)	4.01 (3.33-4.94)	4.51 (3.65-5.68)	5.02 (3.96-6.50)	5.71 (4.32-7.69)	6.24 (4.57-8.70)
2-day	1.64 (1.45-1.89)	2.20 (1.94-2.54)	2.93 (2.58-3.39)	3.53 (3.09-4.12)	4.35 (3.68-5.24)	4.97 (4.13-6.12)	5.61 (4.55-7.07)	6.27 (4.94-8.11)	7.16 (5.42-9.65)	7.84 (5.74-10.9)
3-day	1.74 (1.54-2.01)	2.37 (2.09-2.73)	3.20 (2.82-3.70)	3.87 (3.39-4.52)	4.80 (4.06-5.78)	5.51 (4.57-6.78)	6.24 (5.05-7.86)	6.99 (5.51-9.05)	8.02 (6.07-10.8)	8.81 (6.45-12.3)
4-day	1.88 (1.67-2.17)	2.58 (2.28-2.98)	3.51 (3.09-4.06)	4.27 (3.74-4.98)	5.31 (4.50-6.40)	6.12 (5.08-7.53)	6.95 (5.63-8.75)	7.81 (6.15-10.1)	8.98 (6.80-12.1)	9.89 (7.24-13.8)
7-day	2.10 (1.86-2.42)	2.92 (2.58-3.38)	4.02 (3.55-4.66)	4.93 (4.31-5.75)	6.18 (5.23-7.45)	7.15 (5.93-8.79)	8.15 (6.60-10.3)	9.18 (7.24-11.9)	10.6 (8.03-14.3)	11.7 (8.57-16.3)
10-day	2.21 (1.95-2.54)	3.10 (2.74-3.58)	4.30 (3.79-4.97)	5.29 (4.63-6.18)	6.67 (5.65-8.04)	7.75 (6.43-9.53)	8.85 (7.17-11.1)	10.0 (7.89-13.0)	11.6 (8.78-15.6)	12.8 (9.40-17.9)
20-day	2.58 (2.28-2.98)	3.68 (3.25-4.24)	5.17 (4.56-5.98)	6.42 (5.62-7.49)	8.19 (6.93-9.86)	9.58 (7.95-11.8)	11.0 (8.94-13.9)	12.6 (9.91-16.3)	14.7 (11.1-19.8)	16.4 (12.0-22.8)
30-day	3.01 (2.66-3.47)	4.28 (3.79-4.95)	6.04 (5.33-6.99)	7.54 (6.59-8.79)	9.66 (8.18-11.6)	11.4 (9.42-14.0)	13.1 (10.6-16.5)	15.0 (11.8-19.4)	17.7 (13.4-23.8)	19.8 (14.5-27.6)
45-day	3.54 (3.13-4.08)	4.99 (4.41-5.76)	7.03 (6.19-8.13)	8.78 (7.67-10.2)	11.3 (9.56-13.6)	13.3 (11.1-16.4)	15.5 (12.6-19.5)	17.8 (14.0-23.0)	21.1 (16.0-28.4)	23.7 (17.3-33.0)
60-day	4.07 (3.60-4.69)	5.67 (5.01-6.55)	7.94 (7.00-9.19)	9.90 (8.66-11.6)	12.8 (10.8-15.4)	15.1 (12.5-18.6)	17.6 (14.2-22.1)	20.2 (16.0-26.2)	24.1 (18.2-32.4)	27.2 (19.9-37.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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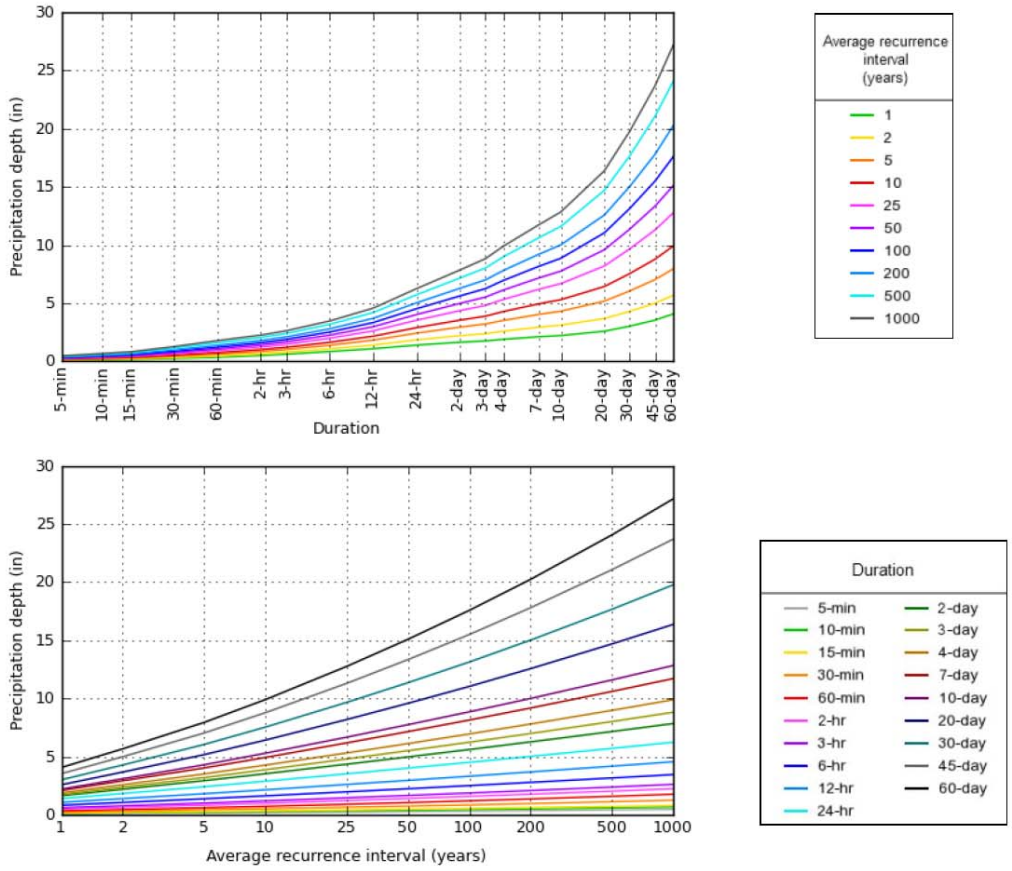
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.9149°, Longitude: -117.2595°



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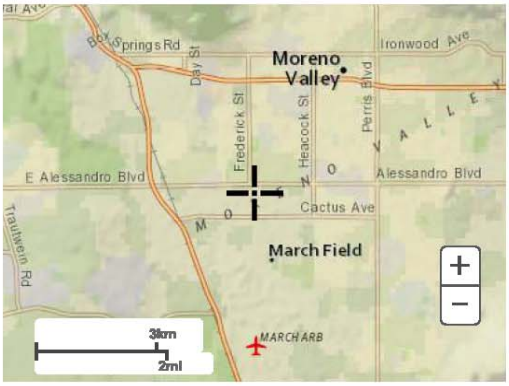
Maps & aerials

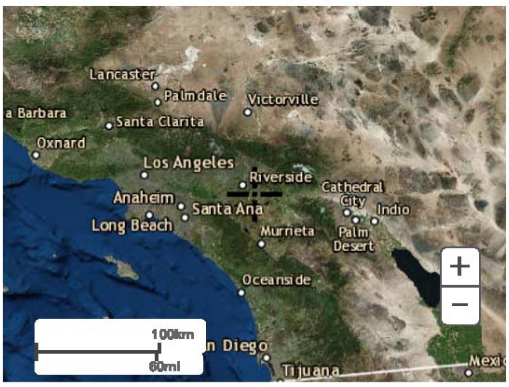
Small scale terrain



Large scale terrain

Large scale map

Large scale aerial



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APPENDIX 2: SHORT-CUT HYDROGRAPHS RESULTS

Pre-Development

Area:	8.780	acres	Per Hydrology Map (to use in this report)	
Pervious:	8.780	acres		
% perv:	100.0%		Soil Type:	C
% imperv:	0.0%		RI (Plate D-5.5):	69 (100% poor grass, pervious)
			RI (Plate D-5.5):	90 (impervious)

RI:	AMC-I	AMC-II	AMC-III	
69	0.58	0.38	0.200	(Plate E-6.2)

Synthetic Unit Hydrograph

Pre-Development Determination (center line of larking lot)

n:	0.03		(interpretation of Plate E.3)	
L:	900	ft	0.095	miles
Lca:	425	ft	0.063	miles
s:	0.0082	ft/ft	211.2	ft/mile
tlag:	4.13	min		
Δt (3hr, 6hr):	5	min		
Δt (24hr):	15	min		

As tlag < 5 - 7 min, Short Cut Hydrograph Method Used.

PRE-DEVELOPMENT CONDITIONS. AREA: Total.

Return Period:	2	yr	Low Loss Rate %:	85%	
Duration of Rain:	24	hr	% impervious:	0.0%	
Rainfall:	1.83	inches	Fp:	0.58	in/hr
Area:	8.78	acres	Constant loss rate, F:	0.580	in/hr
			Fm (as a % of F):	0.500	
Volume:	**8748**	**cu-ft**	**Peak:**	**0.33**	**cfs**

Period	Time (min)	Pattern %	Intensity (in/hr)	Max Loss (in/hr)	Low (in/hr)	Effective (in/hr)	**TOTAL (cfs)**
	0						0.00
1	15	0.2	0.015	1.024	0.012	0.002	0.02
2	30	0.3	0.022	1.012	0.019	0.003	0.03
3	45	0.3	0.022	1.001	0.019	0.003	0.03
4	60	0.4	0.029	0.989	0.025	0.004	0.04
5	75	0.3	0.022	0.977	0.019	0.003	0.03
6	90	0.3	0.022	0.965	0.019	0.003	0.03
7	105	0.3	0.022	0.954	0.019	0.003	0.03
8	120	0.4	0.029	0.942	0.025	0.004	0.04
9	135	0.4	0.029	0.931	0.025	0.004	0.04
10	150	0.4	0.029	0.920	0.025	0.004	0.04
11	165	0.5	0.037	0.909	0.031	0.005	0.05
12	180	0.5	0.037	0.897	0.031	0.005	0.05
13	195	0.5	0.037	0.886	0.031	0.005	0.05
14	210	0.5	0.037	0.875	0.031	0.005	0.05
15	225	0.5	0.037	0.864	0.031	0.005	0.05
16	240	0.6	0.044	0.853	0.037	0.007	0.06
17	255	0.6	0.044	0.843	0.037	0.007	0.06
18	270	0.7	0.051	0.832	0.044	0.008	0.07
19	285	0.7	0.051	0.821	0.044	0.008	0.07
20	300	0.8	0.059	0.811	0.050	0.009	0.08
21	315	0.6	0.044	0.800	0.037	0.007	0.06
22	330	0.7	0.051	0.790	0.044	0.008	0.07
23	345	0.8	0.059	0.779	0.050	0.009	0.08
24	360	0.8	0.059	0.769	0.050	0.009	0.08
25	375	0.9	0.066	0.759	0.056	0.010	0.09
26	390	0.9	0.066	0.749	0.056	0.010	0.09
27	405	1	0.073	0.739	0.062	0.011	0.10
28	420	1	0.073	0.729	0.062	0.011	0.10
29	435	1	0.073	0.719	0.062	0.011	0.10
30	450	1.1	0.081	0.709	0.068	0.012	0.11
31	465	1.2	0.088	0.699	0.075	0.013	0.12
32	480	1.3	0.095	0.690	0.081	0.014	0.13
33	495	1.5	0.110	0.680	0.093	0.016	0.15
34	510	1.5	0.110	0.671	0.093	0.016	0.15
35	525	1.6	0.117	0.661	0.100	0.018	0.16
36	540	1.7	0.124	0.652	0.106	0.019	0.17
37	555	1.9	0.139	0.643	0.118	0.021	0.18
38	570	2	0.146	0.633	0.124	0.022	0.19
39	585	2.1	0.154	0.624	0.131	0.023	0.20
40	600	2.2	0.161	0.615	0.137	0.024	0.21
41	615	1.5	0.110	0.607	0.093	0.016	0.15
42	630	1.5	0.110	0.598	0.093	0.016	0.15
43	645	2	0.146	0.589	0.124	0.022	0.19

44	660	2	0.146	0.580	0.124	0.022	0.19	
45	675	1.9	0.139	0.572	0.118	0.021	0.18	
46	690	1.9	0.139	0.563	0.118	0.021	0.18	
47	705	1.7	0.124	0.555	0.106	0.019	0.17	
48	720	1.8	0.132	0.547	0.112	0.020	0.17	
49	735	2.5	0.183	0.539	0.156	0.027	0.24	
50	750	2.6	0.190	0.531	0.162	0.029	0.25	
51	765	2.8	0.205	0.523	0.174	0.031	0.27	
52	780	2.9	0.212	0.515	0.180	0.032	0.28	
53	795	3.4	0.249	0.507	0.212	0.037	0.33	
54	810	3.4	0.249	0.499	0.212	0.037	0.33	
55	825	2.3	0.168	0.492	0.143	0.025	0.22	
56	840	2.3	0.168	0.484	0.143	0.025	0.22	
57	855	2.7	0.198	0.477	0.168	0.030	0.26	
58	870	2.6	0.190	0.470	0.162	0.029	0.25	
59	885	2.6	0.190	0.462	0.162	0.029	0.25	
60	900	2.5	0.183	0.455	0.156	0.027	0.24	
61	915	2.4	0.176	0.448	0.149	0.026	0.23	
62	930	2.3	0.168	0.442	0.143	0.025	0.22	
63	945	1.9	0.139	0.435	0.118	0.021	0.18	
64	960	1.9	0.139	0.428	0.118	0.021	0.18	
65	975	0.4	0.029	0.422	0.025	0.004	0.04	
66	990	0.4	0.029	0.415	0.025	0.004	0.04	
67	1005	0.3	0.022	0.409	0.019	0.003	0.03	
68	1020	0.3	0.022	0.403	0.019	0.003	0.03	
69	1035	0.5	0.037	0.397	0.031	0.005	0.05	
70	1050	0.5	0.037	0.391	0.031	0.005	0.05	
71	1065	0.5	0.037	0.385	0.031	0.005	0.05	
72	1080	0.4	0.029	0.379	0.025	0.004	0.04	
73	1095	0.4	0.029	0.374	0.025	0.004	0.04	
74	1110	0.4	0.029	0.368	0.025	0.004	0.04	
75	1125	0.3	0.022	0.363	0.019	0.003	0.03	
76	1140	0.2	0.015	0.358	0.012	0.002	0.02	
77	1155	0.3	0.022	0.353	0.019	0.003	0.03	
78	1170	0.4	0.029	0.348	0.025	0.004	0.04	
79	1185	0.3	0.022	0.343	0.019	0.003	0.03	
80	1200	0.2	0.015	0.338	0.012	0.002	0.02	
81	1215	0.3	0.022	0.334	0.019	0.003	0.03	
82	1230	0.3	0.022	0.330	0.019	0.003	0.03	
83	1245	0.3	0.022	0.325	0.019	0.003	0.03	
84	1260	0.2	0.015	0.321	0.012	0.002	0.02	
85	1275	0.3	0.022	0.318	0.019	0.003	0.03	
86	1290	0.2	0.015	0.314	0.012	0.002	0.02	
87	1305	0.3	0.022	0.311	0.019	0.003	0.03	
88	1320	0.2	0.015	0.307	0.012	0.002	0.02	
89	1335	0.3	0.022	0.304	0.019	0.003	0.03	
90	1350	0.2	0.015	0.301	0.012	0.002	0.02	
91	1365	0.2	0.015	0.299	0.012	0.002	0.02	
92	1380	0.2	0.015	0.296	0.012	0.002	0.02	
93	1395	0.2	0.015	0.294	0.012	0.002	0.02	
94	1410	0.2	0.015	0.293	0.012	0.002	0.02	
95	1425	0.2	0.015	0.291	0.012	0.002	0.02	
96	1440	0.2	0.015	0.290	0.012	0.002	0.02	
97	1455						0.00	

Post-Development-West

Area:	4.297	acres	Per Hydrology Map (to use in this report)
Pervious:	0.802	acres	
% perv:	18.7%		Soil Type: C
% imperv:	81.3%		RI (Plate D-5.5): 69 (100% poor grass, pervious)
			RI (Plate D-5.5): 90 (impervious)

RI:	AMC-I	AMC-II	AMC-III	
69	0.58	0.38	0.20	(Plate E-6.2)

Synthetic Unit Hydrograph

Pre-Development Determination (center line of larking lot)

n:	0.015		(interpretation of Plate E.3)	
L:	590	ft	0.095	miles
Lca:	330	ft	0.063	miles
s:	0.0081	ft/ft	211.2	ft/mile
tlag:	1.61	min		
Δt (3hr, 6hr):	5	min		
Δt (24hr):	15	min		

As tlag < 5 - 7 min, Short Cut Hydrograph Method Used.

Stage-Storage for BMP WEST

Elevation (ft)	Area (ft^2)	Volume (ft^3)	
0.00	8300	**0**	BOTTOM OF GRAVEL LAYER (0.4 Voids)
0.25	8300	830	
0.50	8300	1660	
0.75	8300	2490	
1.00	8300	3320	TOP OF GRAVEL LAYER
1.001	8300	3322	BOTTOM OF AMMENDED SOILS LAYER (0.3 Voids)
1.25	8300	3943	
1.50	8300	4565	
1.75	8300	5188	
2.00	8300	5810	
2.25	8300	6433	
2.50	8300	7055	
2.75	8300	7678	
3.00	8300	8300	TOP OF AMMENDED SOILS LAYER
3.001	8300	8308	BOTTOM OF MULCH
3.25	8300	10375	TOP OF MULCH
3.50	8300	12450	
3.75	8300	14525	SURFACE DISCHARGE(1,2)
4.00	8300	16600	
4.25	8300	18675	
4.50	8300	20750	
4.75	8300	22825	
5.00	8300	24900	
5.25	8300	26975	
5.50	8300	29050	
5.75	8300	31125	

(1): Volume at this elevation coresponds with surface volume for WQ purposes (invert of lowest surface outlet)
(2): This elevation corresponds to the top of the riser elevation and is equal to the invert of the existing-receiving stormdrain located along the southwestern project boundary

POST-DEVELOPMENT CONDITIONS. AREA: West.

Return Period:	2 yr		Low Loss Rate %:	24%	
Duration of Rain:	24 hr		% impervious:	81.3%	
Rainfall:	1.83 inches		Fp (AMC-I):	0.58	in/hr
Area:	4.30 acres		Constant loss rate, F:	0.155	in/hr
			Fm (as a % of F):	0.500	
Volume:	**21694** **cu-ft**		**Peak:**	**0.82** **cfs**	

Period	Time (min)	Pattern %	Intensity (in/hr)	Max Loss (in/hr)	Low (in/hr)	Effective (in/hr)	**TOTAL (cfs)**
	0						0.00
1	15	0.2	0.015	0.274	0.004	0.011	0.05
2	30	0.3	0.022	0.271	0.005	0.017	0.07
3	45	0.3	0.022	0.268	0.005	0.017	0.07
4	60	0.4	0.029	0.265	0.007	0.022	0.10
5	75	0.3	0.022	0.262	0.005	0.017	0.07
6	90	0.3	0.022	0.259	0.005	0.017	0.07
7	105	0.3	0.022	0.256	0.005	0.017	0.07
8	120	0.4	0.029	0.253	0.007	0.022	0.10
9	135	0.4	0.029	0.250	0.007	0.022	0.10
10	150	0.4	0.029	0.246	0.007	0.022	0.10
11	165	0.5	0.037	0.243	0.009	0.028	0.12
12	180	0.5	0.037	0.240	0.009	0.028	0.12
13	195	0.5	0.037	0.237	0.009	0.028	0.12
14	210	0.5	0.037	0.235	0.009	0.028	0.12
15	225	0.5	0.037	0.232	0.009	0.028	0.12
16	240	0.6	0.044	0.229	0.011	0.033	0.14
17	255	0.6	0.044	0.226	0.011	0.033	0.14
18	270	0.7	0.051	0.223	0.012	0.039	0.17
19	285	0.7	0.051	0.220	0.012	0.039	0.17
20	300	0.8	0.059	0.217	0.014	0.045	0.19
21	315	0.6	0.044	0.214	0.011	0.033	0.14
22	330	0.7	0.051	0.212	0.012	0.039	0.17
23	345	0.8	0.059	0.209	0.014	0.045	0.19
24	360	0.8	0.059	0.206	0.014	0.045	0.19
25	375	0.9	0.066	0.203	0.016	0.050	0.22
26	390	0.9	0.066	0.201	0.016	0.050	0.22
27	405	1	0.073	0.198	0.018	0.056	0.24
28	420	1	0.073	0.195	0.018	0.056	0.24
29	435	1	0.073	0.193	0.018	0.056	0.24
30	450	1.1	0.081	0.190	0.019	0.061	0.27
31	465	1.2	0.088	0.187	0.021	0.067	0.29
32	480	1.3	0.095	0.185	0.023	0.072	0.31
33	495	1.5	0.110	0.182	0.026	0.083	0.36
34	510	1.5	0.110	0.180	0.026	0.083	0.36
35	525	1.6	0.117	0.177	0.028	0.089	0.39
36	540	1.7	0.124	0.175	0.030	0.095	0.41
37	555	1.9	0.139	0.172	0.033	0.106	0.46
38	570	2	0.146	0.170	0.035	0.111	0.48
39	585	2.1	0.154	0.167	0.037	0.117	0.51
40	600	2.2	0.161	0.165	0.039	0.122	0.53
41	615	1.5	0.110	0.163	0.026	0.083	0.36
42	630	1.5	0.110	0.160	0.026	0.083	0.36
43	645	2	0.146	0.158	0.035	0.111	0.48

44	660	2	0.146	0.156	0.035	0.111	0.48	
45	675	1.9	0.139	0.153	0.033	0.106	0.46	
46	690	1.9	0.139	0.151	0.033	0.106	0.46	
47	705	1.7	0.124	0.149	0.030	0.095	0.41	
48	720	1.8	0.132	0.147	0.032	0.100	0.43	
49	735	2.5	0.183	0.144	0.044	0.139	0.60	
50	750	2.6	0.190	0.142	0.046	0.145	0.63	
51	765	2.8	0.205	0.140	0.049	0.156	0.67	
52	780	2.9	0.212	0.138	0.051	0.161	0.70	
53	795	3.4	0.249	0.136	0.060	0.189	0.82	
54	810	3.4	0.249	0.134	0.060	0.189	0.82	
55	825	2.3	0.168	0.132	0.040	0.128	0.55	
56	840	2.3	0.168	0.130	0.040	0.128	0.55	
57	855	2.7	0.198	0.128	0.047	0.150	0.65	
58	870	2.6	0.190	0.126	0.046	0.145	0.63	
59	885	2.6	0.190	0.124	0.046	0.145	0.63	
60	900	2.5	0.183	0.122	0.044	0.139	0.60	
61	915	2.4	0.176	0.120	0.042	0.134	0.58	
62	930	2.3	0.168	0.118	0.040	0.128	0.55	
63	945	1.9	0.139	0.117	0.033	0.106	0.46	
64	960	1.9	0.139	0.115	0.033	0.106	0.46	
65	975	0.4	0.029	0.113	0.007	0.022	0.10	
66	990	0.4	0.029	0.111	0.007	0.022	0.10	
67	1005	0.3	0.022	0.110	0.005	0.017	0.07	
68	1020	0.3	0.022	0.108	0.005	0.017	0.07	
69	1035	0.5	0.037	0.106	0.009	0.028	0.12	
70	1050	0.5	0.037	0.105	0.009	0.028	0.12	
71	1065	0.5	0.037	0.103	0.009	0.028	0.12	
72	1080	0.4	0.029	0.102	0.007	0.022	0.10	
73	1095	0.4	0.029	0.100	0.007	0.022	0.10	
74	1110	0.4	0.029	0.099	0.007	0.022	0.10	
75	1125	0.3	0.022	0.097	0.005	0.017	0.07	
76	1140	0.2	0.015	0.096	0.004	0.011	0.05	
77	1155	0.3	0.022	0.094	0.005	0.017	0.07	
78	1170	0.4	0.029	0.093	0.007	0.022	0.10	
79	1185	0.3	0.022	0.092	0.005	0.017	0.07	
80	1200	0.2	0.015	0.091	0.004	0.011	0.05	
81	1215	0.3	0.022	0.089	0.005	0.017	0.07	
82	1230	0.3	0.022	0.088	0.005	0.017	0.07	
83	1245	0.3	0.022	0.087	0.005	0.017	0.07	
84	1260	0.2	0.015	0.086	0.004	0.011	0.05	
85	1275	0.3	0.022	0.085	0.005	0.017	0.07	
86	1290	0.2	0.015	0.084	0.004	0.011	0.05	
87	1305	0.3	0.022	0.083	0.005	0.017	0.07	
88	1320	0.2	0.015	0.082	0.004	0.011	0.05	
89	1335	0.3	0.022	0.082	0.005	0.017	0.07	
90	1350	0.2	0.015	0.081	0.004	0.011	0.05	
91	1365	0.2	0.015	0.080	0.004	0.011	0.05	
92	1380	0.2	0.015	0.079	0.004	0.011	0.05	
93	1395	0.2	0.015	0.079	0.004	0.011	0.05	
94	1410	0.2	0.015	0.078	0.004	0.011	0.05	
95	1425	0.2	0.015	0.078	0.004	0.011	0.05	
96	1440	0.2	0.015	0.078	0.004	0.011	0.05	
97	1455						0.00	

Routing of 24 hr - 2 yr Hydrograph in BMP-West					Page #	1
Pump 1	0.15	cfs	Pump 2	0	cfs	
Activate	0.5	ft	Activate	0.00	ft	
Shut Off	0	ft	Shut Off	0.00	ft	

Volume Out	Maximum		
(ft^3)	Volume (ft^3)	Height (ft)	Outflow (cfs)
21465	13563	3.502	0.150

Time (min)	Post Q (cfs)	Volume (ft^3)	Height (ft)	Pump (cfs)
0	0.00	0	0.00	0.00
15	0.05	23	0.01	0.00
30	0.07	77	0.02	0.00
45	0.07	140	0.04	0.00
60	0.10	216	0.06	0.00
75	0.07	293	0.08	0.00
90	0.07	356	0.09	0.00
105	0.07	419	0.11	0.00
120	0.10	495	0.13	0.00
135	0.10	585	0.15	0.00
150	0.10	675	0.17	0.00
165	0.12	774	0.20	0.00
180	0.12	882	0.23	0.00
195	0.12	990	0.26	0.00
210	0.12	1098	0.28	0.00
225	0.12	1206	0.31	0.00
240	0.14	1323	0.34	0.00
255	0.14	1449	0.37	0.00
270	0.17	1589	0.41	0.00
285	0.17	1742	0.45	0.00
300	0.19	1904	0.49	0.00
315	0.14	1917	0.49	0.00
330	0.17	1922	0.50	0.15
345	0.19	1949	0.50	0.15
360	0.19	1985	0.51	0.15
375	0.22	2034	0.53	0.15
390	0.22	2097	0.54	0.15
405	0.24	2169	0.56	0.15
420	0.24	2250	0.58	0.15
435	0.24	2331	0.60	0.15
450	0.27	2426	0.63	0.15
465	0.29	2543	0.66	0.15
480	0.31	2678	0.69	0.15
495	0.36	2844	0.73	0.15
510	0.36	3033	0.78	0.15
525	0.39	3236	0.84	0.15
540	0.41	3461	0.89	0.15
555	0.46	3717	0.96	0.15
570	0.48	4005	1.03	0.15
585	0.51	4316	1.11	0.15
600	0.53	4649	1.20	0.15
615	0.36	4914	1.27	0.15
630	0.36	5103	1.32	0.15
645	0.48	5346	1.38	0.15
660	0.48	5643	1.46	0.15
675	0.46	5931	1.53	0.15
690	0.46	6210	1.60	0.15
705	0.41	6467	1.67	0.15
720	0.43	6710	1.73	0.15

Routing of 24 hr - 2 yr Hydrograph in BMP-West					Page #	2
Time (min)	Post Q (cfs)	Volume (ft^3)	Height (ft)	Pump (cfs)		
735	0.60	7038	1.82	0.15		
750	0.63	7457	1.93	0.15		
765	0.67	7907	2.04	0.15		
780	0.70	8388	2.17	0.15		
795	0.82	8937	2.31	0.15		
810	0.82	9540	2.46	0.15		
825	0.55	10022	2.59	0.15		
840	0.55	10382	2.68	0.15		
855	0.65	10787	2.79	0.15		
870	0.63	11228	2.90	0.15		
885	0.63	11660	3.01	0.15		
900	0.60	12078	3.12	0.15		
915	0.58	12474	3.22	0.15		
930	0.55	12848	3.32	0.15		
945	0.46	13167	3.40	0.15		
960	0.46	13446	3.47	0.15		
975	0.10	13563	3.50	0.15		
990	0.10	13518	3.49	0.15		
1005	0.07	13460	3.48	0.15		
1020	0.07	13388	3.46	0.15		
1035	0.12	13338	3.44	0.15		
1050	0.12	13311	3.44	0.15		
1065	0.12	13284	3.43	0.15		
1080	0.10	13248	3.42	0.15		
1095	0.10	13203	3.41	0.15		
1110	0.10	13158	3.40	0.15		
1125	0.07	13100	3.38	0.15		
1140	0.05	13019	3.36	0.15		
1155	0.07	12938	3.34	0.15		
1170	0.10	12879	3.33	0.15		
1185	0.07	12821	3.31	0.15		
1200	0.05	12740	3.29	0.15		
1215	0.07	12659	3.27	0.15		
1230	0.07	12587	3.25	0.15		
1245	0.07	12515	3.23	0.15		
1260	0.05	12434	3.21	0.15		
1275	0.07	12353	3.19	0.15		
1290	0.05	12272	3.17	0.15		
1305	0.07	12191	3.15	0.15		
1320	0.05	12110	3.13	0.15		
1335	0.07	12029	3.11	0.15		
1350	0.05	11948	3.08	0.15		
1365	0.05	11858	3.06	0.15		
1380	0.05	11768	3.04	0.15		
1395	0.05	11678	3.02	0.15		
1410	0.05	11588	2.99	0.15		
1425	0.05	11498	2.97	0.15		
1440	0.05	11408	2.95	0.15		
1455	0.00	11295	2.92	0.15		

Routing of 24 hr - 2 yr Hydrograph in BMP-West					Page #	4
Time (min)	Post Q (cfs)	Volume (ft^3)	Height (ft)	Pump (cfs)		
2205	0.00	4545	1.17	0.15		
2220	0.00	4410	1.14	0.15		
2235	0.00	4275	1.10	0.15		
2250	0.00	4140	1.07	0.15		
2265	0.00	4005	1.03	0.15		
2280	0.00	3870	1.00	0.15		
2295	0.00	3735	0.96	0.15		
2310	0.00	3600	0.93	0.15		
2325	0.00	3465	0.89	0.15		
2340	0.00	3330	0.86	0.15		
2355	0.00	3195	0.82	0.15		
2370	0.00	3060	0.79	0.15		
2385	0.00	2925	0.76	0.15		
2400	0.00	2790	0.72	0.15		
2415	0.00	2655	0.69	0.15		
2430	0.00	2520	0.65	0.15		
2445	0.00	2385	0.62	0.15		
2460	0.00	2250	0.58	0.15		
2475	0.00	2115	0.55	0.15		
2490	0.00	1980	0.51	0.15		
2505	0.00	1845	0.48	0.15		
2520	0.00	1710	0.44	0.15		
2535	0.00	1575	0.41	0.15		
2550	0.00	1440	0.37	0.15		
2565	0.00	1305	0.34	0.15		
2580	0.00	1170	0.30	0.15		
2595	0.00	1035	0.27	0.15		
2610	0.00	900	0.23	0.15		
2625	0.00	765	0.20	0.15		
2640	0.00	630	0.16	0.15		
2655	0.00	495	0.13	0.15		
2670	0.00	360	0.09	0.15		
2685	0.00	225	0.06	0.15		
2700	0.00	90	0.02	0.15		
2715	0.00	0	0.00	0.00		

Post-Development-East

Area:	4.483	acres	Per Hydrology Map (to use in this report)
Pervious:	0.349	acres	
% perv:	7.8%		Soil Type: C
% imperv:	92.2%		RI (Plate D-5.5): 69 (100% poor grass, pervious)
			RI (Plate D-5.5): 90 (impervious)

RI:	AMC-I	AMC-II	AMC-III	
69	0.58	0.38	0.20	(Plate E-6.2)

Synthetic Unit Hydrograph

Pre-Development Determination (center line of larking lot)

n:	0.015		(interpretation of Plate E.3)	
L:	920	ft	0.095	miles
Lca:	330	ft	0.063	miles
s:	0.0083	ft/ft	211.2	ft/mile
tlag:	1.89	min		
Δt (3hr, 6hr):	5	min		
Δt (24hr):	15	min		

As tlag < 5 - 7 min, Short Cut Hydrograph Method Used.

Dimensions for BMP East

Proposing OldCastle Underground Vaults Model 7x15x6

Dimensions

Length (ft)	Width (ft)	Height (ft)	Number	Area (sf)	Volume (cf)
15	7	6	24	2520	15120

Outside				Footprint
Length (ft)	Width (ft)	Height (ft)	Number	Area (sf)
16	8	6.5	24	3072

Stage-Area for BMP East

Elevation (ft)	Area (ft^2)	Volume (ft^3)	
0.00	2520	**0**	
1.00	2520	2520	
2.00	2520	5040	
3.00	2520	7560	
3.40	2520	8578	DCV(1,2)
4.00	2520	10080	
5.00	2520	12600	
6.00	2520	15120	

(1): Baffle wall to be set inside the storage system at 3.40' to ensure DCV is treated. Flows that reach above this elevation flow over the baffle wall, bypass treatment, and go directly to outflow chamber

(2): Proprietary BMP selected based on capacity to treat and discharge DCV within 48hours. Proprietary BMP selected is MWS-L-4-17 or equal.

POST-DEVELOPMENT CONDITIONS. AREA: East.

Return Period:	2 yr		Low Loss Rate %:	16%	
Duration of Rain:	24 hr		% impervious:	92.2%	
Rainfall:	1.83 inches		Fp (AMC-I):	0.58	in/hr
Area:	4.48 acres		Constant loss rate, F:	0.099	in/hr
			Fm (as a % of F):	0.500	
	Volume: **25063** **cu-ft**		**Peak:** **0.95** **cfs**		

Period	Time (min)	Pattern %	Intensity (in/hr)	Max Loss (in/hr)	Low (in/hr)	Effective (in/hr)	**TOTAL (cfs)**
	0						0.00
1	15	0.2	0.015	0.174	0.002	0.012	0.06
2	30	0.3	0.022	0.172	0.003	0.018	0.08
3	45	0.3	0.022	0.170	0.003	0.018	0.08
4	60	0.4	0.029	0.168	0.005	0.025	0.11
5	75	0.3	0.022	0.166	0.003	0.018	0.08
6	90	0.3	0.022	0.164	0.003	0.018	0.08
7	105	0.3	0.022	0.162	0.003	0.018	0.08
8	120	0.4	0.029	0.160	0.005	0.025	0.11
9	135	0.4	0.029	0.158	0.005	0.025	0.11
10	150	0.4	0.029	0.156	0.005	0.025	0.11
11	165	0.5	0.037	0.155	0.006	0.031	0.14
12	180	0.5	0.037	0.153	0.006	0.031	0.14
13	195	0.5	0.037	0.151	0.006	0.031	0.14
14	210	0.5	0.037	0.149	0.006	0.031	0.14
15	225	0.5	0.037	0.147	0.006	0.031	0.14
16	240	0.6	0.044	0.145	0.007	0.037	0.17
17	255	0.6	0.044	0.143	0.007	0.037	0.17
18	270	0.7	0.051	0.141	0.008	0.043	0.19
19	285	0.7	0.051	0.140	0.008	0.043	0.19
20	300	0.8	0.059	0.138	0.009	0.049	0.22
21	315	0.6	0.044	0.136	0.007	0.037	0.17
22	330	0.7	0.051	0.134	0.008	0.043	0.19
23	345	0.8	0.059	0.133	0.009	0.049	0.22
24	360	0.8	0.059	0.131	0.009	0.049	0.22
25	375	0.9	0.066	0.129	0.010	0.055	0.25
26	390	0.9	0.066	0.127	0.010	0.055	0.25
27	405	1	0.073	0.126	0.012	0.062	0.28
28	420	1	0.073	0.124	0.012	0.062	0.28
29	435	1	0.073	0.122	0.012	0.062	0.28
30	450	1.1	0.081	0.121	0.013	0.068	0.31
31	465	1.2	0.088	0.119	0.014	0.074	0.33
32	480	1.3	0.095	0.117	0.015	0.080	0.36
33	495	1.5	0.110	0.116	0.017	0.092	0.42
34	510	1.5	0.110	0.114	0.017	0.092	0.42
35	525	1.6	0.117	0.112	0.019	0.099	0.45
36	540	1.7	0.124	0.111	0.020	0.105	0.47
37	555	1.9	0.139	0.109	0.022	0.117	0.53
38	570	2	0.146	0.108	0.023	0.123	0.56
39	585	2.1	0.154	0.106	0.024	0.129	0.58
40	600	2.2	0.161	0.105	0.026	0.136	0.61
41	615	1.5	0.110	0.103	0.017	0.092	0.42
42	630	1.5	0.110	0.102	0.017	0.092	0.42
43	645	2	0.146	0.100	0.023	0.123	0.56

44	660	2	0.146	0.099	0.023	0.123	0.56	
45	675	1.9	0.139	0.097	0.022	0.117	0.53	
46	690	1.9	0.139	0.096	0.022	0.117	0.53	
47	705	1.7	0.124	0.094	0.020	0.105	0.47	
48	720	1.8	0.132	0.093	0.021	0.111	0.50	
49	735	2.5	0.183	0.092	0.029	0.154	0.70	
50	750	2.6	0.190	0.090	0.030	0.160	0.72	
51	765	2.8	0.205	0.089	0.032	0.172	0.78	
52	780	2.9	0.212	0.088	0.034	0.179	0.81	
53	795	3.4	0.249	0.086	0.039	0.209	0.95	
54	810	3.4	0.249	0.085	0.039	0.209	0.95	
55	825	2.3	0.168	0.084	0.027	0.142	0.64	
56	840	2.3	0.168	0.082	0.027	0.142	0.64	
57	855	2.7	0.198	0.081	0.031	0.166	0.75	
58	870	2.6	0.190	0.080	0.030	0.160	0.72	
59	885	2.6	0.190	0.079	0.030	0.160	0.72	
60	900	2.5	0.183	0.077	0.029	0.154	0.70	
61	915	2.4	0.176	0.076	0.028	0.148	0.67	
62	930	2.3	0.168	0.075	0.027	0.142	0.64	
63	945	1.9	0.139	0.074	0.022	0.117	0.53	
64	960	1.9	0.139	0.073	0.022	0.117	0.53	
65	975	0.4	0.029	0.072	0.005	0.025	0.11	
66	990	0.4	0.029	0.071	0.005	0.025	0.11	
67	1005	0.3	0.022	0.070	0.003	0.018	0.08	
68	1020	0.3	0.022	0.068	0.003	0.018	0.08	
69	1035	0.5	0.037	0.067	0.006	0.031	0.14	
70	1050	0.5	0.037	0.066	0.006	0.031	0.14	
71	1065	0.5	0.037	0.065	0.006	0.031	0.14	
72	1080	0.4	0.029	0.064	0.005	0.025	0.11	
73	1095	0.4	0.029	0.064	0.005	0.025	0.11	
74	1110	0.4	0.029	0.063	0.005	0.025	0.11	
75	1125	0.3	0.022	0.062	0.003	0.018	0.08	
76	1140	0.2	0.015	0.061	0.002	0.012	0.06	
77	1155	0.3	0.022	0.060	0.003	0.018	0.08	
78	1170	0.4	0.029	0.059	0.005	0.025	0.11	
79	1185	0.3	0.022	0.058	0.003	0.018	0.08	
80	1200	0.2	0.015	0.058	0.002	0.012	0.06	
81	1215	0.3	0.022	0.057	0.003	0.018	0.08	
82	1230	0.3	0.022	0.056	0.003	0.018	0.08	
83	1245	0.3	0.022	0.055	0.003	0.018	0.08	
84	1260	0.2	0.015	0.055	0.002	0.012	0.06	
85	1275	0.3	0.022	0.054	0.003	0.018	0.08	
86	1290	0.2	0.015	0.053	0.002	0.012	0.06	
87	1305	0.3	0.022	0.053	0.003	0.018	0.08	
88	1320	0.2	0.015	0.052	0.002	0.012	0.06	
89	1335	0.3	0.022	0.052	0.003	0.018	0.08	
90	1350	0.2	0.015	0.051	0.002	0.012	0.06	
91	1365	0.2	0.015	0.051	0.002	0.012	0.06	
92	1380	0.2	0.015	0.050	0.002	0.012	0.06	
93	1395	0.2	0.015	0.050	0.002	0.012	0.06	
94	1410	0.2	0.015	0.050	0.002	0.012	0.06	
95	1425	0.2	0.015	0.050	0.002	0.012	0.06	
96	1440	0.2	0.015	0.049	0.002	0.012	0.06	
97	1455						0.00	

Routing of 24 hr - 2 yr Hydrograph in BMP-East					Page #	1
Pump 1	0.18	cfs	Pump 2	0	cfs	
Activate	0.5	ft	Activate	0.00	ft	
Shut Off	0	ft	Shut Off	0.00	ft	

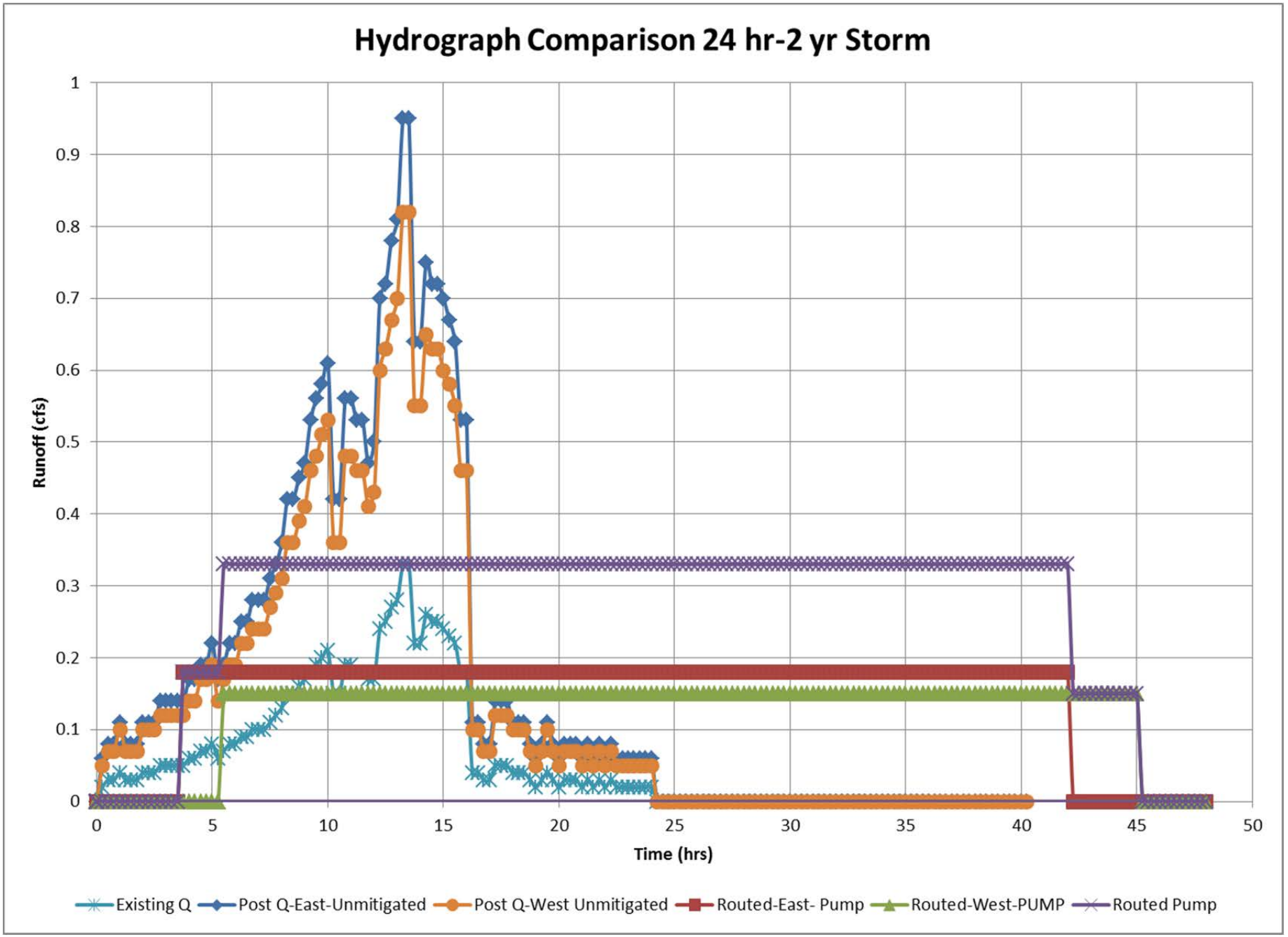
Volume Out	Maximum		
(ft^3)	Volume (ft^3)	Height (ft)	Outflow (cfs)
24948	14432	5.727	0.180

Time (min)	Post Q (cfs)	Volume (ft^3)	Height (ft)	Pump (cfs)
0	0.00	0	0.00	0.00
15	0.06	27	0.01	0.00
30	0.08	90	0.04	0.00
45	0.08	162	0.06	0.00
60	0.11	248	0.10	0.00
75	0.08	333	0.13	0.00
90	0.08	405	0.16	0.00
105	0.08	477	0.19	0.00
120	0.11	563	0.22	0.00
135	0.11	662	0.26	0.00
150	0.11	761	0.30	0.00
165	0.14	873	0.35	0.00
180	0.14	999	0.40	0.00
195	0.14	1125	0.45	0.00
210	0.14	1251	0.50	0.00
225	0.14	1215	0.48	0.18
240	0.17	1193	0.47	0.18
255	0.17	1184	0.47	0.18
270	0.19	1184	0.47	0.18
285	0.19	1193	0.47	0.18
300	0.22	1215	0.48	0.18
315	0.17	1229	0.49	0.18
330	0.19	1229	0.49	0.18
345	0.22	1251	0.50	0.18
360	0.22	1287	0.51	0.18
375	0.25	1337	0.53	0.18
390	0.25	1400	0.56	0.18
405	0.28	1476	0.59	0.18
420	0.28	1566	0.62	0.18
435	0.28	1656	0.66	0.18
450	0.31	1760	0.70	0.18
465	0.33	1886	0.75	0.18
480	0.36	2034	0.81	0.18
495	0.42	2223	0.88	0.18
510	0.42	2439	0.97	0.18
525	0.45	2669	1.06	0.18
540	0.47	2921	1.16	0.18
555	0.53	3209	1.27	0.18
570	0.56	3537	1.40	0.18
585	0.58	3888	1.54	0.18
600	0.61	4262	1.69	0.18
615	0.42	4563	1.81	0.18
630	0.42	4779	1.90	0.18
645	0.56	5058	2.01	0.18
660	0.56	5400	2.14	0.18
675	0.53	5729	2.27	0.18
690	0.53	6044	2.40	0.18
705	0.47	6332	2.51	0.18
720	0.50	6606	2.62	0.18

Routing of 24 hr - 2 yr Hydrograph in BMP-East					Page #	2
Time (min)	Post Q (cfs)	Volume (ft^3)	Height (ft)	Pump (cfs)		
735	0.70	6984	2.77	0.18		
750	0.72	7461	2.96	0.18		
765	0.78	7974	3.16	0.18		
780	0.81	8528	3.38	0.18		
795	0.95	9158	3.63	0.18		
810	0.95	9851	3.91	0.18		
825	0.64	10404	4.13	0.18		
840	0.64	10818	4.29	0.18		
855	0.75	11282	4.48	0.18		
870	0.72	11781	4.68	0.18		
885	0.72	12267	4.87	0.18		
900	0.70	12744	5.06	0.18		
915	0.67	13199	5.24	0.18		
930	0.64	13626	5.41	0.18		
945	0.53	13991	5.55	0.18		
960	0.53	14306	5.68	0.18		
975	0.11	14432	5.73	0.18		
990	0.11	14369	5.70	0.18		
1005	0.08	14292	5.67	0.18		
1020	0.08	14202	5.64	0.18		
1035	0.14	14139	5.61	0.18		
1050	0.14	14103	5.60	0.18		
1065	0.14	14067	5.58	0.18		
1080	0.11	14018	5.56	0.18		
1095	0.11	13955	5.54	0.18		
1110	0.11	13892	5.51	0.18		
1125	0.08	13815	5.48	0.18		
1140	0.06	13716	5.44	0.18		
1155	0.08	13617	5.40	0.18		
1170	0.11	13541	5.37	0.18		
1185	0.08	13464	5.34	0.18		
1200	0.06	13365	5.30	0.18		
1215	0.08	13266	5.26	0.18		
1230	0.08	13176	5.23	0.18		
1245	0.08	13086	5.19	0.18		
1260	0.06	12987	5.15	0.18		
1275	0.08	12888	5.11	0.18		
1290	0.06	12789	5.08	0.18		
1305	0.08	12690	5.04	0.18		
1320	0.06	12591	5.00	0.18		
1335	0.08	12492	4.96	0.18		
1350	0.06	12393	4.92	0.18		
1365	0.06	12285	4.88	0.18		
1380	0.06	12177	4.83	0.18		
1395	0.06	12069	4.79	0.18		
1410	0.06	11961	4.75	0.18		
1425	0.06	11853	4.70	0.18		
1440	0.06	11745	4.66	0.18		
1455	0.00	11610	4.61	0.18		

Routing of 24 hr - 2 yr Hydrograph in BMP-East					Page #	3
Time (min)	Post Q (cfs)	Volume (ft^3)	Height (ft)	Pump (cfs)		
1470	0.00	11448	4.54	0.18		
1485	0.00	11286	4.48	0.18		
1500	0.00	11124	4.41	0.18		
1515	0.00	10962	4.35	0.18		
1530	0.00	10800	4.29	0.18		
1545	0.00	10638	4.22	0.18		
1560	0.00	10476	4.16	0.18		
1575	0.00	10314	4.09	0.18		
1590	0.00	10152	4.03	0.18		
1605	0.00	9990	3.96	0.18		
1620	0.00	9828	3.90	0.18		
1635	0.00	9666	3.84	0.18		
1650	0.00	9504	3.77	0.18		
1665	0.00	9342	3.71	0.18		
1680	0.00	9180	3.64	0.18		
1695	0.00	9018	3.58	0.18		
1710	0.00	8856	3.51	0.18		
1725	0.00	8694	3.45	0.18		
1740	0.00	8532	3.39	0.18		
1755	0.00	8370	3.32	0.18		
1770	0.00	8208	3.26	0.18		
1785	0.00	8046	3.19	0.18		
1800	0.00	7884	3.13	0.18		
1815	0.00	7722	3.06	0.18		
1830	0.00	7560	3.00	0.18		
1845	0.00	7398	2.94	0.18		
1860	0.00	7236	2.87	0.18		
1875	0.00	7074	2.81	0.18		
1890	0.00	6912	2.74	0.18		
1905	0.00	6750	2.68	0.18		
1920	0.00	6588	2.61	0.18		
1935	0.00	6426	2.55	0.18		
1950	0.00	6264	2.49	0.18		
1965	0.00	6102	2.42	0.18		
1980	0.00	5940	2.36	0.18		
1995	0.00	5778	2.29	0.18		
2010	0.00	5616	2.23	0.18		
2025	0.00	5454	2.16	0.18		
2040	0.00	5292	2.10	0.18		
2055	0.00	5130	2.04	0.18		
2070	0.00	4968	1.97	0.18		
2085	0.00	4806	1.91	0.18		
2100	0.00	4644	1.84	0.18		
2115	0.00	4482	1.78	0.18		
2130	0.00	4320	1.71	0.18		
2145	0.00	4158	1.65	0.18		
2160	0.00	3996	1.59	0.18		
2175	0.00	3834	1.52	0.18		
2190	0.00	3672	1.46	0.18		

Routing of 24 hr - 2 yr Hydrograph in BMP-East					Page #	4
Time (min)	Post Q (cfs)	Volume (ft^3)	Height (ft)	Pump (cfs)		
2205	0.00	3510	1.39	0.18		
2220	0.00	3348	1.33	0.18		
2235	0.00	3186	1.26	0.18		
2250	0.00	3024	1.20	0.18		
2265	0.00	2862	1.14	0.18		
2280	0.00	2700	1.07	0.18		
2295	0.00	2538	1.01	0.18		
2310	0.00	2376	0.94	0.18		
2325	0.00	2214	0.88	0.18		
2340	0.00	2052	0.81	0.18		
2355	0.00	1890	0.75	0.18		
2370	0.00	1728	0.69	0.18		
2385	0.00	1566	0.62	0.18		
2400	0.00	1404	0.56	0.18		
2415	0.00	1242	0.49	0.18		
2430	0.00	1080	0.43	0.18		
2445	0.00	918	0.36	0.18		
2460	0.00	756	0.30	0.18		
2475	0.00	594	0.24	0.18		
2490	0.00	432	0.17	0.18		
2505	0.00	270	0.11	0.18		
2520	0.00	108	0.04	0.18		
2535	0.00	0	0.00	0.00		


Hydrograph Comparison 24 hr-2 yr Storm
Runoff (cfs)
Time (hrs)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
5
10
15
20
25
30
35
40
45
50
Existing Q
Post Q-East-Unmitigated
Post Q-West Unmitigated
Routed-East- Pump
Routed-West-PUMP
Routed Pump

APPENDIX 3: HYDROLOGY MAPS

Civil Engineering · Environmental Land Surveying
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
RBF Consultants, Inc.

DATE: 04/05/18
SCALE: 1" = 100'
DRAWN:
CHECKED:

SHEET TITLE: EXISTING CONDITIONS HMP

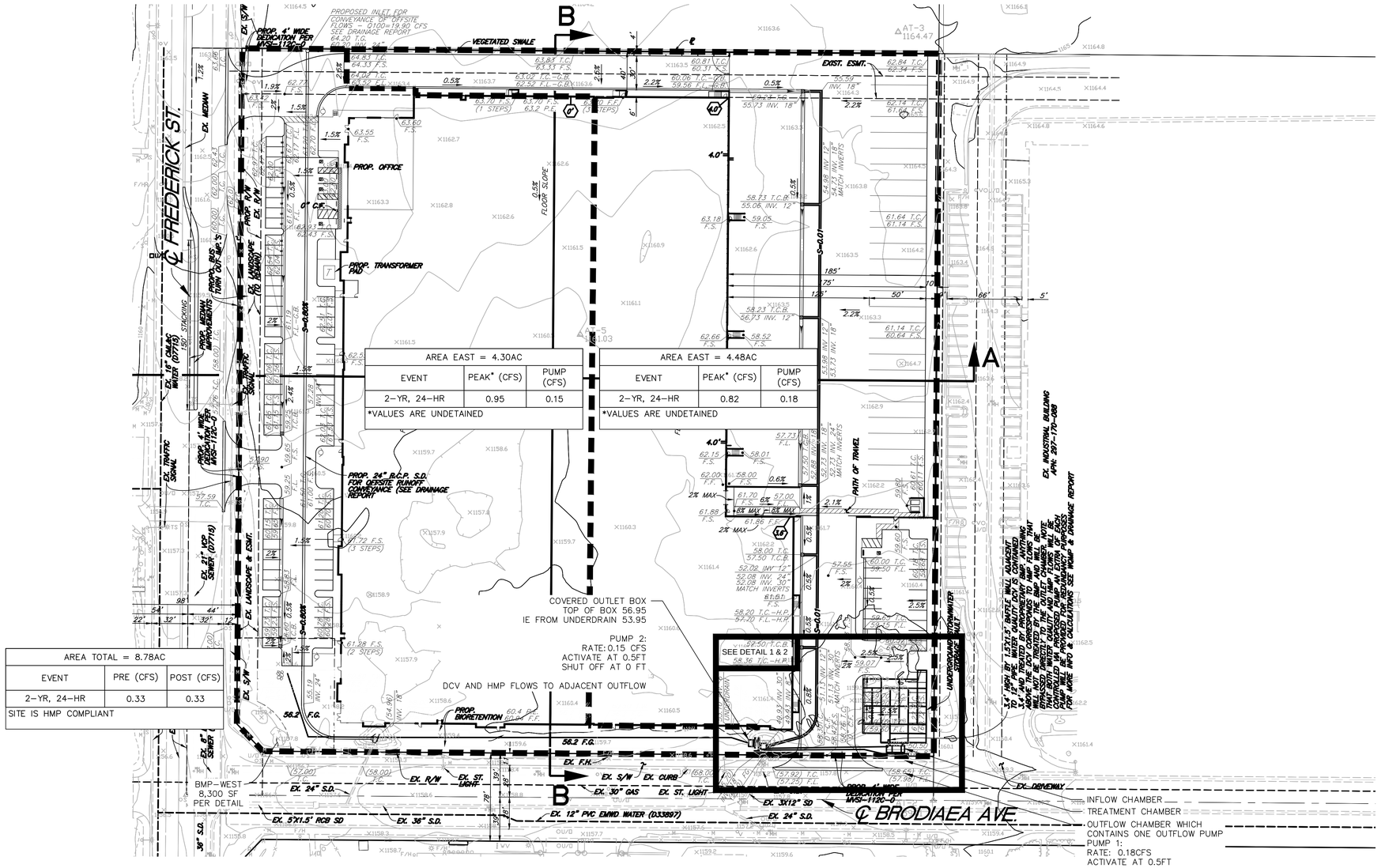
PROJECT: CENTERPOINTE INDUSTRIAL
NWC OF FREDERICK STREET AND BRODIAEA AVENUE
MORENO VALLEY, CA 92557

SHEET 1 OF 1 SHEETS

SAVE DATE: 4/6/2018 ~ PLOT DATE: 4/6/2018 ~ FILE NAME: P:\Acad\1379 SDH -- Newcastle Centerpointe\Reports\Drainage\180328_1379-Drainage.dwg

LEGEND

DMA BOUNDARY



AREA EAST = 4.30AC		
EVENT	PEAK* (CFS)	PUMP (CFS)
2-YR, 24-HR	0.95	0.15
*VALUES ARE UNDETAINED		

AREA EAST = 4.48AC		
EVENT	PEAK* (CFS)	PUMP (CFS)
2-YR, 24-HR	0.82	0.18
*VALUES ARE UNDETAINED		

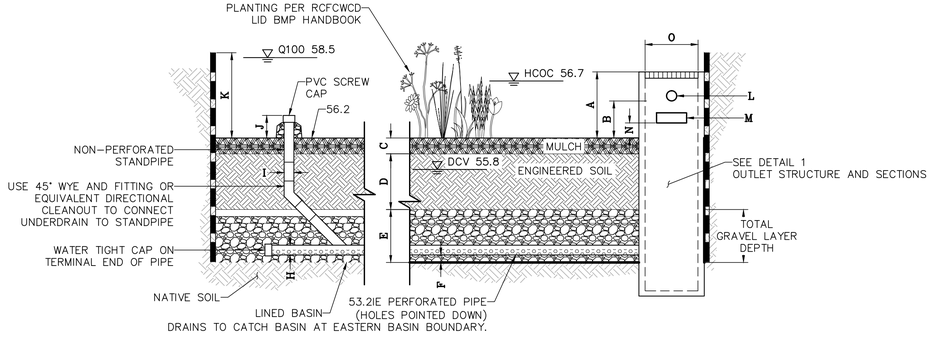
AREA TOTAL = 8.78AC		
EVENT	PRE (CFS)	POST (CFS)
2-YR, 24-HR	0.33	0.33
SITE IS HMP COMPLIANT		

TABULATED DATA

BASIN WEST

A	9"
B	N/A"
C	3"
D	24"
E	12"
F	3"
G	N/A
H	6"
I	6"
J	6"
K	4.3'
L	SEE DETAIL 1
M	N/A
N	N/A
O	SEE DETAIL 1
P	N/A

NOTE: ALL SPECIFICATIONS PER LID BMP MANUAL FACT SHEET FOR BIORETENTION BMP



DETAIL 3 BMP WEST (BIORETENTION)
NTS

NOTE: RECEIVING STORM DRAINS HAVE A SPECIFIED CAPACITY PER CITY OF MORENO VALLEY APPROVED AS-BUILT DRAWING 4-888. DETAINED HMP RUNOFF FROM THE PROJECT SITE IS LESS THAN THE CAPACITY.

50 25 0 50 100 150
SCALE: 1" = 50'

REVISIONS			
NO.	DESCRIPTION	DATE	APP'D

R·E·C Consultants, Inc.
Civil Engineering · Environmental
Land Surveying
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

DATE: 04/06/18
SCALE: 1" = 50'
DRAWN:
CHECKED:

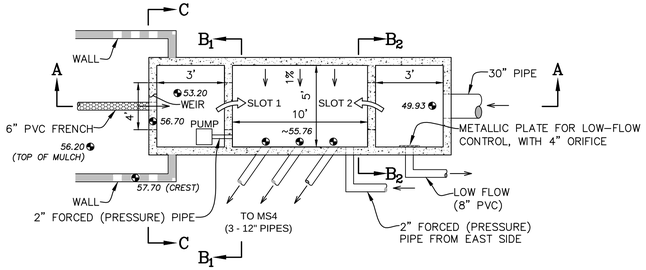
SHEET TITLE: PROPOSED HMP

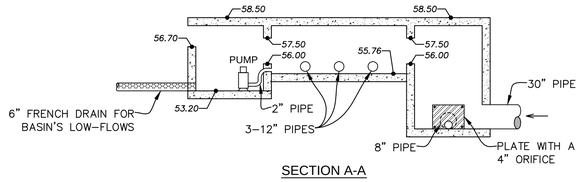
PROJECT: CENTERPOINTE INDUSTRIAL
FREDERICK ST. AND BRODIAEA AVE.
MORENO VALLEY, CA 92557

SHEET 1 OF 1 SHEETS

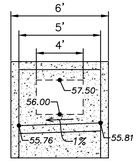
SAVE DATE: 6/12/2018 ~ PLOT DATE: 6/12/2018 ~ FILE NAME: P:\Accel\1379 SDH — Newcastle Centerpointe\Reports\WQMP\180328_1379-Drainage — Standard\180611_1379-Drainage.dwg

Attachment: Water Quality Management Plan (3273 : Centerpointe Commerce Center)

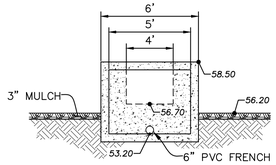




SECTION A-A



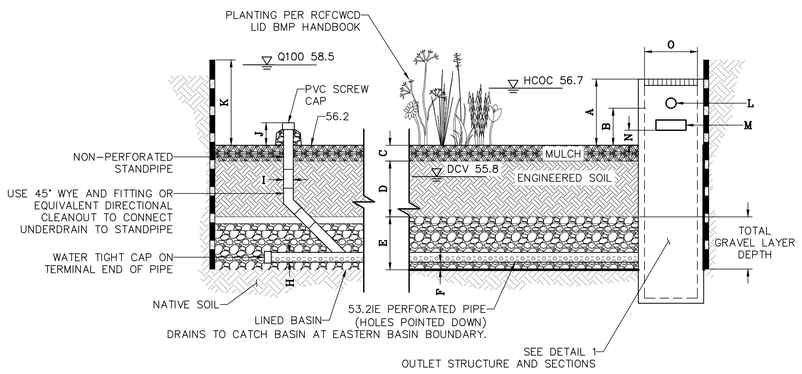
SECTION B1-B1 SLOT DETAILS
(SLOT 1 = SLOT 2) = SECTION B2-B2



SECTION C-C

NOTE:
FOR MODULAR WETLAND, UNDERGROUND SYSTEM & PRESSURE SYSTEM FOR EAST SIDE, SEE DETAIL 2.

1 OUTLET & SECTIONS
NOT TO SCALE



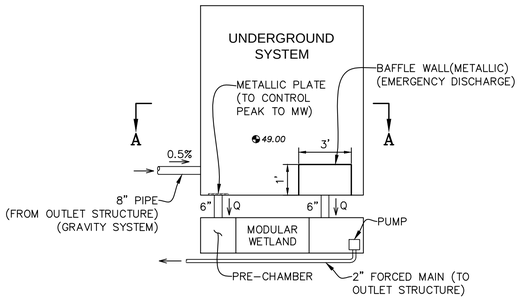
BMP TABLE			
BMP #	TYPE	SIZE (SqFt)	ORIFICE SIZE
WEST	BIORETENTION BASIN	8,300	N/A

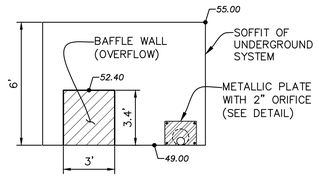
TABULATED DATA
BASIN WEST

A	9"
B	N/A"
C	3"
D	24"
E	12"
F	3"
G	N/A
H	6"
I	6"
J	6"
K	4.3'
L	SEE DETAIL 1
M	N/A
N	N/A
O	SEE DETAIL 1
P	N/A

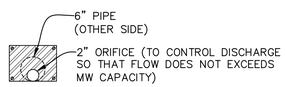
NOTE: ALL SPECIFICATIONS PER LID BMP MANUAL FACT SHEET FOR BIORETENTION BMP

3 BMP WEST (BIORETENTION)
NOT TO SCALE

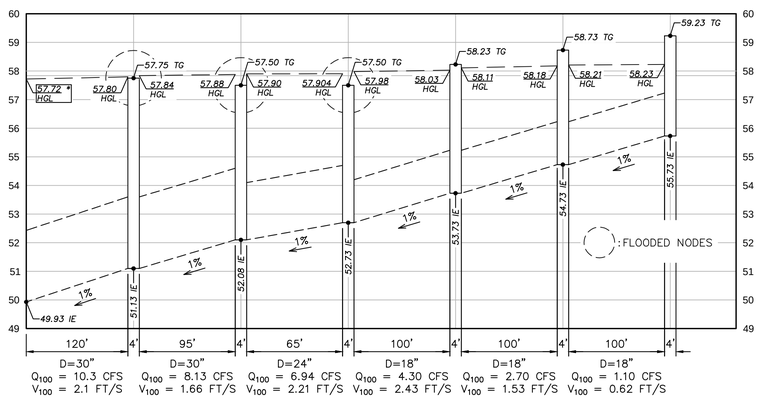




SECTION A-A



ORIFICE DETAIL



* – HGL (HYDRAULIC GRADIENT LINE) SET PER CITY OF MORENO VALLEY APPROVED PLANS (57.60) PLUS ENERGY LOSS TO CONVEY Q_{100} THRU 1.5'x4' RECTANGULAR SLOT (0.12'). HGL VALUES PER WSPG PRINTOUT. SEE PROJECT DRAINAGE STUDY.

2 UNDERGROUND SYSTEM DETAIL
NOT TO SCALE

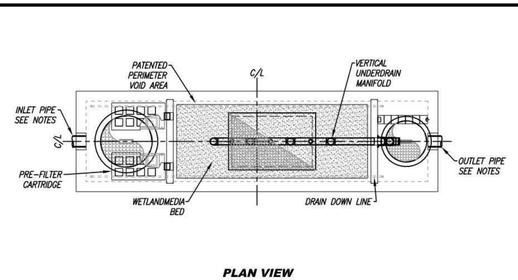
SITE SPECIFIC DATA			
PROJECT NUMBER	7211		
PROJECT NAME	MORENO VALLEY INDUSTRIAL		
PROJECT LOCATION	MORENO VALLEY, CA		
STRUCTURE ID	BASIN B		
TREATMENT REQUIRED			
VOLUME BASED (CF)	FLOW BASED (CFS)		
8,575	N/A		
TREATMENT HGL AVAILABLE (FT)		N/A	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE		OFFLINE	
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	1550.50	PVC	6"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	1550.00	PVC	6"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	1558.00	1558.00	1558.00
SURFACE LOAD	H20 IN-DIRECT	H20 IN-DIRECT	H20 IN-DIRECT
FRAME & COVER	ø30"	30" X 48"	ø24"
WETLANDMEDIA VOLUME (CY)			5.58
WETLANDMEDIA DELIVERY METHOD			PER CONTRACT
ORIFICE SIZE (DIA. INCHES)			ø1.03"
NOTES: PRELIMINARY; NOT FOR CONSTRUCTION. ENGINEER TO SET UPSTREAM BYPASS AT 1553.48.			

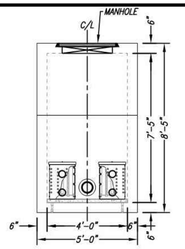
INSTALLATION NOTES

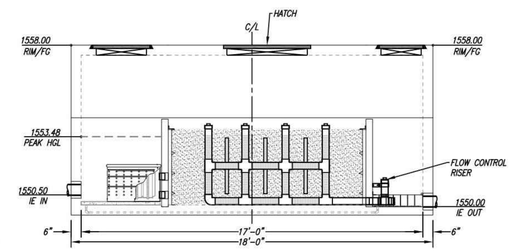
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING MODULAR WETLANDS FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A MODULAR WETLANDS REPRESENTATIVE.

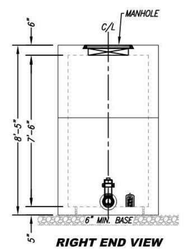
GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.









REQUIRED TREATMENT VOLUME (CF)	8575
DRAINDOWN DURATION (HOURS)	46
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	23.34
OPERATING HEAD (FT)	3.4
WETLANDMEDIA INFILTRATION RATE (IN/HR) OR	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

THE PRODUCT DESCRIBED MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

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Bio Clean — A Forterra Company

MWS-L-4-17-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

4 MODULAR WETLAND
NOT TO SCALE

REVISIONS

NO.	DESCRIPTION	DATE	APP'D

R·E·C Consultants, Inc.
Civil Engineering · Environmental
Land Surveying
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

DETAILS

PROJECT
CENTERPOINTE INDUSTRIAL
FREDERICK ST. AND BRODIAEA AVE.
MORENO VALLEY, CA 92557

SHEET TITLE

DATE: 02/05/18
SCALE: 1" = 20'
DRAWN: J.M.W.
CHECKED: B.A.R.

SHEET 2 OF 2 SHEETS

SAVE DATE: 6/11/2018 ~ PLOT DATE: 6/12/2018 ~ FILE NAME: P:\Acad\1379 SDH — Newcastle Centerpointe\Reports\WQMP\180328_1379-Drainage — Standard\180328_1379-Drainage.dwg

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

TO BE PROVIDED IN FINAL WQMP

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

TO BE PROVIDED IN FINAL WQMP

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

TO BE PROVIDED IN FINAL WQMP

URBAN CROSSROADS

Centerpointe

NOISE IMPACT ANALYSIS

CITY OF MORENO VALLEY

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MAY 25, 2018

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
I-215	Interstate 215
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
MARB/IPA	March Air Reserve Base/Inland Port Airport
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	Centerpointe
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Centerpointe development ("Project"). The Project site is located on the northeast corner of Frederick Street and Brodiaea Avenue in the City of Moreno Valley. The Project is proposed to consist of up to 204,022 square feet (sf) warehouse (without cold storage) use within a single building. This study has been prepared to satisfy the City of Moreno Valley noise standards and thresholds of significance based on guidance in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on nine roadway segments surrounding the Project site were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the *Centerpointe Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Opening Year 2023, and General Plan Buildout (Post-2040) traffic conditions. The analysis shows that the Project-related traffic noise level increases under all traffic scenarios will be *less than significant*.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from the Centerpointe site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The normal activities associated with the proposed Centerpointe are anticipated to include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. The operational noise analysis shows that the Project-related stationary-source noise levels due to the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements will satisfy the City of Moreno Valley 65 dBA L_{eq} daytime and 60 dBA L_{eq} nighttime noise level standards at 200 feet from the property line of the noise source (Project site) and at all nearby sensitive receiver locations. Further, since the Project-related operational noise levels will satisfy the more restrictive 65 dBA L_{eq} daytime and 60 dBA L_{eq} nighttime exterior noise level standards, they will also comply with the 90 dBA L_{eq} 8-hour continuous noise level limit identified in the City of Moreno Valley Municipal Code.

In addition, this analysis demonstrates that the Project will contribute *less than significant* operational noise level contributions to the existing ambient noise environment during the daytime and nighttime hours at all of the sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed 24-hour seven days per week Project activities, such as the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading

of dry goods, roof-top air conditioning units, and parking lot vehicle movements, will be *less than significant*.

OPERATIONAL VIBRATION ANALYSIS

The operation of the Project site will include heavy trucks transiting on site to and from the loading dock areas. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels for heavy trucks at normal traffic speeds do not exceed 65 VdB, and therefore, will be below the Federal Transit Administration (FTA) vibration threshold of 80 VdB at nearby sensitive receiver locations. Since truck deliveries transiting on site will be travelling at very low speeds it is expected that delivery truck vibration impacts at nearby homes will be *less than significant*.

CONSTRUCTION NOISE ANALYSIS

Construction noise represents a short-term increase on the ambient noise levels. Construction-related noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site when certain activities occur at the Project site boundary. Using sample reference noise levels to represent the planned construction activities of the Centerpointe site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. The Project-related short-term construction noise levels are shown to satisfy the City of Moreno Valley Municipal Code Municipal Code 65 dBA L_{eq} daytime and 60 dBA L_{eq} nighttime noise level thresholds. Therefore, based on the results of this analysis, all receiver locations will experience *less than significant* impacts due to Project construction noise levels.

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The analysis shows that the unmitigated Project-construction vibration levels will remain below the Federal Transit Administration (FTA) 80 VdB threshold at all receiver locations, and are therefore, considered a *less than significant* impact. Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating at the Project site perimeter.

CONSTRUCTION NOISE AND VIBRATION ABATEMENT MEASURES

Though construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts, the following practices would reduce noise level increases produced by the construction equipment to the nearby noise-sensitive residential land uses:

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that Project construction activities shall comply with the City of Moreno Valley Municipal Code requirements. (3)

- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receivers nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the center).

SUMMARY OF SIGNIFICANCE FINDINGS

The results of this Centerpointe Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	*n/a*
Operational Noise	9	*Less Than Significant*	*n/a*
Operational Vibration		*Less Than Significant*	*n/a*
Construction Noise	10	*Less Than Significant*	*n/a*
Construction Vibration		*Less Than Significant*	*n/a*

"n/a" = No mitigation is required.

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Centerpointe ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational and short-term construction noise impacts.

1.1 SITE LOCATION

The proposed Centerpointe site is located on the northeast corner of Frederick Street and Brodiaea Avenue in the City of Moreno Valley, as shown on Exhibit 1-A. Existing uses in the Project study area include a commercial-designated vacant lot north of the Project site, existing business park/warehouse use to the east, the Riverside County Department of Waste Resources facilities to the south, and existing City of Moreno Valley offices to the west. The closest existing residential homes to the Project site are located approximately 800 feet north of the Project site across Alessandro Boulevard. The March Air Reserve Base/Inland Port Airport (MARB/IPA) runway is located approximately 1.2 miles southwest of the Project site, and Interstate 215 (I-215) is located roughly 1.2 miles west of the Project site.

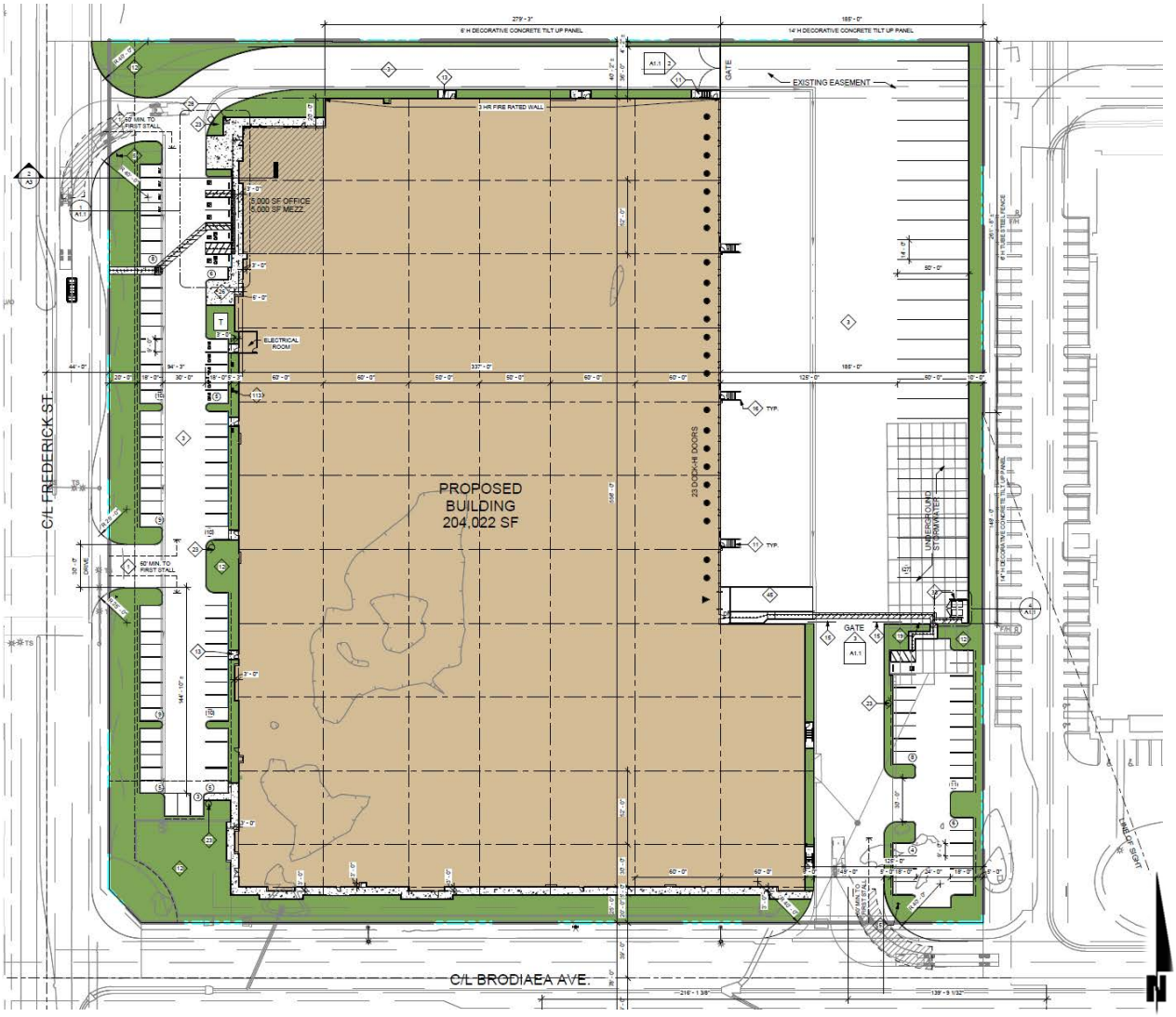
1.2 PROJECT DESCRIPTION

The Project is proposed to consist of up to 204,022 square feet (sf) warehouse (without cold storage) use within a single building, as shown on Exhibit 1-B. At the time this noise analysis was prepared the future tenants of the proposed Project were unknown. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. This noise analysis is intended to describe noise level impacts associated with the expected typical warehouse and distribution storage activities at the Project site. At the time of this analysis, no cold storage was planned at the Project site, and therefore is not analyzed in this report.

According to the *Centerpointe Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 486 trip-ends per day (actual vehicles). (2) The Project trip generation includes 100 truck trip-ends per day from the proposed buildings within the Project site. This noise study relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (4) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 100 feet, which can cause serious discomfort. (5) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Day-Night Average Noise Level (LDN) and the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The LDN and CNEL are weighted averages of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The LDN time of day corrections include the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. The CNEL time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., in addition to the corrections for the LDN. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. LDN and CNEL do not represent the actual sound level heard at any particular time, but rather represent the total sound exposure. The City of Moreno Valley relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources, and therefore, this analysis uses the CNEL noise level to apply the more conservative evening hour corrections to the 24-hour noise levels.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (4)

2.3.2 Ground Absorption

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (6)

2.3.3 Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (4)

2.3.4 Shielding

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an “out of sight, out of mind” effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby resident. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (6)

2.4 Noise Control

Noise control is the process of obtaining an acceptable noise environment for a particular observation point or receptor by controlling the noise source, transmission path, receptor, or all three. This concept is known as the source-path-receptor concept. In general, noise control measures can be applied to any and all of these three elements.

2.5 Noise Barrier Attenuation

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor.

Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (6)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (7)

2.7 COMMUNITY RESPONSE TO NOISE

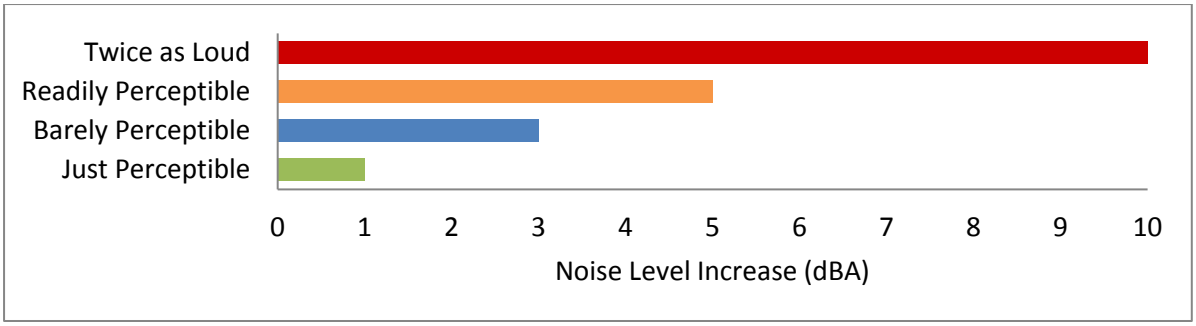
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon each individual's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (8) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (8)

Despite this variability in behavior on an individual level, the population as a whole can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (6)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



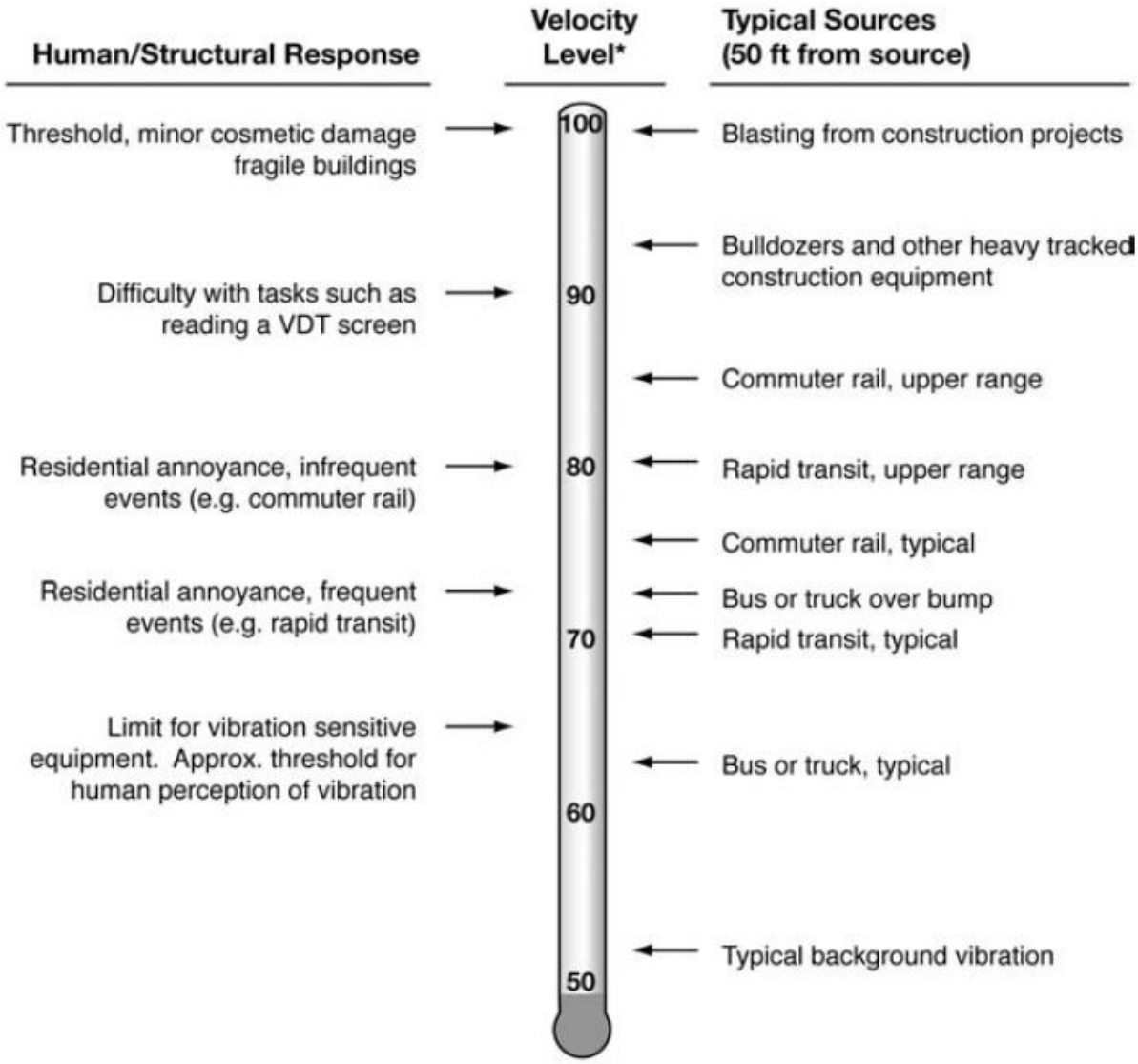
2.8 VIBRATION

According to the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (9), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise Impact and Vibration Assessment.

3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains fairly constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared according to guidelines adopted by the Governor's Office of Planning and Research (OPR). (10) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The 2016 State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (11) These noise standards are applied to new construction in California for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available, and the noise level exceeds 65 dBA L_{eq} for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

3.3 CITY OF MORENO VALLEY GENERAL PLAN

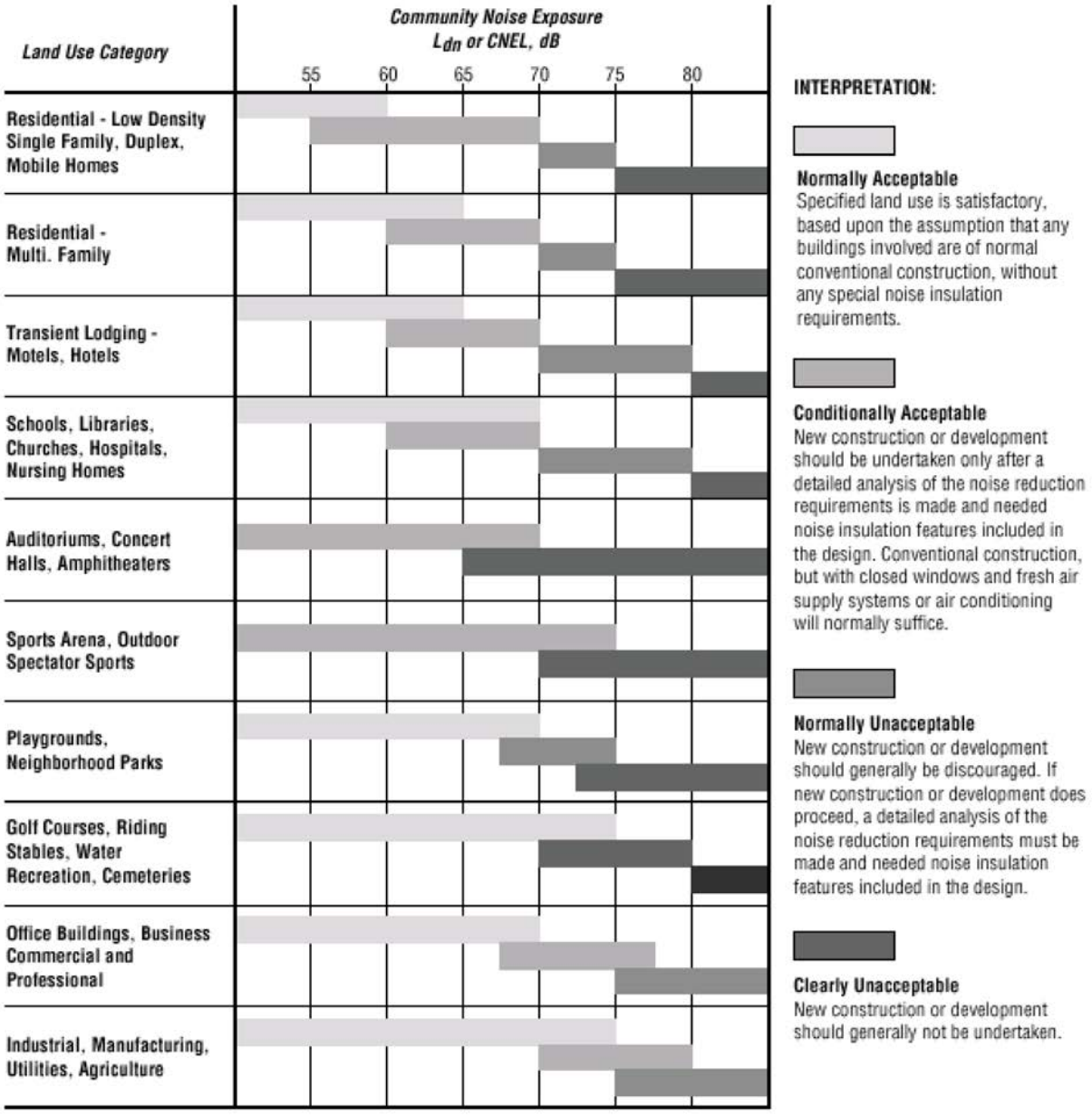
The City of Moreno Valley Noise Element typically provides the standards for land use compatibility for community noise exposure. However, the City of Moreno Valley General Plan does not include a noise element or specific transportation-related noise standards. Rather, noise is considered in the Environmental Safety section of the General Plan Safety Element. (12) While the General Plan provides background and noise fundamentals, it does not identify criteria to assess the impacts associated with off-site transportation-related noise impacts. Therefore,

for this analysis, the transportation noise criteria are derived from standards contained in the California Office of Planning and Research (OPR) *General Plan Guidelines*.

The OPR land use/noise compatibility standards are used by many California cities and counties and specify the maximum noise levels allowable for new developments impacted by transportation noise sources. The OPR land use/noise compatibility criteria, found in Figure 2 of the *General Plan Guidelines, Appendix C: Noise Element Guidelines,* identify the criteria for industrial land uses such as the Project, as shown on Exhibit 3-A. When the unmitigated exterior noise levels approach 70 dBA CNEL industrial land use is considered *normally acceptable*. With exterior noise levels ranging from 70 to 80 dBA CNEL, industrial land uses are considered *conditionally acceptable*, and with exterior noise levels greater than 80 dBA CNEL, they are considered *normally unacceptable*. For *normally unacceptable* land use, *new construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.* (10) For the purposes of this analysis, industrial land use such as the Project does not contain outdoor living areas requiring exterior noise mitigation as outlined in the OPR *General Plan Guidelines*, and therefore, only the interior noise levels experienced by employees at the Project site are evaluated against the appropriate noise level standards.

The purpose of the transportation noise criteria is to protect, create, and maintain an environment free from noise and vibration that may jeopardize the health or welfare of sensitive receptors, or degrade quality of life. City General Policies (City of Moreno Valley General Plan, pp.9-31, 9-32) act to ensure that when exterior noise levels exceed 65 dBA CNEL at sensitive receptors, mitigation is provided to ensure that interior noise levels of 45 dBA CNEL are maintained. General Plan Policies in this regard are consistent with, and support, the California Building Code interior noise standards.

EXHIBIT 3-A: LAND USE NOISE COMPATIBILITY CRITERIA



Source: OPR General Plan Guidelines, Appendix C: Noise Element Guidelines, Figure 2.

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Centerpointe Project, stationary-source (operational) noise such as the expected idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements are typically evaluated against standards established under a City's Municipal Code.

The City of Moreno Valley Municipal Code, Chapter 11.80 *Noise Regulation*, provides performance standards and noise control guidelines for determining and mitigating non-transportation or stationary-source noise impacts from operations at private properties. The City of Moreno Valley Municipal Code defines *Maximum Sound Levels (in dB(A)) for Source Land Uses* in Table 11.80.030-2 for *Residential* and *Commercial* land uses. As defined by the Municipal Code, Section 11.80.020 *Definitions*, *Commercial* land use *means all uses of land not otherwise classified as residential,* and *Residential* land use *means all uses of land primarily for dwelling units, as well as hospitals, schools, colleges and universities, and places of religious assembly.* (3) For the purpose of this analysis, the Centerpointe Project is considered *Commercial* land use since it is not classified as residential. Based on this standard, the operational noise level limits for commercial land use, from Table 11.80.030-2, of 65 dBA L_{eq} during the daytime (8:00 a.m. to 10:00 p.m.) hours and 60 dBA L_{eq} during the nighttime (10:01 p.m. to 7:59 a.m.) hours shall apply to the operational noise from the Project.

Further, Section 11.80.030 (C) *Prohibited Acts*, *Nonimpulsive Sound Decibel Limits*, states: *No person shall maintain, create, operate or cause to be operated on private property any source of sound in such a manner as to create any nonimpulsive sound which exceeds the limits set forth for the source land use category (as defined in Section 11.80.020) in Table 11.80.030-2 when measured at a distance of two hundred (200) feet or more from the real property line of the source of the sound, if the sound occurs on a privately owned property…* (3) Therefore, at a distance of 200 feet from the property line, the Project's operational noise levels shall not exceed the 65 dBA L_{eq} daytime and 60 dBA L_{eq} nighttime noise level standards for commercial land uses, as shown on Table 3-1.

The City of Moreno Valley Municipal Code also identifies continuous sound level limits in Table 11.80.030-1 based on the Center for Disease Control and Prevention and the National Institute for Occupational Safety and Health (NIOSH) noise exposure guidelines. A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The City of Moreno Valley noise level threshold starts at 90 dBA for more than eight hours per day, and for every increase, the exposure time is reduced. The City of Moreno Valley identifies noise level thresholds of 92 dBA for more than 6 hours per day, 95 dBA for more than 4 hour per day, 97 dBA for more than 3 hours per day, and up to 100 dBA for more than 2 hours per day. However, this noise study uses the more restrictive City of Moreno Valley noise level limits identified on Table 11.80.030-2 for source land uses in the Municipal Code, shown on Table 3-1 of this report, to evaluate the potential operational noise levels due to the operation of the Project.

TABLE 3-1: OPERATIONAL NOISE STANDARDS AT 200 FEET FROM THE SOURCE

Jurisdiction	Source Land Use	Time Period	Maximum Noise Level for Source Land Uses @ 200' (dBA L_{eq})[2]
City of Moreno Valley[1]	Commercial	Daytime (8:00 a.m. - 10:00 p.m.)	65
		Nighttime (10:01 p.m. - 7:59 a.m.)	60

[1] Source: City of Moreno Valley Municipal Code, Chapter 11.80 Noise Regulation, Table 11.80.030-2 Maximum Sound Levels (in dB(A)) for Source Land Uses when measured at a distance of 200 feet from the property line of the source land use (Appendix 3.1).
[2] Leq represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Centerpointe site, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The Municipal Code noise standards for construction are described below for the City of Moreno Valley to determine the potential noise impacts at nearby receiver locations. The construction-related noise standards are shown on Table 3-2.

The Municipal Code noise standards for construction are described below for the City of Moreno Valley to determine the potential noise impacts at nearby sensitive receiver locations. As a subset of its stationary-source noise regulations, the City Municipal Code establishes permitted hours of construction activity. More specifically, Municipal Code Section 11.80.030 (D) (7), *Construction and Demolition*, provides the following:

> *No person shall operate, or cause operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between the hours of eight p.m. and seven a.m. the following day such that the sound there from creates a noise disturbance, except for emergency work by public service utilities or for other work approved by the city manager or designee.*

Therefore, based on the Section 11.80.030 (D) (7) construction regulations, a construction-related *noise disturbance* occurs if Project construction activity occurs outside of the permitted hours. However, for this analysis, the stationary-source noise level limits of 65 dBA L_{eq} during the daytime hours and 60 dBA L_{eq} during the nighttime hours are used as appropriate thresholds for the nearby sensitive land uses (e.g. residential homes) in the Project study area. In addition, grading operations shall be limited to the hours identified in Section 8.21.050 (O) of 7:00 a.m. to 6:00 p.m., Monday through Friday, and 8:00 a.m. to 4:00 p.m. on weekends and holidays or as approved by the City Engineer. The City of Moreno Valley construction noise standards are shown on Table 3-2 and included in Appendix 3.1. As previously discussed in Section 3.4, the construction noise level threshold used in this noise study represents a conservative approach, since it is more restrictive than the continuous sound level limits of Table 11.80.030-1 of the City of Moreno Valley Municipal Code.

TABLE 3-2: CONSTRUCTION NOISE STANDARDS FROM THE SOURCE LAND USE

Jurisdiction	Permitted Hours of Construction Activity	Construction Noise Level Standard (dBA L_{eq})[2]	
		Daytime	Nighttime
City of Moreno Valley[1]	General Activity: 7:00 a.m. to 8:00 p.m. on any day. Grading is limited to 7:00 a.m. to 6:00 p.m. Monday to Friday; 8:00 a.m. to 4:00 p.m. on weekends and holidays.	65	60[3]

[1] Source: City of Moreno Valley Municipal Code, Section 11.80.030 (D) (7) and Section 8.21.050 (O) (Appendix 3.1).
[2] Acceptable threshold for determining the relative significance of short-term Project construction noise levels, based on the City of Moreno Valley stationary noise standards shown on Table 3-1.
[3] Any nighttime construction activity requires an exemption from the City of Moreno Valley Municipal Code as indicated in Section 11.80.030 (E) (8) for a special event permit (Section 11.80.040). The special event permit application shall be submitted to the City of Moreno Valley Planning Department for approval and meet the requirements of Municipal Code Section 11.80.040.
"Daytime" = 8:00 a.m. to 10:00 p.m.; "Nighttime" = 10:01 p.m. to 7:59 a.m.

3.6 VIBRATION STANDARDS

The City of Moreno Valley has not identified or adopted specific vibration level standards. However, the United States Department of Transportation Federal Transit Administration (FTA) provides guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines allow 80 VdB for residential uses and buildings where people normally sleep. (9) Operational and construction activities can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. Large bulldozers and loaded trucks can cause perceptible vibration levels proximate receptors. The FTA guidelines of 80 VdB for sensitive land uses provide a substantiated basis for determining the relative significance of potential Project-related vibration impacts due to on-site operational and construction activities.

3.7 MARCH AIR RESERVE BASE/INLAND PORT AIRPORT LAND USE COMPATIBILITY

The March Air Reserve Base/Inland Port Airport (MARB/IPA) is located approximately 1.2 miles southwest of the Project site. The *Riverside County Airport Land Use Compatibility Plan Policy Document* (RC ALUCP) includes the policies for determining the land use compatibility of the Project since it is located within 2 miles of an airport runway. Policy 4.1.5 *Noise Exposure for Other Land Uses* of the RC ALUCP requires that land uses, such as the industrial land use of the Project site, demonstrate compatibility with the acceptable noise levels on Table 2B. The Table 2B *Supporting Compatibility Criteria: Noise* matrix is shown on Exhibit 3-B and indicates that *clearly acceptable* industrial land uses experience exterior noise levels below 65 dBA CNEL. For *clearly acceptable* noise levels, *the activities associated with the specified land use can be carried out with essentially no interference from the noise exposure*. *Normally acceptable* noise levels for industrial land uses range from 65 to 70 dBA CNEL, and *noise is a factor to be considered in*

that slight interference with outdoor activities may occur. Conventional construction methods will eliminate most noise intrusions upon indoor activities. (13)

The noise contour boundaries used to determine the potential aircraft-related noise impacts at the Project site are found on Exhibit MA-4 of the RC ALUCP and are presented on Exhibit 3-C of this report. Based on the RC ALUCP noise level contours for the MARB/IPA, the Project is located outside of the 60 dBA CNEL noise level contours, and therefore, represents *clearly acceptable* land use based on the RC ALUCP compatibility criteria, and no noise mitigation is required with typical building construction.

EXHIBIT 3-B: RC ALUCP SUPPORTING COMPATIBILITY CRITERIA: NOISE

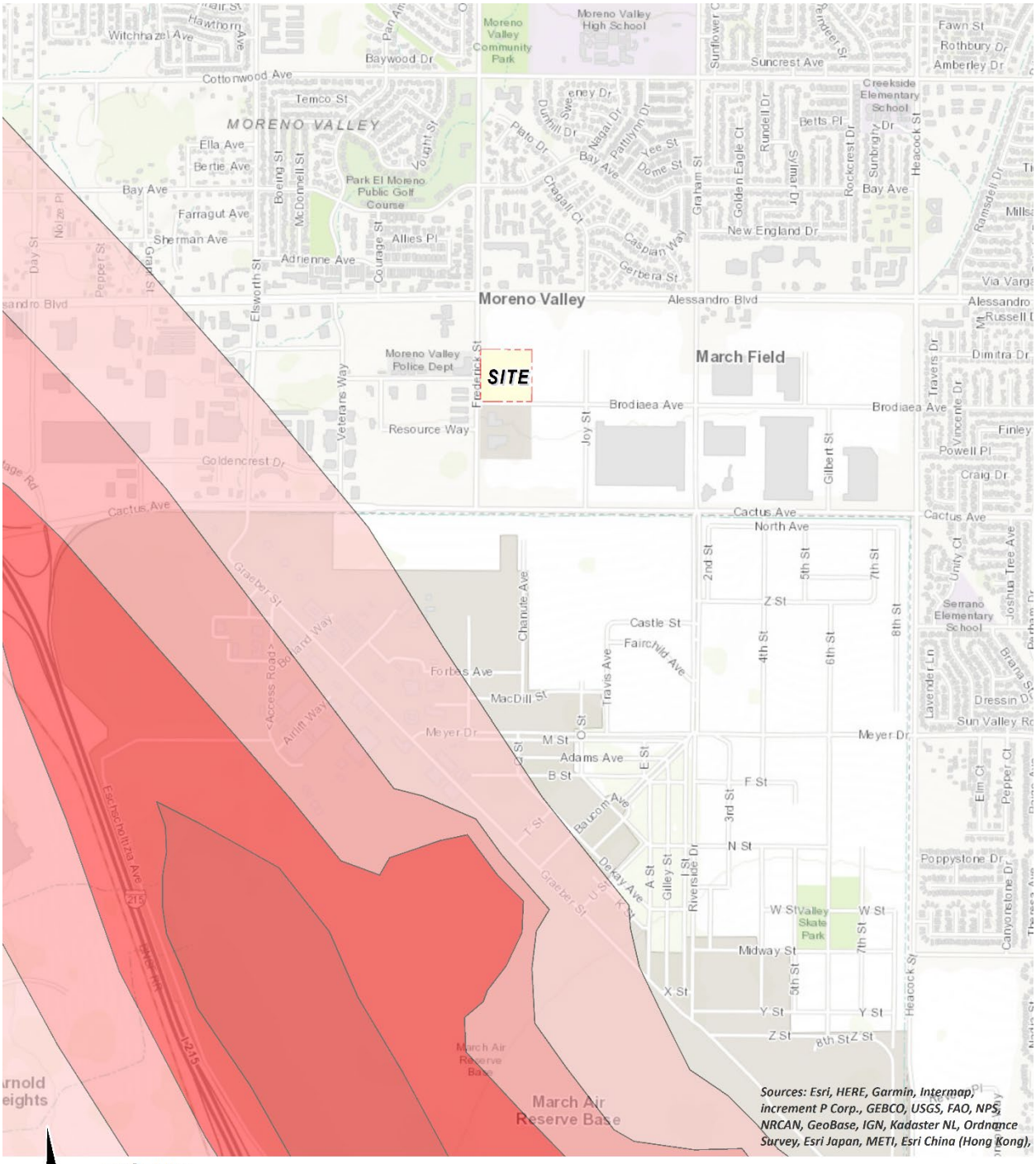
	CNEL (dB)				
Land Use Category	**50–55**	**55–60**	**60–65**	**65–70**	**70–75**
Residential *					
single-family, nursing homes, mobile homes	++	o	–	– –	– –
multi-family, apartments, condominiums	++	+	o	– –	– –
Public					
schools, libraries, hospitals	+	o	–	– –	– –
churches, auditoriums, concert halls	+	o	o	–	– –
transportation, parking, cemeteries	++	++	++	+	o
Commercial and Industrial					
offices, retail trade	++	+	o	o	–
service commercial, wholesale trade, warehousing, light industrial	++	++	+	o	o
general manufacturing, utilities, extractive industry	++	++	++	+	+
Agricultural and Recreational					
cropland	++	++	++	++	+
livestock breeding	++	+	o	o	–
parks, playgrounds, zoos	++	+	+	o	–
golf courses, riding stables, water recreation	++	++	+	o	o
outdoor spectator sports	++	+	+	o	–
amphitheaters	+	o	–	– –	– –

Land Use Acceptability		**Interpretation/Comments**
++	*Clearly Acceptable*	The activities associated with the specified land use can be carried out with essentially no interference from the noise exposure.
+	*Normally Acceptable*	Noise is a factor to be considered in that slight interference with outdoor activities may occur. Conventional construction methods will eliminate most noise intrusions upon indoor activities.
o	*Marginally Acceptable*	The indicated noise exposure will cause moderate interference with outdoor activities and with indoor activities when windows are open. The land use is acceptable on the conditions that outdoor activities are minimal and construction features which provide sufficient noise attenuation are used (e.g., installation of air conditioning so that windows can be kept closed). Under other circumstances, the land use should be discouraged.
–	*Normally Unacceptable*	Noise will create substantial interference with both outdoor and indoor activities. Noise intrusion upon indoor activities can be mitigated by requiring special noise insulation construction. Land uses which have conventionally constructed structures and/or involve outdoor activities which would be disrupted by noise should generally be avoided.
– –	*Clearly Unacceptable*	Unacceptable noise intrusion upon land use activities will occur. Adequate structural noise insulation is not practical under most circumstances. The indicated land use should be avoided unless strong overriding factors prevail and it should be prohibited if outdoor activities are involved.

* Subtract 5 dB for low-activity outlying airports (Chiriaco Summit and Desert Center)

Source: Riverside County Airport Land Use Compatibility Plan, Table 2B.

EXHIBIT 3-C: MARB/IPA FUTURE AIRPORT NOISE CONTOURS



LEGEND:

Unmitigated Noise Level Contour Boundaries

60 dBA CNEL | 65 dBA CNEL | 70 dBA CNEL | 75 dBA CNEL | 80 dBA CNEL

Source: Riverside County, Airport Land Use Compatibility Plan, Exhibit MA-4.

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

B. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

C. A substantial permanent increase in ambient noise levels in the Project vicinity above existing levels without the proposed Project; or

D. A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above noise levels existing without the proposed Project.

E. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the Project area to excessive noise levels.

F. For a project within the vicinity of a private airstrip, expose people residing or working in the Project area to excessive noise levels.

While the CEQA Guidelines and the City of Moreno Valley General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts under CEQA Guideline A, they do not define the levels at which increases are considered substantial for use under Guidelines B, C, and D. CEQA Guidelines E and F apply to nearby public and private airports, if any, and the Project's land use compatibility. The closest airport which would require additional noise analysis under CEQA guidelines E and F is the MARB/IPA. As previously shown on Exhibit 3-C, the Project site is located outside of the 60 dBA CNEL noise level contour boundary of the MARB/IPA. Based on the RC ALUCP noise level contours for the MARB/IPA, the Project is located outside of the 60 dBA CNEL noise level contours, and therefore, represents *clearly acceptable* land use based on the RC ALUCP compatibility criteria, and no noise mitigation is required with typical building construction. Therefore, the potential impacts under CEQA guidelines E and F are considered to be *less than significant* and are not further analyzed in this noise study.

4.1 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels and the location of noise-sensitive receivers in order to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (14)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (15) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL).

For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. According to the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

Without Project Noise Level	Potential Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

Federal Interagency Committee on Noise (FICON), 1992.

4.2 NON-NOISE-SENSITIVE RECEIVERS

Since the City of Moreno Valley General Plan Safety Element does not identify criteria to assess the impacts associated with off-site transportation-related noise impacts, the OPR land use/noise compatibility criteria, found in Figure 2 of the *General Plan Guidelines, Appendix C: Noise Element Guidelines* is used to determine potential impacts at adjacent land uses. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise level for non-noise-sensitive land use, such as industrial use, is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* according to the *Land Use Compatibility Criteria*. (10)

To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria are used. When the without Project noise levels at the non-noise-sensitive land uses are below the *normally acceptable* 70 dBA CNEL compatibility criteria, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the OPR land use/noise compatibility criteria, found in Figure 2 of the *General Plan Guidelines, Appendix C: Noise Element Guidelines normally acceptable* 70 dBA CNEL exterior noise level criteria.

4.3 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. industrial, etc.):
    - are less than the OPR General Plan Guidelines, Figure 2, *normally acceptable* 70 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - are greater than the OPR General Plan Guidelines, Figure 2, *normally acceptable* 70 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase.

OPERATIONAL NOISE

- If Project-related operational (stationary source) noise levels:
    - exceed the 65 dBA L_{eq} daytime or 60 dBA L_{eq} nighttime noise level standards at 200 feet from the property line of the noise source (City of Moreno Valley Municipal Code, Table 11.80.030-2); or
    - exceed the 65 dBA L_{eq} daytime or 60 dBA L_{eq} nighttime noise level standards at residential receivers in the City of Moreno Valley (City of Moreno Valley Municipal Code, Table 11.80.030-2);
        - To present a conservative approach, the adjacent office uses in the Project study area are also analyzed based on the more conservative operational noise level limits required for noise-sensitive residential receiver locations.
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - are less than 60 dBA L_{eq} and the Project creates a *readily perceptible* 5 dBA L_{eq} or greater Project-related noise level increase; or
    - range from 60 to 65 dBA L_{eq} and the Project creates a *barely perceptible* 3 dBA L_{eq} or greater Project-related noise level increase; or
    - already exceed 65 dBA L_{eq}, and the Project creates a community noise level increase of greater than 1.5 dBA L_{eq} (FICON, 1992).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities:
    - create noise levels at sensitive residential receivers in the City of Moreno Valley which exceed the short-term construction noise level threshold of 65 dBA L_{eq} during the daytime hours, or 60 dBA L_{eq} during the nighttime hours, or the continuous noise level limit of 90 dBA L_{eq} (based on the City of Moreno Valley Municipal Code, Table 11.80.030-2 source land use noise level limits, and the Table 11.80.030-1 continuous noise level limits).
- If short-term project generated construction source vibration levels could exceed the FTA maximum acceptable vibration standard of 80 vibration decibels (VdB) at noise-sensitive receiver locations.

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
	Non-Noise-Sensitive[2]	if ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational	Noise-Sensitive	At 200' from the property line of the source[3]	65 dBA L_{eq}	60 dBA L_{eq}
		At residential land use[3]	65 dBA L_{eq}	60 dBA L_{eq}
		if ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
		if ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
		if ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase	
		Vibration Level Threshold[4]	80 VdB	n/a
Construction	Noise-Sensitive	At residential land use[3]	65 dBA L_{eq}	60 dBA L_{eq}
			90 dBA L_{eq}	90 dBA L_{eq}
		Vibration Level Threshold[4]	80 VdB	n/a

[1] Source: FICON, 1992.
[2] Source: OPR General Plan Guidelines, Figure 2 Land Use Compatibility Criteria.
[3] Source: City of Moreno Valley Municipal Code, Chapter 11.80 Noise Regulation (Appendix 3.1).
[4] Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.
"Daytime" = 8:00 a.m. - 10:00 p.m.; "Nighttime" = 10:01 p.m. - 7:59 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, four 24-hour noise level measurements were taken at potential receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, January 3rd, 2018. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (16)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (4) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (9)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (9) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby

sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (8:00 a.m. to 10:00 p.m.) and nighttime (10:01 p.m. to 7:59 a.m.) noise levels at each noise level measurement location consistent with the City of Moreno Valley Municipal Code. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the north of the Project site near existing residential homes and commercial land use on Alessandro Boulevard. The noise level measurements collected show an overall 24-hour exterior noise level of 62.2 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 57.4 dBA L_{eq} with an average nighttime noise level of 55.5 dBA L_{eq}.
- Location L2 represents the noise levels at the southern Project site boundary near existing industrial and public facility uses on Brodiaea Avenue. The noise level measurements collected show an overall 24-hour exterior noise level of 64.5 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 58.9 dBA L_{eq} with an average nighttime noise level of 57.9 dBA L_{eq}.
- Located west of the Project site, location L3 represents the noise levels across Frederick Street adjacent to existing office buildings. The noise level measurements collected show an overall 24-hour exterior noise level of 70.2 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 66.5 dBA L_{eq} with an average nighttime noise level of 62.9 dBA L_{eq}.
- Location L4 represents the noise levels west of the Project site on Frederick Street adjacent to the City of Moreno Valley City Hall building. The noise level measurements collected show an overall 24-hour exterior noise level of 62.8 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 59.0 dBA L_{eq} with an average nighttime noise level of 55.5 dBA L_{eq}.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial roadway network. This includes the auto and heavy truck activities near the noise level measurement locations. Additional background noise sources in the Project study area include aircraft overflight noise from the MARB/IPA. The 24-hour existing noise level measurements are shown on Table 5-1.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Distance to Project Boundary (Feet)	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
			Daytime	Nighttime	
L1	900'	Located north of the Project site near existing residential homes and commercial land use on Alessandro Boulevard.	57.4	55.5	62.2
L2	0'	Located at the southern Project site boundary near existing industrial and public facility uses on Brodiaea Avenue.	58.9	57.9	64.5
L3	100'	Located west of the Project site across Frederick Street adjacent to existing office buildings.	66.5	62.9	70.2
L4	100'	Located west of the Project site on Frederick Street adjacent to the City of Moreno Valley City Hall building.	59.0	55.5	62.8

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average hourly levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 8:00 a.m. to 10:00 p.m.; "Nighttime" = 10:01 p.m. to 7:59 a.m.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (17) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (18) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (19)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the nine study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications according to the City of Moreno Valley *General Plan Circulation Element*, and the posted vehicle speeds. The ADT volumes used in this study are presented on Table 6-2 were obtained from the *Centerpointe Traffic Impact Analysis* prepared by Urban Crossroads, Inc., for the following traffic scenarios: Existing, Opening Year 2023, and General Plan Buildout (Post-2040) conditions. (2) Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Planned (Existing) Land Use[1]	Distance from Centerline to Nearest Adjacent Land Use (Feet)[2]	Posted Speed Limit (mph)
1	Frederick St.	s/o Alessandro Bl.	Office/Commercial	44'	40
2	Frederick St.	n/o Brodiaea Av.	Office/Business Park	44'	40
3	Frederick St.	n/o Cactus Av.	Business Park	44'	40
4	Graham St.	s/o Brodiaea Av.	Business Park	44'	40
5	Alessandro Bl.	w/o Frederick St.	Office/Comm./(Residential)	67'	45
6	Calle San Juan De Los Lagos	w/o Frederick St.	Office/Business Park	39'	40
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	Office/Business Park	39'	40
8	Brodiaea Av.	w/o Graham St.	Business Park	39'	40
9	Cactus Av.	w/o Frederick St.	Business Park	67'	50

[1] Source: City of Moreno Valley General Plan Land Use Map, Figure 2-2.
[2] Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the General Plan Circulation Element.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]					
			Existing (2017)		Opening Year 2023		General Plan Buildout 2040+	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Frederick St.	s/o Alessandro Bl.	11,850	12,026	18,424	18,600	20,267	20,443
2	Frederick St.	n/o Brodiaea Av.	9,240	9,391	15,942	16,093	17,536	17,687
3	Frederick St.	n/o Cactus Av.	9,844	10,040	16,595	16,791	18,255	18,451
4	Graham St.	s/o Brodiaea Av.	7,649	7,719	11,502	11,572	12,652	12,722
5	Alessandro Bl.	w/o Frederick St.	34,230	34,320	40,989	41,079	52,919	53,009
6	Calle San Juan De Los Lagos	w/o Frederick St.	3,164	3,241	3,894	3,971	4,892	4,969
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	1,818	1,895	2,007	2,084	2,810	2,887
8	Brodiaea Av.	w/o Graham St.	889	1,006	995	1,112	1,374	1,491
9	Cactus Av.	w/o Frederick St.	40,788	40,945	69,929	70,086	63,057	63,214

[1] Source: Centerpointe Traffic Impact Analysis, Urban Crossroads, Inc., May 2018.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	76.53%	11.31%	12.17%	100.00%
Medium Trucks	82.62%	6.84%	10.54%	100.00%
Heavy Trucks	81.46%	6.18%	12.36%	100.00%

[1] Based on existing ADT counts by vehicle type taken on 4/3/2018 Frederick Street north of Brodiaea Avenue (Centerpointe Traffic Impact Analysis, Urban Crossroads, Inc., May 2018). All values rounded to the nearest one-hundredth.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

According to the *Centerpointe Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 486 trip-ends per day (actual vehicles). (2) The Project trip generation includes 100 truck trip-ends per day from the proposed buildings within the Project site. This noise study relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

To quantify the off-site noise levels, the Project related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix.

The 71 daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *Traffic Impact Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-7 show the vehicle mixes used for the with Project traffic scenarios.

TABLE 6-4: WITHOUT PROJECT CONDITIONS VEHICLE MIX

Classification	Total Daily % Traffic Flow[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	94.08%	3.93%	1.99%	100.00%

[1] Based on existing ADT counts by vehicle type taken on 4/3/2018 Frederick Street north of Brodiaea Avenue (Centerpointe Traffic Impact Analysis, Urban Crossroads, Inc., May 2018). All values rounded to the nearest one-hundredth.

TABLE 6-5: EXISTING WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Frederick St.	s/o Alessandro Bl.	93.66%	4.00%	2.34%	100.00%
2	Frederick St.	n/o Brodiaea Av.	93.80%	3.96%	2.24%	100.00%
3	Frederick St.	n/o Cactus Av.	93.39%	4.05%	2.55%	100.00%
4	Graham St.	s/o Brodiaea Av.	93.73%	4.00%	2.27%	100.00%
5	Alessandro Bl.	w/o Frederick St.	93.94%	3.96%	2.10%	100.00%
6	Calle San Juan De Los Lagos	w/o Frederick St.	94.22%	3.84%	1.95%	100.00%
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	94.32%	3.77%	1.91%	100.00%
8	Brodiaea Av.	w/o Graham St.	90.79%	4.47%	4.74%	100.00%
9	Cactus Av.	w/o Frederick St.	93.90%	3.96%	2.13%	100.00%

[1] Source: Centerpointe Traffic Impact Analysis, Urban Crossroads, Inc., May 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: OPENING YEAR WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Frederick St.	s/o Alessandro Bl.	93.81%	3.97%	2.22%	100.00%
2	Frederick St.	n/o Brodiaea Av.	93.91%	3.95%	2.14%	100.00%
3	Frederick St.	n/o Cactus Av.	93.67%	4.00%	2.33%	100.00%
4	Graham St.	s/o Brodiaea Av.	93.84%	3.98%	2.18%	100.00%
5	Alessandro Bl.	w/o Frederick St.	93.96%	3.95%	2.08%	100.00%
6	Calle San Juan De Los Lagos	w/o Frederick St.	94.19%	3.85%	1.95%	100.00%
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	94.30%	3.79%	1.92%	100.00%
8	Brodiaea Av.	w/o Graham St.	91.10%	4.42%	4.48%	100.00%
9	Cactus Av.	w/o Frederick St.	93.98%	3.95%	2.07%	100.00%

[1] Source: Centerpointe Traffic Impact Analysis, Urban Crossroads, Inc., May 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-7: GENERAL PLAN BUILDOUT WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Frederick St.	s/o Alessandro Bl.	93.83%	3.97%	2.20%	100.00%
2	Frederick St.	n/o Brodiaea Av.	93.93%	3.95%	2.12%	100.00%
3	Frederick St.	n/o Cactus Av.	93.71%	4.00%	2.30%	100.00%
4	Graham St.	s/o Brodiaea Av.	93.86%	3.97%	2.16%	100.00%
5	Alessandro Bl.	w/o Frederick St.	93.99%	3.95%	2.06%	100.00%
6	Calle San Juan De Los Lagos	w/o Frederick St.	94.17%	3.87%	1.96%	100.00%
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	94.23%	3.83%	1.94%	100.00%
8	Brodiaea Av.	w/o Graham St.	91.86%	4.29%	3.85%	100.00%
9	Cactus Av.	w/o Frederick St.	93.96%	3.95%	2.08%	100.00%

[1] Source: Centerpointe Traffic Impact Analysis, Urban Crossroads, Inc., May 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

6.3 VIBRATION ASSESSMENT

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-8. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $L_{VdB}(D) = L_{VdB}(25\ ft) - 30\log(D/25)$

TABLE 6-8: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Vibration Decibels (VdB) at 25 feet[1]
Small bulldozer	58
Jackhammer	79
Loaded Trucks	86
Large bulldozer	87

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *Centerpointe Traffic Impact Analysis*. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- Existing Conditions Without / With Project: This scenario refers to the existing present-day noise conditions without and with the proposed Project.
- Opening Year 2023 Without / With the Project: This scenario refers to Opening Year noise conditions without and with the proposed Project. This scenario includes all cumulative projects identified in the Traffic Impact Analysis.
- General Plan Buildout (Post-2040) Without / With the Project: This scenario refers to General Plan Buildout noise conditions without and with the proposed Project. This scenario includes all cumulative projects identified in the Traffic Impact Analysis.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not take into account the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the nine study area roadway segments analyzed from the without Project to the with Project conditions in each of the three timeframes: Existing, Opening Year 2023, and General Plan Buildout (Post-2040) conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Frederick St.	s/o Alessandro Bl.	Office/Commercial	70.1	45	96	208
2	Frederick St.	n/o Brodiaea Av.	Office/Business Park	69.0	RW	82	176
3	Frederick St.	n/o Cactus Av.	Business Park	69.3	RW	85	183
4	Graham St.	s/o Brodiaea Av.	Business Park	68.2	RW	72	155
5	Alessandro Bl.	w/o Frederick St.	Office/Comm./(Residential)	73.4	113	243	524
6	Calle San Juan De Los Lagos	w/o Frederick St.	Office/Business Park	64.2	RW	RW	74
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	Office/Business Park	61.8	RW	RW	51
8	Brodiaea Av.	w/o Graham St.	Business Park	58.7	RW	RW	RW
9	Cactus Av.	w/o Frederick St.	Business Park	75.2	149	321	691

[1] Source: City of Moreno Valley General Plan Land Use Map, Figure 2-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Frederick St.	s/o Alessandro Bl.	Office/Commercial	70.5	47	102	219
2	Frederick St.	n/o Brodiaea Av.	Office/Business Park	69.3	RW	85	183
3	Frederick St.	n/o Cactus Av.	Business Park	69.8	RW	92	199
4	Graham St.	s/o Brodiaea Av.	Business Park	68.5	RW	75	162
5	Alessandro Bl.	w/o Frederick St.	Office/Comm./(Residential)	73.5	114	247	531
6	Calle San Juan De Los Lagos	w/o Frederick St.	Office/Business Park	64.3	RW	RW	75
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	Office/Business Park	61.9	RW	RW	52
8	Brodiaea Av.	w/o Graham St.	Business Park	61.1	RW	RW	46
9	Cactus Av.	w/o Frederick St.	Business Park	75.3	151	326	703

[1] Source: City of Moreno Valley General Plan Land Use Map, Figure 2-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: OPENING YEAR 2023 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Frederick St.	s/o Alessandro Bl.	Office/Commercial	72.0	60	129	279
2	Frederick St.	n/o Brodiaea Av.	Office/Business Park	71.4	55	117	253
3	Frederick St.	n/o Cactus Av.	Business Park	71.6	56	121	260
4	Graham St.	s/o Brodiaea Av.	Business Park	70.0	44	94	204
5	Alessandro Bl.	w/o Frederick St.	Office/Comm./(Residential)	74.2	127	274	591
6	Calle San Juan De Los Lagos	w/o Frederick St.	Office/Business Park	65.1	RW	40	86
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	Office/Business Park	62.2	RW	RW	55
8	Brodiaea Av.	w/o Graham St.	Business Park	59.2	RW	RW	RW
9	Cactus Av.	w/o Frederick St.	Business Park	77.5	213	459	990

[1] Source: City of Moreno Valley General Plan Land Use Map, Figure 2-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: OPENING YEAR 2023 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Frederick St.	s/o Alessandro Bl.	Office/Commercial	72.3	62	134	289
2	Frederick St.	n/o Brodiaea Av.	Office/Business Park	71.6	56	120	259
3	Frederick St.	n/o Cactus Av.	Business Park	71.9	59	127	273
4	Graham St.	s/o Brodiaea Av.	Business Park	70.2	45	97	209
5	Alessandro Bl.	w/o Frederick St.	Office/Comm./(Residential)	74.3	129	278	598
6	Calle San Juan De Los Lagos	w/o Frederick St.	Office/Business Park	65.2	RW	40	86
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	Office/Business Park	62.3	RW	RW	56
8	Brodiaea Av.	w/o Graham St.	Business Park	61.4	RW	RW	48
9	Cactus Av.	w/o Frederick St.	Business Park	77.6	215	464	1000

[1] Source: City of Moreno Valley General Plan Land Use Map, Figure 2-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: GENERAL PLAN BUILDOUT WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Frederick St.	s/o Alessandro Bl.	Office/Commercial	72.4	64	138	297
2	Frederick St.	n/o Brodiaea Av.	Office/Business Park	71.8	58	125	270
3	Frederick St.	n/o Cactus Av.	Business Park	72.0	60	129	277
4	Graham St.	s/o Brodiaea Av.	Business Park	70.4	47	101	217
5	Alessandro Bl.	w/o Frederick St.	Office/Comm./(Residential)	75.3	151	325	700
6	Calle San Juan De Los Lagos	w/o Frederick St.	Office/Business Park	66.1	RW	46	100
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	Office/Business Park	63.7	RW	RW	69
8	Brodiaea Av.	w/o Graham St.	Business Park	60.6	RW	RW	43
9	Cactus Av.	w/o Frederick St.	Business Park	77.1	199	429	924

[1] Source: City of Moreno Valley General Plan Land Use Map, Figure 2-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-6: GENERAL PLAN BUILDOUT WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Frederick St.	s/o Alessandro Bl.	Office/Commercial	72.6	66	142	307
2	Frederick St.	n/o Brodiaea Av.	Office/Business Park	72.0	59	128	276
3	Frederick St.	n/o Cactus Av.	Business Park	72.3	62	135	290
4	Graham St.	s/o Brodiaea Av.	Business Park	70.6	48	103	223
5	Alessandro Bl.	w/o Frederick St.	Office/Comm./(Residential)	75.4	152	328	707
6	Calle San Juan De Los Lagos	w/o Frederick St.	Office/Business Park	66.1	RW	46	100
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	Office/Business Park	63.8	RW	RW	69
8	Brodiaea Av.	w/o Graham St.	Business Park	62.3	RW	RW	55
9	Cactus Av.	w/o Frederick St.	Business Park	77.2	201	434	934

[1] Source: City of Moreno Valley General Plan Land Use Map, Figure 2-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITION PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 presents the Existing without Project conditions CNEL noise levels. The Exiting without Project exterior noise levels are expected to range from 58.7 to 75.2 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 61.1 to 75.3 dBA CNEL. As shown on Table 7-7 the Project is expected to generate an exterior noise level increase of up to 2.4 dBA CNEL at adjacent land uses, which will satisfy the significance thresholds identified in Section 4. Therefore, the off-site Project-related traffic noise level increase is considered a *less than significant* impact under Existing conditions.

TABLE 7-7: EXISTING CONDITION OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACT

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Threshold Exceeded?[3]
			No Project	With Project	Project Addition		
1	Frederick St.	s/o Alessandro Bl.	70.1	70.5	0.4	No	No
2	Frederick St.	n/o Brodiaea Av.	69.0	69.3	0.3	No	No
3	Frederick St.	n/o Cactus Av.	69.3	69.8	0.5	No	No
4	Graham St.	s/o Brodiaea Av.	68.2	68.5	0.3	No	No
5	Alessandro Bl.	w/o Frederick St.	73.4	73.5	0.1	Yes	No
6	Calle San Juan De Los Lagos	w/o Frederick St.	64.2	64.3	0.1	No	No
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	61.8	61.9	0.1	No	No
8	Brodiaea Av.	w/o Graham St.	58.7	61.1	2.4	No	No
9	Cactus Av.	w/o Frederick St.	75.2	75.3	0.1	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] "Yes" = Existing, noise-sensitive land uses adjacent to the study area roadway segment.
[3] Significance Criteria (Section 4).

7.3 OPENING YEAR 2023 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-8 presents a comparison of the Opening Year 2023 without and with Project conditions CNEL noise levels. Table 7-3 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 59.2 to 77.5 dBA CNEL without the Project. Table 7-4 presents the Opening Year 2023 with Project conditions noise level contours that are expected to range from 61.4 to 77.6 dBA CNEL. As shown on Table 7-8 the Project is expected to generate an exterior noise level increase of up to 2.2 dBA CNEL at adjacent land uses, which will satisfy the significance thresholds identified in Section 4. Therefore, the off-site Project-related traffic noise level increase is considered a *less than significant* impact under Opening Year 2023 conditions.

TABLE 7-8: OPENING YEAR 2023 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Threshold Exceeded?[3]
			No Project	With Project	Project Addition		
1	Frederick St.	s/o Alessandro Bl.	72.0	72.3	0.3	No	No
2	Frederick St.	n/o Brodiaea Av.	71.4	71.6	0.2	No	No
3	Frederick St.	n/o Cactus Av.	71.6	71.9	0.3	No	No
4	Graham St.	s/o Brodiaea Av.	70.0	70.2	0.2	No	No
5	Alessandro Bl.	w/o Frederick St.	74.2	74.3	0.1	Yes	No
6	Calle San Juan De Los Lagos	w/o Frederick St.	65.1	65.2	0.1	No	No
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	62.2	62.3	0.1	No	No
8	Brodiaea Av.	w/o Graham St.	59.2	61.4	2.2	No	No
9	Cactus Av.	w/o Frederick St.	77.5	77.6	0.1	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] "Yes" = Existing, noise-sensitive land uses adjacent to the study area roadway segment.
[3] Significance Criteria (Section 4).

7.4 General Plan Buildout Project Traffic Noise Level Contributions

Table 7-9 presents a comparison of the General Plan Buildout (Post-2040) without and with Project conditions CNEL noise levels. Table 7-5 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 60.6 to 77.1 dBA CNEL without the Project. Table 7-6 presents the General Plan Buildout (Post-2040) with Project conditions noise level contours that are expected to range from 62.3 to 77.2 dBA CNEL. As shown on Table 7-9 the Project is expected to generate an exterior noise level increase of up to 1.7 dBA CNEL at adjacent land uses, which will satisfy the significance thresholds identified in Section 4. Therefore, the off-site Project-related traffic noise level increase is considered a *less than significant* impact under General Plan Buildout (Post-2040) conditions.

TABLE 7-9: GENERAL PLAN BUILDOUT OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Threshold Exceeded?[3]
			No Project	With Project	Project Addition		
1	Frederick St.	s/o Alessandro Bl.	72.4	72.6	0.2	No	No
2	Frederick St.	n/o Brodiaea Av.	71.8	72.0	0.2	No	No
3	Frederick St.	n/o Cactus Av.	72.0	72.3	0.3	No	No
4	Graham St.	s/o Brodiaea Av.	70.4	70.6	0.2	No	No
5	Alessandro Bl.	w/o Frederick St.	75.3	75.4	0.1	Yes	No
6	Calle San Juan De Los Lagos	w/o Frederick St.	66.1	66.1	0.0	No	No
7	Calle San Juan De Los Lagos	e/o Veterans Wy.	63.7	63.8	0.1	No	No
8	Brodiaea Av.	w/o Graham St.	60.6	62.3	1.7	No	No
9	Cactus Av.	w/o Frederick St.	77.1	77.2	0.1	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] "Yes" = Existing, noise-sensitive land uses adjacent to the study area roadway segment.
[3] Significance Criteria (Section 4).

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8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following seven receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Noise-sensitive receivers near the Project site include existing residential homes, and non-noise-sensitive receivers include existing office uses, as described below. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures.

R1: Located approximately 794 feet north of the Project site, R1 represents existing residential homes north of Alessandro Boulevard. A long-term noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents existing Riverside County Department of Waste Resources facilities and offices at roughly 146 feet south of the Project site. A long-term noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing offices located west of the Project site at approximately 146 feet on Frederick Street. A long-term noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Located approximately 109 feet west of the Project site, R4 represents the existing Moreno Valley City Hall building and offices. A long-term noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS

9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from operation of the proposed Centerpointe Project. Exhibit 9-A identifies the representative receiver locations and noise source locations used to assess the operational noise levels.

9.1 OPERATIONAL NOISE SOURCES

At the time this noise analysis was prepared the future tenants of the proposed Project were unknown. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements.

9.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements all operating continuously. These noise level impacts will likely vary throughout the day.

9.2.1 TRUCK IDLING, DELIVERIES, BACKUP ALARMS, AND LOADING/UNLOADING

Short-term reference noise level measurements were collected on Wednesday, January 7th, 2015, by Urban Crossroads, Inc. at the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building, of roughly 285,000 square feet, with a loading dock area on the western side of the building façade. Up to ten trucks were observed in the loading dock area including a combination of track trailer semi-trucks, two-axle delivery trucks, and background forklift operations.

The unloading/docking activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of loading dock activities generating a reference noise level of 62.8 dBA L_{eq} at a uniform reference distance of 50 feet. At this measurement location, the noise sources associated with employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition,

during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine and air brakes noise.

9.2.2 ROOF-TOP AIR CONDITIONING UNITS

In order to assess the impacts created by the roof-top air conditioning units at the Project buildings, reference noise levels measurements were taken at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a single mechanical roof-top air conditioning unit on the roof of an existing Walmart store. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At 5 feet from the roof-top air conditioning unit, the exterior noise levels were measured at 77.2 dBA L_{eq}. Using the uniform reference distance of 50 feet, the noise level is 57.2 dBA L_{eq}. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. The roof-top air condition units were observed to operate the most during the daytime hours, for a total of 39 minutes per hour, and are anticipated to operate during the daytime and nighttime hours at the Project site. The noise attenuation provided by a parapet wall is not reflected in this reference noise level measurement.

9.2.3 PARKING LOT VEHICLE MOVEMENTS (AUTOS)

To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements over a 24-hour period on May 17th, 2017 at the parking lot for the Panasonic Avionics Corporation in the City of Lake Forest. The peak hour of activity measured over the 24-hour noise level measurement period occurred between 12:00 p.m. to 1:00 p.m., or the typical lunch hour for employees working in the area. The measured reference noise level at 50 feet from parking lot vehicle movements was measured at 41.7 dBA L_{eq}. The parking lot noise levels are mainly due to cars pulling in and out of spaces during peak lunch hour activity and employees talking. Noise associated with parking lot vehicle movements is expected to operate for the entire hour (60 minutes).

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Hourly Activity (Mins)[4]	Reference Noise Level (dBA L_{eq})	
					@ Ref. Dist.	@ 50 Feet
Truck Unloading/Docking Activity[1]	0:15:00	30'	8'	60	67.2	62.8
Roof-Top Air Conditioning Units[2]	96:00:00	5'	5'	39	77.2	57.2
Parking Lot Vehicle Movements[3]	01:00:00	10'	5'	60	52.2	41.7

[1] Reference noise level measurements were collected from the existing operations of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino on Wednesday, January 7, 2015.
[2] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[3] As measured by Urban Crossroads, Inc. on 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest.
[4] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site based on the reference noise level measurement activity.

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

9.3 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed warehouse operations that include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. The operational noise level calculations, shown on Table 9-2, account for the distance attenuation provided due to geometric spreading when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. With geometric spreading, sound levels attenuate (or decrease) at a rate of 6 dB for each doubling of distance from a point source (e.g. idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements).

Table 9-2 presents the combined total operational noise level projections at 200 feet consistent with the City of Moreno Valley Municipal Code. The Project operational noise levels at 200 feet are estimated at 51.5 dBA L_{eq}. Based on the results of this analysis, the Project operational noise levels associated with the Centerpointe will satisfy the City of Moreno Valley Municipal Code 65 dBA L_{eq} daytime and 60 dBA L_{eq} nighttime exterior noise level standards at 200 feet from the source land use. Further, it should be noted that the land uses within 200 feet of the Project site boundary are designated as business park, office, and commercial land use.

TABLE 9-2: OPERATIONAL NOISE LEVEL PROJECTIONS AT 200 FEET

Noise Source	Ref. Noise Level (dBA L_{eq})	Distance Atten. @ 200' (dBA L_{eq})[1]	Hourly Activity (Mins.)[2]	Hourly Activity Adjustment (dBA L_{eq})	Noise Level @ 200' (dBA L_{eq})
Truck Unloading/Docking Activity	67.2	-16.5	60	0.0	50.7
Roof-Top Air Conditioning Units	77.2	-32.0	39	-1.9	43.3
Parking Lot Vehicle Movements	52.2	-19.5	60	0.0	32.7
				Combined Total:	51.5

[1] Drop off rate of 6 dBA per doubling of distance (point source).
[2] Anticipated duration (minutes within the hour) of noise activity during peak hourly conditions expected at the Project site.

Table 9-3 indicates that the unmitigated hourly noise levels associated with the Centerpointe Project at the nearby sensitive receiver locations are expected to range from 35.7 to 42.7 dBA L_{eq}. The Project-related operational noise levels, as shown on Table 9-3, will satisfy the City of Moreno Valley 65 dBA L_{eq} daytime and 60 dBA L_{eq} nighttime exterior noise level standards at all nearby sensitive receiver locations. The operational noise level calculations are included in Appendix 9.1.

TABLE 9-3: UNMITIGATED OPERATIONAL NOISE LEVEL PROJECTIONS AT RECEIVER LOCATIONS

Receiver Location[1]	Land Use	Noise Levels by Noise Source (dBA L_{eq})[2]			Combined Operational Noise Levels (dBA L_{eq})[3]	Threshold Exceeded?[4]	
		Unloading/ Docking Activity	Roof-Top Air Conditioning Unit	Parking Lot Vehicle Movements		Daytime (65 dBA L_{eq})	Nighttime (60 dBA L_{eq})
R1	Residential	38.4	29.0	21.9	39.0	No	No
R2	Office	25.0	33.3	31.1	35.7	No	No
R3	Office	23.4	36.4	33.1	38.2	No	No
R4	Office	24.3	41.8	34.9	42.7	No	No

[1] See Exhibit 9-A for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 9-1.
[3] Calculations for each noise source are provided in Appendix 9.2.
[4] Do the Project operational noise levels exceed the standards (Table 3-1)?

9.4 PROJECT OPERATIONAL NOISE CONTRIBUTION

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (4) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the ambient daytime and nighttime conditions are presented on Tables 9-4 and 9-5.

As indicated on Tables 9-4 and 9-5, the Project will contribute a daytime operational noise level increase of up to 0.1 dBA L_{eq} and a nighttime operational noise level increase of up to 0.2 dBA L_{eq} at the sensitive receiver locations. Since the Project-related operational noise level contributions will satisfy the significance criteria discussed in Section 4, the increases at the sensitive receiver locations will be *less than significant*.

TABLE 9-4: PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]	Threshold Exceeded?[7]
R1	39.0	L1	57.4	57.5	0.1	No
R2	35.7	L2	58.9	58.9	0.0	No
R3	38.2	L3	66.5	66.5	0.0	No
R4	42.7	L4	59.0	59.1	0.1	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

TABLE 9-5: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]	Threshold Exceeded?[7]
R1	39.0	L1	55.5	55.6	0.1	No
R2	35.7	L2	57.9	57.9	0.0	No
R3	38.2	L3	62.9	62.9	0.0	No
R4	42.7	L4	55.5	55.7	0.2	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

9.5 OPERATIONAL VIBRATION IMPACTS

Although the human threshold of perception for vibration is around 65 VdB, human response to vibration is not usually significant unless the vibration exceeds 70 VdB. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement condition. Typical vibration levels for heavy trucks at normal traffic speeds do not exceed 65 VdB, and therefore, will be below the FTA vibration threshold of 80 VdB at nearby sensitive receiver locations. Truck deliveries transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will not exceed the 80 VdB vibration threshold.

10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction noise source locations in relation to the nearby receiver locations previously described in Section 8.

10.1 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers and portable generators that when combined can reach high levels. The number and mix of construction equipment is expected to occur in the following stages:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to in excess of 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages are based on the *Centerpointe Air Quality Impact Analysis* prepared by Urban Crossroads, Inc. (20)

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 10-1 have been adjusted for consistency to describe a common reference distance of 50 feet.

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

ID	Noise Source	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L_{eq})	Reference Noise Levels @ 50 Feet (dBA L_{eq})[5]
1	Truck Pass-Bys & Dozer Activity[1]	30'	63.6	59.2
2	Dozer Activity[1]	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities[2]	30'	71.9	67.5
4	Foundation Trenching[2]	30'	72.6	68.2
5	Rough Grading Activities[2]	30'	77.9	73.5
6	Framing[2]	30'	66.7	62.3
7	Concrete Mixer Truck Movements[3]	50'	71.2	71.2
8	Concrete Paver Activities[3]	30'	70.0	65.6
9	Concrete Mixer Pour & Paving Activities[3]	30'	70.3	65.9
10	Concrete Mixer Backup Alarms & Air Brakes[3]	50'	71.6	71.6
11	Concrete Mixer Pour Activities[3]	50'	67.7	67.7

[1] As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.
[2] As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.
[3] Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.
[4] As measured by Urban Crossroads, Inc. on 9/9/16 during the demolition of an existing parking lot at 41 Corporate Park in Irvine.
[5] Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

10.3 DAYTIME CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels, calculations of the daytime Project construction noise level impacts at the nearby sensitive receiver locations were completed. Tables 10-2 to 10-6 present the short-term daytime construction noise levels for each stage of construction. Table 10-8 provides a summary of the construction noise levels by phase at the noise receiver locations. Based on the stages of construction, the noise impacts associated with the proposed Project are expected to create temporarily high noise levels at the nearby receiver locations. To assess the peak daytime construction noise levels, this analysis shows the highest noise impacts when the equipment with the highest reference noise level is operating at the closest point from the primary construction activity to each receiver location.

TABLE 10-2: SITE PREPARATION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	64.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	824'	-24.3	0.0	39.8
R2	182'	-11.2	-5.0	47.9
R3	174'	-10.8	0.0	53.3
R4	134'	-8.6	0.0	55.6

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation (if any) from existing barriers/berms in the Project study area.

TABLE 10-3: GRADING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	73.5

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	824'	-24.3	0.0	49.1
R2	182'	-11.2	-5.0	57.2
R3	174'	-10.8	0.0	62.6
R4	134'	-8.6	0.0	64.9

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation (if any) from existing barriers/berms in the Project study area.

TABLE 10-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Foundation Trenching	68.2
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	68.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	824'	-24.3	0.0	43.8
R2	182'	-11.2	-5.0	51.9
R3	174'	-10.8	0.0	57.3
R4	134'	-8.6	0.0	59.6

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation (if any) from existing barriers/berms in the Project study area.

TABLE 10-5: PAVING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	71.6

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	824'	-24.3	0.0	47.3
R2	182'	-11.2	-5.0	55.4
R3	174'	-10.8	0.0	60.8
R4	134'	-8.6	0.0	63.0

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation (if any) from existing barriers/berms in the Project study area.

TABLE 10-6: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	67.5

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	824'	-24.3	0.0	43.1
R2	182'	-11.2	-5.0	51.2
R3	174'	-10.8	0.0	56.6
R4	134'	-8.6	0.0	58.9

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation (if any) from existing barriers/berms in the Project study area.

10.4 NIGHTTIME CONCRETE POUR NOISE ANALYSIS

Using the reference concrete pour activity construction equipment noise levels, calculations of the nighttime Project construction noise level impacts at the nearby sensitive receiver locations were completed. Table 10-7 presents the short-term nighttime construction noise levels at the noise receiver locations which are expected to range from 47.3 to 63.0 dBA L_{eq}. To assess the peak nighttime construction noise levels, this analysis shows the highest noise impacts when the equipment with the highest reference noise level is operating at the closest point from the primary construction activity to each receiver location.

TABLE 10-7: NIGHTTIME CONCRETE POUR EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	71.6

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	824'	-24.3	0.0	47.3
R2	182'	-11.2	-5.0	55.4
R3	174'	-10.8	0.0	60.8
R4	134'	-8.6	0.0	63.0

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation (if any) from existing barriers/berms in the Project study area.

10.5 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when equipment is operating at the closest point from primary construction activity to each sensitive receiver location. As shown on Table 10-8, the highest unmitigated daytime construction noise levels are expected to range from 49.1 to 64.9 dBA L_{eq} and nighttime construction noise levels are expected to range from 47.3 to 63.0 dBA L_{eq} at the nearby sensitive receiver locations.

As shown on Table 10-8, the unmitigated Project daytime and nighttime construction noise levels satisfy the 65 dBA L_{eq} daytime and 60 dBA L_{eq} nighttime City of Moreno Valley Municipal Code thresholds, respectively, during peak Project construction activity at all receiver locations. Receiver locations R2 to R4 represent office uses that are unoccupied during nighttime hours when nighttime concrete pours would take place, and as such, are not analyzed against the nighttime noise level standards for the purpose of this analysis. Further, the unmitigated Project-related construction noise levels will satisfy the less restrictive 90 dBA L_{eq} 8-hour continuous noise level limit identified in the City of Moreno Valley Municipal Code. Therefore, impacts from Project construction noise levels are considered less than significant.

TABLE 10-8: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location	Distance to Receiver (Feet)	Daytime Construction Noise Levels (dBA L_{eq})[1]						Nighttime Concrete Pour Noise Levels (dBA L_{eq})[2]	Threshold Exceeded?[3]	
		Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Construction Noise Levels		Daytime (65 dBA L_{eq})	Nighttime (60 dBA L_{eq})
R1	824'	39.8	49.1	43.8	47.3	43.1	49.1	47.3	No	No
R2	182'	47.9	57.2	51.9	55.4	51.2	57.2	55.4	No	n/a
R3	174'	53.3	62.6	57.3	60.8	56.6	62.6	60.8	No	n/a
R4	134'	55.6	64.9	59.6	63.0	58.9	64.9	63.0	No	n/a

[1] Daytime construction noise levels as shown on Tables 10-2 to 10-6.
[2] Nighttime construction noise levels as shown on Table 10-7.
[3] Do the peak daytime and/or nighttime construction noise levels exceed their respective, applicable Municipal Code noise level standards?
"n/a" = receiver location represents an office use that would be unoccupied during nighttime construction activity.

10.6 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to building, the vibration is usually short-term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as large bulldozers would operate close enough to any residences to cause a vibration impact.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading. Using the vibration source level of construction equipment provided on Table 6-8 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-9 presents the expected Project related vibration levels at the nearby receiver locations.

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference level of 87 VdB at 25 feet. At distances ranging from 134 to 824 feet from the Project construction activities, construction vibration levels are expected to range from 41.5 to 65.1 VdB, as shown on Table 10-9. Using the construction vibration assessment methods provided by the FTA, Project construction vibration levels will remain below the FTA 80 VdB threshold at all sensitive receiver locations, and therefore, is considered a *less than significant* impact.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating at the Project site perimeter.

TABLE 10-9: UNMITIGATED CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location[1]	Distance to Construction Activity (Feet)	Receiver Vibration Levels (VdB)[2]					Threshold Exceeded?[3]
		Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level	
R1	824'	12.5	33.5	40.5	41.5	41.5	No
R2	182'	32.1	53.1	60.1	61.1	61.1	No
R3	174'	32.7	53.7	60.7	61.7	61.7	No
R4	134'	36.1	57.1	64.1	65.1	65.1	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-8.
[3] Does the peak vibration exceed the FTA maximum acceptable vibration standard of 80 VdB?

10.7 CONSTRUCTION NOISE AND VIBRATION ABATEMENT MEASURES

Though construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts, the following practices would reduce noise level increases produced by the construction equipment to the nearby noise-sensitive residential land uses:

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that Project construction activities shall comply with the City of Moreno Valley Municipal Code requirements. (3)
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receivers nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the center).

11 REFERENCES

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3. **City of Moreno Valley.** *Municipal Code, Chapter 11.80 Noise Regulation.*

4. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.

5. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.

6. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* June, 1995.

7. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.

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9. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.

10. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2003.

11. **State of California.** *California Green Building Standards Code.* January 2016.

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14. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.

15. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.

16. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*

17. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.

18. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.

19. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.

20. **Urban Crossroads, Inc.** *Centerpointe Air Quality Impact Analysis.* May 2018.

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12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Centerpointe Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

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EDUCATION

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 3.1:

CITY OF MORENO VALLEY MUNICIPAL CODE

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Chapter 11. 80 NOISE REGULATION

11.80.010 Legislative findings.

It is found and declared that:

A. Excessive sound within the limits of the city is a condition which has existed for some time, and the amount and intensity of such sound is increasing.

B. Such excessive sound is a detriment to the public health, safety, and welfare and quality of life of the residents of the city.

C. The necessity in the public interest for the provisions and prohibitions hereinafter contained and enacted is declared as a matter of legislative determination and public policy, and it is further declared that the provisions and prohibitions hereinafter contained and enacted are in pursuance of and for the purpose of securing and promoting the public health, safety, welfare and quality of life of the city and its inhabitants. (Ord. 740 § 1.2, 2007)

11.80.020 Definitions.

For purposes of this chapter, certain words and phrases used herein are defined as follows:

"A-weighted sound level" means the sound pressure level in decibels as measured with a sound level meter using the A-weighting network. The unit of measurement is the dB(A).

"Commercial" means all uses of land not otherwise classified as residential, as defined in this section.

"Construction" means any site preparation, and/or any assembly, erection, repair, or alteration, excluding demolition, of any structure, or improvements to real property.

"Continuous airborne sound" means sound that is measured by the slow-response setting of a meter manufactured to the specifications of ANSI Section 1.4-1983 (R2006) "Specification for Sound Level Meters," or its successor.

"Daytime" means eight a.m. to ten p.m. the same day.

"Decibel" (dB) means a unit for measuring the amplitude of sound, equal to twenty (20) times the logarithm to the base ten (10) of the ratio of the pressure of the sound measured to the reference pressure, which is twenty (20) microPascals (twenty (20) microNewtons per square meter.)

"Demolition" means any dismantling, intentional destruction or removal of structures or other improvements to real property.

"Disturb" means to interrupt, interfere with, or hinder the enjoyment of peace or quiet or the normal listening activities or the sleep, rest or mental concentration of the hearer.

"Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or significant property damage which necessitates immediate action. Economic loss alone shall not constitute an emergency. It shall be the burden of an alleged violator to prove an "emergency."

"Emergency work" means any work made necessary to restore property to a safe condition following an emergency, or to protect persons or property threatened by an imminent emergency, to the extent such work is, in fact, necessary to protect persons or property from exposure to imminent danger or damage.

"Frequency" means the number of complete oscillation cycles per unit of time.

"Impulsive sound" means sound of short duration, usually less than one second, with an abrupt onset and rapid decay. Examples of sources of impulsive sound include explosions, drop forge impacts, and discharge of firearms.

"Nighttime" means 10:01 p.m. to 7:59 a.m. the following day.

"Noise disturbance" means any sound which:

1. Disturbs a reasonable person of normal sensitivities;

2. Exceeds the sound level limits set forth in this chapter; or

3. Is plainly audible as defined in this section. Where no specific distance is set forth for the determination of audibility, references to noise disturbance shall be deemed to mean plainly audible at a distance of two hundred (200) feet from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right of way, public space or other publicly owned property.

"Person" means any person, person's firm, association, copartnership, joint venture, corporation, or any entity public or private in nature.

"Plainly audible" means that the sound or noise produced or reproduced by any particular source, can be clearly distinguished from ambient noise by a person using his/her normal hearing faculties.

"Public right-of-way" means any street, avenue, boulevard, sidewalk, bike path or alley, or similar place normally accessible to the public which is owned or controlled by a governmental entity.

"Public space" means any park, recreational or community facility, or lot which contains at least one building that is open to the general public during its hours of operation.

"Residential" means all uses of land primarily for dwelling units, as well as hospitals, schools, colleges and universities, and places of religious assembly.

"Sound" means an oscillation in pressure, particle displacement, particle velocity or other physical parameter, in a medium with internal forces that causes compression and rarefaction of that medium capable of producing an auditory impression. The description of sound may include any characteristic of such sound, including duration, intensity and frequency.

"Sound level" means the weighted sound pressure level as measured in dB(A) by a sound level meter and as specified in American National Standards Institute (ANSI) specifications for sound-level meters (ANSI Section 1.4-1971 (R1976)). If the frequency weighting employed is not indicated, the A-weighting shall apply.

"Sound level meter" means an instrument, demonstrably capable of accurately measuring sound levels as defined above.

All technical definitions not defined above shall be in accordance with applicable publications and standards of the American National Standards Institute (ANSI). (Ord. 740 § 1.2, 2007)

11.80.030 Prohibited acts.

A. General Prohibition. It is unlawful and a violation of this chapter to maintain, make, cause, or allow the making of any sound that causes a noise disturbance, as defined in Section 11.80.020.

B. Sound causing permanent hearing loss.

1. Sound level limits. Based on statistics from the Center for Disease Control and Prevention and the National Institute for Occupational Safety and Health, Table 1 and Table 1-A specify sound level limits which, if exceeded, will have a high probability of producing permanent hearing loss in anyone in the area where the sound levels are being exceeded. No sound shall be permitted within the city which exceeds the parameters set forth in Tables 11.80.030-1 and 11.80.030-1-A of this chapter:

Table 11.80.030-1
MAXIMUM CONTINUOUS SOUND LEVELS*

Duration per Day Continuous Hours	Sound level [db(A)]
8	90
6	92

4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

* When the daily sound exposure is composed of two or more periods of sound exposure at different levels, the combined effect of all such periods shall constitute a violation of this section if the sum of the percent of allowed period of sound exposure at each level exceeds 100 percent

Table 11.80.030-1A

MAXIMUM IMPULSIVE SOUND LEVELS

Number of Repetitions per 24-Hour Period	Sound level [dB(A)]
1	145
10	135
100	125

2. Exemptions. No violation shall exist if the only persons exposed to sound levels in excess of those listed in Tables 11.80.030-1 and 11.80.030-1A are exposed as a result of:

a. Trespass;

b. Invitation upon private property by the person causing or permitting the sound; or

c. Employment by the person or a contractor of the person causing or permitting the sound.

C. Nonimpulsive Sound Decibel Limits. No person shall maintain, create, operate or cause to be operated on private property any source of sound in such a manner as to create any nonimplusive sound which exceeds the limits set forth for the source land use category (as defined in Section 11.80.020) in Table 11.80.030-2 when measured at a distance of two hundred (200) feet or more from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right-of-way, public space or other publicly owned property. Any source of sound in violation of this subsection shall be deemed prima facie to be a noise disturbance.

Table 11.80.030-2

MAXIMUM SOUND LEVELS (IN dB(A)) FOR SOURCE LAND USES

Residential		Commer cial	
Daytime	Nighttime	Daytime	Nighttime
60	55	65	60

D. Specific Prohibitions. In addition to the general prohibitions set out in subsection A of this section, and unless otherwise exempted by this chapter, the following specific acts, or the causing or permitting thereof, are regulated as follows:

1. Motor Vehicles. No person shall operate or cause to be operated a public or private motor vehicle, or combination of vehicles towed by a motor vehicle, that creates a sound exceeding the sound level limits in Table 11.80.030-2 when the vehicle(s) are not otherwise subject to noise regulations provided for by the California Vehicle Code.

2. Radios, Televisions, Electronic Audio Equipment, Musical Instruments or Similar Devices from a Stationary Source. No person shall operate, play or permit the operation or playing of any radio, tape player, television, electronic audio equipment, musical instrument, sound amplifier or other mechanical or electronic sound making device that produces, reproduces or amplifies sound in such a manner as to create a noise disturbance. However, this subsection shall not apply to any use or activity exempted in subsection E of this section and any use or activity for which a special permit has been issued pursuant to Section 11.80.040.

3. Radios, Electronic Audio Equipment, or Similar Devices from a Mobile Source Such as a Motor Vehicle. Sound amplification or reproduction equipment on or in a motor vehicle is subject to regulation in accordance with the California Vehicle Code when upon the public right-of-way. When upon public space or publicly owned property other than the public right-of-way or upon private property open to the public, sound amplification or reproduction equipment shall not be operated in such a manner that it is plainly audible at a distance of fifty (50) feet in any direction from the vehicle.

4. Portable, Hand-Held Music or Sound Amplification or Reproduction Equipment. Such equipment shall not be operated on a public right-of-way, public space or other publicly owned property in such a manner as to be plainly audible at a distance of fifty (50) feet in any direction from the operator.

5. Loudspeakers and Public Address Systems.

a. Except as permitted by Section 11.80.040, no person shall operate, or permit the operation of, any loudspeaker, public address system or similar device, for any commercial purpose:

1. Which produces, reproduces or amplifies sound in such a manner as to create a noise disturbance; or

2. During nighttime hours on a public right-of-way, public space or other publicly owned property.

b. No person shall operate, or permit the operation of, any loudspeaker, public address system or similar device, for any noncommercial purpose, during nighttime hours in such a manner as to create a noise disturbance.

6. Animals. No person shall own, possess or harbor an animal or bird that howls, barks, meows, squawks, or makes other sounds that:

a. Create a noise disturbance;

b. Are of frequent or continued duration for ten (10) or more consecutive minutes and are plainly audible at a distance of fifty (50) feet from the real property line of the source of the sound; or

c. Are intermittent for a period of thirty (30) or more minutes and are plainly audible at a distance of fifty (50) feet from the real property line of the source of the sound.

7. Construction and Demolition. No person shall operate or cause the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of eight p.m. and seven a.m. the following day such that the sound there from creates a noise disturbance, except for emergency work by public service utilities or for other work approved by the city manager or designee. This section shall not apply to the use of power tools as provided in subsection (D)(9) of this section.

8. Emergency Signaling Devices. No person shall intentionally sound or permit the sounding outdoors of any fire, burglar or civil defense alarm, siren or whistle, or similar stationary emergency signaling device, except for emergency purposes or for testing as follows:

a. Testing of a stationary emergency signaling device shall not occur between seven p.m. and seven a.m. the following day;

b. Testing of a stationary emergency signaling device shall use only the minimum cycle test time, in no case to exceed sixty (60) seconds;

c. Testing of a complete emergency signaling system, including the functioning of the signaling device and the personnel response to the signaling device, shall not occur more than once in each calendar month. Such testing shall only occur only on weekdays between seven a.m. and seven p.m. and shall be exempt from the time limit specified in subsection (D)(8)(2) of this

section.

9. Power Tools. No person shall operate or permit the operation of any mechanically, electrically or gasoline motor-driven tool during nighttime hours so as to cause a noise disturbance across a residential real property boundary.

10. Pumps, Air Conditioners, Air-Handling Equipment and Other Continuously Operating Equipment. Notwithstanding the general prohibitions of subsection a of this section, no person shall operate or permit the operation of any pump, air conditioning, air-handling or other continuously operating motorized equipment in a state of disrepair or in a manner which otherwise creates a noise disturbance distinguishable from normal operating sounds.

E. Exemptions. The following uses and activities shall be exempt from the sound level regulations except the maximum sound levels provided in Tables 11.80.030-1 and 11.80.030-1A:

1. Sounds resulting from any authorized emergency vehicle when responding to an emergency call or acting in time of an emergency.

2. Sounds resulting from emergency work as defined in Section 11.80.020

3. Any aircraft operated in conformity with, or pursuant to, federal law, federal air regulations and air traffic control instruction used pursuant to and within the duly adopted federal air regulations; and any aircraft operating under technical difficulties in any kind of distress, under emergency orders of air traffic control, or being operated pursuant to and subsequent to the declaration of an emergency under federal air regulations.

4. All sounds coming from the normal operations of interstate motor and rail carriers, to the extent that local regulation of sound levels of such vehicles has been preempted by the Noise Control Act of 1972 (42 U.S.C. § 4901 et seq.) or other applicable federal laws or regulations

5. Sounds from the operation of motor vehicles, to the extent they are regulated by the California Vehicle Code.

6. Any constitutionally protected noncommercial speech or expression conducted within or upon a any public right-of-way, public space or other publicly owned property constituting an open or a designated public forum in compliance with any applicable reasonable time, place and manner restrictions on such speech or expression or otherwise pursuant to legal authority.

7. Sounds produced at otherwise lawful and permitted city-sponsored events, organized sporting events, school assemblies, school playground activities, by permitted fireworks, and by permitted parades on public right-of-way, public space or other publicly owned property.

8. An event for which a temporary use permit or special event permit has been issued under other provisions of this code, where the provisions of Section 11.80.040 are met, the permit granted expressly grants an exemption from specific standards contained in this chapter, and the permittee and all persons under the permittee's reasonable control actually comply with all conditions of such permit. Violation of any condition of such a permit related to sound or sound equipment shall be a violation of this chapter and punishable as such.

F. Nothing in this chapter shall be construed to limit, modify or repeal any other regulation elsewhere in this code relating to the regulation of noise sources, nor shall any such other regulation be read to permit the emission of noise in violation of any provision of this chapter. (Ord. 740 § 1.2, 2007)

11.80.040 Special provisions for temporary use and special event permits.

The exemption by permit set forth in Section 11.80.030(E)(8) shall be subject to the following requirements and conditions:

A. The permit application shall include the name, address and telephone number of the permit applicant; the date, hours and location for which the permit is requested; and the nature of the event or activity. It shall also specify the types of sounds and/or sound equipment to be permitted, the proposed duration of such sound, the specific standards from which the sound is to be exempted, and the reasons for each requested exemption.

B. The permit shall be issued provided the proposed activity meets the requirements of this section and the issuing official determines that the sound to be emitted at the event as proposed would not be detrimental to the public health, safety or welfare, that the event cannot reasonably achieve its legitimate aims and purposes without the exemption and that the sound levels proposed will not unreasonably damage the peace and quiet enjoyment of the lawful users of surrounding properties, nor constitute a public nuisance.

C. The official issuing the permit may prescribe any reasonable conditions or requirements he/she deems necessary to minimize noise disturbances upon the community or the surrounding neighborhood, and/or to protect the health, safety or welfare of the public, including participants in the permitted event, including use of mufflers, screens or other sound-attenuating devices.

D. Any permit granted must be in writing and shall contain all conditions upon which the permit shall be effective.

E. No more than six events requiring a sound limit exemption may be held at any particular location upon privately owned or controlled property per calendar year, provided further that the number of events shall not exceed the number permitted under the regulations for the type of permit issued. For purposes of this subsection, "location" means a legal parcel of real property or a complete shopping or commercial center or mall sharing common parking and access even if comprised of multiple legal parcels.

F. The exemption from sound limits under such permit shall not exceed maximum period of four hours in one twenty-four (24) hour day.

G. The permit will only be granted for hours between nine a.m. and ten p.m. on all days other than Friday and Saturday; and, on Friday and Saturday, between the hours of nine a.m. and one a.m. of the following day, except in the following circumstances:

1. A permit may be granted for hours between nine a.m. on New Year's Eve and one a.m. the following day (New Year's Day).

2. A permit may be granted for hours between nine a.m. and two a.m. the following day if there are no residences, hospitals, or nursing homes within a 0.5 mile radius of the property where the function is taking place.

H. Functions for which the permits are issued shall be limited to a continuous airborne sound level not to exceed seventy (70) dB(A), as measured two hundred (200) feet from the real property boundary of the source property if on private property, or from the source if on public right of way, public space or other publicly owned property. (Ord. 740 § 1.2, 2007)

11.80.050 Measurement or assessment of sound.

A. Measurement With Sound Meter.

1. The measurement of sound shall be made with a sound level meter meeting the standards prescribed by ANSI Section 1.4-1983 (R2006). The instruments shall be maintained in calibration and good working order. A calibration check shall be made of the system at the time of any sound level measurement. Measurements recorded shall be taken so as to provide a proper representation of the source of the sound. The microphone during measurement shall be positioned so as not to create any unnatural enhancement or diminution of the measured sound. A windscreen for the microphone shall be used at all times. However, a violation of this chapter may occur without the occasion of the measurements being made as otherwise provided.

2. The slow meter response of the sound level meter shall be used in order to best determine the average amplitude.

3. The measurement shall be made at any point on the property into which the sound is being transmitted and shall be made at least three feet away from any ground, wall, floor, ceiling, roof and other plane surface.

4. In case of multiple occupancy of a property, the measurement may be made at any point inside the premises to which any complainant has right of legal private occupancy; provided that the measurement shall not be made within three feet of any ground, wall, floor, ceiling, roof or other plane surface.

5. All measurements of sound provided for in this chapter will be made by qualified officials of the city who are designated by the city manger or designee to operate the apparatus used to make the measurements.

B. Assessment Without Sound Level Meter. Any police officer, code enforcement officer, or other official designated by the city manager or designee who hears a noise or sound that is plainly audible, as defined in Section 11.80.020, in violation of this chapter, may enforce this chapter and shall assess the noise or sound according to the following standards:

1. The primary means of detection shall be by means of the official's normal hearing faculties, not artificially enhanced.

2. The official shall first attempt to have a direct line of sight and hearing to the vehicle or real property from which the sound or noise emanates so that the official can readily identify the offending source of the sound or noise and the distance involved. If the official is unable to have a direct line of sight and hearing to the vehicle or real property from which the sound or noise emanates, then the official shall confirm the source of the sound or noise by approaching the suspected vehicle or real property until the official is able to obtain a direct line of sight and hearing, and confirm the source of the sound or noise that was heard at the place of the original assessment of the sound or noise.

3. The official need not be required to identify song titles, artists, or lyrics in order to establish a violation. (Ord. 740 § 1.2, 2007)

11.80.060 Violation.

A. Violation of Sound Level Limits. Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punishable by a fine not to exceed one thousand dollars ($1,000.00) and/or six months in the county jail, or both. Notwithstanding the foregoing, any violation of the provisions of this chapter may, in the discretion of the citing officer or the city attorney, be cited and/or prosecuted as an infraction or be subject to civil citation pursuant to Chapter 1.10.

B. Joint and Several Responsibility. In addition to the person causing the offending sound, the owner, tenant or lessee of property, or a manager, overseer or agent, or any other person lawfully entitled to possess the property from which the offending sound is emitted at the time the offending sound is emitted, shall be responsible for compliance with this chapter if the additionally responsible party knows or should have known of the offending noise disturbance. It shall not be a lawful defense to assert that some other person caused the sound. The lawful possessor or operator of the premises shall be responsible for operating or maintaining the premises in compliance with this chapter and may be cited regardless of whether or not the person actually causing the sound is also cited.

C. Violation May be Declared a Public Nuisance. The operation or maintenance of any device, equipment, instrument, vehicle or machinery in violation of any provisions of this chapter which endangers the public health, safety and quality of life of residents in the area is declared to be a public nuisance, and may be subject to abatement summarily or by a restraining order or injunction issued

by a court of competent jurisdiction. (Ord. 824 § 1.2, 2011; Ord. 740 § 1.2, 2007)

View the mobile version.

APPENDIX 5.1:

STUDY AREA PHOTOS

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JN:11412 Centerpointe

L1-E
33, 55' 2.850000", 117, 15' 25.190000"

L1-N
33, 55' 2.780000", 117, 15' 25.210000"

L1-S
33, 55' 2.750000", 117, 15' 25.210000"

L1-W
33, 55' 2.740000", 117, 15' 25.240000"

L2-E
33, 54' 49.660000", 117, 15' 38.100000"

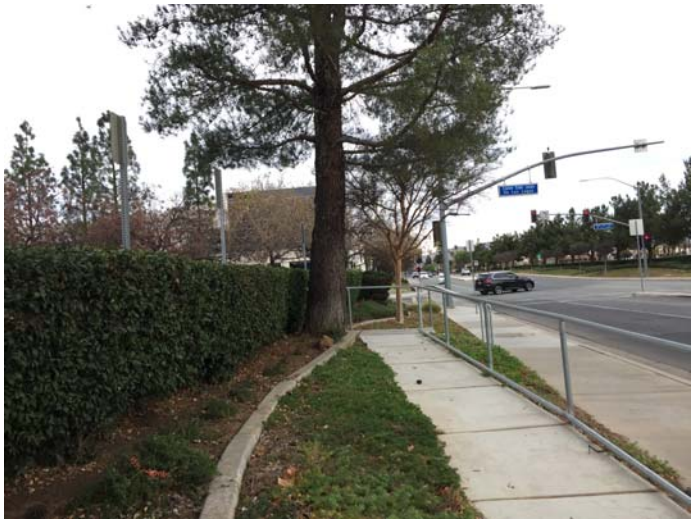
L2-N
33, 54' 49.830000", 117, 15' 38.200000"

JN:11412 Centerpointe

L2-S
33, 54' 49.660000", 117, 15' 38.100000"

L2-W
33, 54' 49.660000", 117, 15' 38.100000"

L3-E
33, 54' 50.540000", 117, 15' 40.590000"



L3-N
33, 54' 50.530000", 117, 15' 40.620000"

L3-S
33, 54' 50.530000", 117, 15' 40.620000"

L3-W
33, 54' 50.530000", 117, 15' 40.620000"

JN:11412 Centerpointe

L4-E
33, 54' 54.830000", 117, 15' 40.810000"

L4-N
33, 54' 54.850000", 117, 15' 40.760000"

L4-S
33, 54' 54.840000", 117, 15' 40.790000"

L4-W
33, 54' 54.850000", 117, 15' 40.760000"

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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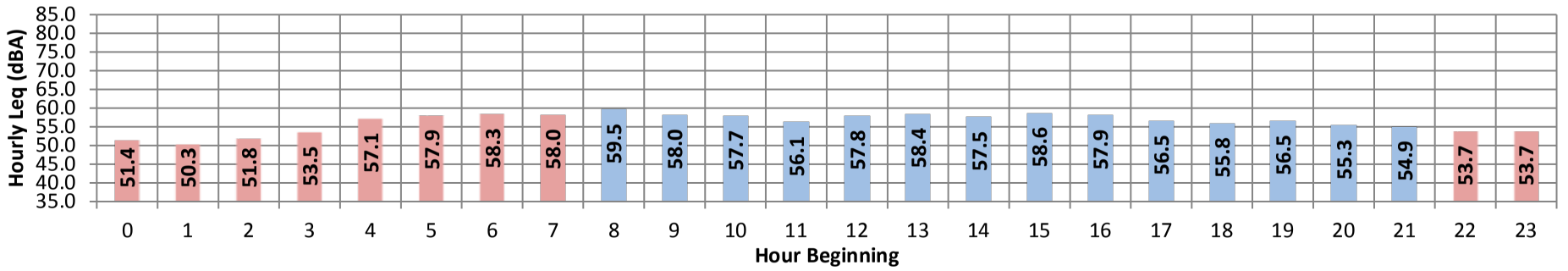
24-Hour Noise Level Measurement Summary

Project Name:	Centerpointe	*JN:*	11412	*Energy Average Leq*	*24-Hour*
Location:	L1 - Located north of the Project site near existing residential homes and commercial land use on Alessandro Boulevard.	*Analyst:*	A. Wolfe	*Day* / *Night*	*CNEL*
		Date:	1/3/2018	57.4 / 55.5	62.2

Hourly Leq dBA Readings (unadjusted)

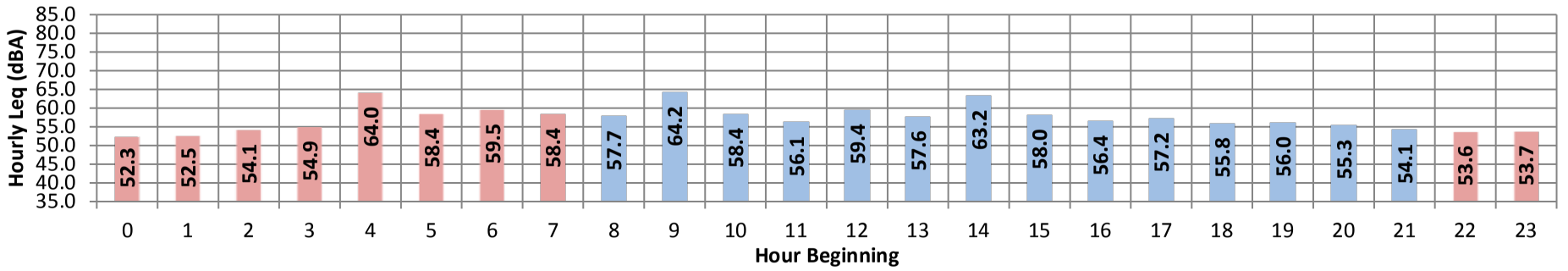


Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	54.9	68.7	45.2	63.0	61.0	59.0	57.0	53.0	51.0	48.0	47.0	46.0
	Max	59.5	81.2	50.9	68.0	65.0	63.0	62.0	60.0	57.0	54.0	53.0	52.0
Energy Average:		57.4	Average:		65.7	63.6	60.7	59.4	56.3	54.2	51.2	50.6	49.1
Night	Min	50.3	68.6	41.8	61.0	57.0	53.0	52.0	49.0	47.0	44.0	43.0	43.0
	Max	58.3	79.8	52.1	66.0	64.0	62.0	61.0	58.0	56.5	54.0	54.0	53.0
Energy Average:		55.5	Average:		63.2	60.5	57.7	56.5	53.5	51.6	48.9	48.3	47.3
Hourly Summary													
Night	0	51.4	70.1	42.8	62.0	59.0	55.0	53.0	49.0	47.0	44.0	44.0	43.0
	1	50.3	68.9	41.8	61.0	57.0	53.0	52.0	49.0	47.0	44.0	43.0	43.0
	2	51.8	69.1	44.2	61.0	58.0	55.0	54.0	51.0	49.0	47.0	46.0	45.0
	3	53.5	68.6	45.6	61.0	59.0	57.0	56.0	53.0	52.0	48.0	47.0	46.0
	4	57.1	79.8	49.8	65.0	62.0	59.0	58.0	56.0	54.0	52.0	51.0	50.0
	5	57.9	77.5	51.1	66.0	63.0	61.0	60.0	57.0	55.0	53.0	53.0	52.0
	6	58.3	72.6	52.1	65.0	63.0	62.0	61.0	58.0	56.5	54.0	54.0	53.0
	7	58.0	75.4	49.0	65.0	64.0	62.0	61.0	58.0	55.0	52.0	52.0	50.0
Day	8	59.5	74.4	50.5	67.0	65.0	63.0	62.0	60.0	57.0	54.0	53.0	51.0
	9	58.0	80.9	49.3	65.0	64.0	61.0	60.0	57.0	55.0	52.0	51.0	50.0
	10	57.7	73.7	48.6	67.0	65.0	61.0	60.0	57.0	54.0	51.0	51.0	50.0
	11	56.1	68.7	48.4	63.0	61.0	60.0	59.0	56.0	54.0	51.0	51.0	49.0
	12	57.8	73.3	48.2	68.0	64.0	61.0	60.0	57.0	55.0	53.0	52.0	51.0
	13	58.4	81.2	48.2	67.0	64.0	60.0	59.0	56.0	55.0	53.0	52.0	50.0
	14	57.5	74.4	50.9	64.0	62.0	60.0	60.0	57.0	56.0	53.0	53.0	52.0
	15	58.6	74.9	50.0	66.0	64.0	62.0	61.0	58.0	56.0	54.0	53.0	51.0
	16	57.9	76.5	47.9	67.0	65.0	62.0	61.0	57.0	55.0	52.0	51.0	49.0
	17	56.5	73.9	47.4	65.0	63.0	61.0	59.0	56.0	54.0	50.0	49.0	48.0
	18	55.8	69.9	46.7	65.0	63.0	60.0	58.0	55.0	53.0	49.0	49.0	47.0
	19	56.5	76.2	46.5	67.0	64.0	61.0	59.0	55.0	52.0	48.0	48.0	47.0
	20	55.3	76.6	45.2	64.0	63.0	59.0	57.0	54.0	52.0	48.0	47.0	46.0
	21	54.9	72.1	46.5	65.0	63.0	59.0	57.0	53.0	51.0	49.0	48.0	47.0
Night	22	53.7	75.6	44.4	63.0	60.0	57.0	55.0	52.0	50.0	48.0	47.0	46.0
	23	53.7	75.3	43.9	63.0	60.0	56.0	55.0	52.0	50.0	47.0	46.0	45.0

24-Hour Noise Level Measurement Summary

Project Name:	Centerpointe	*JN:*	11412	*Energy Average Leq*	*24-Hour*
Location:	L2 - Located at the southern Project site boundary near existing industrial and public facility uses on Brodiaea Avenue.	*Analyst:*	A. Wolfe	*Day* / *Night*	*CNEL*
		Date:	1/3/2018	58.9 / 57.9	64.5

Hourly Leq dBA Readings (unadjusted)



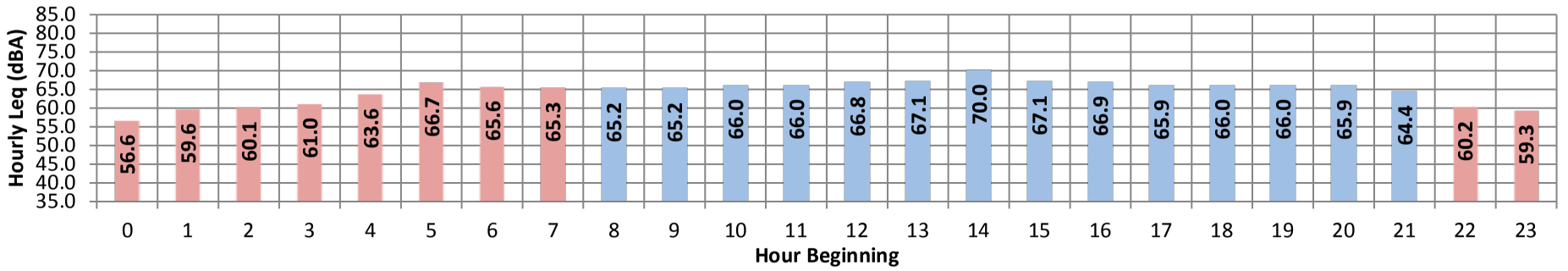
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	54.1	70.8	40.6	64.0	61.0	58.0	56.0	52.0	49.0	44.0	43.0	41.0
	Max	64.2	92.8	46.0	75.0	68.0	63.0	61.0	56.0	53.0	49.0	49.0	47.0
Energy Average:		58.9	Average:		67.5	64.6	60.9	58.9	54.0	51.1	47.1	46.4	45.0
Night	Min	52.3	70.9	43.5	61.0	57.0	54.0	53.0	50.0	47.0	45.0	44.0	44.0
	Max	64.0	93.8	53.5	73.0	67.0	63.0	62.0	59.0	57.0	55.0	55.0	54.0
Energy Average:		57.9	Average:		65.4	62.2	58.4	57.0	53.9	51.9	49.2	48.8	48.1
Hourly Summary													
Night	0	52.3	75.5	43.5	61.0	57.0	54.0	53.0	50.0	48.0	45.0	44.0	44.0
	1	52.5	72.0	44.1	62.0	58.0	55.0	54.0	51.0	49.0	46.0	45.0	45.0
	2	54.1	79.1	45.2	62.0	60.0	56.0	55.0	52.0	50.0	48.0	47.0	46.0
	3	54.9	72.9	49.1	63.0	60.0	58.0	57.0	54.0	53.0	51.0	50.0	50.0
	4	64.0	93.8	50.7	73.0	67.0	61.0	59.0	56.0	54.0	52.0	52.0	51.0
	5	58.4	75.1	52.0	68.0	66.0	63.0	61.0	57.0	55.0	53.0	53.0	52.0
	6	59.5	73.6	53.5	67.0	66.0	63.0	62.0	59.0	57.0	55.0	55.0	54.0
	7	58.4	74.7	49.2	69.0	67.0	63.0	61.0	57.0	55.0	51.0	51.0	50.0
Day	8	57.7	79.5	44.7	69.0	65.0	61.0	58.0	53.0	51.0	48.0	48.0	46.0
	9	64.2	87.2	42.5	75.0	68.0	62.0	60.0	52.0	49.0	45.0	44.0	43.0
	10	58.4	80.7	40.6	70.0	67.0	63.0	61.0	54.0	50.0	44.0	43.0	41.0
	11	56.1	79.3	41.1	66.0	64.0	61.0	59.0	53.0	49.0	44.0	43.0	42.0
	12	59.4	88.1	41.7	69.0	66.0	61.0	59.0	53.0	50.0	45.0	44.0	42.0
	13	57.6	82.2	42.6	68.0	64.0	60.0	58.0	53.0	50.0	46.0	45.0	43.0
	14	63.2	92.8	44.8	70.0	66.0	63.0	61.0	56.0	52.0	48.0	47.0	46.0
	15	58.0	84.2	45.7	66.0	64.0	61.0	59.0	55.0	53.0	49.0	48.0	47.0
	16	56.4	71.6	45.7	66.0	65.0	62.0	59.0	55.0	53.0	49.0	48.0	47.0
	17	57.2	76.1	45.8	67.0	65.0	62.0	60.0	56.0	53.0	49.0	49.0	47.0
	18	55.8	72.0	46.0	65.0	64.0	60.0	59.0	55.0	52.0	48.0	48.0	47.0
	19	56.0	78.8	45.2	65.0	63.0	60.0	58.0	54.0	52.0	48.0	47.0	46.0
	20	55.3	74.0	45.7	65.0	63.0	59.0	57.0	54.0	51.0	48.0	48.0	47.0
	21	54.1	70.8	45.8	64.0	61.0	58.0	56.0	53.0	51.0	48.0	47.0	46.0
Night	22	53.6	70.9	44.3	64.0	60.0	56.0	55.0	53.0	51.0	46.0	46.0	45.0
	23	53.7	75.1	43.6	65.0	61.0	55.0	53.0	50.0	47.0	45.0	45.0	44.0

24-Hour Noise Level Measurement Summary

Project Name:	Centerpointe	*JN:*	11412
Location:	L3 - Located west of the Project site across Frederick Street adjacent to existing office buildings.	*Analyst:*	A. Wolfe
		Date:	1/3/2018

Energy Average Leq		*24-Hour*
Day	*Night*	*CNEL*
66.5	62.9	70.2

Hourly Leq dBA Readings (unadjusted)

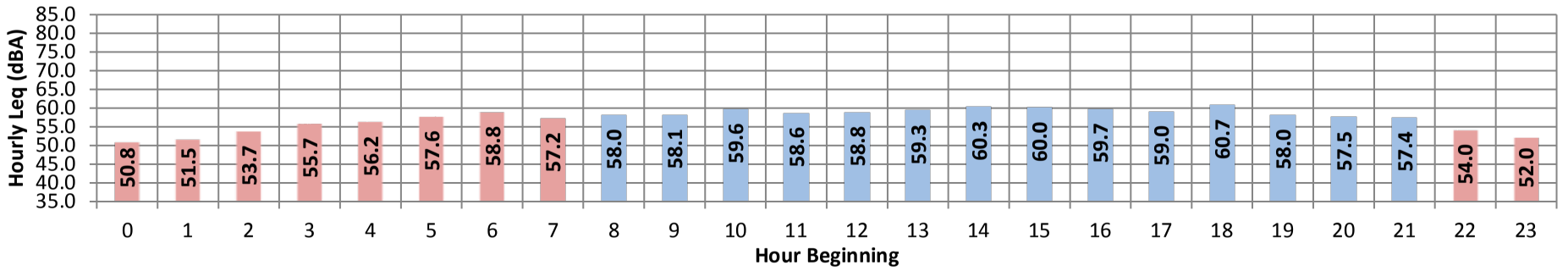


Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	64.4	81.1	42.2	74.0	73.0	71.0	68.0	60.0	52.0	47.0	46.0	44.0
	Max	70.0	96.7	48.5	80.0	76.0	73.0	72.0	67.0	61.0	52.0	50.0	49.0
Energy Average:		66.5	Average:		75.6	73.9	71.8	70.5	64.2	57.6	49.4	48.0	46.1
Night	Min	56.6	75.6	42.1	70.0	67.0	59.0	57.0	50.0	46.0	44.0	43.0	43.0
	Max	66.7	93.2	52.0	76.0	74.0	72.0	70.0	64.0	58.0	54.0	53.0	53.0
Energy Average:		62.9	Average:		73.3	71.1	66.8	63.9	56.0	52.1	49.0	48.0	47.3
Hourly Summary													
Night	0	56.6	75.6	42.1	70.0	67.0	61.0	57.0	50.0	48.0	45.0	44.0	43.0
	1	59.6	87.3	43.7	71.0	67.0	59.0	57.0	51.0	49.0	46.0	45.0	44.0
	2	60.1	86.0	45.7	72.0	69.0	63.0	59.0	53.0	50.0	48.0	47.0	46.0
	3	61.0	86.4	48.2	73.0	71.0	66.0	63.0	55.0	52.0	50.0	49.0	49.0
	4	63.6	82.6	49.4	75.0	74.0	70.0	68.0	58.0	54.0	52.0	51.0	50.0
	5	66.7	93.2	50.8	76.0	74.0	72.0	70.0	61.0	56.0	53.0	52.0	51.0
	6	65.6	85.9	52.0	76.0	74.0	72.0	70.0	63.0	58.0	54.0	53.0	53.0
	7	65.3	85.7	49.5	75.0	74.0	72.0	70.0	64.0	58.0	53.0	52.0	51.0
Day	8	65.2	81.1	47.4	75.0	74.0	71.0	70.0	64.0	58.0	51.0	50.0	48.0
	9	65.2	90.5	43.1	75.0	73.0	71.0	69.0	63.0	57.0	47.0	46.0	44.0
	10	66.0	88.2	42.2	76.0	74.0	71.0	70.0	64.0	58.0	48.0	47.0	44.0
	11	66.0	87.8	43.1	75.0	74.0	72.0	71.0	65.0	59.0	49.0	47.0	44.0
	12	66.8	91.9	43.8	76.0	74.0	72.0	71.0	65.0	59.0	50.0	48.0	45.0
	13	67.1	87.1	43.9	77.0	75.0	72.0	71.0	65.0	59.0	50.0	48.0	45.0
	14	70.0	96.7	45.7	80.0	76.0	73.0	72.0	67.0	60.0	50.0	48.0	47.0
	15	67.1	83.7	44.9	76.0	75.0	73.0	72.0	67.0	61.0	51.0	49.0	47.0
	16	66.9	87.0	48.5	75.0	74.0	73.0	72.0	67.0	60.0	52.0	50.0	49.0
	17	65.9	81.9	47.7	75.0	73.0	72.0	71.0	65.0	59.0	51.0	50.0	49.0
	18	66.0	88.6	45.2	75.0	74.0	72.0	71.0	64.0	56.0	48.0	47.0	46.0
	19	66.0	93.5	45.6	74.0	73.0	71.0	70.0	62.0	55.0	49.0	48.0	46.0
	20	65.9	94.1	45.7	74.0	73.0	71.0	69.0	61.0	53.0	48.0	48.0	47.0
	21	64.4	90.1	44.5	75.0	73.0	71.0	68.0	60.0	52.0	47.0	46.0	45.0
Night	22	60.2	78.9	42.3	73.0	71.0	67.0	63.0	54.0	50.0	45.0	44.0	43.0
	23	59.3	78.4	42.2	72.0	70.0	66.0	62.0	51.0	46.0	44.0	43.0	43.0

24-Hour Noise Level Measurement Summary

			Energy Average Leq		24-Hour
Project Name:	Centerpointe	*JN:* 11412	*Day*	*Night*	*CNEL*
Location:	L4 - Located west of the Project site on Frederick Street adjacent to the City of Moreno Valley City Hall building.	*Analyst:* A. Wolfe	59.0	55.5	62.8
		Date: 1/3/2018			

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	57.4	75.4	41.1	66.0	64.0	62.0	61.0	55.0	51.0	46.0	45.0	43.0
	Max	60.7	85.4	46.4	69.0	68.0	65.0	64.0	60.0	57.0	51.0	49.0	48.0
Energy Average:		59.0	Average:		67.2	65.6	63.4	62.3	58.2	54.3	48.3	47.1	45.4
Night	Min	50.8	67.8	42.1	62.0	60.0	56.0	53.0	48.0	46.0	44.0	43.0	42.0
	Max	58.8	81.9	48.8	67.0	66.0	64.0	63.0	58.0	54.0	51.0	50.0	50.0
Energy Average:		55.5	Average:		64.3	62.6	59.6	57.7	52.4	49.3	46.8	46.2	45.4
Hourly Summary													
Night	0	50.8	67.8	42.2	62.0	60.0	56.0	54.0	48.0	46.0	44.0	43.0	42.0
	1	51.5	72.2	42.1	62.0	60.0	56.0	53.0	48.0	46.0	44.0	43.0	42.0
	2	53.7	77.3	43.1	64.0	61.0	57.0	54.0	49.0	47.0	45.0	44.0	43.0
	3	55.7	81.9	44.8	64.0	62.0	59.0	57.0	52.0	49.0	47.0	47.0	46.0
	4	56.2	74.7	47.5	66.0	64.0	61.0	60.0	54.0	51.0	49.0	48.0	48.0
	5	57.6	76.7	48.2	66.0	65.0	63.0	61.0	57.0	53.0	50.0	50.0	49.0
	6	58.8	79.7	48.8	67.0	66.0	64.0	63.0	58.0	54.0	51.0	50.0	50.0
	7	57.2	68.2	46.7	65.0	64.0	62.0	61.0	57.0	53.0	49.0	48.0	47.0
Day	8	58.0	78.1	44.5	67.0	66.0	63.0	61.0	57.0	54.0	48.0	47.0	46.0
	9	58.1	84.9	42.0	66.0	64.0	62.0	61.0	57.0	53.0	46.0	45.0	43.0
	10	59.6	83.2	41.1	69.0	66.0	63.0	62.0	58.0	54.0	46.0	45.0	43.0
	11	58.6	80.2	41.5	67.0	65.0	63.0	62.0	58.0	54.0	47.0	46.0	43.0
	12	58.8	79.5	43.5	67.0	65.0	63.0	62.0	59.0	55.0	49.0	47.0	45.0
	13	59.3	78.8	43.1	68.0	66.0	64.0	63.0	59.0	55.0	48.0	47.0	45.0
	14	60.3	78.3	45.0	69.0	68.0	65.0	64.0	60.0	56.0	50.0	48.0	46.0
	15	60.0	83.4	45.7	67.0	66.0	64.0	63.0	60.0	57.0	51.0	49.0	47.0
	16	59.7	76.1	46.4	67.0	66.0	64.0	64.0	60.0	56.0	50.0	49.0	48.0
	17	59.0	75.4	46.1	66.0	65.0	64.0	63.0	59.0	56.0	50.0	49.0	47.0
	18	60.7	85.4	46.3	68.0	66.0	64.0	63.0	59.0	54.0	49.0	48.0	47.0
	19	58.0	76.0	44.9	67.0	65.0	63.0	62.0	57.0	53.0	48.0	47.0	45.0
	20	57.5	76.1	45.0	66.0	65.0	63.0	61.0	57.0	52.0	48.0	47.0	46.0
	21	57.4	80.1	43.8	67.0	65.0	63.0	61.0	55.0	51.0	46.0	45.0	44.0
Night	22	54.0	69.8	43.0	64.0	63.0	60.0	58.0	52.0	48.0	45.0	45.0	44.0
	23	52.0	69.4	42.7	63.0	61.0	58.0	56.0	49.0	46.0	44.0	44.0	43.0

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Frederick St.
Road Segment: s/o Alessandro Bl.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,850 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,185 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.85	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-14.64	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-17.59	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.4	64.4	62.2	57.7	65.8	66.3
Medium Trucks:	63.9	62.2	57.4	54.5	62.9	63.3
Heavy Trucks:	66.2	64.5	59.3	57.6	65.6	65.9
Vehicle Noise:	70.4	68.6	64.8	61.6	69.7	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	91	196	423
CNEL:	45	96	208	447

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Frederick St.
Road Segment: n/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,240 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	924 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.93	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-15.72	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.67	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.3	63.4	61.1	56.6	64.7	65.2
Medium Trucks:	62.8	61.2	56.3	53.5	61.9	62.2
Heavy Trucks:	65.1	63.4	58.2	56.5	64.5	64.8
Vehicle Noise:	69.3	67.5	63.8	60.5	68.7	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	77	166	358
CNEL:	38	82	176	379

Friday, May 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Frederick St.
Road Segment: n/o Cactus Av.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,844 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	984 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.66	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-15.45	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.40	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.6	61.4	56.9	65.0	65.5
Medium Trucks:	63.0	61.4	56.6	53.7	62.1	62.5
Heavy Trucks:	65.4	63.7	58.5	56.7	64.8	65.1
Vehicle Noise:	69.6	67.8	64.0	60.8	68.9	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	81	174	374
CNEL:	40	85	183	395

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Graham St.
Road Segment: s/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,649 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	765 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.76	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-16.54	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.49	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.5	62.5	60.3	55.8	63.9	64.4
Medium Trucks:	62.0	60.3	55.5	52.6	61.0	61.4
Heavy Trucks:	64.3	62.6	57.4	55.7	63.7	64.0
Vehicle Noise:	68.5	66.7	62.9	59.7	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	68	147	316
CNEL:	33	72	155	334

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Alessandro Bl.
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,230 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,423 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.24	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	79.45	-10.55	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-13.50	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.0	68.0	65.8	61.3	69.4	69.9
Medium Trucks:	67.2	65.6	60.8	57.9	66.3	66.6
Heavy Trucks:	69.1	67.4	62.2	60.4	68.5	68.8
Vehicle Noise:	73.7	71.9	68.2	64.9	73.0	73.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	107	230	495	1,066
CNEL:	113	243	524	1,129

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Calle San Juan De Los Lagos
Road Segment: w/o Frederick St.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,164 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	316 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-6.59	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-20.38	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.33	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.5	58.5	56.3	51.8	59.9	60.4
Medium Trucks:	58.0	56.3	51.5	48.6	57.1	57.4
Heavy Trucks:	60.3	58.6	53.4	51.7	59.7	60.0
Vehicle Noise:	64.5	62.7	59.0	55.7	63.9	64.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	15	33	70	152
CNEL:	16	35	74	160

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Calle San Juan De Los Lagos
Road Segment: e/o Veterans Wy.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,818 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	182 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-9.00	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-22.79	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-25.73	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.1	56.1	53.9	49.4	57.5	58.0
Medium Trucks:	55.6	53.9	49.1	46.2	54.6	55.0
Heavy Trucks:	57.9	56.2	51.0	49.3	57.3	57.6
Vehicle Noise:	62.1	60.3	56.5	53.3	61.4	61.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	10	23	49	105
CNEL:	11	24	51	111

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Brodiaea Av.
Road Segment: w/o Graham St.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	889 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	89 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-12.10	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-25.89	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-28.84	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.0	53.0	50.8	46.3	54.4	54.9
Medium Trucks:	52.4	50.8	46.0	43.1	51.5	51.9
Heavy Trucks:	54.8	53.1	47.9	46.1	54.2	54.5
Vehicle Noise:	59.0	57.2	53.4	50.2	58.3	58.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	7	14	30	65
CNEL:	7	15	32	69

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Cactus Av.
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,788 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,079 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	3.55	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	81.00	-10.24	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-13.19	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.0	70.1	67.8	63.3	71.4	71.9
Medium Trucks:	69.1	67.4	62.6	59.8	68.2	68.5
Heavy Trucks:	70.5	68.8	63.6	61.9	69.9	70.2
Vehicle Noise:	75.5	73.7	70.1	66.7	74.8	75.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	140	303	652	1,405
CNEL:	149	321	691	1,488

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Frederick St.
Road Segment: s/o Alessandro Bl.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,026	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,203	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.66%
Medium Trucks:	82.6%	6.8%	10.5%	4.00%
Heavy Trucks:	81.5%	6.2%	12.4%	2.34%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.81	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-14.51	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-16.84	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.4	64.5	62.2	57.7	65.8	66.3
Medium Trucks:	64.0	62.4	57.6	54.7	63.1	63.4
Heavy Trucks:	66.9	65.3	60.1	58.3	66.4	66.6
Vehicle Noise:	70.7	69.0	65.1	62.0	70.1	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	45	96	207	447
CNEL:	47	102	219	472

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Frederick St.
Road Segment: n/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,391 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	939 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.80%
Medium Trucks:	82.6%	6.8%	10.5%	3.96%
Heavy Trucks:	81.5%	6.2%	12.4%	2.24%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.88	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-15.62	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.10	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.4	63.4	61.1	56.7	64.8	65.3
Medium Trucks:	62.9	61.3	56.5	53.6	62.0	62.3
Heavy Trucks:	65.7	64.0	58.8	57.0	65.1	65.4
Vehicle Noise:	69.6	67.8	64.0	60.8	68.9	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	81	174	374
CNEL:	40	85	183	395

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Frederick St.
Road Segment: n/o Cactus Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,040 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,004 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.39%
Medium Trucks:	82.6%	6.8%	10.5%	4.05%
Heavy Trucks:	81.5%	6.2%	12.4%	2.55%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.61	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-15.23	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-17.24	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	61.4	57.0	65.1	65.5
Medium Trucks:	63.3	61.6	56.8	54.0	62.4	62.7
Heavy Trucks:	66.5	64.8	59.7	57.9	66.0	66.2
Vehicle Noise:	70.1	68.4	64.5	61.3	69.5	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	41	88	189	407
CNEL:	43	92	199	429

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Graham St.
Road Segment: s/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,719 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	772 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.73%
Medium Trucks:	82.6%	6.8%	10.5%	4.00%
Heavy Trucks:	81.5%	6.2%	12.4%	2.27%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.73	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-16.43	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.88	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.5	62.6	60.3	55.8	63.9	64.4
Medium Trucks:	62.1	60.4	55.6	52.8	61.2	61.5
Heavy Trucks:	64.9	63.2	58.0	56.3	64.3	64.6
Vehicle Noise:	68.8	67.0	63.2	60.0	68.1	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	71	153	330
CNEL:	35	75	162	348

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Alessandro Bl.
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,320 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,432 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.94%
Medium Trucks:	82.6%	6.8%	10.5%	3.96%
Heavy Trucks:	81.5%	6.2%	12.4%	2.10%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.25	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	79.45	-10.51	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-13.26	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.0	68.0	65.8	61.3	69.4	69.9
Medium Trucks:	67.3	65.6	60.8	57.9	66.3	66.7
Heavy Trucks:	69.3	67.6	62.4	60.7	68.7	69.0
Vehicle Noise:	73.8	72.0	68.3	65.0	73.1	73.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	108	233	502	1,082
CNEL:	114	247	531	1,145

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Calle San Juan De Los Lagos
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,241 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	324 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.22%
Medium Trucks:	82.6%	6.8%	10.5%	3.84%
Heavy Trucks:	81.5%	6.2%	12.4%	1.95%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-6.48	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-20.38	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.33	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.6	58.7	56.4	51.9	60.0	60.5
Medium Trucks:	58.0	56.3	51.5	48.6	57.1	57.4
Heavy Trucks:	60.3	58.6	53.4	51.7	59.7	60.0
Vehicle Noise:	64.5	62.8	59.0	55.7	63.9	64.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	15	33	71	153
CNEL:	16	35	75	162

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Calle San Juan De Los Lagos
Road Segment: e/o Veterans Wy.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,895 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	190 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.32%
Medium Trucks:	82.6%	6.8%	10.5%	3.77%
Heavy Trucks:	81.5%	6.2%	12.4%	1.91%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-8.80	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-22.79	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-25.73	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.3	56.3	54.1	49.6	57.7	58.2
Medium Trucks:	55.6	53.9	49.1	46.2	54.6	55.0
Heavy Trucks:	57.9	56.2	51.0	49.3	57.3	57.6
Vehicle Noise:	62.2	60.4	56.6	53.4	61.5	61.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	11	23	49	106
CNEL:	11	24	52	112

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Brodiaea Av.
Road Segment: w/o Graham St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,006 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	101 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	90.79%
Medium Trucks:	82.6%	6.8%	10.5%	4.47%
Heavy Trucks:	81.5%	6.2%	12.4%	4.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-11.72	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-24.80	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-24.54	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.4	53.4	51.1	46.7	54.8	55.3
Medium Trucks:	53.5	51.9	47.1	44.2	52.6	53.0
Heavy Trucks:	59.1	57.4	52.2	50.5	58.5	58.8
Vehicle Noise:	61.4	59.7	55.4	52.6	60.8	61.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	9	20	44	95
CNEL:	10	21	46	100

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Cactus Av.
Road Segment: w/o Frederick St.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,945 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,095 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.90%
Medium Trucks:	82.6%	6.8%	10.5%	3.96%
Heavy Trucks:	81.5%	6.2%	12.4%	2.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	3.55	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	81.00	-10.19	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-12.89	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.0	70.1	67.8	63.4	71.5	71.9
Medium Trucks:	69.1	67.5	62.7	59.8	68.2	68.5
Heavy Trucks:	70.8	69.1	63.9	62.2	70.2	70.5
Vehicle Noise:	75.6	73.8	70.2	66.8	74.9	75.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	143	308	664	1,430
CNEL:	151	326	703	1,515

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 Without Project
Road Name: Frederick St.
Road Segment: s/o Alessandro Bl.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,424 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,842 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.06	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-12.73	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-15.68	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.4	64.1	59.6	67.7	68.2
Medium Trucks:	65.8	64.1	59.3	56.5	64.9	65.2
Heavy Trucks:	68.1	66.4	61.2	59.5	67.5	67.8
Vehicle Noise:	72.3	70.5	66.8	63.5	71.7	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	57	122	264	568
CNEL:	60	129	279	600

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 Without Project
Road Name: Frederick St.
Road Segment: n/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,942 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,594 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.43	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-13.36	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-16.31	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	65.7	63.4	59.0	67.1	67.6
Medium Trucks:	65.1	63.5	58.7	55.8	64.2	64.6
Heavy Trucks:	67.5	65.8	60.6	58.8	66.9	67.2
Vehicle Noise:	71.7	69.9	66.1	62.9	71.0	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	52	111	239	516
CNEL:	55	117	253	545

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 Without Project
Road Name: Frederick St.
Road Segment: n/o Cactus Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,595 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,660 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.61	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-13.18	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-16.13	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.9	65.9	63.6	59.2	67.3	67.7
Medium Trucks:	65.3	63.7	58.9	56.0	64.4	64.7
Heavy Trucks:	67.6	66.0	60.8	59.0	67.1	67.4
Vehicle Noise:	71.9	70.1	66.3	63.1	71.2	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	53	114	246	530
CNEL:	56	121	260	560

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 Without Project
Road Name: Graham St.
Road Segment: s/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,502 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,150 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.98	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-14.77	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-17.72	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.3	64.3	62.0	57.6	65.7	66.2
Medium Trucks:	63.7	62.1	57.3	54.4	62.8	63.1
Heavy Trucks:	66.0	64.4	59.2	57.4	65.5	65.8
Vehicle Noise:	70.3	68.5	64.7	61.5	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	41	89	192	415
CNEL:	44	94	204	439

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 Without Project
Road Name: Alessandro Bl.
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,989 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,099 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	4.02	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	79.45	-9.77	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-12.72	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.8	68.8	66.5	62.1	70.2	70.7
Medium Trucks:	68.0	66.4	61.6	58.7	67.1	67.4
Heavy Trucks:	69.8	68.2	63.0	61.2	69.3	69.6
Vehicle Noise:	74.5	72.7	69.0	65.7	73.8	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	120	259	558	1,202
CNEL:	127	274	591	1,273

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 Without Project
Road Name: Calle San Juan De Los Lagos
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,894 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	389 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-5.69	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-19.48	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.43	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.4	59.5	57.2	52.7	60.8	61.3
Medium Trucks:	58.9	57.2	52.4	49.5	58.0	58.3
Heavy Trucks:	61.2	59.5	54.3	52.6	60.6	60.9
Vehicle Noise:	65.4	63.6	59.9	56.6	64.8	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	17	38	81	174
CNEL:	18	40	86	184

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 Without Project
Road Name: Calle San Juan De Los Lagos
Road Segment: e/o Veterans Wy.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,007 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	201 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-8.57	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-22.36	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-25.31	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.5	56.6	54.3	49.8	57.9	58.4
Medium Trucks:	56.0	54.4	49.6	46.7	55.1	55.4
Heavy Trucks:	58.3	56.6	51.4	49.7	57.8	58.0
Vehicle Noise:	62.5	60.7	57.0	53.7	61.9	62.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	11	24	52	112
CNEL:	12	26	55	118

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 Without Project
Road Name: Brodiaea Av.
Road Segment: w/o Graham St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	995 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-11.61	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-25.40	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-28.35	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.5	53.5	51.2	46.8	54.9	55.4
Medium Trucks:	52.9	51.3	46.5	43.6	52.0	52.3
Heavy Trucks:	55.3	53.6	48.4	46.6	54.7	55.0
Vehicle Noise:	59.5	57.7	53.9	50.7	58.8	59.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	7	15	33	70
CNEL:	7	16	34	74

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 Without Project
Road Name: Cactus Av.
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	69,929 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,993 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	5.89	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	81.00	-7.90	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-10.85	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.4	72.4	70.1	65.7	73.8	74.3
Medium Trucks:	71.4	69.8	65.0	62.1	70.5	70.8
Heavy Trucks:	72.8	71.2	66.0	64.2	72.3	72.5
Vehicle Noise:	77.8	76.0	72.4	69.0	77.2	77.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	201	434	934	2,012
CNEL:	213	459	990	2,132

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 With Project
Road Name: Frederick St.
Road Segment: s/o Alessandro Bl.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,860 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.81%
Medium Trucks:	82.6%	6.8%	10.5%	3.97%
Heavy Trucks:	81.5%	6.2%	12.4%	2.22%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.09	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-12.64	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-15.17	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.4	64.1	59.6	67.8	68.2
Medium Trucks:	65.9	64.2	59.4	56.5	65.0	65.3
Heavy Trucks:	68.6	66.9	61.7	60.0	68.0	68.3
Vehicle Noise:	72.5	70.8	66.9	63.7	71.9	72.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	59	127	273	588
CNEL:	62	134	289	622

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 With Project
Road Name: Frederick St.
Road Segment: n/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,093 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,609 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.91%
Medium Trucks:	82.6%	6.8%	10.5%	3.95%
Heavy Trucks:	81.5%	6.2%	12.4%	2.14%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.47	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-13.29	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-15.96	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	65.8	63.5	59.0	67.1	67.6
Medium Trucks:	65.2	63.6	58.8	55.9	64.3	64.6
Heavy Trucks:	67.8	66.1	60.9	59.2	67.3	67.5
Vehicle Noise:	71.8	70.1	66.3	63.0	71.2	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	53	114	245	528
CNEL:	56	120	259	559

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 With Project
Road Name: Frederick St.
Road Segment: n/o Cactus Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,791 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,679 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.67%
Medium Trucks:	82.6%	6.8%	10.5%	4.00%
Heavy Trucks:	81.5%	6.2%	12.4%	2.33%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.64	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-13.05	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-15.41	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.9	65.9	63.7	59.2	67.3	67.8
Medium Trucks:	65.4	63.8	59.0	56.1	64.5	64.9
Heavy Trucks:	68.4	66.7	61.5	59.7	67.8	68.1
Vehicle Noise:	72.2	70.4	66.6	63.4	71.5	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	56	120	259	557
CNEL:	59	127	273	589

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 With Project
Road Name: Graham St.
Road Segment: s/o Brodiaea Av.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,572 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,157 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.84%
Medium Trucks:	82.6%	6.8%	10.5%	3.98%
Heavy Trucks:	81.5%	6.2%	12.4%	2.18%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.97	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-14.70	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-17.31	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.3	64.3	62.0	57.6	65.7	66.2
Medium Trucks:	63.8	62.2	57.4	54.5	62.9	63.2
Heavy Trucks:	66.5	64.8	59.6	57.8	65.9	66.2
Vehicle Noise:	70.4	68.7	64.9	61.7	69.8	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	43	92	198	427
CNEL:	45	97	209	451

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 With Project
Road Name: Alessandro Bl.
Road Segment: w/o Frederick St.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,079 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,108 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.96%
Medium Trucks:	82.6%	6.8%	10.5%	3.95%
Heavy Trucks:	81.5%	6.2%	12.4%	2.08%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	4.03	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	79.45	-9.73	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-12.52	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.8	68.8	66.5	62.1	70.2	70.7
Medium Trucks:	68.0	66.4	61.6	58.7	67.1	67.4
Heavy Trucks:	70.0	68.4	63.2	61.4	69.5	69.8
Vehicle Noise:	74.5	72.8	69.1	65.7	73.9	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	122	262	565	1,217
CNEL:	129	278	598	1,288

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 With Project
Road Name: Calle San Juan De Los Lagos
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,971 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	397 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.19%
Medium Trucks:	82.6%	6.8%	10.5%	3.85%
Heavy Trucks:	81.5%	6.2%	12.4%	1.95%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-5.60	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-19.48	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.43	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.5	59.5	57.3	52.8	60.9	61.4
Medium Trucks:	58.9	57.2	52.4	49.5	58.0	58.3
Heavy Trucks:	61.2	59.5	54.3	52.6	60.6	60.9
Vehicle Noise:	65.4	63.7	59.9	56.6	64.8	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	18	38	81	175
CNEL:	19	40	86	185

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 With Project
Road Name: Calle San Juan De Los Lagos
Road Segment: e/o Veterans Wy.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,084 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	208 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.30%
Medium Trucks:	82.6%	6.8%	10.5%	3.79%
Heavy Trucks:	81.5%	6.2%	12.4%	1.92%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-8.39	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-22.36	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-25.31	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.7	56.7	54.5	50.0	58.1	58.6
Medium Trucks:	56.0	54.4	49.6	46.7	55.1	55.4
Heavy Trucks:	58.3	56.6	51.4	49.7	57.8	58.0
Vehicle Noise:	62.6	60.8	57.1	53.8	61.9	62.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	11	24	53	113
CNEL:	12	26	56	120

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 With Project
Road Name: Brodiaea Av.
Road Segment: w/o Graham St.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,112 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	111 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	91.10%
Medium Trucks:	82.6%	6.8%	10.5%	4.42%
Heavy Trucks:	81.5%	6.2%	12.4%	4.48%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-11.27	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-24.41	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-24.35	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.8	53.9	51.6	47.1	55.2	55.7
Medium Trucks:	53.9	52.3	47.5	44.6	53.0	53.3
Heavy Trucks:	59.3	57.6	52.4	50.6	58.7	59.0
Vehicle Noise:	61.7	59.9	55.7	52.9	61.1	61.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	10	21	46	99
CNEL:	10	22	48	104

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2023 With Project
Road Name: Cactus Av.
Road Segment: w/o Frederick St.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	70,086 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,009 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.98%
Medium Trucks:	82.6%	6.8%	10.5%	3.95%
Heavy Trucks:	81.5%	6.2%	12.4%	2.07%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	5.89	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	81.00	-7.87	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-10.67	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.4	72.4	70.1	65.7	73.8	74.3
Medium Trucks:	71.4	69.8	65.0	62.1	70.5	70.9
Heavy Trucks:	73.0	71.3	66.2	64.4	72.5	72.7
Vehicle Noise:	77.9	76.1	72.5	69.1	77.2	77.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	203	438	944	2,034
CNEL:	215	464	1,000	2,154

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 Without Project
Road Name: Frederick St.
Road Segment: s/o Alessandro Bl.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,267 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,027 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.48	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-12.31	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-15.26	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.7	66.8	64.5	60.0	68.1	68.6
Medium Trucks:	66.2	64.6	59.8	56.9	65.3	65.6
Heavy Trucks:	68.5	66.8	61.6	59.9	68.0	68.2
Vehicle Noise:	72.7	70.9	67.2	63.9	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	61	130	281	605
CNEL:	64	138	297	640

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 Without Project
Road Name: Frederick St.
Road Segment: n/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,536 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,754 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.85	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-12.94	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-15.89	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	66.1	63.9	59.4	67.5	68.0
Medium Trucks:	65.6	63.9	59.1	56.2	64.6	65.0
Heavy Trucks:	67.9	66.2	61.0	59.3	67.3	67.6
Vehicle Noise:	72.1	70.3	66.5	63.3	71.4	71.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	55	118	255	549
CNEL:	58	125	270	581

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 Without Project
Road Name: Frederick St.
Road Segment: n/o Cactus Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,255 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,826 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.02	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-12.77	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-15.72	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.3	64.0	59.6	67.7	68.2
Medium Trucks:	65.7	64.1	59.3	56.4	64.8	65.1
Heavy Trucks:	68.1	66.4	61.2	59.4	67.5	67.8
Vehicle Noise:	72.3	70.5	66.7	63.5	71.6	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	56	122	262	564
CNEL:	60	129	277	597

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 Without Project
Road Name: Graham St.
Road Segment: s/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,652 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,265 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.57	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-14.36	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-17.31	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.7	64.7	62.4	58.0	66.1	66.6
Medium Trucks:	64.1	62.5	57.7	54.8	63.2	63.5
Heavy Trucks:	66.5	64.8	59.6	57.8	65.9	66.2
Vehicle Noise:	70.7	68.9	65.1	61.9	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	95	205	442
CNEL:	47	101	217	467

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 Without Project
Road Name: Alessandro Bl.
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	52,919 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,292 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	5.13	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	79.45	-8.66	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-11.61	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.9	69.9	67.6	63.2	71.3	71.8
Medium Trucks:	69.1	67.5	62.7	59.8	68.2	68.5
Heavy Trucks:	71.0	69.3	64.1	62.3	70.4	70.7
Vehicle Noise:	75.6	73.8	70.1	66.8	74.9	75.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	143	307	662	1,426
CNEL:	151	325	700	1,509

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 Without Project
Road Name: Calle San Juan De Los Lagos
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,892 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	489 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-4.70	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-18.49	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.44	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.4	60.4	58.2	53.7	61.8	62.3
Medium Trucks:	59.9	58.2	53.4	50.5	58.9	59.3
Heavy Trucks:	62.2	60.5	55.3	53.6	61.6	61.9
Vehicle Noise:	66.4	64.6	60.8	57.6	65.7	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	20	44	94	203
CNEL:	21	46	100	215

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 Without Project
Road Name: Calle San Juan De Los Lagos
Road Segment: e/o Veterans Wy.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,810 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	281 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-7.10	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-20.89	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.84	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.0	55.8	51.3	59.4	59.9
Medium Trucks:	57.4	55.8	51.0	48.1	56.5	56.9
Heavy Trucks:	59.8	58.1	52.9	51.1	59.2	59.5
Vehicle Noise:	64.0	62.2	58.4	55.2	63.3	63.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	14	30	65	140
CNEL:	15	32	69	148

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 Without Project
Road Name: Brodiaea Av.
Road Segment: w/o Graham St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,374 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	137 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-10.21	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-24.00	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-26.95	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	56.9	54.9	52.6	48.2	56.3	56.8
Medium Trucks:	54.3	52.7	47.9	45.0	53.4	53.7
Heavy Trucks:	56.7	55.0	49.8	48.0	56.1	56.4
Vehicle Noise:	60.9	59.1	55.3	52.1	60.2	60.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	9	19	40	87
CNEL:	9	20	43	92

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 Without Project
Road Name: Cactus Av.
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	63,057 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,306 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.08%
Medium Trucks:	82.6%	6.8%	10.5%	3.93%
Heavy Trucks:	81.5%	6.2%	12.4%	1.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	5.44	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	81.00	-8.35	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-11.30	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.9	72.0	69.7	65.2	73.3	73.8
Medium Trucks:	71.0	69.3	64.5	61.6	70.1	70.4
Heavy Trucks:	72.4	70.7	65.5	63.8	71.8	72.1
Vehicle Noise:	77.4	75.6	72.0	68.6	76.7	77.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	188	405	872	1,878
CNEL:	199	429	924	1,990

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 With Project
Road Name: Frederick St.
Road Segment: s/o Alessandro Bl.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,443 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,044 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.83%
Medium Trucks:	82.6%	6.8%	10.5%	3.97%
Heavy Trucks:	81.5%	6.2%	12.4%	2.20%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.50	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-12.23	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.80	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.8	66.8	64.5	60.1	68.2	68.6
Medium Trucks:	66.3	64.6	59.8	57.0	65.4	65.7
Heavy Trucks:	69.0	67.3	62.1	60.3	68.4	68.7
Vehicle Noise:	72.9	71.2	67.3	64.1	72.3	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	62	135	290	625
CNEL:	66	142	307	660

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 With Project
Road Name: Frederick St.
Road Segment: n/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,687 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,769 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.93%
Medium Trucks:	82.6%	6.8%	10.5%	3.95%
Heavy Trucks:	81.5%	6.2%	12.4%	2.12%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.88	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-12.89	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-15.58	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	66.2	63.9	59.4	67.5	68.0
Medium Trucks:	65.6	64.0	59.2	56.3	64.7	65.0
Heavy Trucks:	68.2	66.5	61.3	59.6	67.6	67.9
Vehicle Noise:	72.2	70.5	66.7	63.4	71.6	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	56	121	261	562
CNEL:	59	128	276	594

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 With Project
Road Name: Frederick St.
Road Segment: n/o Cactus Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,451 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,845 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.71%
Medium Trucks:	82.6%	6.8%	10.5%	4.00%
Heavy Trucks:	81.5%	6.2%	12.4%	2.30%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.05	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-12.65	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-15.05	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.3	64.1	59.6	67.7	68.2
Medium Trucks:	65.8	64.2	59.4	56.5	64.9	65.3
Heavy Trucks:	68.7	67.0	61.9	60.1	68.2	68.4
Vehicle Noise:	72.6	70.8	67.0	63.8	71.9	72.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	59	127	274	591
CNEL:	62	135	290	625

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 With Project
Road Name: Graham St.
Road Segment: s/o Brodiaea Av.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,722 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,272 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.86%
Medium Trucks:	82.6%	6.8%	10.5%	3.97%
Heavy Trucks:	81.5%	6.2%	12.4%	2.16%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.56	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	77.72	-14.29	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-16.93	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.7	64.7	62.5	58.0	66.1	66.6
Medium Trucks:	64.2	62.6	57.8	54.9	63.3	63.6
Heavy Trucks:	66.8	65.2	60.0	58.2	66.3	66.6
Vehicle Noise:	70.8	69.1	65.3	62.1	70.2	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	45	98	211	454
CNEL:	48	103	223	479

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 With Project
Road Name: Alessandro Bl.
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	53,009 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,301 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.99%
Medium Trucks:	82.6%	6.8%	10.5%	3.95%
Heavy Trucks:	81.5%	6.2%	12.4%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	5.14	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	79.45	-8.63	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-11.45	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.9	69.9	67.6	63.2	71.3	71.8
Medium Trucks:	69.1	67.5	62.7	59.8	68.2	68.5
Heavy Trucks:	71.1	69.4	64.2	62.5	70.6	70.8
Vehicle Noise:	75.6	73.8	70.1	66.8	75.0	75.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	144	310	668	1,439
CNEL:	152	328	707	1,523

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 With Project
Road Name: Calle San Juan De Los Lagos
Road Segment: w/o Frederick St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,969 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	497 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.17%
Medium Trucks:	82.6%	6.8%	10.5%	3.87%
Heavy Trucks:	81.5%	6.2%	12.4%	1.96%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-4.62	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-18.49	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.44	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.5	60.5	58.2	53.8	61.9	62.4
Medium Trucks:	59.9	58.2	53.4	50.5	58.9	59.3
Heavy Trucks:	62.2	60.5	55.3	53.6	61.6	61.9
Vehicle Noise:	66.4	64.6	60.9	57.6	65.8	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	20	44	95	204
CNEL:	22	46	100	216

Friday, May 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 With Project
Road Name: Calle San Juan De Los Lagos
Road Segment: e/o Veterans Wy.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,887 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	289 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	94.23%
Medium Trucks:	82.6%	6.8%	10.5%	3.83%
Heavy Trucks:	81.5%	6.2%	12.4%	1.94%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-6.98	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-20.89	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.84	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.1	58.2	55.9	51.4	59.5	60.0
Medium Trucks:	57.4	55.8	51.0	48.1	56.5	56.9
Heavy Trucks:	59.8	58.1	52.9	51.1	59.2	59.5
Vehicle Noise:	64.0	62.3	58.5	55.2	63.4	63.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	14	30	66	141
CNEL:	15	32	69	149

Friday, May 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 With Project
Road Name: Brodiaea Av.
Road Segment: w/o Graham St.
Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,491 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	149 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	39.0 feet
Centerline Dist. to Observer:	39.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	91.86%
Medium Trucks:	82.6%	6.8%	10.5%	4.29%
Heavy Trucks:	81.5%	6.2%	12.4%	3.85%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.443
Medium Trucks:	37.206
Heavy Trucks:	37.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-9.96	1.78	-1.20	*-4.58*	0.000	0.000
Medium Trucks:	77.72	-23.26	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.74	1.82	-1.20	*-5.57*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	57.1	55.2	52.9	48.4	56.5	57.0
Medium Trucks:	55.1	53.5	48.7	45.8	54.2	54.5
Heavy Trucks:	59.9	58.2	53.0	51.3	59.3	59.6
Vehicle Noise:	62.6	60.8	56.7	53.8	62.0	62.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	11	24	53	113
CNEL:	12	26	55	119

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2040 With Project
Road Name: Cactus Av.
Road Segment: w/o Frederick St.

Project Name: Centerpointe
Job Number: 11412

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	63,214 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,321 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	82 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	76.5%	11.3%	12.2%	93.96%
Medium Trucks:	82.6%	6.8%	10.5%	3.95%
Heavy Trucks:	81.5%	6.2%	12.4%	2.08%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.226
Medium Trucks:	53.059
Heavy Trucks:	53.076

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	5.44	-0.51	-1.20	*-4.71*	0.000	0.000
Medium Trucks:	81.00	-8.32	-0.49	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-11.10	-0.49	-1.20	*-5.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.9	72.0	69.7	65.2	73.3	73.8
Medium Trucks:	71.0	69.4	64.6	61.7	70.1	70.4
Heavy Trucks:	72.6	70.9	65.7	64.0	72.0	72.3
Vehicle Noise:	77.4	75.7	72.0	68.6	76.8	77.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	190	409	882	1,900
CNEL:	201	434	934	2,013

Friday, May 18, 2018

APPENDIX 9.1:

OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R1**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	824.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	824.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	824.0	-28.8	-28.8	-28.8	-28.8	-28.8	-28.8
Shielding (Barrier Attenuation)	824.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		38.4	-28.8	-28.8	-28.8	-28.8	-28.8
60 Minute Hourly Adjustment		**38.4**	**-28.8**	**-28.8**	**-28.8**	**-28.8**	**-28.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R1**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,030.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	1,030.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	30.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,030.0	-46.3	-46.3	-46.3	-46.3	-46.3	-46.3
Shielding (Barrier Attenuation)	1,030.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		30.9	-46.3	-46.3	-46.3	-46.3	-46.3
39 Minute Hourly Adjustment		**29.0**	**-48.2**	**-48.2**	**-48.2**	**-48.2**	**-48.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/9/2018

Observer Location: **R1**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,051.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	1,051.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,051.0	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Shielding (Barrier Attenuation)	1,051.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		21.9	-30.3	-30.3	-30.3	-30.3	-30.3
60 Minute Hourly Adjustment		**21.9**	**-30.3**	**-30.3**	**-30.3**	**-30.3**	**-30.3**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/9/2018

Observer Location: **R2**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	511.0	feet	***Barrier Height:***	**30.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	501.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	511.0	-24.6	-24.6	-24.6	-24.6	-24.6	-24.6
Shielding (Barrier Attenuation)	10.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Raw (Distance + Barrier)		25.0	-42.2	-42.2	-42.2	-42.2	-42.2
60 Minute Hourly Adjustment		**25.0**	**-42.2**	**-42.2**	**-42.2**	**-42.2**	**-42.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R2**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	632.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	632.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	632.0	-42.0	-42.0	-42.0	-42.0	-42.0	-42.0
Shielding (Barrier Attenuation)	632.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		35.2	-42.0	-42.0	-42.0	-42.0	-42.0
39 Minute Hourly Adjustment		**33.3**	**-43.9**	**-43.9**	**-43.9**	**-43.9**	**-43.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R2**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	256.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	256.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	256.0	-21.1	-21.1	-21.1	-21.1	-21.1	-21.1
Shielding (Barrier Attenuation)	256.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		31.1	-21.1	-21.1	-21.1	-21.1	-21.1
60 Minute Hourly Adjustment		**31.1**	**-21.1**	**-21.1**	**-21.1**	**-21.1**	**-21.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R3**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	612.0	feet	***Barrier Height:***	**30.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	602.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	612.0	-26.2	-26.2	-26.2	-26.2	-26.2	-26.2
Shielding (Barrier Attenuation)	10.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Raw (Distance + Barrier)		23.4	-43.8	-43.8	-43.8	-43.8	-43.8
60 Minute Hourly Adjustment		**23.4**	**-43.8**	**-43.8**	**-43.8**	**-43.8**	**-43.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R3**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	439.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	439.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	30.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	439.0	-38.9	-38.9	-38.9	-38.9	-38.9	-38.9
Shielding (Barrier Attenuation)	439.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		38.3	-38.9	-38.9	-38.9	-38.9	-38.9
39 Minute Hourly Adjustment		**36.4**	**-40.8**	**-40.8**	**-40.8**	**-40.8**	**-40.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R3**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	187.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	187.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	187.0	-19.1	-19.1	-19.1	-19.1	-19.1	-19.1
Shielding (Barrier Attenuation)	187.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		33.1	-19.1	-19.1	-19.1	-19.1	-19.1
60 Minute Hourly Adjustment		**33.1**	**-19.1**	**-19.1**	**-19.1**	**-19.1**	**-19.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R4**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	555.0	feet	***Barrier Height:***	**30.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	545.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	555.0	-25.3	-25.3	-25.3	-25.3	-25.3	-25.3
Shielding (Barrier Attenuation)	10.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Raw (Distance + Barrier)		24.3	-42.9	-42.9	-42.9	-42.9	-42.9
60 Minute Hourly Adjustment		**24.3**	**-42.9**	**-42.9**	**-42.9**	**-42.9**	**-42.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R4**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	236.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	236.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	236.0	-33.5	-33.5	-33.5	-33.5	-33.5	-33.5
Shielding (Barrier Attenuation)	236.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		43.7	-33.5	-33.5	-33.5	-33.5	-33.5
39 Minute Hourly Adjustment		**41.8**	**-35.4**	**-35.4**	**-35.4**	**-35.4**	**-35.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/9/2018

Observer Location: **R4**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Centerpointe
Job Number: 11412
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	142.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	142.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	142.0	-17.3	-17.3	-17.3	-17.3	-17.3	-17.3
Shielding (Barrier Attenuation)	142.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		34.9	-17.3	-17.3	-17.3	-17.3	-17.3
60 Minute Hourly Adjustment		**34.9**	**-17.3**	**-17.3**	**-17.3**	**-17.3**	**-17.3**

CENTERPOINTE
TRAFFIC IMPACT ANALYSIS
CITY OF MORENO VALLEY

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SEPTEMBER 12, 2018

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APPENDICES

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LIST OF EXHIBITS

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LIST OF TABLES

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
E+P	Existing Plus Project
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
N/A	Not Applicable
NCHRP	National Cooperative Highway Research Program
NP	No Project (or Without Project)
PCE	Passenger Car Equivalents
PHF	Peak Hour Factor
Project	Centerpointe
RCTC	Riverside County Transportation Commission
RivTAM	Riverside County Transportation Analysis Model
RTA	Riverside Transit Authority
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
sf	Square Feet
TIA	Traffic Impact Analysis
TUMF	Transportation Uniform Mitigation Fee
WP	With Project
WRCOG	Western Riverside Council of Governments
V/C	Volume to Capacity

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Centerpointe development ("Project") located on the northeast corner of Frederick Street and Brodiaea Avenue in the City of Moreno Valley as shown on Exhibit 1-1.

The purpose of this traffic impact analysis is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to achieve acceptable circulation system operational conditions. This traffic study has been prepared in accordance with the City of Moreno Valley Transportation Engineering Division's Traffic Impact Analysis Preparation Guide (August 2007) and consultation with City of Moreno Valley staff during the scoping process. (1) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

1.1 PROJECT OVERVIEW

For the purposes of this analysis, in an effort to conduct a conservative analysis, the Project has been evaluated to consist of up to 163,218 square feet (sf) of warehouse (without cold storage) use (80 percent of the total square footage) and 40,804 sf of general light industrial use (20 percent of the total square footage) for a total of 204,022 sf within a single building. Per the City's traffic study guidelines, the Opening Year Cumulative will have a 5-year minimum time horizon from baseline conditions. As such, the Opening Year Cumulative analysis will assess 2023 traffic conditions.

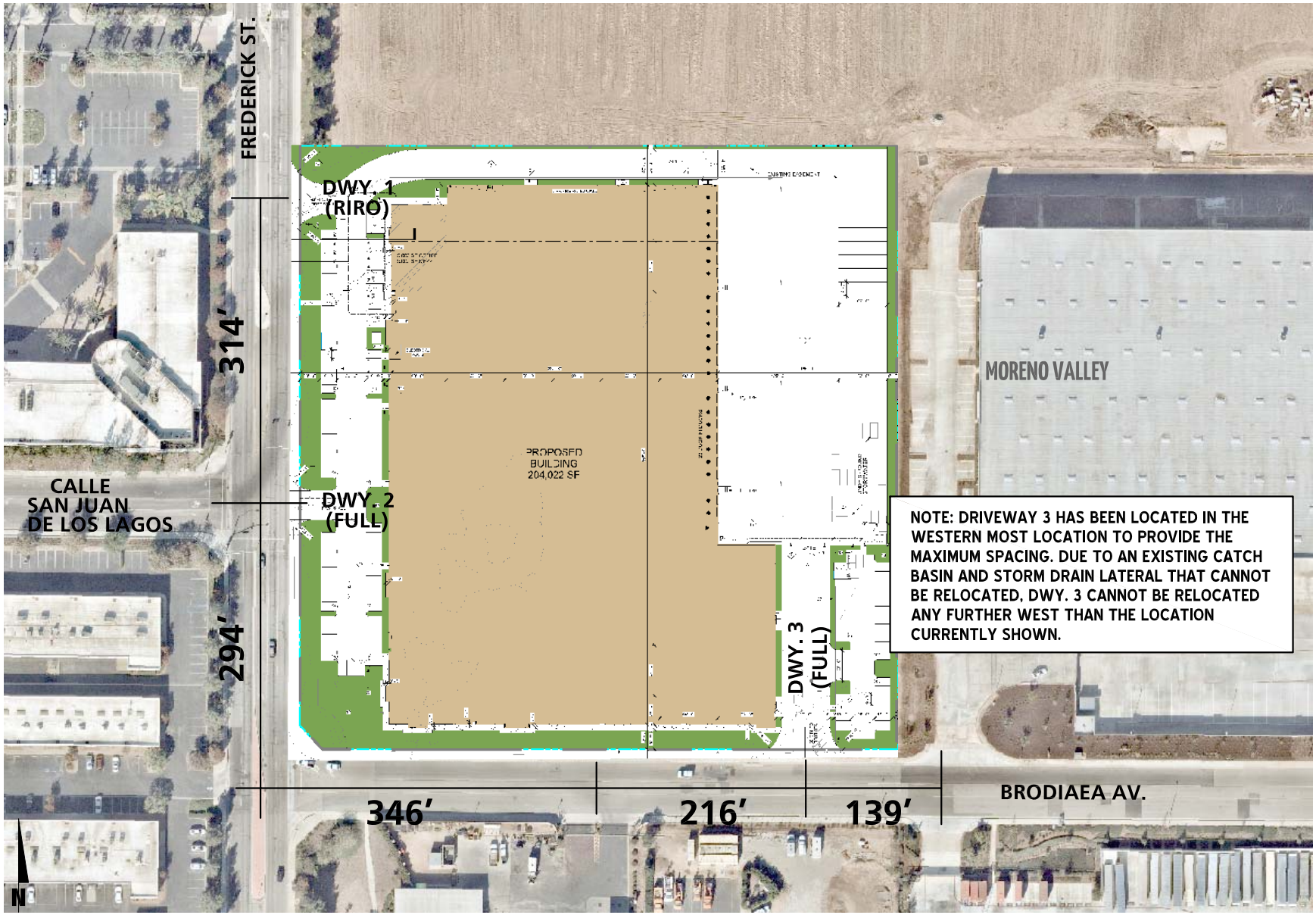
Vehicular and truck traffic access will be provided via the following driveways (see Exhibit 1-1):

- Frederick St. & Driveway 1 – Right-in right-out only (trucks only)
- Frederick St. & Calle San Juan de Los Lagos/Driveway 2 – Full access driveway (passenger cars only)
- Driveway 3 & Brodiaea Av. – Full-access driveway (both passenger cars and trucks)

Regional access to the Project site is provided via the I-215 Freeway at Alessandro Boulevard and Cactus Avenue interchanges.

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017. (2) The Project is estimated to generate a net total of 629 passenger-car-equivalent (PCE) trip-ends per day on a typical weekday with approximately 72 net AM PCE peak hour trips and 74 net PM PCE peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



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URBAN CROSSROADS

1.1.1 Site Plan Driveway Locations

As shown on Exhibit 1-1, each driveway meets the required 150 foot spacing, with the exception of Driveway 3. The spacing of Driveway 3 has been located in the western most location to provide maxing spacing with the adjacent intersection. However, due to an existing catch basin and storm drain lateral that cannot be relocated, Driveway 3 cannot be relocated any further west than the location currently shown on Exhibit 1-1. Additionally, the location of Driveway 3 has been reviewed approved by the City of Moreno Valley through the scoping process. As such, the location of each Project driveway is acceptable based on the City of Moreno Valley Municipal Code and City staff.

1.2 Analysis Scenarios

For the purposes of this traffic study, potential impacts to traffic and circulation have been assessed for each of the following conditions:

- Existing (2018) (1 scenario)
- Existing plus Project (E+P) (1 scenario)
- Opening Year Cumulative (2023), Without and With Project (2 scenarios)
- General Plan Buildout (Post-2040), Without and With Project (2 scenarios)

1.2.1 Existing (2018) Conditions

Information for Existing (2018) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.2.2 Existing plus Project Conditions

The Existing plus Project (E+P) analysis determines circulation system deficiencies that would occur on the existing roadway system in the scenario of the Project being placed upon Existing conditions.

1.2.3 Opening Year Cumulative (2023) Conditions

To account for growth in traffic between Existing Conditions (2018) and the Project Opening Year Cumulative (2023), a compounded annual traffic growth rate of 2.0 percent was assumed (10.41 percent aggregate growth in background traffic for the period from 2018through 2023).

The 2.0 percent annual growth rate is intended to capture non-specific ambient traffic growth. Conservatively, the TIA estimates area-wide traffic growth, then adds traffic generated by other known or probable related projects. These related projects are at least in part already accounted for in the assumed annual 2.0 percent ambient growth in traffic noted above; and in some instances, these related projects would likely not be implemented and operational within the 2023 Opening Year Cumulative time frame assumed for the Project. The resulting traffic growth rate used in the TIA (2.0 percent compounded annual ambient growth plus traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic impacts under 2023 traffic conditions.

1.2.4 General Plan Buildout (Post-2040) Conditions

The General Plan Buildout (Post-2040) Without Project traffic conditions were derived from the Riverside County Transportation Analysis Model (RivTAM) modified to represent General Plan Buildout conditions for the City of Moreno Valley using accepted procedures for model forecast refinement and smoothing. The traffic forecasts reflect the area-wide growth anticipated between Existing conditions and General Plan Buildout conditions. The General Plan Buildout With Project traffic forecasts were determined by adding the Project traffic to the General Plan Buildout Without Project traffic forecasts from the RivTAM model. The General Plan Buildout traffic forecasts used in the traffic analysis were refined with existing peak hour traffic count data collected at intersection analysis locations. The initial estimate of the future peak hour turning movements have, therefore, been reviewed for reasonableness. The reasonableness checks performed include a review of traffic flow conservation in addition to a comparison with the Existing and Opening Year Cumulative traffic volumes. Where necessary, the General Plan Buildout volumes have been adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes.

The General Plan Buildout Without and With Project traffic conditions analyses will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the Transportation Uniform Mitigation Fee (TUMF) and Development Impact Fee (DIF) programs, or other approved funding mechanism can accommodate the long-range cumulative traffic at the target Level of Service (LOS) identified in the City of Moreno Valley General Plan. (3) If the "funded" improvements can provide the target LOS, then the Project's payment into TUMF and/or DIF will be considered as long-range cumulative mitigation through the conditions of approval. Other improvements needed beyond the "funded" improvements (such as localized improvements to non-TUMF facilities) are identified as such. Post-processing worksheets for General Plan Buildout (Post-2040) Without Project traffic conditions are provided in Appendix 4.1.

1.3 Study Area

To ensure that this TIA satisfies the City of Moreno Valley's traffic study requirements, Urban Crossroads, Inc. prepared a project traffic study scoping package for review by City of Moreno Valley staff prior to the preparation of this report. The scoping agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology and is included in Appendix 1.1.

1.3.1 INTERSECTIONS

The 8 study area intersections shown on Exhibit 1-2 and listed on Table 1-1 were selected for this TIA based on the City of Moreno Valley's Traffic Study Guidelines and in consultation with City of Moreno Valley staff. Pursuant to the Traffic Study Guidelines, the City requires analysis of intersections where the Project would contribute 50 or more peak hour trips.[1] In an effort to conduct a conservative analysis, the PCE trip generation for the proposed Project has been utilized to determine if the 50 peak hour trip criteria has been met at the study area intersections. Although the Project is anticipated to contribute less than 50 peak hour trips to the study area intersections, the study area shown on Exhibit 1-2 has been developed based on direction from City staff through the scoping process. (1)

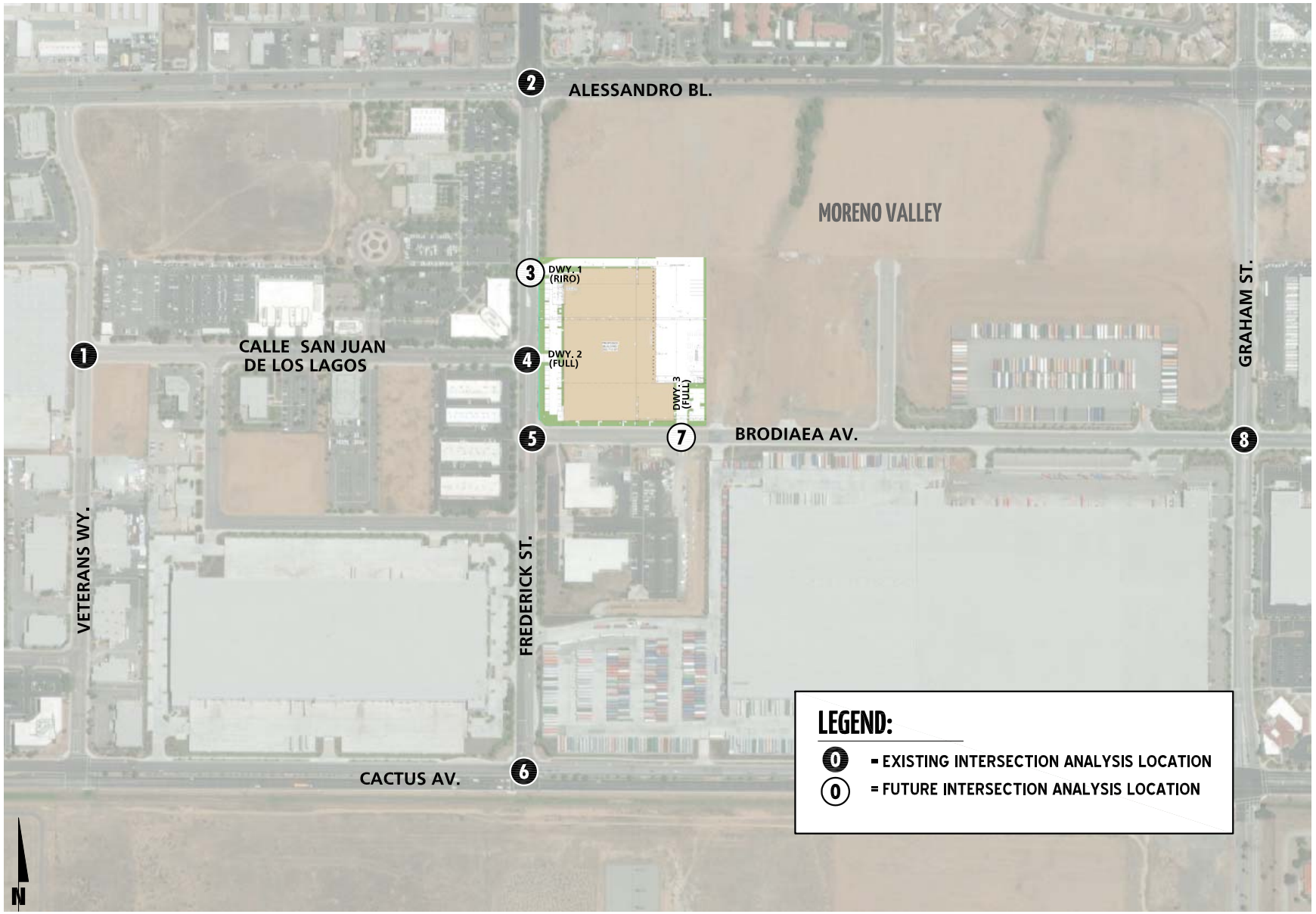
TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	Veterans Wy. & Calle San Juan de Los Lagos	Moreno Valley	No
2	Frederick St. & Alessandro Bl.	Moreno Valley	No
3	Frederick St. & Driveway 1 – Future Intersection	Moreno Valley	No
4	Frederick St. & Calle San Juan de Los Lagos/Driveway 2	Moreno Valley	No
5	Frederick St. & Brodiaea Av.	Moreno Valley	No
6	Frederick St. & Cactus Av.	Moreno Valley	No
7	Driveway 3 & Brodiaea Av. – Future Intersection	Moreno Valley	No
8	Graham St. & Brodiaea Av.	Moreno Valley	No

The intent of a Congestion Management Program (CMP) is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related impacts, and improve air quality. Counties within California have developed CMPs with varying methods and strategies to meet the intent of the CMP legislation. The County of Riverside CMP became effective with the passage of Proposition 111 in 1990 and updated most recently in 2011. The Riverside County Transportation Commission (RCTC) adopted the 2011 CMP for the County of Riverside in December 2011. (4) There are currently no CMP intersections in this study area.

[1] The "50 or more peak hour trips" intersection analytic protocol stipulated in the City's Traffic Study Guidelines is consistent with standard industry practice. It is noted further that the 50 peak hour trip threshold is employed by other agencies throughout southern California including Caltrans, County of Riverside, County of San Bernardino, and the County of Orange.

EXHIBIT 1-2: LOCATION MAP



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URBAN CROSSROADS

1.3.2 ROADWAY SEGMENTS

No roadway segments were evaluated as the Project is anticipated to contribute fewer than 50 peak hour trips on all roadway segments adjacent to intersection analysis locations. In an effort to conduct a conservative analysis, the PCE trip generation for the proposed Project has been utilized to determine if the 50 peak hour trip criteria has been met on the study area roadway segments.

1.4 SUMMARY OF INTERSECTION ANALYSIS

This section provides a summary of the analysis results for Existing, E+P, Opening Year Cumulative, and General Plan Buildout traffic conditions. A summary of intersection LOS by analysis scenario is shown in Exhibit 1-3.

Existing (2018) Conditions

Intersection Operations Analysis

As shown on Exhibit 1-3, the study area intersections are currently operating at an acceptable LOS during both peak hours.

E+P Conditions

Intersection Operations Analysis

As shown in Exhibit 1-3, all 8 study area intersections are anticipated to continue to operate at an acceptable LOS during both peak hours.

Peak Hour Queuing Analysis

A queuing analysis was performed every study area intersection to determine if the turn pocket lengths can accommodate E+P 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours for E+P traffic conditions.

There are queuing issues anticipated during the AM or PM peak hours at the intersection of Frederick Street and Alessandro Boulevard for the southbound, eastbound, and westbound left turn pockets. However, the Project is not anticipated to contribute trips to every movement. As such, improvement strategies have only been recommended at the location where the Project is anticipated to contribute trips during the AM or PM peak hours:

- Frederick Street & Alessandro Boulevard, westbound left turn lane (AM peak hour only)

Recommended Improvements

There are no deficient intersections anticipated for E+P traffic conditions and the Project is anticipated to contribute less than 50 peak hour trips and would result in a net increase to the peak hour delay of less than 1.0 second to the study area intersections. As such, there are no significant impacts.

EXHIBIT 1-3: SUMMARY OF DEFICIENT INTERSECTIONS BY ANALYSIS SCENARIO

#	Intersection	Existing (2018)	E+P	Opening Year (2020) Without Project	Opening Year (2020) With Project	General Plan Buildout (Post-2040) Without Project	General Plan Buildout (Post-2040) With Project
1	Veterans Wy. & Calle San Jaun de Los Lagos	◐	◐	◐	◐	◐	◐
2	Frederick St. & Alessandro Bl.	◐	◐	◐	◐	◐	◐
3	Frederick St. & Dwy. 1	NA	◐	NA	◐	NA	◐
4	Frederick St. & Calle San Jaun de Los Lagos	◐	◐	◐	◐	◐	◐
5	Frederick St. & Brodiaea Av.	◐	◐	◐	◐	◐	◐
6	Frederick St. & Cactus Av.	◐	◐	◐	◐	◐	◐
7	Dwy. 3 & Brodiaea Av.	NA	◐	NA	◐	NA	◐
8	Graham St. & Brodiaea Av.	◐	◐	◐	◐	◐	◐

LEGEND:

◖ = AM PEAK HOUR
◗ = PM PEAK HOUR
◐ = ACCEPTABLE LOS A-D
◐ = DEFICIENT LOS E
◐ = DEFICIENT LOS F
NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

Although the Project's impact is less-than-significant, the following improvement has been identified to address the queuing issue for E+P traffic conditions at the request of City staff:

Improvement – Frederick Street & Alessandro Boulevard (#2)

- Modify the existing landscaped median to provide a 265-foot westbound left turn pocket with a 90-foot transition. The back-to-back left with the adjacent driveway would modify the left turn storage to 75-feet.

Opening Year Cumulative (2023) Conditions

Intersection Operations Analysis

As shown on Exhibit 1-3, there is one study area intersection that is anticipated to operate at an unacceptable LOS during one peak hour during both Opening Year Cumulative Without Project and With Project traffic conditions (i.e., intersection #2).

Peak Hour Queuing Analysis

A queuing analysis was performed every study area intersection to determine if the turn pocket lengths can accommodate near-term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours and only for the With Project analysis scenario.

There are queuing issues anticipated during the AM and/or PM peak hours at the intersection of Frederick Street and Alessandro Boulevard for the southbound left turn lane, eastbound left turn lane, eastbound right turn lane, and westbound left turn lane. The intersection of Frederick Street and Calle San Juan de Los Lagos/Driveway 2 is anticipated to experience queuing issues for the eastbound left turn lane. The intersection of Frederick Street and Cactus Avenue is anticipated to experience queuing issues for the westbound right turn lane. However, the Project is not anticipated to contribute trips to every movement. As such, improvement strategies have only been recommended at those locations where the Project is anticipated to contribute trips during the AM or PM peak hours:

- Frederick Street & Alessandro Boulevard, westbound left turn lane (AM and PM peak hours)
- Frederick Street & Cactus Avenue, westbound right turn lane (AM peak hour only)

Recommended Improvements

The Project is anticipated to contribute less than 50 peak hour trips to the intersections of Frederick Street and Alessandro Boulevard, Frederick Street and Calle San Juan de Los Lagos/Driveway 2, and Frederick Street and Cactus Avenue. The addition of Project traffic would result in an increase to the delay of less than 1.0 second. As such, the impact is considered less than significant and no mitigation measures are required to address intersection operations.

Although the Project's impact is less-than-significant, the following improvements have been identified to address the queuing issues for Opening Year Cumulative (2023) traffic conditions at the request of City staff:

Improvement – Frederick Street & Alessandro Boulevard (#2)

- Modify the existing landscaped median to provide a 265-foot westbound left turn pocket with a 90-foot transition. The back-to-back left with the adjacent driveway would modify the left turn storage to 75-feet.

Improvement – Frederick Street & Cactus Avenue (#6)

- Restripe the westbound right turn lane to provide 500-feet of storage

General Plan Buildout (Post-2040) Conditions

Intersection Operations Analysis

As shown on Exhibit 1-3, there are no additional study area intersections anticipated to operate at an unacceptable LOS for both General Plan Buildout Without Project and With Project, beyond those previously identified in Opening Year Cumulative (2023) traffic conditions.

Peak Hour Queuing Analysis

A queuing analysis was performed at every study area intersection to determine if the turn pocket lengths can accommodate long-term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours and only for the With Project analysis scenario.

There are queuing issues anticipated during the AM and/or PM peak hours at the intersection of Frederick Street and Alessandro Boulevard for the southbound left turn lane, southbound right turn lane, eastbound left turn lane, eastbound right turn lane, and westbound left turn lane. The intersection of Frederick Street and Calle San Juan de Los Lagos/Driveway 2 is anticipated to experience queuing issues for the eastbound left turn lane. The intersection of Frederick Street and Cactus Avenue is anticipated to experience queuing issues for the eastbound left turn lane and the westbound right turn lane. However, the Project is not anticipated to contribute trips to every movement. As such, improvement strategies have only been recommended at those locations where the Project is anticipated to contribute trips during the AM or PM peak hours:

- Frederick Street & Alessandro Boulevard, eastbound right turn lane (PM peak hour only)
- Frederick Street & Alessandro Boulevard, westbound left turn lane (AM and PM peak hours)
- Frederick Street & Cactus Avenue, eastbound left turn lane (AM peak hour only)
- Frederick Street & Cactus Avenue, westbound right turn lane (AM and PM peak hours)

Recommended Improvements

The Project is anticipated to contribute less than 50 peak hour trips to the intersections of Frederick Street and Alessandro Boulevard, Frederick Street and Calle San Juan de Los Lagos/Driveway 2, and Frederick Street and Cactus Avenue. The addition of Project traffic would

result in an increase to the delay of less than 1.0 second. As such, the impact is considered less than significant and no mitigation measures are required to address intersection operations.

Although the Project's impact is less-than-significant, the following improvements have been identified to address the queuing issues for General Plan Buildout (Post-2040) traffic conditions at the request of City staff:

Improvements – Frederick Street & Alessandro Boulevard (#2)

- Add a 200-foot eastbound right turn pocket (with the existing eastbound right turn restriped as a 3rd eastbound through lane, consistent with the City of Moreno Valley General Plan)
- Add a 2nd westbound left turn lane

Improvements – Frederick Street & Cactus Avenue (#6)

- Restripe the eastbound left turn lane to provide 450-feet of storage
- Restripe the westbound right turn lane to provide 500-feet of storage

1.5 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements throughout the City of Moreno Valley are funded through a combination of project mitigation, fair share contributions or development impact fee programs, such as TUMF program or the City's DIF program.

1.5.1 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The Western Riverside Council of Governments (WRCOG) is responsible for establishing and updating Transportation Uniform Mitigation Fee (TUMF) rates. The County may grant to developers a credit against the specific components of fees for the dedication of land or the construction of facilities identified in the list of improvements funded by each of these fee programs. Fees are based upon projected land uses and a related transportation need to address growth based upon a 2016 Nexus study.

TUMF is an ambitious regional program created to address cumulative impacts of growth throughout western Riverside County. Program guidelines are being handled on an iterative basis. Exemptions, credits, reimbursements and local administration are being deferred to primary agencies. The County of Riverside serves this function for the proposed Project. Fees submitted to the County are passed on to the WRCOG as the ultimate program administrator.

TUMF guidelines empower a local zone committee to prioritize and arbitrate certain projects. The Project is located in the Central Zone. The zone has developed a 5-year capital improvement program to prioritize public construction of certain roads. TUMF is focused on improvements necessitated by regional growth. The TUMF Transportation Improvement Program map for Moreno Valley is included in Appendix 1.2.

1.5.2 CITY OF MORENO VALLEY DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The City of Moreno Valley has created its own local Development Impact Fee (DIF) program to impose and collect fees from new residential, commercial and industrial development for the purpose of funding roadways and intersections necessary to accommodate City growth as identified in the City's General Plan Circulation Element. The City's DIF program includes facilities that are not part of, or which may exceed improvements identified and covered by the TUMF program. As a result, the pairing of the regional and local fee programs provides a more comprehensive funding and implementation plan to ensure an adequate and interconnected transportation system. Under the City's DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

The timing to use the DIF fees is established through periodic capital improvement programs which are overseen by the City's Public Works Department. Periodic traffic counts, review of traffic accidents, and a review of traffic trends throughout the City are also periodically performed by City staff and consultants. The City uses this data to determine the timing of implementing the improvements listed in its facilities list.

The Project Applicant would pay requisite DIF pursuant to incumbent City ordinance requirements. Payment of requisite DIF would satisfy the Applicant's mitigation responsibilities for potentially significant impacts affecting DIF-funded facilities.

1.5.3 FAIR SHARE FEES

The Project Applicant's mitigation responsibilities may also be may be fulfilled through payment of fair-share fees. Fair share fees would be paid in instances where required traffic facilities are not otherwise funded by TUMF and/or DIF programs noted above. Fair share calculations are provided on Table 1-2 for each of the study area intersections where the Project is anticipated to contribute cumulatively to a peak hour queuing issue.

1.6 SITE ADJACENT ROADWAY AND SITE ACCESS IMPROVEMENTS

This section summarizes Project site access and on-site circulation recommendations. Vehicular and truck traffic access will be provided via the following driveways:

- Driveway 1 & Frederick St. – Right-in right-out only (trucks only)
- Frederick St. & Calle San Juan de Los Lagos/Driveway 2 – Full access driveway (passenger cars only)
- Driveway 3 & Brodiaea Av. – Full access driveway (both passenger cars and trucks)

Regional access to the Project site is provided via the I-215 Freeway at Alessandro Boulevard and Cactus Avenue interchanges.

Table 1-2

Project Fair Share Calculations for Intersections

#	Intersection		Existing	Project	2040 With Project Volume	Total New Traffic	Project % of New Traffic
2	Frederick St. & Alessandro Bl.						
		AM:	2,927	17	4,922	1,995	0.85%
		PM:	3,659	28	6,560	2,901	**0.97%**
6	Frederick St. & Cactus Av.						
		AM:	3,177	14	5,945	2,768	**0.51%**
		PM:	3,709	14	6,892	3,183	0.44%

BOLD = Denotes highest fair share percentage.

1.6.1 SITE ADJACENT ROADWAY IMPROVEMENTS

Since both Frederick Street and Brodiaea Avenue are built out to their ultimate cross-section, according to the City of Moreno Valley General Plan, there are no roadway improvement recommendations. The Project is proposing to provide a bus turnout along its frontage on Frederick Street. However, additional curb, gutter, and sidewalk improvements are recommended, as needed for site access along the Project's frontage consistent with the City's standards.

1.6.2 SITE ACCESS IMPROVEMENTS

The recommended site access driveway improvements for the Project are described below. Exhibit 1-4 illustrates the on-site and site adjacent recommended roadway lane improvements. Construction of on-site and site adjacent improvements are recommended to occur in conjunction with adjacent Project development activity or as needed for Project access purposes.

Frederick St. & Driveway 1 (#3) – Install a stop control on the westbound approach and construct the intersection with the following geometrics:

Northbound Approach: One through lane and one shared through-right turn lane.

Southbound Approach: Two through lanes.

Eastbound Approach: Not Applicable (N/A)

Westbound Approach: One right turn lane.

Frederick St. & Calle San Juan de Los Lagos/Driveway 2 (#4) – Modify the existing traffic signal to accommodate the Project driveway and construct the intersection with the following geometrics:

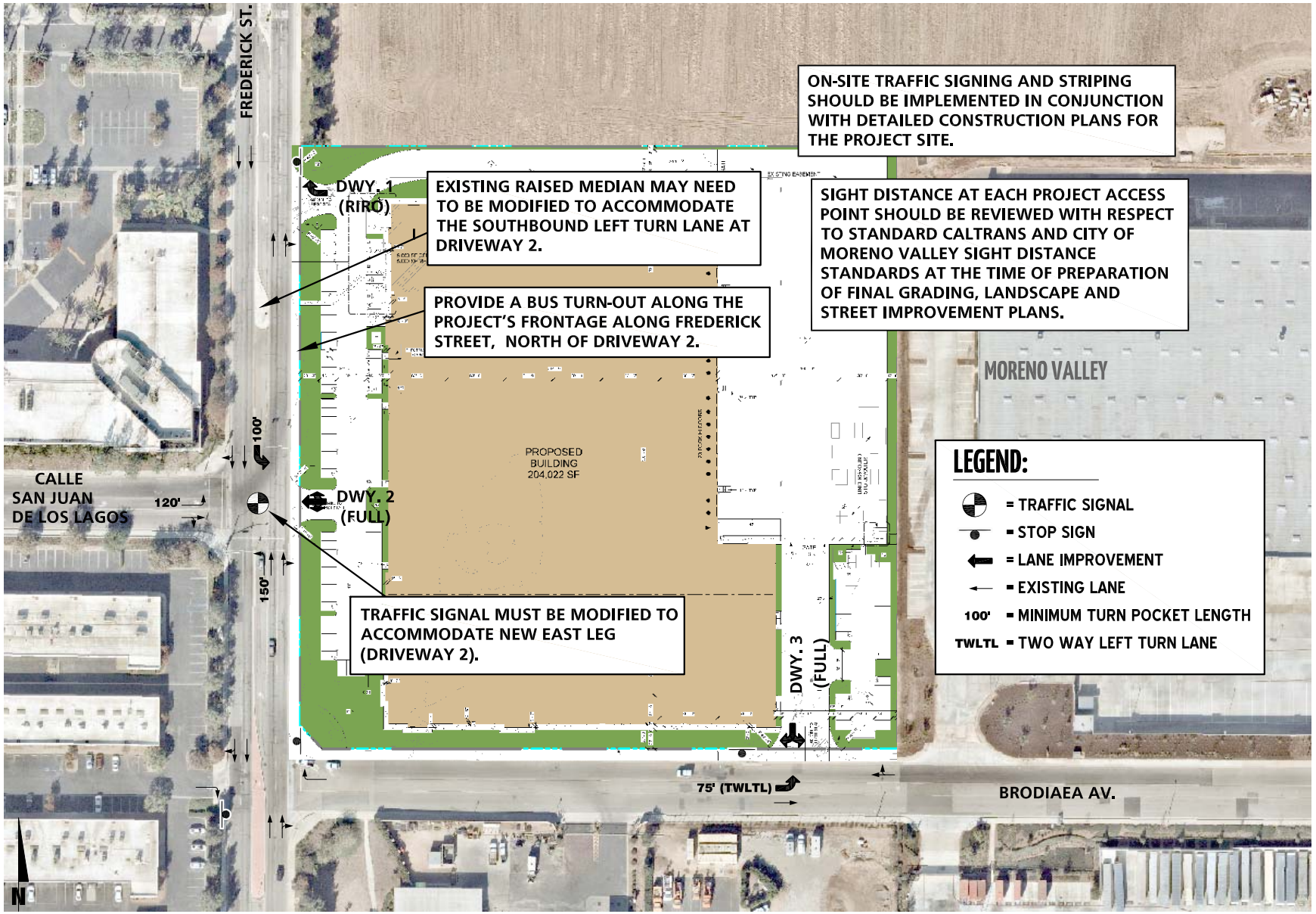
Northbound Approach: One left turn lane, one through lane, and one shared through-right turn lane.

Southbound Approach: One left turn lane with a minimum of 100-feet of storage, one through lane, and one shared through-right turn lane. Modification may be necessary to the median on Frederick Street to accommodate the southbound left turn lane.

Eastbound Approach: One left turn lane and one shared through-right turn lane.

Westbound Approach: One shared left-through-right turn lane.

EXHIBIT 1-4: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS



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URBAN CROSSROADS

Driveway 3 & Brodiaea Av. – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

Northbound Approach: N/A

Southbound Approach: One shared left-right turn lane.

Eastbound Approach: One left turn lane with a minimum of 75-feet of storage within the painted median and one through lane.

Westbound Approach: One shared through-right turn lane.

1.6.3 QUEUING ANALYSIS AT THE PROJECT DRIVEWAYS

A queuing analysis was conducted for the Project driveways for General Plan Buildout (Post-2040) traffic conditions to determine the turn pocket lengths necessary to accommodate near-term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours for all analysis scenarios.

The queuing analysis indicates that a 100-foot southbound left turn lane can accommodate the 95th percentile queues at the intersection of Frederick Street & Calle San Juan de Los Lagos. The queuing analysis also indicates that 50 feet of storage can accommodate the eastbound left turn queues at the intersection of Driveway 3 & Brodiaea Avenue. However, consistent with the City's minimum storage length requirements for driveways serving heavy trucks, a 75-foot eastbound left turn lane has been recommended at Driveway 3 on Brodiaea Avenue. Queuing worksheets are included in Appendix 1.3.

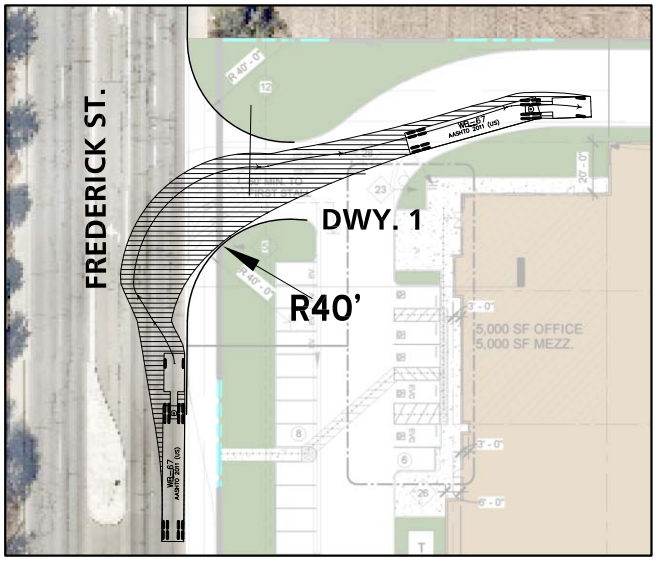
1.7 TRUCK ACCESS AND CIRCULATION

A truck turning template has been overlaid on the site plan at Driveway 1 on Frederick Street and Driveway 3 on Brodiaea Avenue, which are anticipated to be utilized by heavy trucks, in order to determine the appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers. For the purposes of this evaluation, the WB-67 class truck template has been utilized. WB-67 class trucks are approximately 73.5 feet in length.

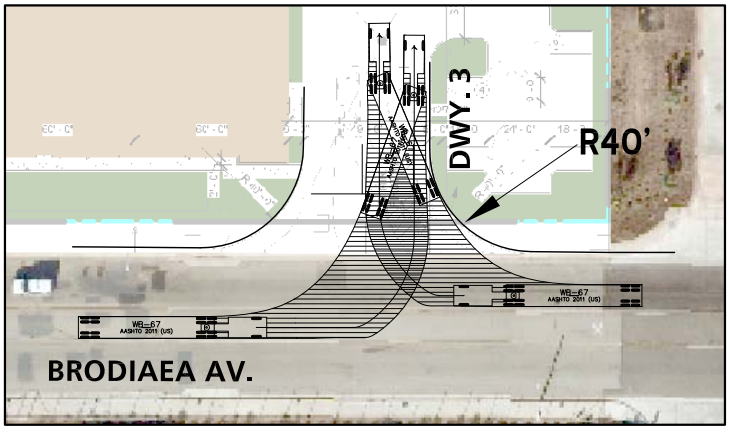
Exhibit 1-5 illustrates the proposed truck access for the site and circulation for Driveway 1 and Driveway 3. As shown on Exhibit 1-5, the proposed curb radii of 40-feet at the intersections of Frederick Street at Driveway 1 and Driveway 3 at Brodiaea Avenue are anticipated to accommodate the ingress and egress of trucks.

EXHIBIT 1-5: TRUCK ACCESS

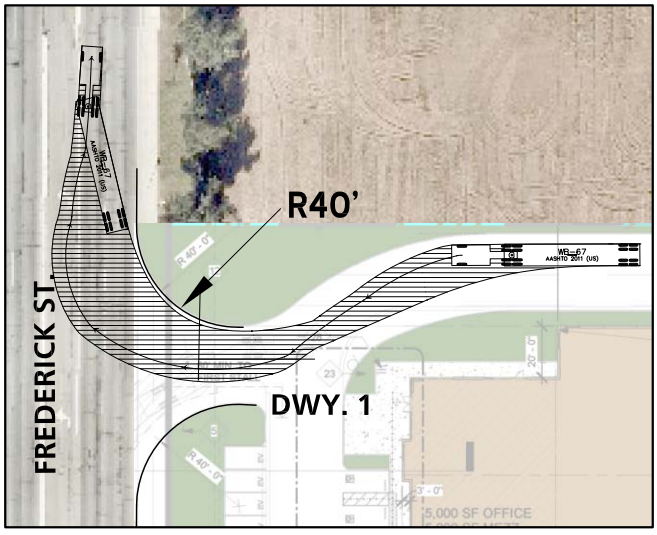
INBOUND



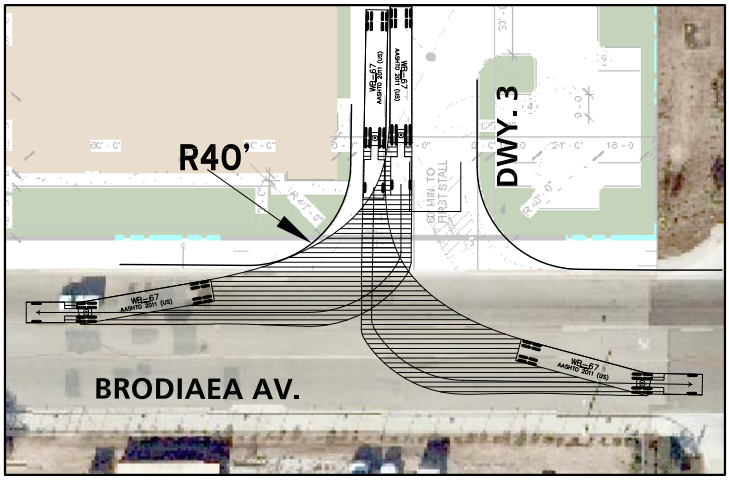
INBOUND



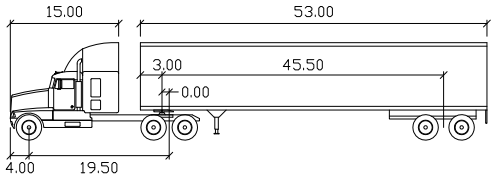
OUTBOUND



OUTBOUND

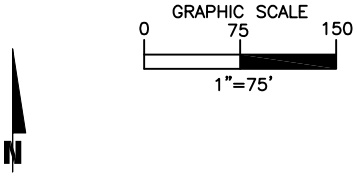


LEGEND:



WB-67 feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		



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2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with City of Moreno Valley's traffic study guidelines. (1)

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The Highway Capacity Manual (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (5) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

City of Moreno Valley

The City of Moreno Valley requires signalized intersection operations analysis based on the methodology described in the HCM. (5) Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections, LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1. Study area intersections have been evaluated using the Synchro (Version 10) analysis software package.

Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths	80.01 and up	F	F

Source: HCM 6th Edition

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows, while lower PHF values are indicative of greater variability of flow during the peak hour. (5)

2.2.2 UNSIGNALIZED INTERSECTIONS

The unsignalized intersections in the study area are located within the City of Moreno Valley. The City of Moreno Valley require the operations of unsignalized intersections be evaluated using the methodology described the HCM. (5) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay Per Vehicle (Seconds)	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Little or no delays.	0 to 10.00	A	F
Short traffic delays.	10.01 to 15.00	B	F
Average traffic delays.	15.01 to 25.00	C	F
Long traffic delays.	25.01 to 35.00	D	F
Very long traffic delays.	35.01 to 50.00	E	F
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F	F

Source: HCM 6th Edition

At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by the California Department of Transportation (Caltrans) and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TIA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD) for all unsignalized study area intersections. (6)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The CA MUTCD indicate that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (6) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions. Warrant 3 is appropriate to use for this TIA because it provides specialized warrant criteria for intersections with urban characteristics (e.g. located in communities with populations of more than 10,000 persons or with adjacent major streets operating below 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future unsignalized intersections, that currently do not exist, have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets.

As shown on Table 2-3, traffic signal warrant analyses were performed for the following unsignalized study area intersections during the peak weekday conditions wherein the Project is anticipated to contribute the highest trips:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
1	Veterans Wy. & Calle San Juan de Los Lagos	Moreno Valley
3	Frederick St. & Driveway 1 – Future Intersection	Moreno Valley
5	Frederick St. & Brodiaea Av.	Moreno Valley
7	Driveway 3 & Brodiaea Av. – Future Intersection	Moreno Valley

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 *E+P Traffic Analysis,* Section 6 *Opening Year Cumulative (2023) Traffic Analysis,* and Section 7 *General Plan Buildout (Post-2040) Traffic Analysis* of this report.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.4 QUEUING ANALYSIS

A queuing analysis was conducted for all study area intersections for E+P, Opening Year Cumulative (2023), and General Plan Buildout (Post-2040) traffic conditions in an effort to determine the turn pocket lengths necessary to accommodate 95th percentile queues. The analysis was conducted for both the weekday AM and weekday PM peak hours.

The traffic modeling and signal timing optimization software package Synchro (Version 10) has been utilized to assess queues. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses as specified in the Highway Capacity Manual (HCM). Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length in Synchro. The LOS and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. SimTraffic has been utilized to assess peak hour queuing for both E+P and Opening Year Cumulative With Project traffic conditions. The random simulations generated by SimTraffic have been utilized to determine the 50th and 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded up to 5 times, during the weekday AM and weekday PM peak hours, and has been seeded for 60-minute periods with 60-minute recording intervals.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been utilized for purposes of determining the necessary turn pocket storage lengths, the 50th percentile queues are also reported. The 50th percentile queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. The 50th percentile, or average, queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations. However, many jurisdictions utilize the 95th percentile queues for design purposes. The maximum back of queue observed for every two-minute period is recorded by SimTraffic.

2.5 MINIMUM LEVEL OF SERVICE (LOS)

The definition of an intersection deficiency in the City of Moreno Valley is based on the City of Moreno Valley General Plan Circulation Element. The City of Moreno Valley General Plan states that target LOS C or LOS D be maintained along City roads (including intersections) wherever possible. Exhibit 2-1 depicts the level of service standards within the City.

For the purposes of this study and based on Exhibit 2-1, the following intersections were evaluated using LOS C as the minimum acceptable LOS:

- Veterans Wy. & Calle San Juan de Los Lagos (#1)
- Frederick St. & Driveway 1 – Future Intersection (#3)
- Frederick St. & Calle San Juan de Los Lagos/Driveway 2 (#4)
- Frederick St. & Brodiaea Av. (#5)
- Driveway 3 & Brodiaea Av. – Future Intersection (#7)
- Graham St. & Brodiaea Av. (#8)

The following intersections were evaluated using LOS D as the minimum acceptable LOS:

- Frederick St. & Alessandro Bl. (#2)
- Frederick St. & Cactus Av. (#6)

2.6 THRESHOLDS OF SIGNIFICANCE

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies. To determine whether the addition of project traffic (as defined through the comparison of Existing traffic conditions to E+P traffic conditions) at a study intersection would result in a direct project-specific traffic impact, and consistent with the City of Moreno Valley LOS standards as shown in Exhibit 2-1, the following will be utilized:

- When the pre-Project condition is at or better than the acceptable LOS C (or LOS D for City designated intersections), and project-generated traffic, as measured by 50 or more peak hour

trips, causes deterioration below the acceptable LOS D (or LOS E at City designated intersections), a deficiency is deemed to occur.

However, when the pre-Project condition is already below LOS D/LOS E (i.e., unacceptable LOS), the Project will be responsible for mitigating its impact to a level of service equal to or better than it was without the Project.

Cumulative traffic impacts are created as a result of a combination of the proposed Project together with other future developments contributing to the overall traffic impacts requiring additional improvements to maintain acceptable level of service operations with or without the Project. A Project's contribution to a significant cumulative impact can be reduced to less than significant if the Project is required to implement or fund its fair share of improvements designed to alleviate its cumulatively considerable contribution to the impact. Cumulatively considerable is defined as the addition of 50 or more peak hour trips.

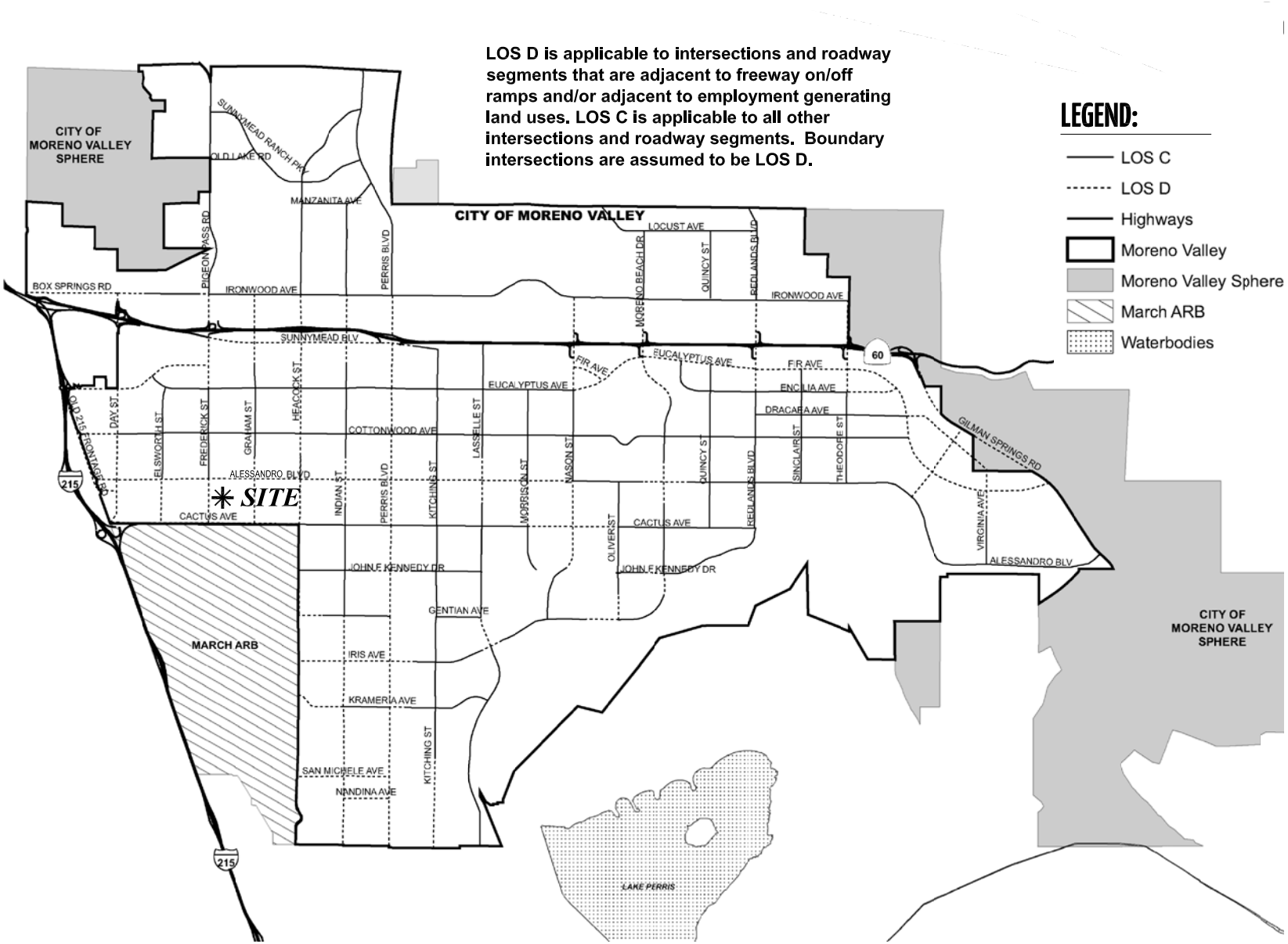
In the event that an intersection is operating at or is forecast to operate at a deficient LOS, the CMP guidelines have defined a series of steps to be completed to determine the Project's contribution to the deficiency of intersections, which has been applied to both CMP and non-CMP study area intersections. The steps are as follows:

- Determine the mitigation measures necessary to achieve an acceptable service level,
- Calculate the Project's share in the future traffic volume projections for the peak hours,
- Estimate the cost to implement recommended mitigation measures, and
- Calculate the Project's fair-share contribution to mitigate the Project's traffic impacts

Although the City of Moreno Valley does not have a delay-based significance threshold for peak hour intersection operations, a 1.0 second delay has been utilized for the purposes of this analysis for study area intersections operating at a deficient LOS under pre-project traffic conditions. Since the Project is not anticipated to contribute 50 or more peak hour trips to any of the study area intersections, the delay-based criteria was utilized to identify significant impacts. Most other agencies that use a delay-based significance threshold use a delay-based criteria of 1.0 to 5.0 seconds. In other words, a significant impact is identified if the addition of Project traffic results in an increase to the delay by 1.0 second or more over the pre-project condition when the intersection is operating at a deficient LOS for pre-project traffic conditions.

Lastly, the City of Moreno Valley also does not have a significance threshold for peak hour queues. For the purposes of this analysis, if the addition of Project traffic is found to have a less than significant impact to the peak hour operations, then a less than significant impact has also been identified for the peak hour queues at the same intersection. However, queuing results have been reported at the City's request.

EXHIBIT 2-1: CITY OF MORENO VALLEY LEVEL OF SERVICE (LOS) STANDARDS



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URBAN CROSSROADS

2.7 PROJECT FAIR SHARE CALCULATION METHODOLOGY

In cases where this TIA identifies that the Project would contribute to cumulatively considerable traffic deficiencies, Project fair share costs of improvements necessary to address those deficiencies have been identified. The Project's fair share is determined based on the following equation, which is the ratio of Project traffic to new traffic, where new traffic is total future (Horizon Year) traffic less existing baseline traffic:

Project Fair Share % = Project Traffic / (2040 With Project Total Traffic – Existing Traffic)

The Project fair share contribution calculations are presented in Section 1.5 *Local and Regional Funding Mechanisms* of this TIA.

3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Moreno Valley General Plan Circulation Network, and a review of existing peak hour intersection operations and traffic signal warrant analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the scoping agreement with City of Moreno Valley staff (Appendix 1.1), the study area includes a total of 8 existing and future intersections as shown previously on Exhibit 1-2 have been evaluated at the request of City staff. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF MORENO VALLEY GENERAL PLAN CIRCULATION ELEMENT

The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on the City of Moreno Valley General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the City of Moreno Valley General Plan Circulation Element, and Exhibit 3-3 illustrates the City of Moreno Valley General Plan roadway cross-sections.

3.3 TRUCK ROUTES

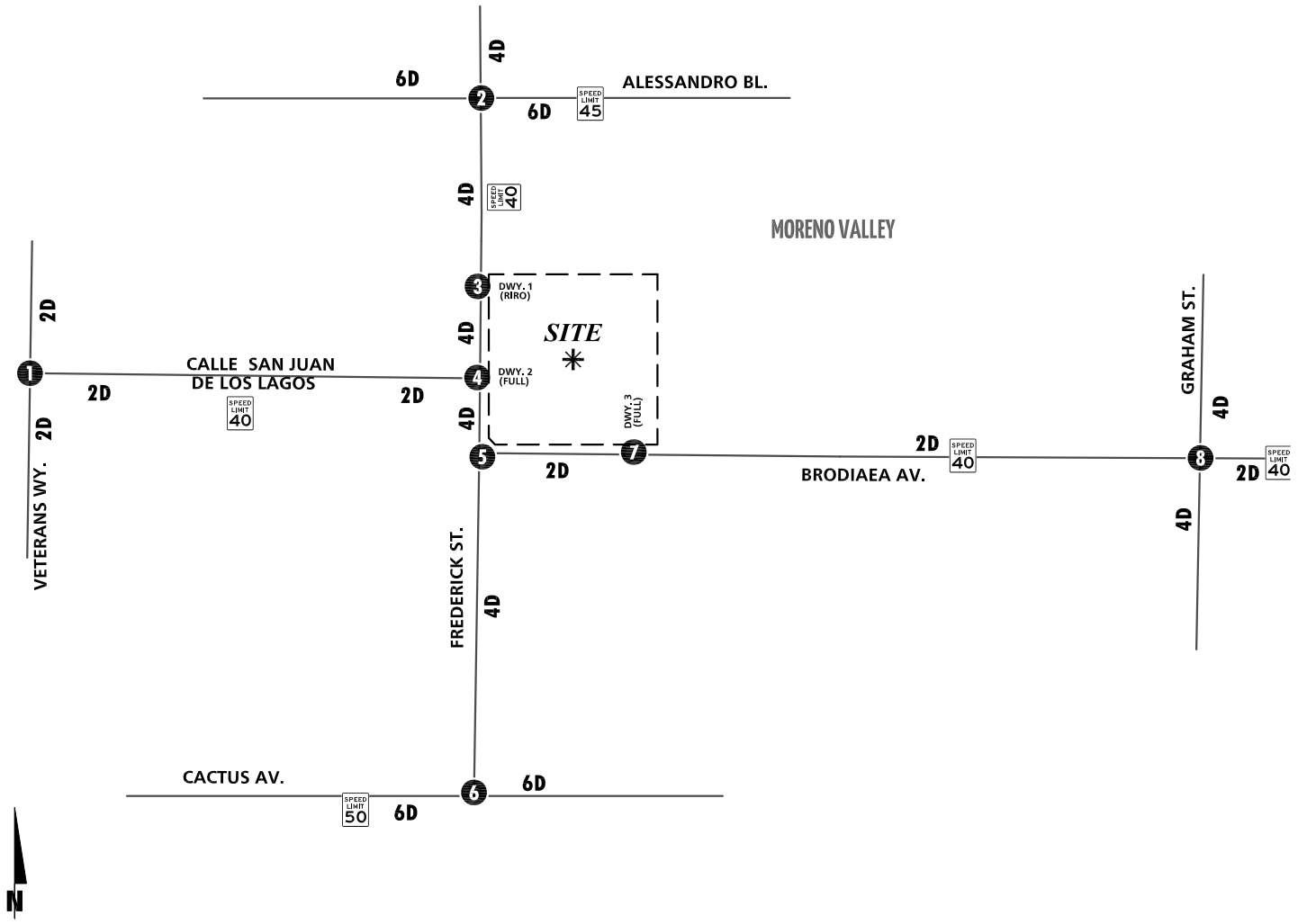
While the City of Moreno Valley's General Plan recognizes the trucking industry and the importance of the region's role in the movement of goods, there are no truck routes defined within the County. Exhibit 3-4 shows the existing truck routes throughout the City of Moreno Valley. Based on the exhibit, Frederick Street, Alessandro Boulevard, and Cactus Avenue are identified as truck routes within the study area.

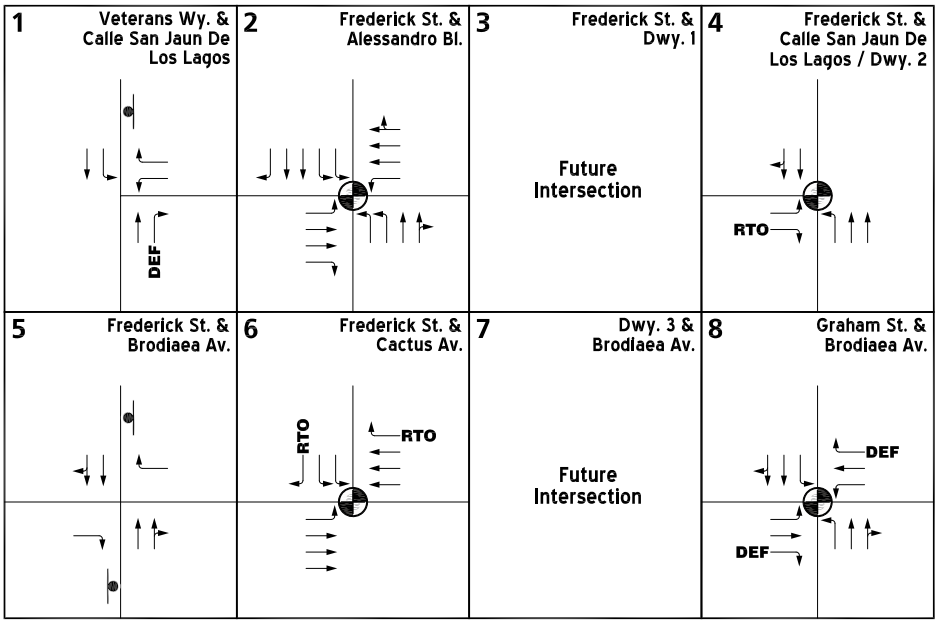
3.4 TRANSIT SERVICE

The study area is currently served by the Riverside Transit Authority (RTA), a public transit agency serving the unincorporated Riverside County region. As shown on Exhibit 3-5, RTA Route 11 serves Frederick Street and Cactus Avenue to the east of Frederick Street to southbound on Graham Street. RTA Route 20 serves Alessandro Boulevard within the study area.

Transit service is reviewed and updated by RTA periodically to address ridership, budget, and community demands Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. The Project is proposing to provide a bus turnout along its frontage on Frederick Street.

EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS





LEGEND:

- = TRAFFIC SIGNAL
- = STOP SIGN
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- RTO = RIGHT TURN OVERLAP
- DEF = DEFACTO RIGHT TURN
- SPEED LIMIT 25 = SPEED LIMIT (MPH)

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EXHIBIT 3-2: CITY OF MORENO VALLEY GENERAL PLAN CIRCULATION ELEMENT

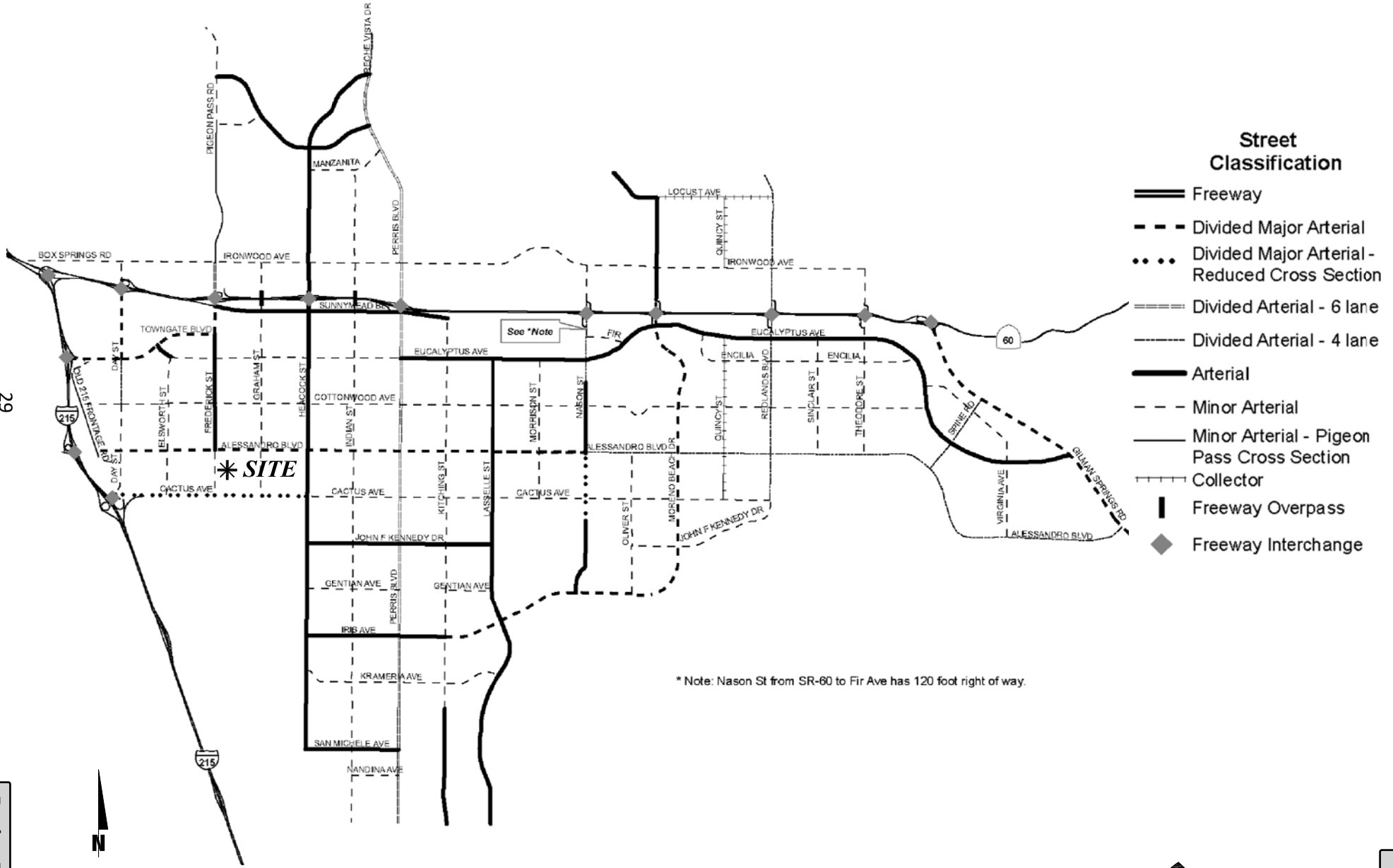

EXHIBIT 3-3: CITY OF MORENO VALLEY GENERAL PLAN ROADWAY CROSS-SECTIONS

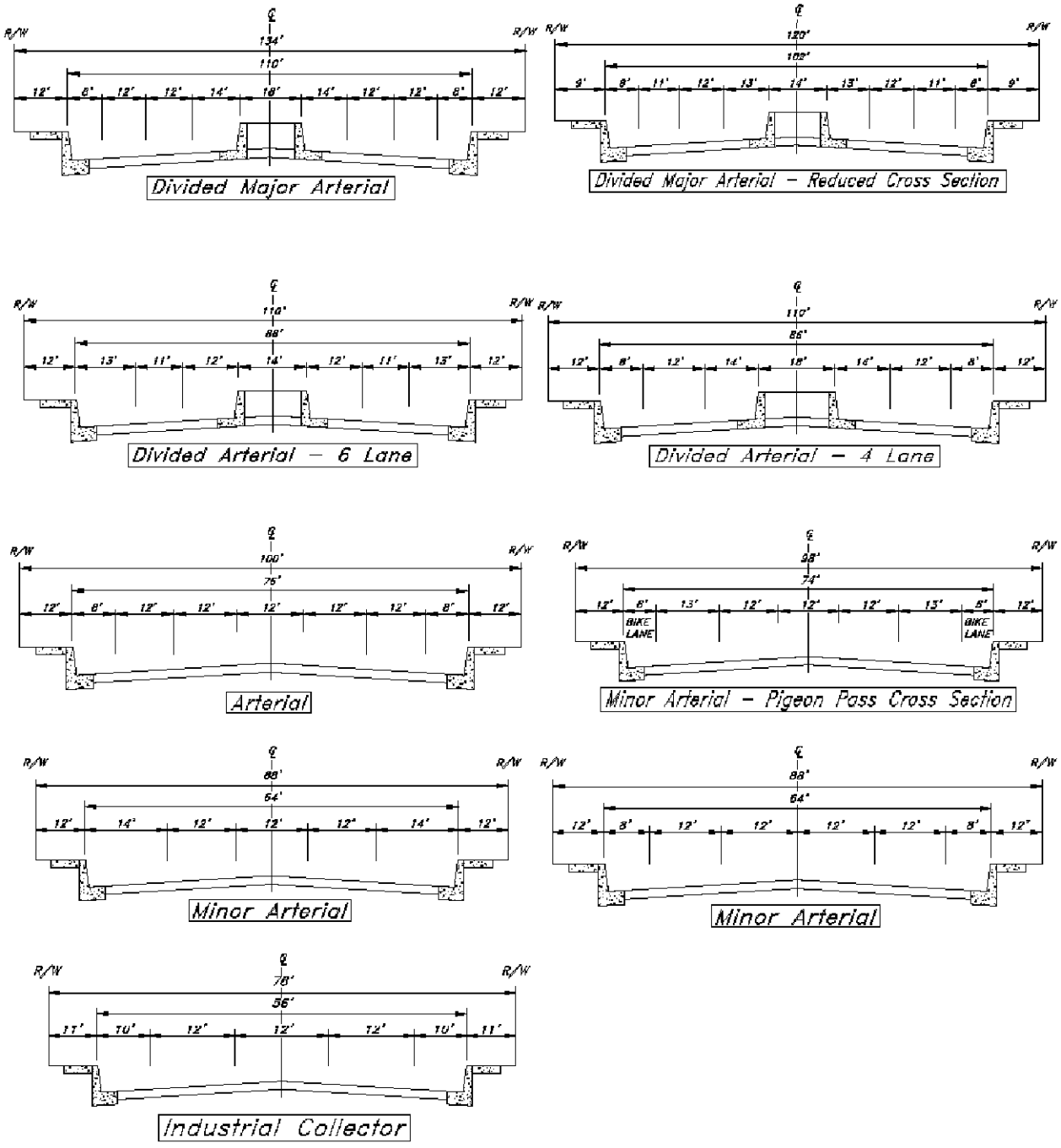

EXHIBIT 3-4: EXISTING TRUCK ROUTES

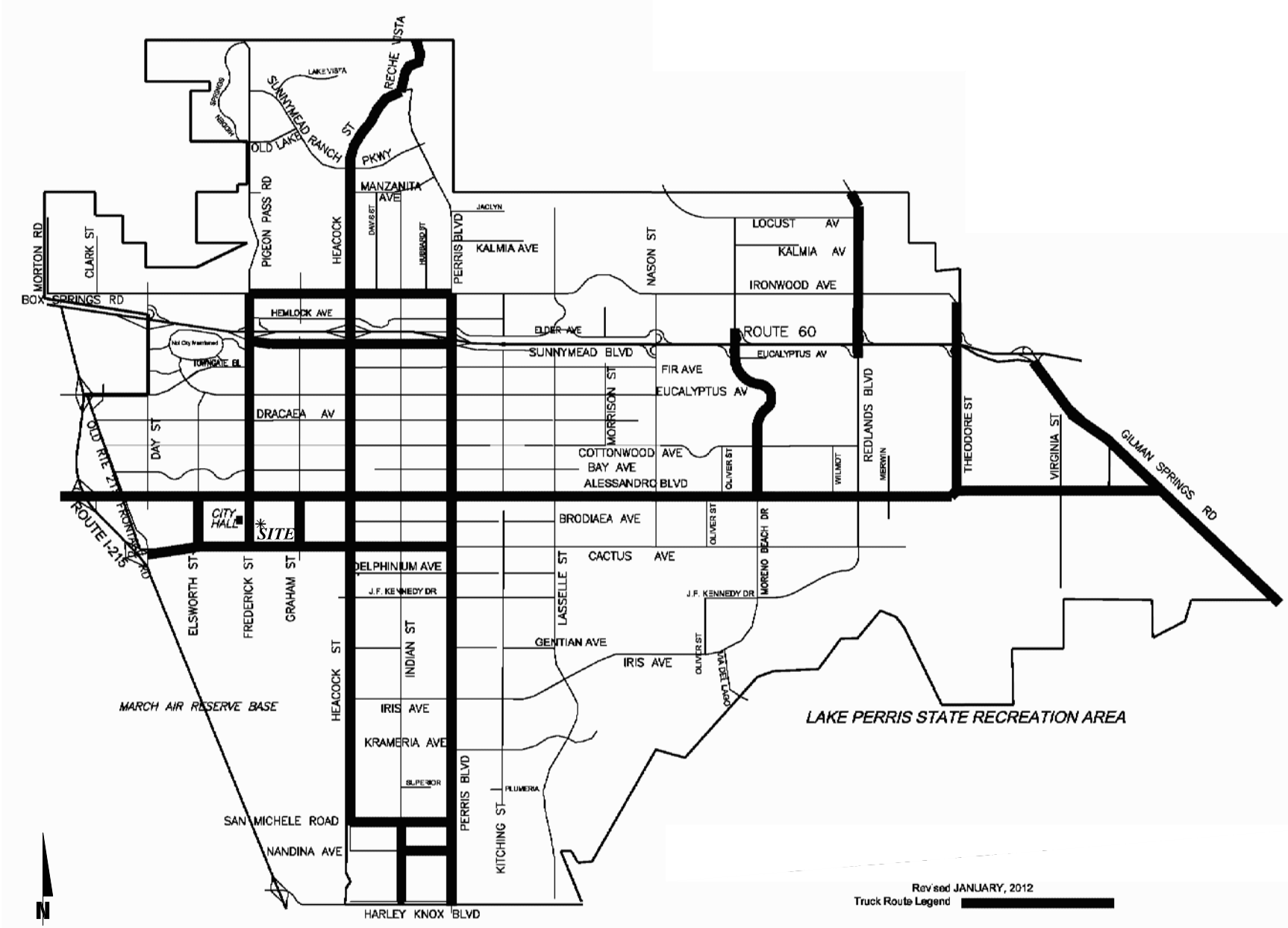

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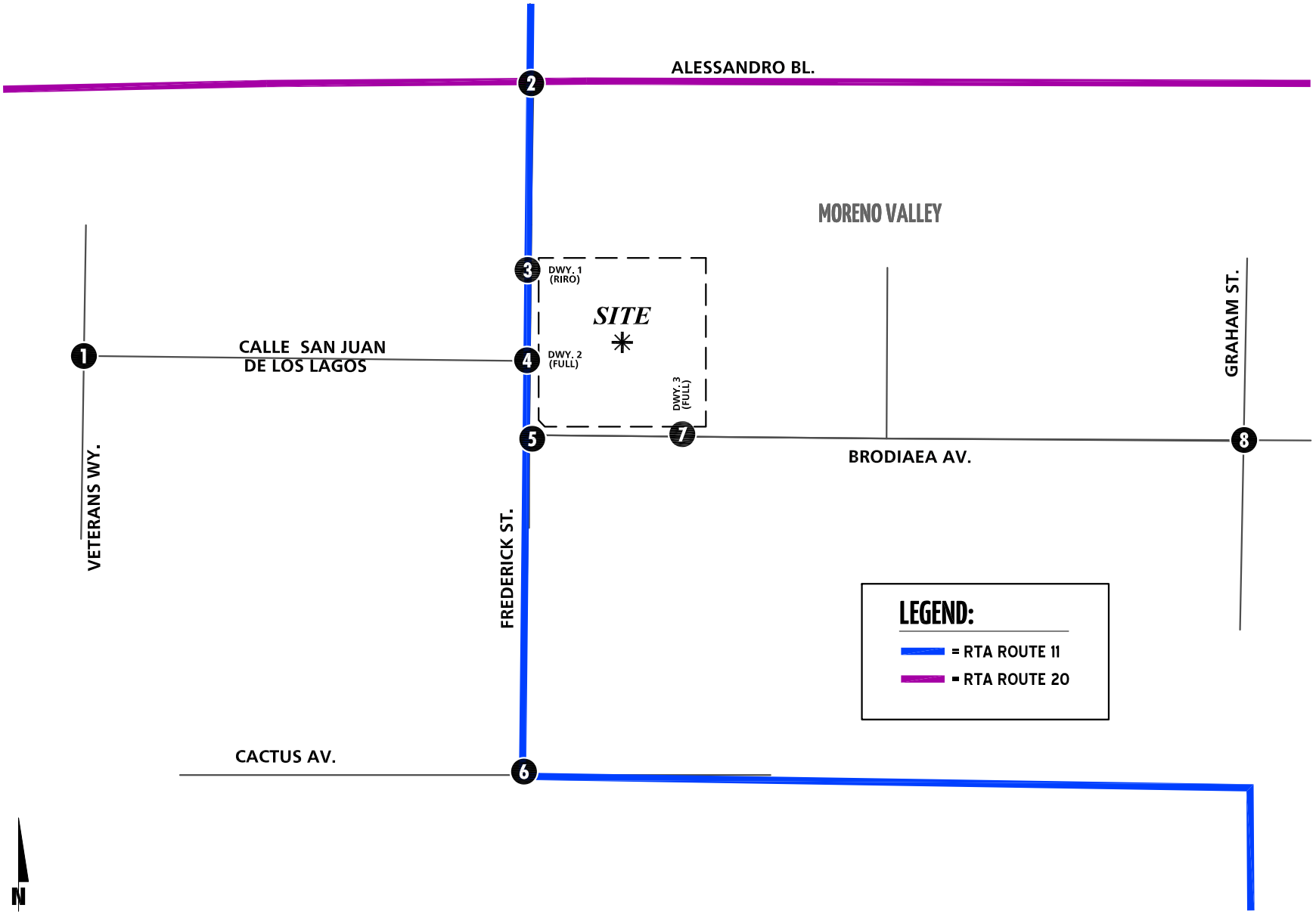
EXHIBIT 3-5: EXISTING TRANSIT ROUTES



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URBAN CROSSROADS

3.5 BICYCLE & PEDESTRIAN FACILITIES

In an effort to promote alternative modes of transportation, the City of Moreno Valley General Plan also includes a trails and bikeway system. The City of Moreno Valley trails and bikeway system are shown on Exhibit 3-6 and Exhibit 3-7. The Juan Bautista de Anza Class I Multi-Use Trail (previously the Aqueduct Multi-Use Trail) is located just east of the study area and runs in the north-south direction along Heacock Street. There are currently Class II bike lanes along Alessandro Boulevard, Frederick Street, and Cactus Avenue. Field observations conducted in September 2017 indicate nominal pedestrian and bicycle activity within the study area. Exhibit 3-8 illustrates the existing pedestrian facilities, including sidewalks and crosswalk locations, and the Class I trail and Class II bike lanes within the study area.

3.6 EXISTING (2018) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in April 2018. The following peak hours were selected for analysis:

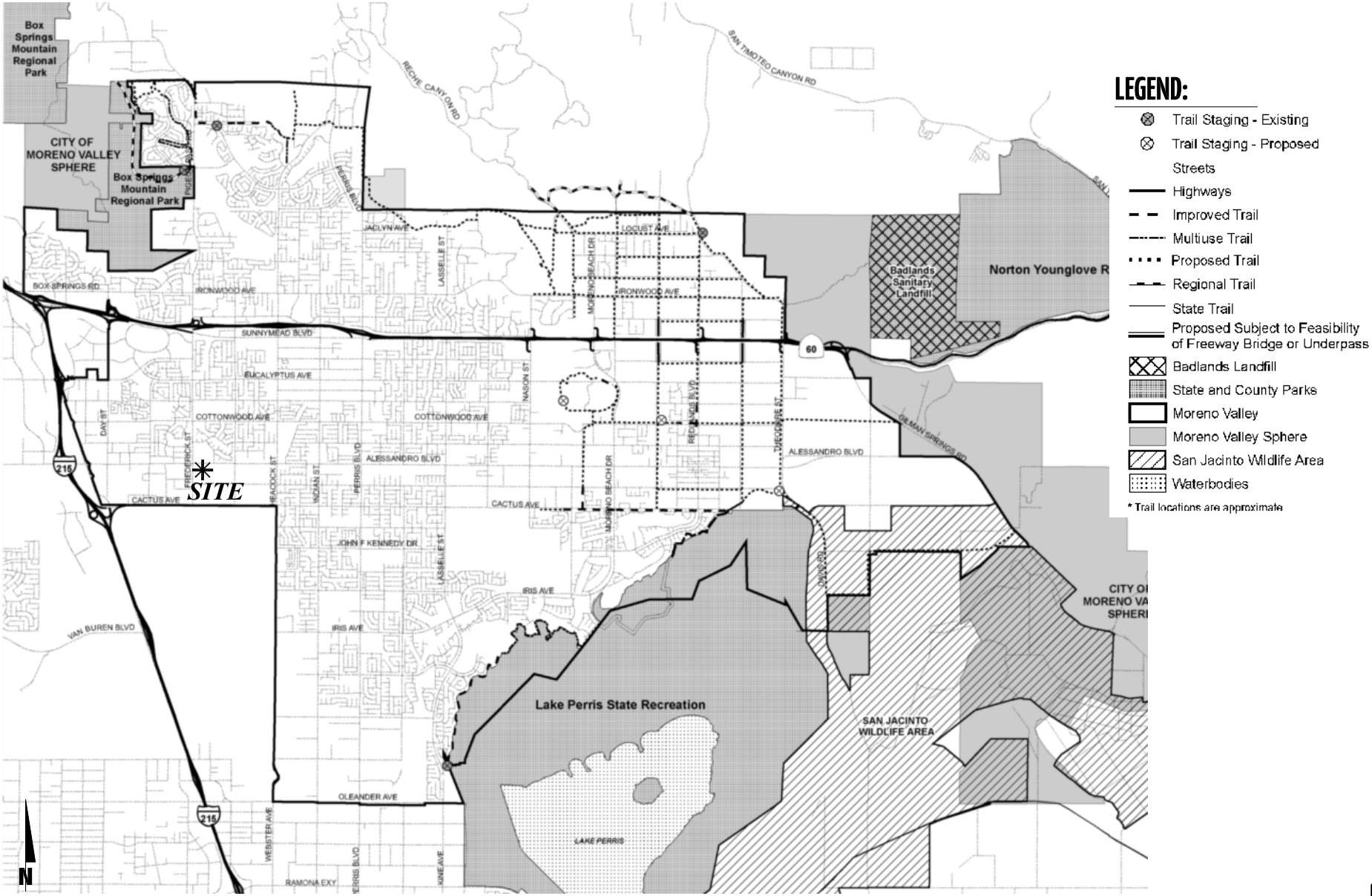
- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

The weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules.

The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. These raw turning volumes have been flow conserved between intersections with limited access, no access, and where there are currently no uses generating traffic (e.g., between ramp-to-arterial intersections, etc.). The traffic counts collected in April 2018 include the vehicle classifications as shown below:

- Passenger Cars
- 2-Axle Trucks
- 3-Axle Trucks
- 4 or More Axle Trucks

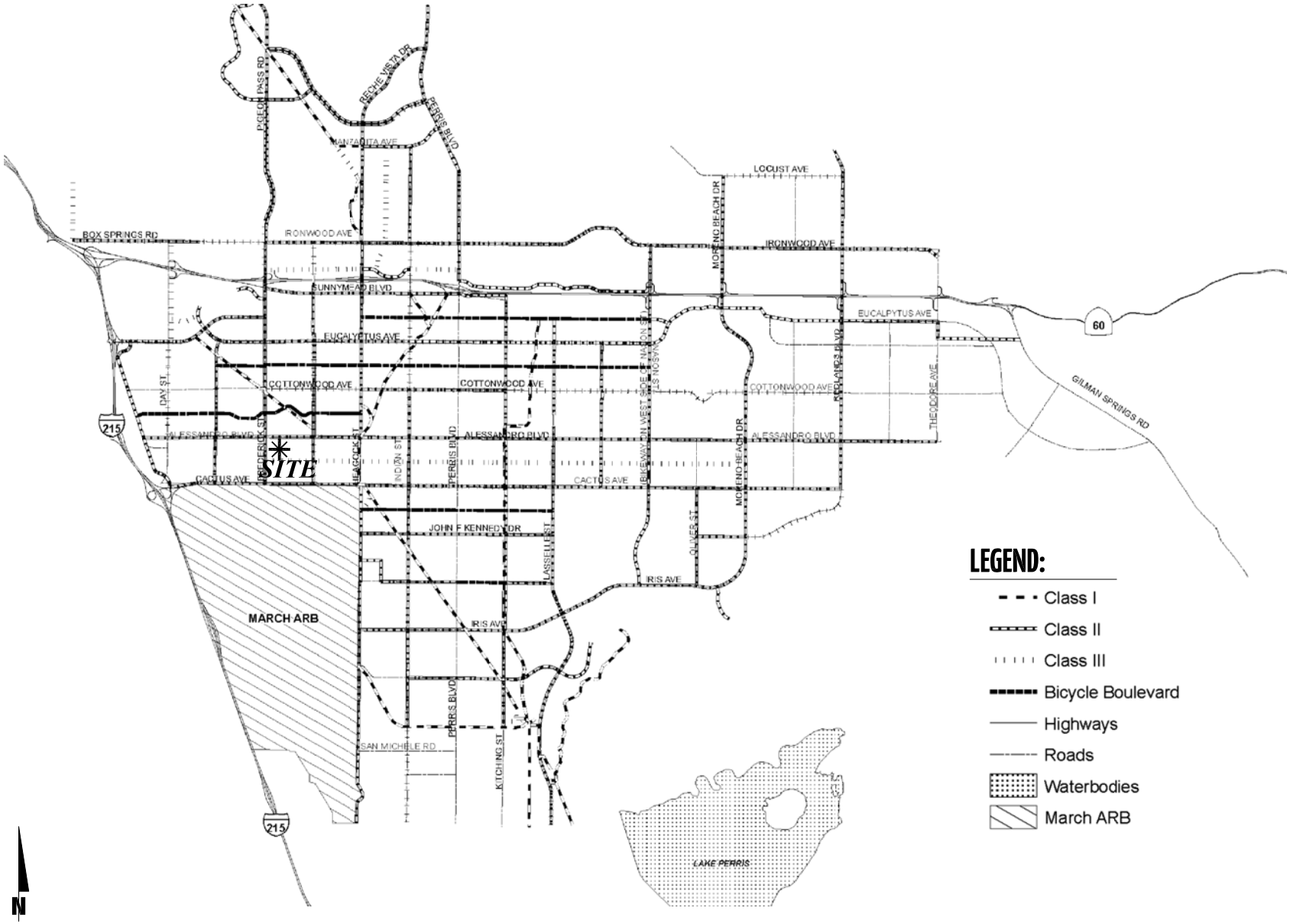
EXHIBIT 3-6: CITY OF MORENO VALLEY MASTER PLAN OF TRAILS



11410 - mv-trails.dwg

URBAN CROSSROADS

EXHIBIT 3-7: CITY OF MORENO VALLEY BIKE PLAN



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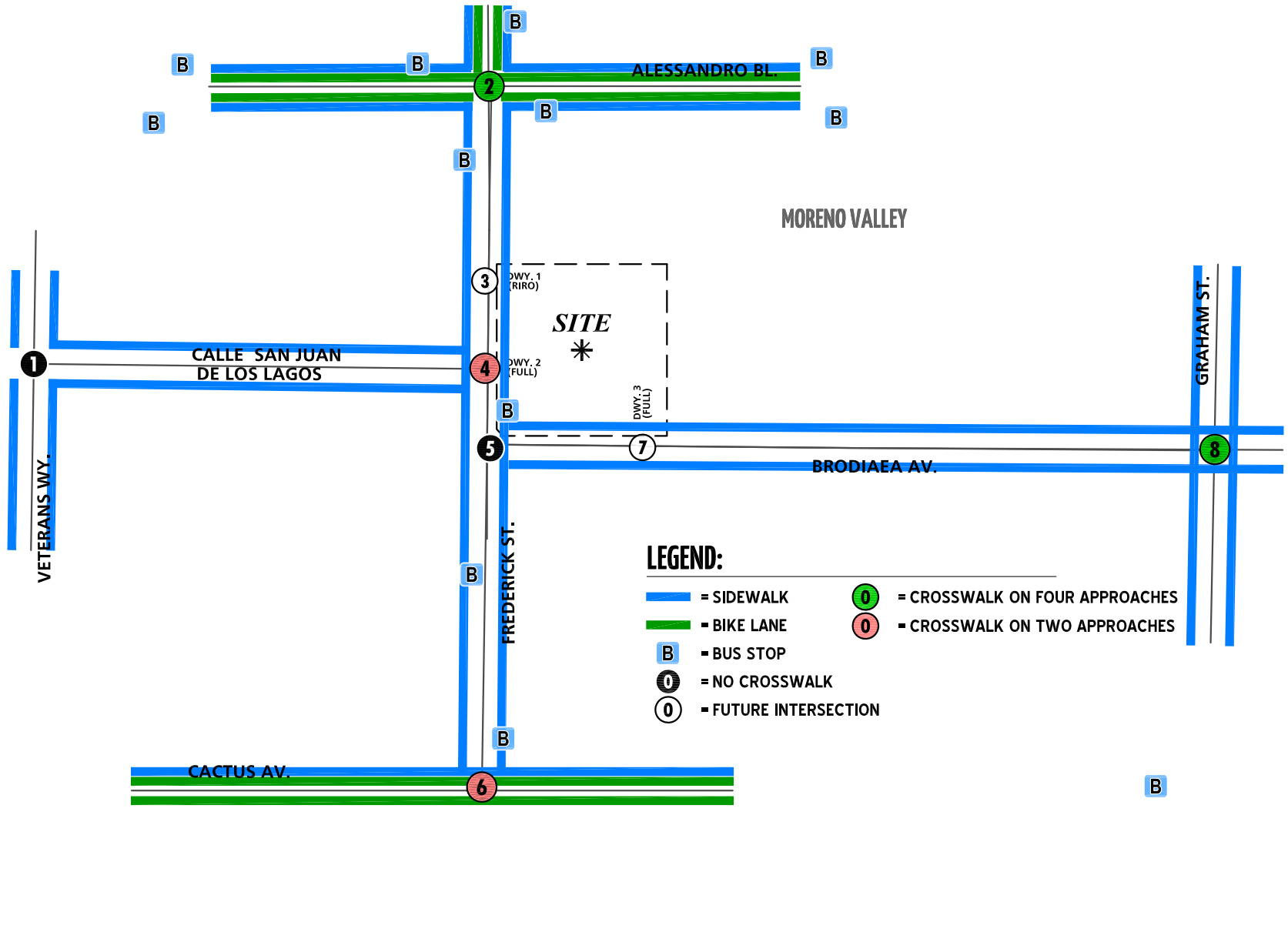
URBAN CROSSROADS

EXHIBIT 3-8: EXISTING PEDESTRIAN FACILITIES



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To represent the impact large trucks, buses, and recreational vehicles have on traffic flow, all trucks were converted into PCEs. By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is also much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For the purpose of this analysis, a PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks to estimate each turning movement. These factors are consistent with the values recommended for use in the San Bernardino County CMP and are in excess of the factor recommended for use in the County of Riverside traffic study guidelines. (7) Although the County of Riverside has a recommended PCE factor of 2.0, the San Bernardino County CMP PCE factors have been utilized in an effort to conduct a more conservative analysis.

Existing weekday average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-9. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 13.0298 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 7.67 percent. As such, the above equation utilizing a factor of 13.0298 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.67 percent (i.e., 1/0.0767 = 13.0298) and was assumed to sufficiently estimate average daily traffic (ADT) volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes (in PCE) are also shown on Exhibit 3-9.

3.7 INTERSECTION OPERATIONS ANALYSIS

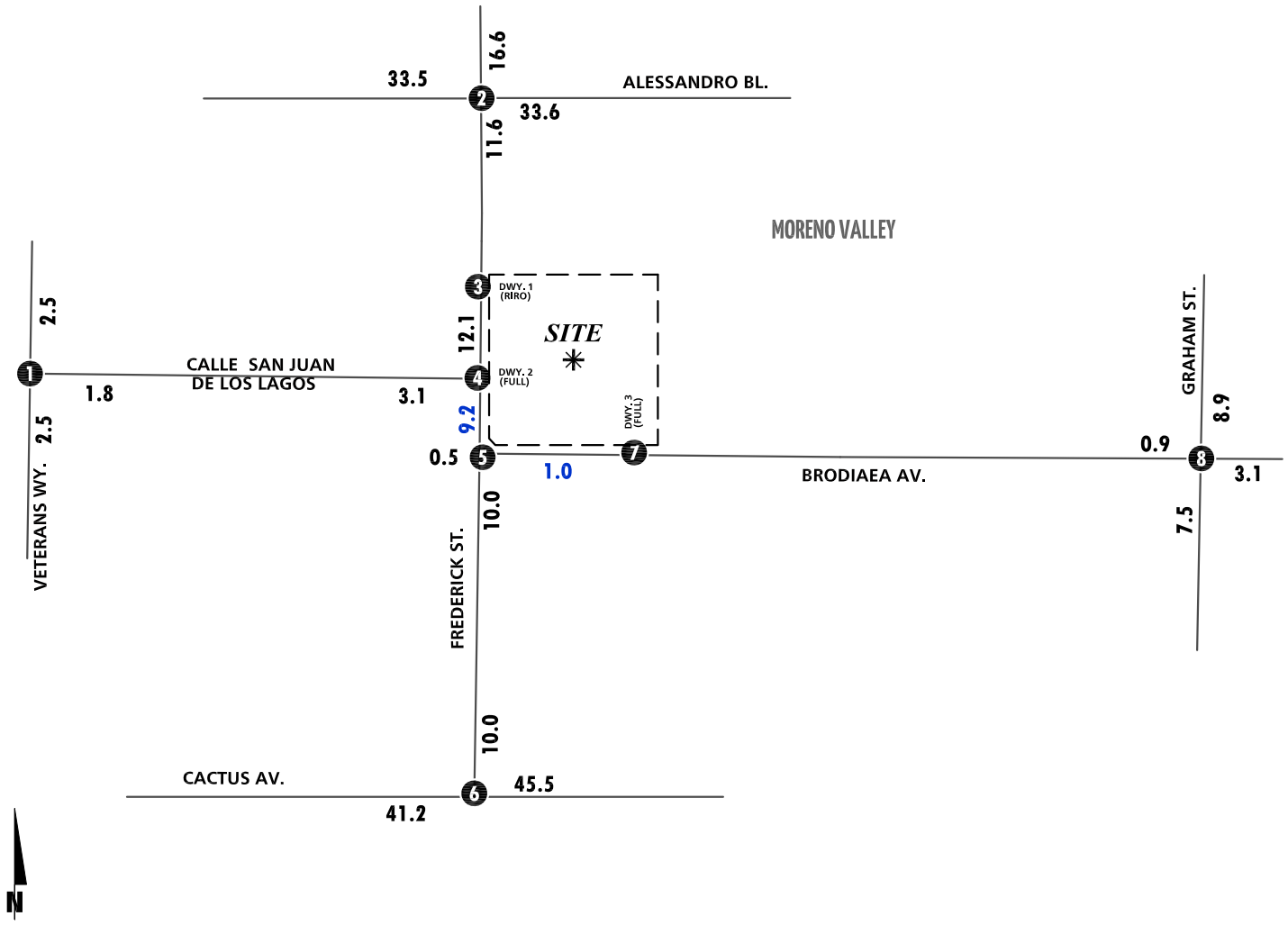
Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1 which indicates that the existing study area intersections are currently operating at an acceptable LOS during the peak hours (i.e., LOS C or better, or LOS D at City designated intersections).

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-10. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

3.8 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. No study area intersections currently warrant a traffic signal for Existing traffic conditions (see Appendix 3.3).

EXHIBIT 3-9: EXISTING (2018) TRAFFIC VOLUMES (IN PCE)



1 Veterans Wy. & Calle San Jaun De Los Lagos 31(45) 40(27) 22(42) 33(42) 50(78) 61(28)	**2** Frederick St. & Alessandro Bl. 186(118) 248(267) 99(262) 105(162) 1315(804) 75(59) 110(196) 436(1224) 35(136) 85(97) 218(267) 17(70)	**3** Frederick St. & Dwy. 1 Future Intersection	**4** Frederick St. & Calle San Jaun De Los Lagos / Dwy. 2 77(55) 256(432) 24(136) 12(25) 45(22) 306(304)	**5** Frederick St. & Brodiaea Av. 13(10) 255(447) 67(48) 5(28) 284(277) 8(18)
6 Frederick St. & Cactus Av. 83(139) 131(408) 147(141) 1681(969) 164(77) 972(1976)	**7** Dwy. 3 & Brodiaea Av. Future Intersection	**8** Graham St. & Brodiaea Av. 5(3) 241(266) 42(75) 75(68) 52(46) 20(20) 2(3) 6(11) 3(3) 3(3) 194(265) 18(22)		

LEGEND:

10.0 = ACTUAL (COUNT-BASED) VEHICLES PER DAY (1000'S)
10.0 = ESTIMATED VEHICLES PER DAY (1000'S)
10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

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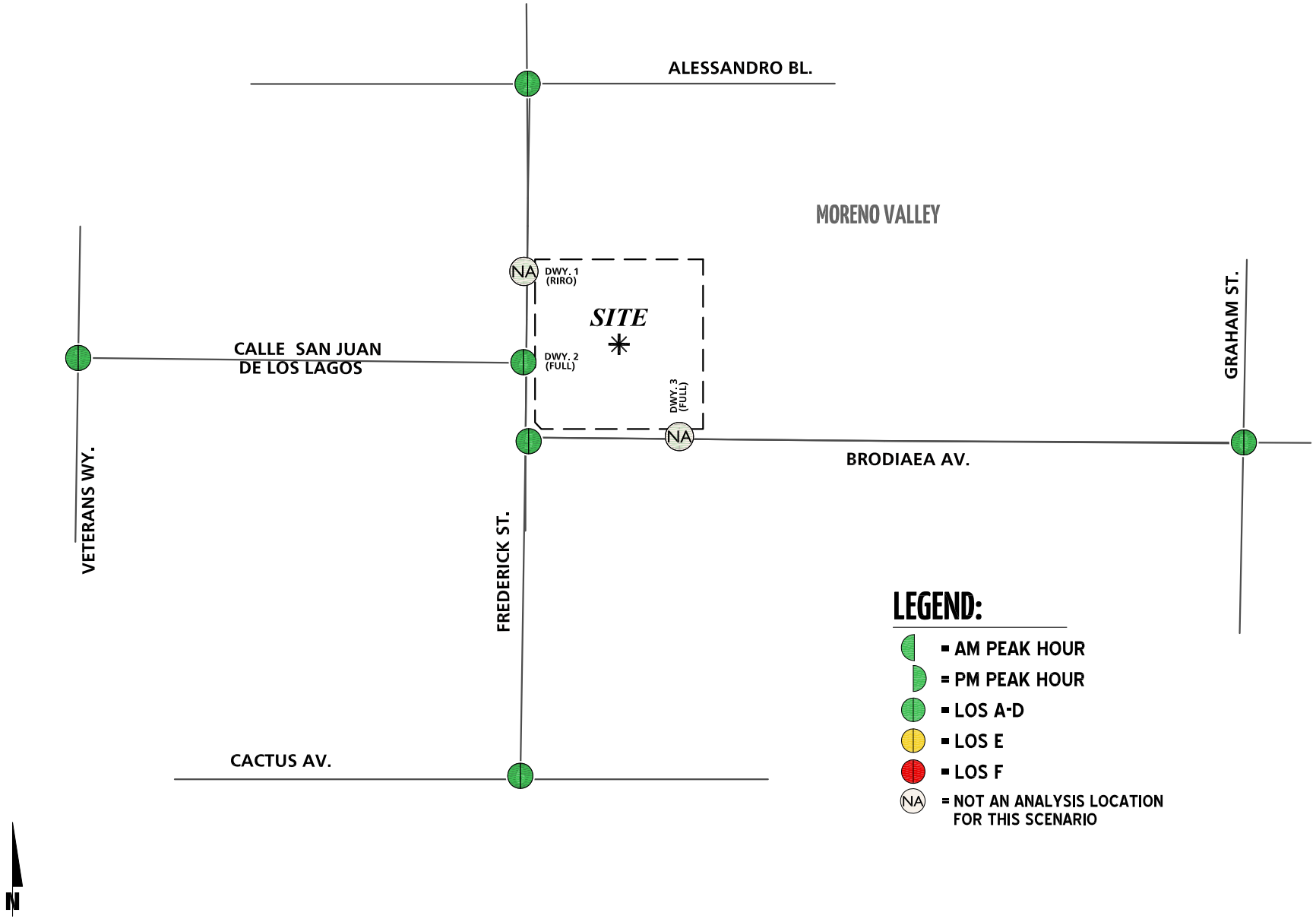
URBAN CROSSROADS

EXHIBIT 3-10: EXISTING (2018) SUMMARY OF LOS



11410 - los.dwg

URBAN CROSSROADS

Table 3-1

Intersection Analysis for Existing (2018) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Veterans Wy. & Calle San Juan de Los Lagos	CSS	0	1	d	1	1	0	0	0	0	1	0	1	9.7	9.7	A	A
2	Frederick St. & Alessandro Bl.	TS	2	2	0	2	2	1	1	2	1	1	3	0	38.8	48.6	D	D
3	Frederick St. & Driveway 1		Future Intersection															
4	Frederick St. & Calle San Juan de Los Lagos/Driveway 2	TS	1	2	0	0	2	0	1	0	1>	0	0	0	6.4	11.7	A	B
5	Frederick St. & Brodiaea Av.	CSS	0	2	0	0	2	0	0	0	1	0	0	1	9.6	10.0	A	B
6	Frederick St. & Cactus Av.	TS	0	0	0	2	0	1>	1	3	0	0	3	1>	14.1	12.1	B	B
7	Driveway 3 & Brodiaea Av.		Future Intersection															
8	Graham St. & Brodiaea Av.	TS	1	2	0	1	2	0	1	1	d	1	1	d	13.2	13.3	B	B

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes

L = Left; T = Through; R = Right; d = Defacto Right-Turn Lane; > = Right-Turn Overlap Phasing

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross-Street Stop

3.9 QUEUING ANALYSIS

A queuing analysis was conducted for all study area intersections to determine 95th percentile queues during the peak hours. The queuing analysis results are summarized on Table 3-2 for Existing (2018) traffic conditions, which indicates that the following movements currently experience queuing issues based on the 95th percentile peak hour traffic flows:

- Frederick Street & Alessandro Boulevard, southbound left turn lane (PM peak hour only)
- Frederick Street & Alessandro Boulevard, eastbound left turn lane (PM peak hour only)
- Frederick Street & Alessandro Boulevard, westbound left turn lane (AM peak hour only)

Queuing worksheets for Existing (2018) traffic conditions are included in Appendix 3.4.

3.10 RECOMMENDED IMPROVEMENTS

All study area intersections are currently operating at acceptable LOS (LOS C or better, or LOS D at City designated intersections) for Existing (2018) traffic conditions. As such, no intersection improvements have been recommended.

Table 3-2

Peak Hour Queuing Summary for Existing Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
Veterans Wy. & Calle San Juan de Los Lagos	NBR	1,050	3	0	Yes	Yes
	SBL	115	16	14	Yes	Yes
	WBL	100	37	41	Yes	Yes
	WBR	380	26	31	Yes	Yes
Frederick St. & Alessandro Bl.	NBL	135	52	56	Yes	Yes
	NBL	135	69	76	Yes	Yes
	SBL	120	73	**202**	Yes	**No**
	SBL	120	123	**230**	Yes[3]	Yes[2]
	SBR	100	107	65	Yes[3]	Yes
	EBL	250	139	**373**	Yes	**No**
	EBR	1,600	23	52	Yes	Yes
	WBL	130	**213**	138	**No**	Yes[3]
Frederick St. & Calle San Juan de Los Lagos/Driveway 2	NBL	150	63	53	Yes	Yes
	EBL	120	45	128	Yes	Yes[3]
Frederick St. & Brodiaea Av.	WBR	490	46	45	Yes	Yes
Frederick St. & Cactus Av.	SBL	140	66	149	Yes	Yes[2]
	SBL	810	83	172	Yes	Yes
	SBR	810	59	67	Yes	Yes
	EBL	300	145	90	Yes	Yes
	WBR	265	52	49	Yes	Yes
Graham St. & Brodiaea Av.	NBL	160	12	13	Yes	Yes
	SBL	150	53	61	Yes	Yes
	EBL	210	10	17	Yes	Yes
	EBR	180	16	13	Yes	Yes
	WBL	150	43	42	Yes	Yes
	WBR	180	45	45	Yes	Yes

* **BOLD** = Queue length exceeds available stacking distance.

NOTE: The Project is anticipated to contribute less than 50 peak hour trips to the study area intersections. As such, the Project's impact to the identified queuing issues are less than significant.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, however, there is sufficient storage within the striped median for vehicles to continue to stack without blocking the adjacent through lane.

[3] An additional 15 feet of stacking, which is assumed to be provided in the transition for turn pockets, is reflected in the stacking distance shown on this table, where applicable.

4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment, onto the study area roadway network. The Project has been evaluated to consist of up to 163,218 sf of warehouse (without cold storage) use (80 percent of the total square footage) and 40,804 sf of general light industrial use (20 percent of the total square footage) for a total of 204,022 sf within a single building. Per the City's traffic study guidelines, the Opening Year Cumulative will have a 5-year minimum horizon from baseline conditions. As such, the Opening Year Cumulative analysis will assess 2023 traffic conditions.

Vehicular and truck traffic access will be provided via the following driveways (see Exhibit 1-1):

- Driveway 1 & Frederick St. – Right-in right-out only (trucks only)
- Frederick St. & Calle San Juan de Los Lagos/Driveway 2 – Full access driveway (passenger cars only)
- Driveway 3 & Brodiaea Av. – Full access driveway (both passenger cars and trucks)

Regional access to the Project site is provided via the I-215 Freeway at Alessandro Boulevard and Cactus Avenue interchanges.

4.1 PROJECT TRIP GENERATION

4.1.1 PROPOSED PROJECT

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. The ITE Trip Generation Manual is a nationally recognized source for estimating site-specific trip generation. ITE's most current version of the Trip Generation Manual is based on more than 4,800 trip generation studies submitted to ITE by public agencies, consulting firms, universities/colleges, developers, associations, and local sections/districts/student chapters of ITE. (2)

The ITE Trip Generation Manual includes data regarding the types of vehicles that are generated (passenger cars and trucks), but provides no guidance on vehicle mix (different sizes of trucks). While trucks, as a percentage of total traffic, has been based on the ITE Trip Generation Handbook, data regarding the specific truck mix has been obtained from a separate report: The South Coast Air Quality Management District's (SCAQMD) Warehouse Truck Trip Study Data Results and Usage recommended truck mix. (8) (9) The ITE Trip Generation Handbook identifies a breakdown of trips between passenger cars (80 percent) and trucks (20 percent). The SCAQMD is currently recommending the use of the ITE Trip Generation Manual in conjunction with their truck mix by axle-type to better quantify trip rates associated with local warehouse and distribution projects, as truck emission represent more than 90 percent of air quality impacts from these projects. This recommended procedure has been utilized for the purposes of this analysis for the Warehousing use (ITE land use code 150) in effort to be consistent with other technical studies prepared for the Project.

Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 3 different truck types: 2-axle, 3-axle, and 4+-axle trucks. For the purposes of this analysis, the percentage of trucks, by axle type, were obtained from the SCAQMD interim recommended truck mix. The SCAQMD has recently performed surveys of existing facilities and compiled the data to provide interim guidance on the mix of heavy trucks for these types of warehousing facilities. Based on this interim guidance from the SCAQMD, the following truck fleet mix was utilized for the purposes of estimating the truck trip generation for the site: 16.7% of the total trucks as 2-axle trucks, 20.7% of the total trucks as 3-axle trucks, and 62.5% of the total trucks as 4+-axle trucks.

The ITE Trip Generation Manual and the ITE Trip Generation Handbook does not provide a vehicle mix for the General Light Industrial (ITE land use code 110) land use. As such, the vehicle mix identified in the City of Fontana Truck Trip Generation Study has been utilized for the General Light Industrial land use. (10)

Lastly, PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCE factors are consistent with the recommended PCE factors in Appendix B of the San Bernardino County CMP, 2016 Update (i.e., 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks). Although the County of Riverside has a recommended PCE factor of 2.0, the San Bernardino County CMP PCE factors have been utilized in an effort to conduct a more conservative analysis as the resulting PCE trip generation is higher.

Trip generation rates used to estimate Project traffic are shown in Table 4-1 for PCE and Table 4-2 for actual vehicles. A summary of the Project's trip generation is also shown on Table 4-1 for PCE and Table 4-2 for actual vehicles. For purposes of this analysis, ITE land use code 150 (Warehousing) and ITE land use code 110 (General Light Industrial) have been used to derive site specific trip generation estimates. In order to accurately reflect the impact that heavy trucks would have on the street system, Project trips have been further broken down between passenger cars and trucks for each of the peak hours and weekday daily trip generation.

As directed by the City of Moreno Valley and consistent with standard traffic engineering practice in Southern California, PCE factors have been utilized due to the expected heavy truck component for the proposed Project uses. PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. These PCE factors are consistent with the values recommended by the San Bernardino County CMP and are accepted factors in the City of Moreno Valley. (7) A PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks.

As shown on Table 4-1, the proposed project is estimated to generate a net total of 629 passenger-car-equivalent (PCE) trip-ends per day on a typical weekday with approximately 72 net AM PCE peak hour trips and 74 net PM PCE peak hour trips.

Table 4-1

Project Trip Generation Summary (PCE)

Land Use	ITE LU Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Rates[1]									
General Light Industrial[3]	110	TSF	0.616	0.084	0.700	0.082	0.548	0.630	4.960
Passenger Cars (78.6%)			0.484	0.066	0.550	0.064	0.431	0.495	3.899
2-Axle Trucks (8.0%) (PCE = 1.5)[5]			0.074	0.010	0.084	0.010	0.066	0.076	0.595
3-Axle Trucks (3.9%) (PCE = 2.0)[5]			0.048	0.007	0.055	0.006	0.043	0.049	0.387
4-Axle+ Trucks (9.5%) (PCE = 3.0)[5]			0.176	0.024	0.200	0.023	0.156	0.180	1.414
Warehousing Without Cold Storage[3,4]	150	TSF	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.00%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%) (PCE = 1.5)[5]			0.007	0.002	0.009	0.003	0.007	0.010	0.087
3-Axle Trucks (4.14%) (PCE = 2.0)[5]			0.011	0.003	0.014	0.004	0.011	0.016	0.144
4-Axle+ Trucks (12.52%) (PCE = 3.0)[5]			0.049	0.015	0.064	0.019	0.052	0.071	0.654

Project	Quantity	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Summary									
Centerpointe									
General Light Industrial (20%)	40.804	TSF							
Passenger Cars:			20	3	23	3	18	21	159
Truck Trips:									
2-axle:			3	0	3	0	3	3	24
3-axle:			2	0	2	0	2	2	16
4+-axle:			7	1	8	1	6	7	58
- Net Truck Trips (PCE)			*12*	*1*	*13*	*1*	*11*	*12*	*98*
Warehousing Without Cold Storage (80%)	163.218	TSF							
Passenger Cars:			17	5	22	7	18	25	227
Truck Trips:									
2-axle:			1	0	1	0	1	1	14
3-axle:			2	1	3	1	2	3	24
4+-axle:			8	2	10	3	9	12	107
- Net Truck Trips (PCE)			*11*	*3*	*14*	*4*	*12*	*16*	*145*
TOTAL NET TRIPS (PCE)			***60***	***12***	***72***	***15***	***59***	***74***	***629***

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[2] TSF = Thousand Square Feet

[3] Vehicle Mix Source: City of Fontana Truck Trip Generation Study, August 2003.

[4] Truck Mix Source: SCAQMD Warehouse Truck Trip Study Data Results and Usage (2014).

Normalized % - Without Cold Storage:

16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.5% 4-Axle trucks

[5] PCE rates are per SBCTA (more conservative than Riverside County).

Table 4-2

Project Trip Generation Summary (Actual Vehicles)

Land Use	ITE LU Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Rates (Actual Vehicles)[1]									
General Light Industrial[3]	TSF	110	0.616	0.084	0.700	0.082	0.548	0.630	4.960
Passenger Cars (78.6%)			0.484	0.066	0.550	0.064	0.431	0.495	3.899
2-Axle Trucks (8.0%)			0.049	0.007	0.056	0.007	0.044	0.050	0.397
3-Axle Trucks (3.9%)			0.024	0.003	0.027	0.003	0.021	0.025	0.193
4-Axle+ Trucks (9.5%)			0.059	0.008	0.067	0.008	0.052	0.060	0.471
Warehousing Without Cold Storage[3,4]	150	TSF	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.00%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%)			0.004	0.001	0.006	0.002	0.005	0.006	0.058
3-Axle Trucks (4.14%)			0.005	0.002	0.007	0.002	0.006	0.008	0.072
4-Axle+ Trucks (12.52%)			0.016	0.005	0.021	0.006	0.017	0.024	0.218

Project	Quantity	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Summary									
Centerpointe									
General Light Industrial (20%)	40.804	TSF							
Passenger Cars:			20	3	23	3	18	21	159
Truck Trips:									
2-axle:			2	0	2	0	2	2	16
3-axle:			1	0	1	0	1	1	8
4+-axle:			2	0	2	0	2	2	19
- Net Truck Trips (Actual)			*5*	*0*	*5*	*0*	*5*	*5*	*43*
Warehousing Without Cold Storage (80%)	163.218	TSF							
Passenger Cars:			17	5	22	7	18	25	227
Truck Trips:									
2-axle:			1	0	1	0	1	1	9
3-axle:			1	0	1	0	1	1	12
4+-axle:			3	1	4	1	3	4	36
- Net Truck Trips (Actual)			*5*	*1*	*6*	*1*	*5*	*6*	*57*
TOTAL NET TRIPS (Actual)			***47***	***9***	***56***	***11***	***46***	***57***	***486***

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[2] TSF = Thousand Square Feet

[3] Vehicle Mix Source: City of Fontana Truck Trip Generation Study, August 2003.

[4] Truck Mix Source: SCAQMD Warehouse Truck Trip Study Data Results and Usage (2014).
Normalized % - Without Cold Storage:
16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.5% 4-Axle trucks

4.1.2 COMPARISON BETWEEN EXISTING AND PROPOSED LAND USES

Under the currently adopted City of Moreno Valley General Plan, the land use for the northeast corner of Frederick Street and Brodiaea Avenue is designated as Office. The proposed Project land use is Light Industrial. Based on a review of the City of Moreno Valley Municipal Code (Section 9.02.020), the most conservative allowable use was determined to be the medical-dental office use. Table 4-3 summarizes the trip generation for the medical-dental office land use in comparison to the proposed Project trip generation previously summarized on Table 4-1. As shown in Table 4-3, the proposed Project will result in a reduction of 2,048 PCE daily trips, with a reduction in 255 PCE AM trips and 246 PCE PM trips. As such, there would be an overall reduction to the trip generation with the proposed Project.

4.2 PROJECT TRIP DISTRIBUTION

Trip distribution is the process of identifying the probable destinations, directions, or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered to identify the route where the Project traffic would distribute.

The Project trip distribution was developed based on anticipated travel patterns to and from the Project site for both passenger cars and truck traffic. The truck trip distribution patterns have been developed based on the anticipated travel patterns for trucks and the truck routes within the vicinity of the Project. The Project trip distribution patterns for both passenger cars and trucks were developed based on an understanding of existing travel patterns in the area, the geographical location of the site, and the site's proximity to the regional arterial and state highway system.

The passenger car trip distribution patterns utilized for the purposes of this analysis are shown on Exhibit 4-1 and truck trip distribution patterns are shown on Exhibit 4-2. In an effort to conduct a conservative analysis, the PCE trip generation for the proposed Project has been utilized to determine if the 50 peak hour trip criteria has been met at the study area intersections.

4.3 MODAL SPLIT

The traffic reducing potential of public transit, walking, or bicycling have not been considered in this TIA. Essentially, the traffic projections are "conservative" in that these alternative travel modes might be able to reduce the forecasted traffic volumes (employee trips only).

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-3 in PCE.

Table 4-3

Trip Generation Comparison Between Adopted Land Use and Proposed Land Use (PCE)

Land Use	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Currently Adopted Land Use Trip Generation Summary									
Medical-Dental Office[1,3]	TSF	270	2.17	0.61	2.78	0.97	2.49	3.46	34.80
Adopted Land Use Designation	TSF	229.474	498	140	638	222	572	794	7,986
CURRENTLY ADOPTED LAND USE TOTAL NET TRIPS			***498***	***140***	***638***	***222***	***572***	***794***	***7,986***
PROPOSED PROJECT TOTAL NET TRIPS[4] (PCE)			***60***	***12***	***72***	***15***	***59***	***74***	***629***
Trip Generation Comparison									
VARIANCE (PROJECT - ADOPTED)			***-438***	***-128***	***-566***	***-207***	***-513***	***-720***	***-7,357***

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[2] TSF = thousand square feet

[3] Medical-Dental Office assumed to currently be the most conservative allowable use.

[4] Project trip generation (in PCE) from Table 4-1.

EXHIBIT 4-1: PROJECT (PASSENGER CAR) TRIP DISTRIBUTION

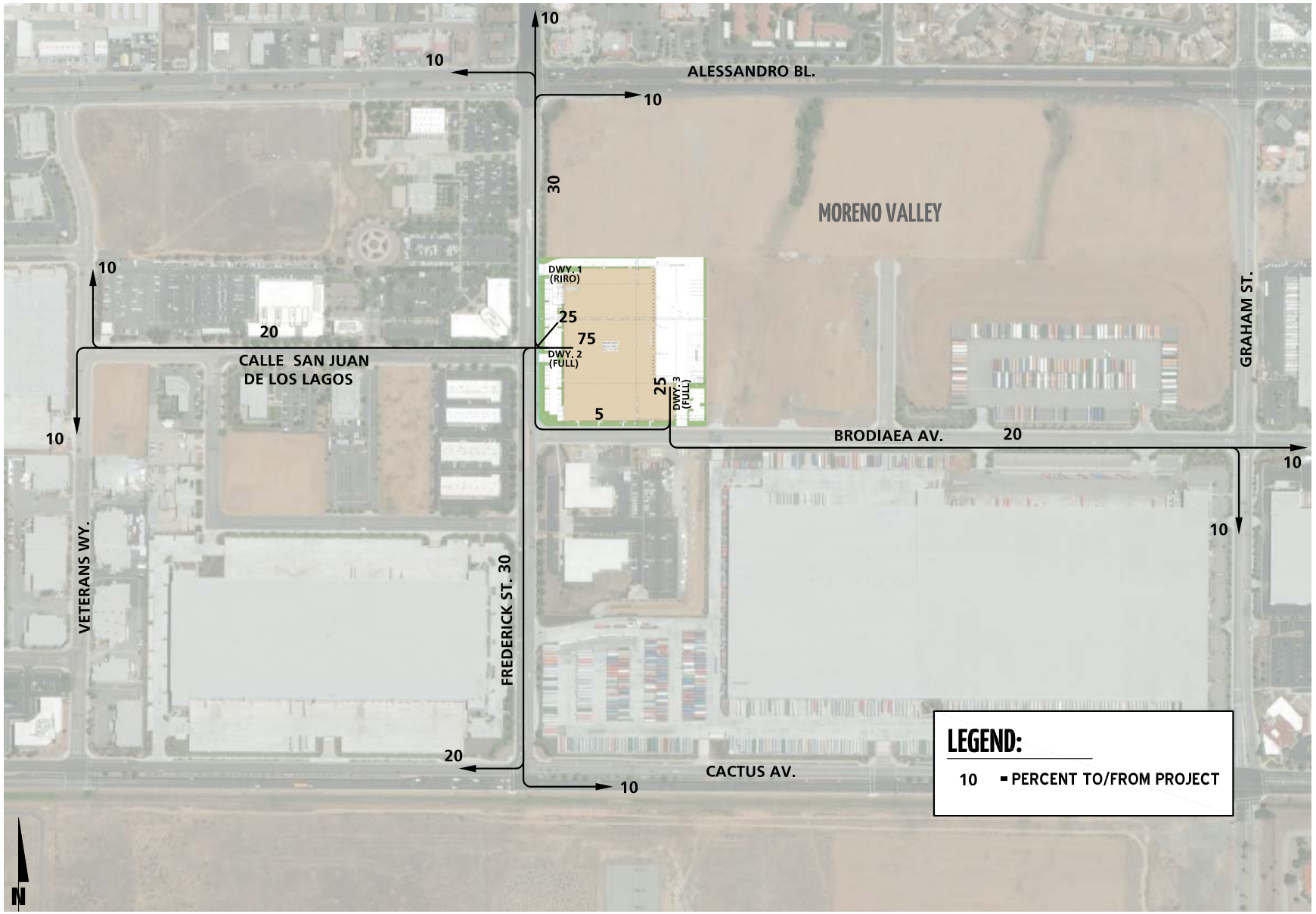


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EXHIBIT 4-2: PROJECT (TRUCKS) TRIP DISTRIBUTION

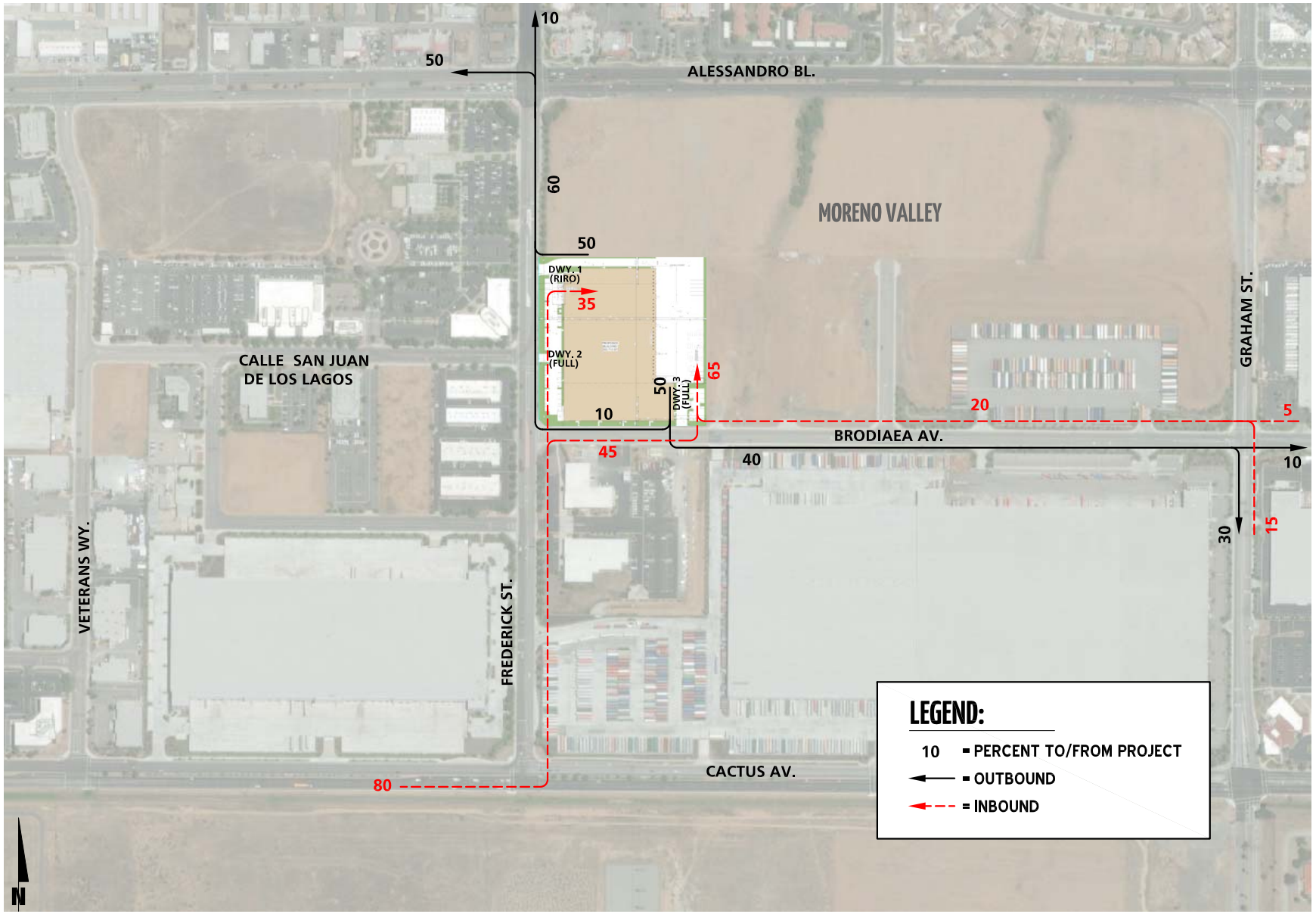

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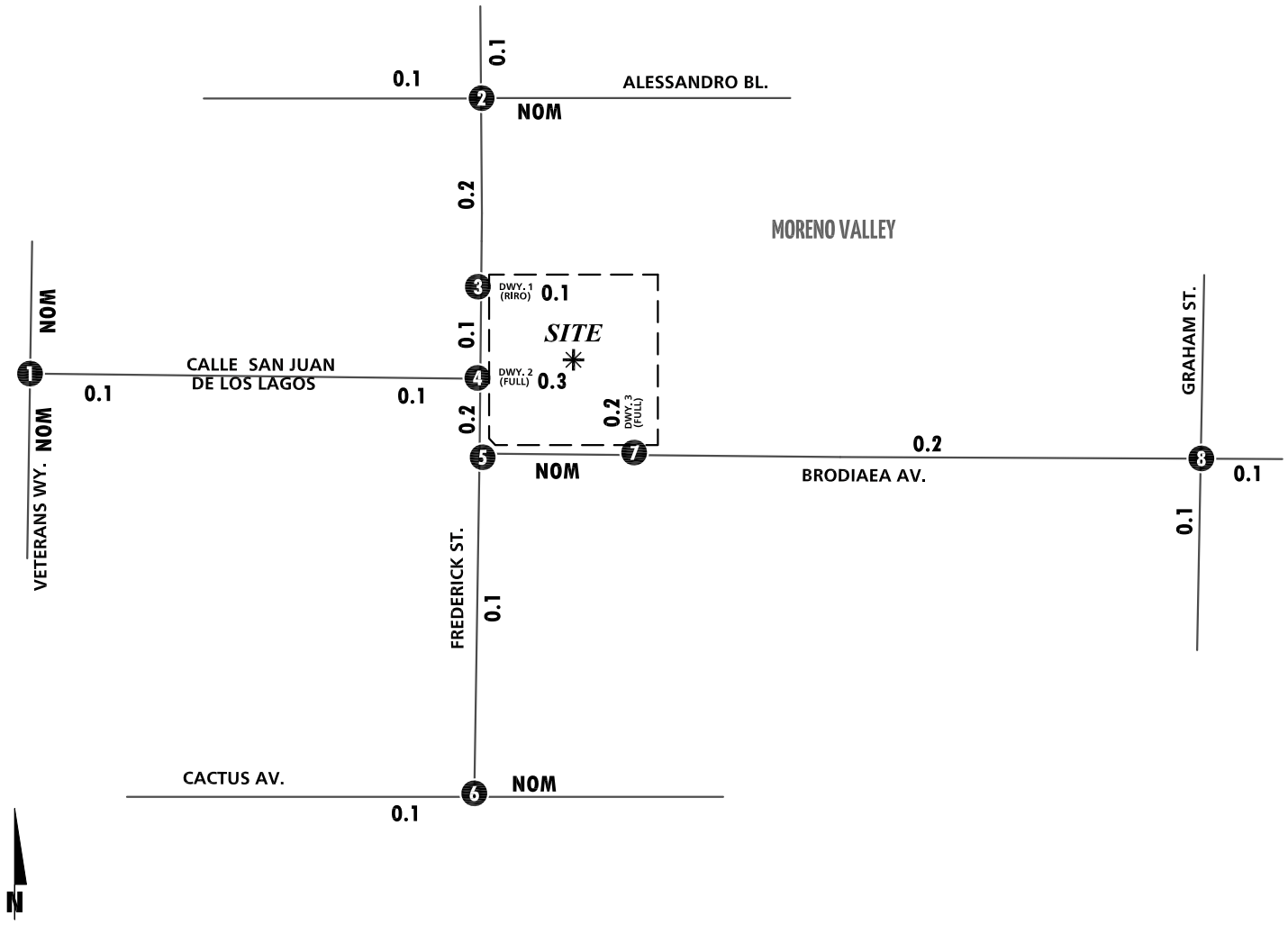
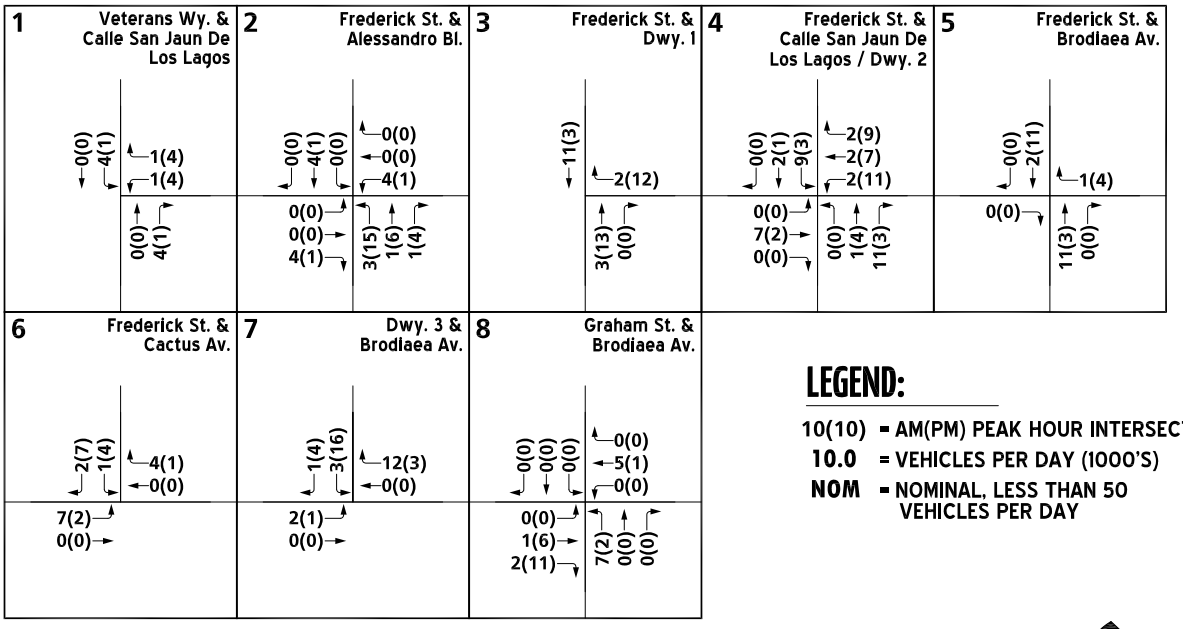
EXHIBIT 4-3: PROJECT ONLY TRAFFIC VOLUMES (IN PCE)





LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

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4.5 BACKGROUND TRAFFIC

To account for growth in traffic between Existing Conditions (2018) and the Project Opening Year Cumulative (2023), a compounded annual traffic growth rate of 2.0 percent was assumed (10.41 percent aggregate growth in background traffic for the period between 2018 and 2023). The 2.0 percent annual growth rate is intended to capture non-specific ambient traffic growth.

In context, the TIA's assumed 2.0 percent compounded annual growth rate is considered a reasonable approximation of future traffic growth when compared to demographic projections reflected in other local and regional growth modeling efforts. More specifically, the Southern California Association of Governments (SCAG) 2016—2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) growth forecasts for the City of Moreno Valley assume the City population to increase from 197,600 in 2012 to 256,600 by the year 2040, or an approximate 0.94 percent growth rate compounded annually. The RTP/SCS assumed growth in households over the same 28-year period reflects an increase from 51,800 households to 73,000 households; a rate of 1.23 percent compounded annually. At the upper end of assumed RTP/SCS growth rates, employment over the same 28-year period is projected to increase from 31,400 jobs to 83,200 jobs; a rate of approximately 3.54 percent compounded annually. (11) The 2.0 percent compounded annual traffic growth rate used in the TIA reflects the fact that not all persons comprising population growth, household growth, or employment growth would translate on a one-to-one basis as a new vehicle trip in the region; and establishes a judicious midrange estimate lying between the RTP/SCS assumed regional population growth rate (0.94 percent) and the RTP/SCS assumed regional employment growth rate (3.54 percent).

Conservatively, the TIA estimates of area traffic growth then add traffic generated by other known or probable related projects. These related projects are at least in part already accounted for in the assumed annual 2.0 percent ambient growth in traffic noted above; and in some instances these related projects would likely not be implemented and functional within the 2023 Opening Year Cumulative time frame assumed for the Project. The resulting traffic growth rate used in the TIA (2.0 percent annual ambient growth plus traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic impacts under 2023 conditions.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

California Environmental Quality Act (CEQA) guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Moreno Valley. The cumulative project list includes known and foreseeable projects that are anticipated to contribute traffic to the study area intersections.

Where applicable, cumulative projects anticipated to contribute measurable traffic (i.e. 50 or more peak hour trips) to study area intersections have been manually added to the study area network to generate Opening Year Cumulative forecasts. In other words, this list of cumulative development projects has been reviewed to determine which projects would likely contribute

measurable traffic through the study area intersections (e.g., those cumulative projects in close proximity to the proposed Project). For the purposes of this analysis, the cumulative projects that were determined to affect one or more of the study area intersections are shown on Exhibit 4-4, listed on Table 4-4, and have been considered for inclusion.

Although it is unlikely that these cumulative projects would be fully built and occupied by Year 2023, they have been included in an effort to conduct a conservative analysis and overstate as opposed to understate potential traffic impacts.

Any other cumulative projects that are not expected to contribute measurable traffic to study area intersections have not been included since the traffic would dissipate due to the distance from the Project site and study area intersections. Any additional traffic generated by other projects not on the cumulative projects list is accounted for through background ambient growth factors that have been applied to the peak hour volumes at study area intersections as discussed in Section 4.5 *Background Traffic*. Cumulative development project ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-5.

4.7 NEAR-TERM TRAFFIC FORECASTS

To provide a comprehensive assessment of potential transportation network deficiencies, a "buildup" analysis was performed in support of this work effort. The "buildup" method was used to approximate the Opening Year Cumulative traffic forecasts, and is intended to identify the cumulative impacts on both the existing and planned near-term circulation system. The Opening Year Cumulative traffic forecasts include background traffic, traffic generated by other cumulative development projects within the study area, and the traffic generated by the proposed Project.

The "buildup" approach combines existing traffic counts with a background ambient growth factor to forecast the near-term 2023 traffic conditions. An ambient growth factor of 10.41% (2023) accounts for background (area-wide) traffic increases that occur over time, up to the year 2023 from the year 2018 (compounded two percent per year growth over a 5-year period). Traffic volumes generated by the Project are then added to assess the Opening Year Cumulative traffic conditions. The 2023 roadway network is similar to the existing conditions roadway network with the exception of future roadways and intersections proposed to be developed by the Project.

EXHIBIT 4-4: CUMULATIVE DEVELOPMENT LOCATION MAP

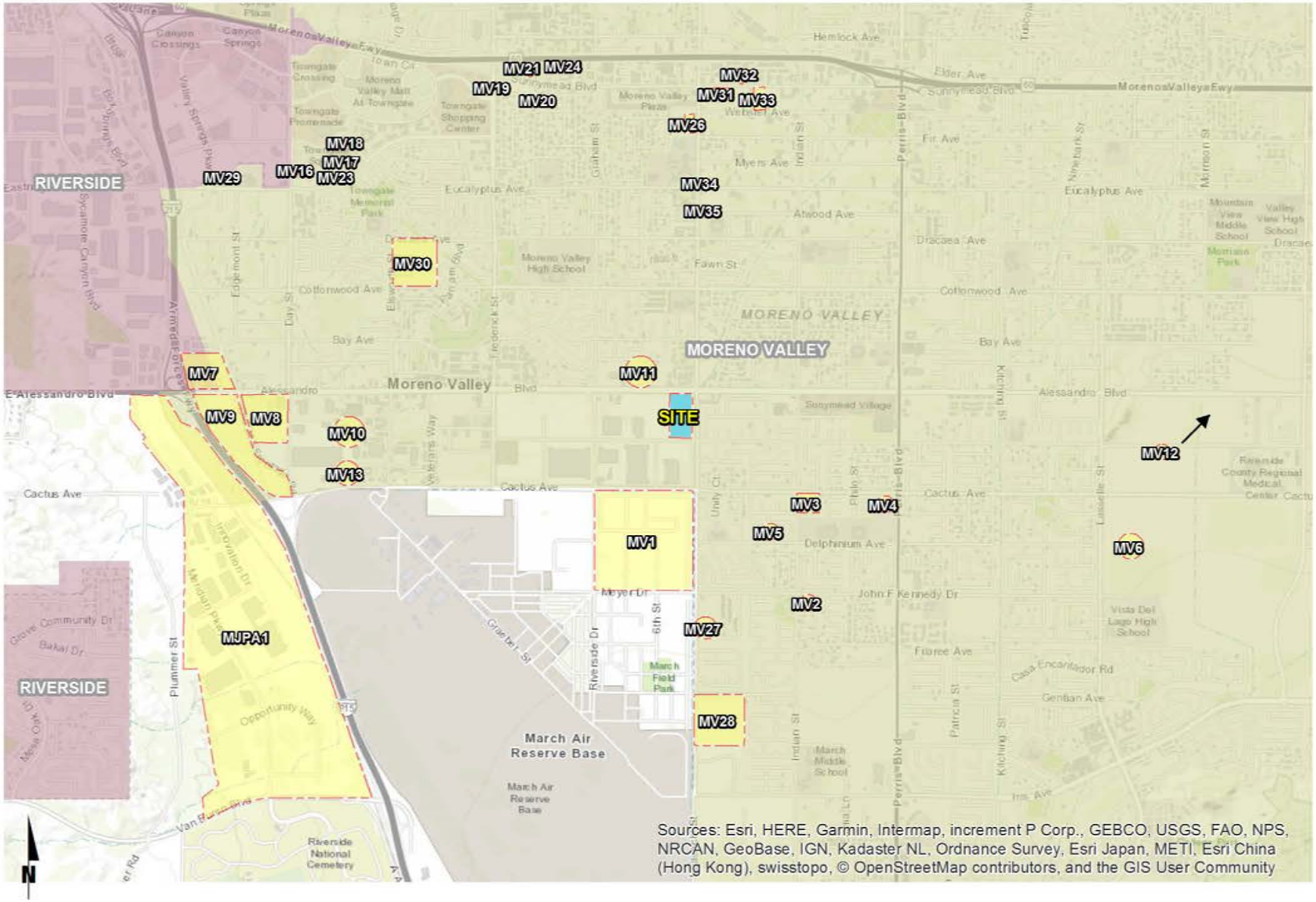
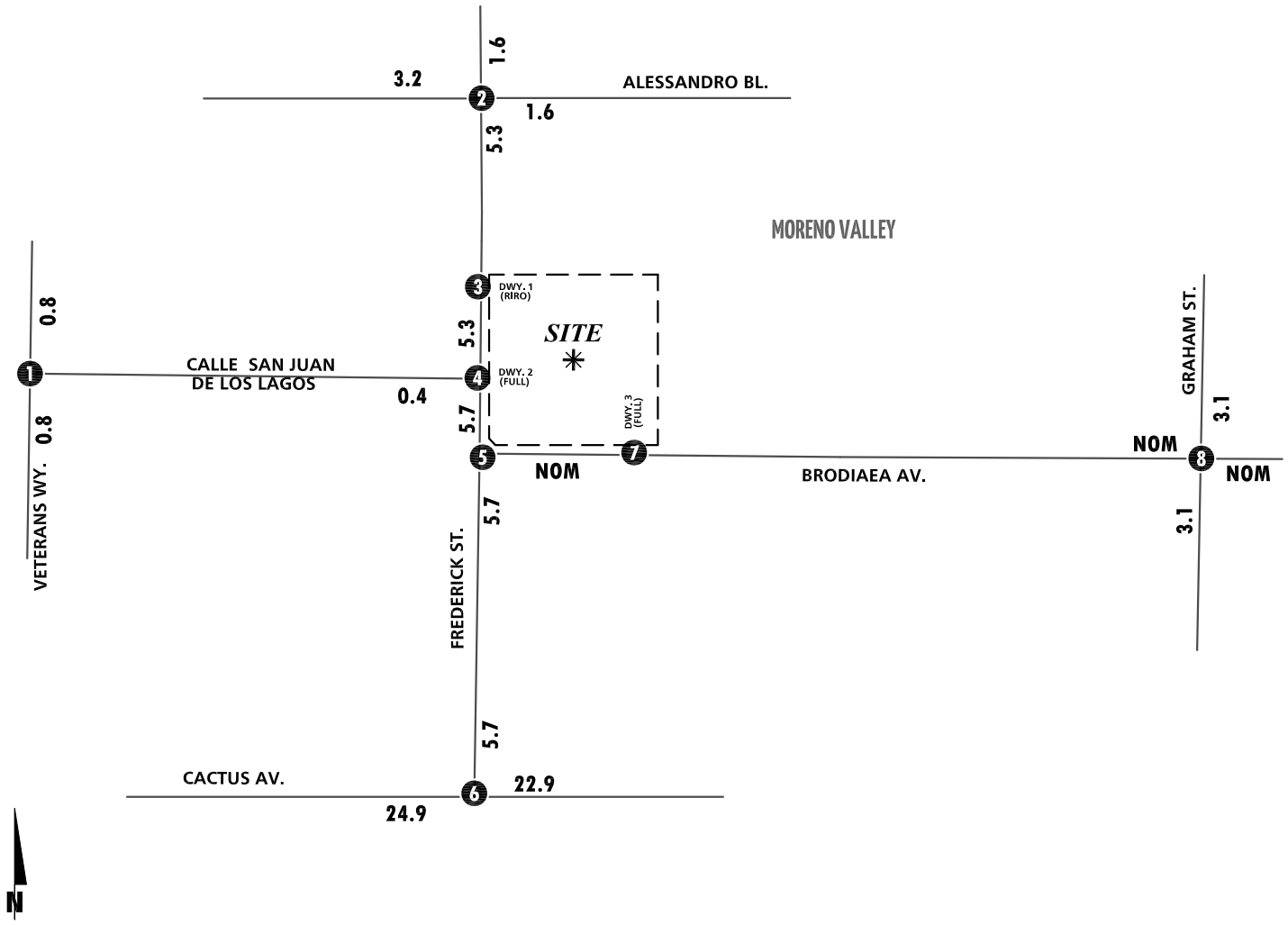
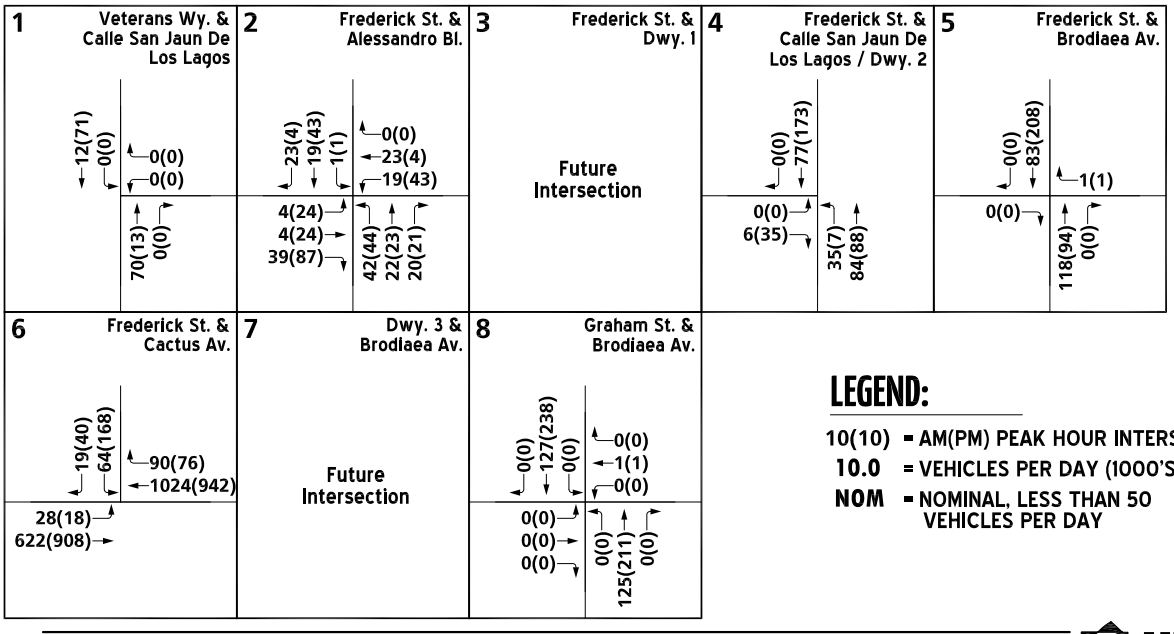


EXHIBIT 4-5: CUMULATIVE PROJECT ONLY TRAFFIC VOLUMES (IN PCE)





LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

Table 4-4

Cumulative Development Land Use Summary

ID	Project Name	Land Use[1]	Quantity	Units[2]
MV1	March Lifecare Campus Specific Plan[3]	Medical Offices	190.000	TSF
		Commercial Retail	210.000	TSF
		Research & Education	200.000	TSF
		Hospital	50	Beds
		Institutional Residential	660	Beds
MV2	O'Reilly Automotive	Automobile Parts Sale	7.500	TSF
	PA15-004	Retail/Restaurant/Fast Food	2.973	TSF
MV3	TM 33417	Condo/Townhomes	60	DU
MV4	TM 33607	Condo/Townhomes	52	DU
MV5	32711 Isaac Genah	SFDR	9	DU
MV6	a Moreno Medical Campus	Medical Offices	80.000	TSF
	b Aqua Bella Specific Plan	SFDR	2,922	DU
	c TR 34329 (Granite Capitol)	SFDR	90	DU
	d Cresta Bella	General Office	30.000	TSF
MV7	P07-0102; and P09-0416, -0418, -0419	General Light Industrial	652.018	TSF
	Alessandro Bl. (APN 263-091-008; 263-100-019; 263-100-005; P14-0841 to 0848)	Commercial and Industrial Complex	101.580	TSF
MV8	Alessandro Metrolink Station	Light Rail Transit Station	300	SP
MV9	Freeway Business Center	High-Cube Warehouse	709.083	TSF
MV10	PA 08-0047-0052 (Komar Cactus Plaza)[3]	Hotel	110	Rooms
		Fast Food w/Drive Thru	8.000	TSF
		Commercial	42.400	TSF
MV11	PA 09-0031	Gas Station	12	VFP
MV12	Prologis	High-Cube Warehouse	1916.19	TSF
		High-Cube Warehouse	328.448	TSF
	World Logistics Center	High-Cube Warehouse	41400	TSF
		Warehousing	200	TSF
		Gas Station w/ Market	12	VFP
		Existing SFDR	7	DU
MV13	Moreno Valley Cactus Center (PEN16-0131)	Warehouse	36.95	TSF
		Fast Food w/Drive Thru	7.9	TSF
		Gas Station w/Car Wash	28	VFP
MV14	Brodiaea Commerce Center	High-Cube Warehouse	262.398	TSF
MV15	Hawthorne Inn	Hotel	79	RM
MV16	The Quarter	Hotel	216	RM
MV17	Ayres Hotel & Spa	Hotel	127	RM
MV18	Hampton Inn & Suites	Hotel	115	RM
MV19	La Quinta Inn & Suites	Hotel	58	RM
MV20	Travelers Inn	Hotel	55	RM
MV21	Comfort Inn	Hotel	92	RM
MV22	Sleep Inn & Suites	Hotel	66	RM
MV23	TownGate Square	Office	170.000	TSF
MV24	Olivewood Plaza	Office	22.758	TSF
MV25	Centerpointe Office Area	Office	258.000	TSF
MV26	Riverside County Office Building	Office	52.000	TSF
MV27	Invermex, Inc.	SFDR	32	DU
MV28	Rados	SFDR	135	DU
MV29	Latco SC Inc.	Multifamily Housing	112	DU
MV30	Winchester Associates "Scottish Village"	Multifamily Housing	194	DU
MV31	33771 Jian Qiang Liu	Multifamily Housing	12	DU
MV32	Cal Choice Inv. Inc.	Multifamily Housing	12	DU
MV33	35663 Jimmy Lee	Multifamily Housing	12	DU
MV34	35769 Michael Chen	Multifamily Housing	16	DU
MV35	PA09-0006 Jim Nydam	Multifamily Housing	15	DU
MV36	Nova Homes	Multifamily Housing	122	DU
MJPA1	Meridian Business Park North	Industrial Park	5,985.000	TSF

[1] SFDR = Single Family Detached Residential

[2] DU = Dwelling Units; TSF = Thousand Square Feet; SP = Spaces; VFP = Vehicle Fueling Positions

[3] Source: March Lifecare Campus Specific Plan Traffic Impact Analysis, Mountain Pacific, Inc., May 2009 (Revised).

As noted previously, an analysis of the proposed Project at various development tiers has been assessed for the purposes of this traffic study. The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- Opening Year Cumulative (2023) Without Project
  - Existing 2018 counts
  - Ambient growth (10.41%)
  - Cumulative Development traffic
- Opening Year Cumulative (2023) With Project
  - Existing 2018 counts
  - Ambient growth (10.41%)
  - Cumulative Development traffic
  - Project traffic

4.8 General Plan Buildout (Post-2040) Volume Development

The General Plan Buildout (Post-2040) With Project traffic conditions were derived from the RivTAM modified to represent General Plan Buildout conditions for the City of Moreno Valley using accepted procedures for model forecast refinement and smoothing. The traffic forecasts reflect the area-wide growth anticipated between Existing conditions and General Plan Buildout conditions.

In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the General Plan Buildout With Project peak hour forecasts were refined using the model derived long-range forecasts, along with existing peak hour traffic count data collected at each analysis location in April 2018. Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns to further refine the General Plan Buildout With Project peak hour forecasts.

The refined future peak hour approach and departure volumes obtained from the model output data are then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program (NCHRP Report 255), along with initial estimates of turning movement proportions. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment forecast volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

Typically, the model growth is prorated and is subsequently added to the existing (base validation) traffic volumes to represent Long Range traffic conditions. However, review of the resulting model growth indicates negative growth for several study area intersections. In an effort to conduct a conservative analysis, reductions to traffic forecasts from either Existing or Opening Year Cumulative traffic conditions were not assumed as part of this analysis. Additional growth has also been applied on a movement-by-movement basis, where applicable, to estimate reasonable General Plan Buildout forecasts. General Plan Buildout turning volumes were compared to Opening Year

Cumulative volumes in order to ensure a minimum growth as a part of the refinement process. The minimum growth includes any additional growth between Opening Year Cumulative and General Plan Buildout traffic conditions that is not accounted for by the traffic generated by cumulative development projects and ambient growth rates assumed between Existing (2018) and Opening Year Cumulative traffic conditions. Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns to further refine the General Plan Buildout peak hour forecasts.

The future General Plan Buildout without Project peak hour turning movements were then reviewed by Urban Crossroads for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two freeway ramp locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there are no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis.

The truck component of RivTAM has data that is unusually low. As such, in an effort to conduct a conservative analysis, the presence of trucks has been accounted for based on the manual volume adjustments made to demonstrate growth above Opening Year Cumulative traffic forecasts, which are presented and evaluated in PCE (see *Section 3.6 Existing (2018) Traffic Counts* for discussion on PCE). As such, the General Plan Buildout forecasts are also assumed to be in PCE for the purposes of this analysis.

Post-processing worksheets for General Plan Buildout Without Project traffic conditions are provided in Appendix 4.1.

5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Existing plus Project (E+P) conditions and the resulting intersection operations, queuing, and traffic signal warrant analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for E+P conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for E+P conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).

5.2 E+P TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. Exhibit 5-1 shows the ADT and peak hour intersection turning movement volumes (in PCE), which can be expected for E+P traffic conditions.

5.3 INTERSECTION OPERATIONS ANALYSIS

E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicate that the study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours, consistent with Existing traffic conditions. Exhibit 5-2 summarizes the weekday AM and PM peak hour study area intersections LOS under E+P traffic conditions, consistent with the results provided in Table 5-1. The intersection operations analysis worksheets are included in Appendix 5.1 of this TIA.

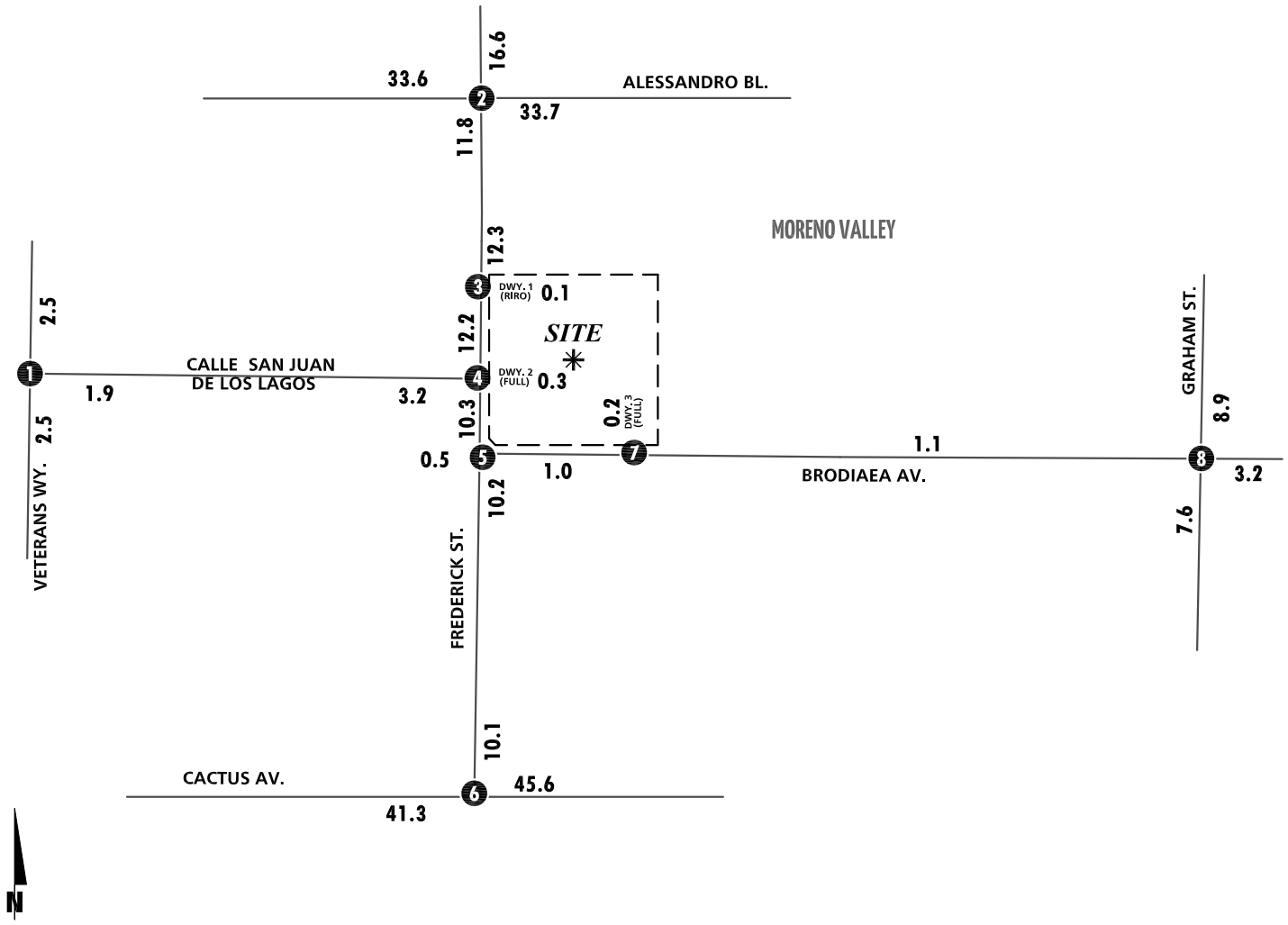
5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no unsignalized study area intersections anticipated to meet either peak hour or planning level (ADT) volume-based traffic signal warrants under E+P traffic conditions (see Appendix 5.2).

5.5 QUEUING ANALYSIS

A queuing analysis was conducted for all study area intersections to determine if the turn pocket lengths are adequate to accommodate near-term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The queuing analysis results are summarized on Table 5-2 for E+P traffic conditions. Queuing worksheets are included in Appendix 5.3.

EXHIBIT 5-1: E+P TRAFFIC VOLUMES (IN PCE)



1 Veterans Wy. & Calle San Jaun De Los Lagos	2 Frederick St. & Alessandro Bl.	3 Frederick St. & Dwy. 1	4 Frederick St. & Calle San Jaun De Los Lagos / Dwy. 2	5 Frederick St. & Brodiaea Av.
31(45) 44(28) 23(46) 34(46)	186(118) 252(268) 99(262) 105(162) 1315(804) 79(60)	343(490) 2(12)	77(55) 258(433) 9(3) 2(9) 2(7) 2(11)	13(10) 257(458) 68(52)
50(78) 65(29)	110(196) 436(1224) 39(137) 88(112) 219(273) 18(74)	333(453) 0(0)	24(136) 7(2) 12(25) 45(22) 307(308) 11(3)	5(28) 295(280) 8(18)

6 Frederick St. & Cactus Av.	7 Dwy. 3 & Brodiaea Av.	8 Graham St. & Brodiaea Av.
85(146) 132(412) 151(142) 1681(969)	1(4) 3(16) 12(3) 67(48)	5(3) 241(266) 42(75) 75(68) 57(47) 20(20)
171(79) 972(1976)	2(1) 8(18)	2(3) 7(17) 5(14) 10(5) 194(265) 18(22)

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

EXHIBIT 5-2: E+P SUMMARY OF LOS

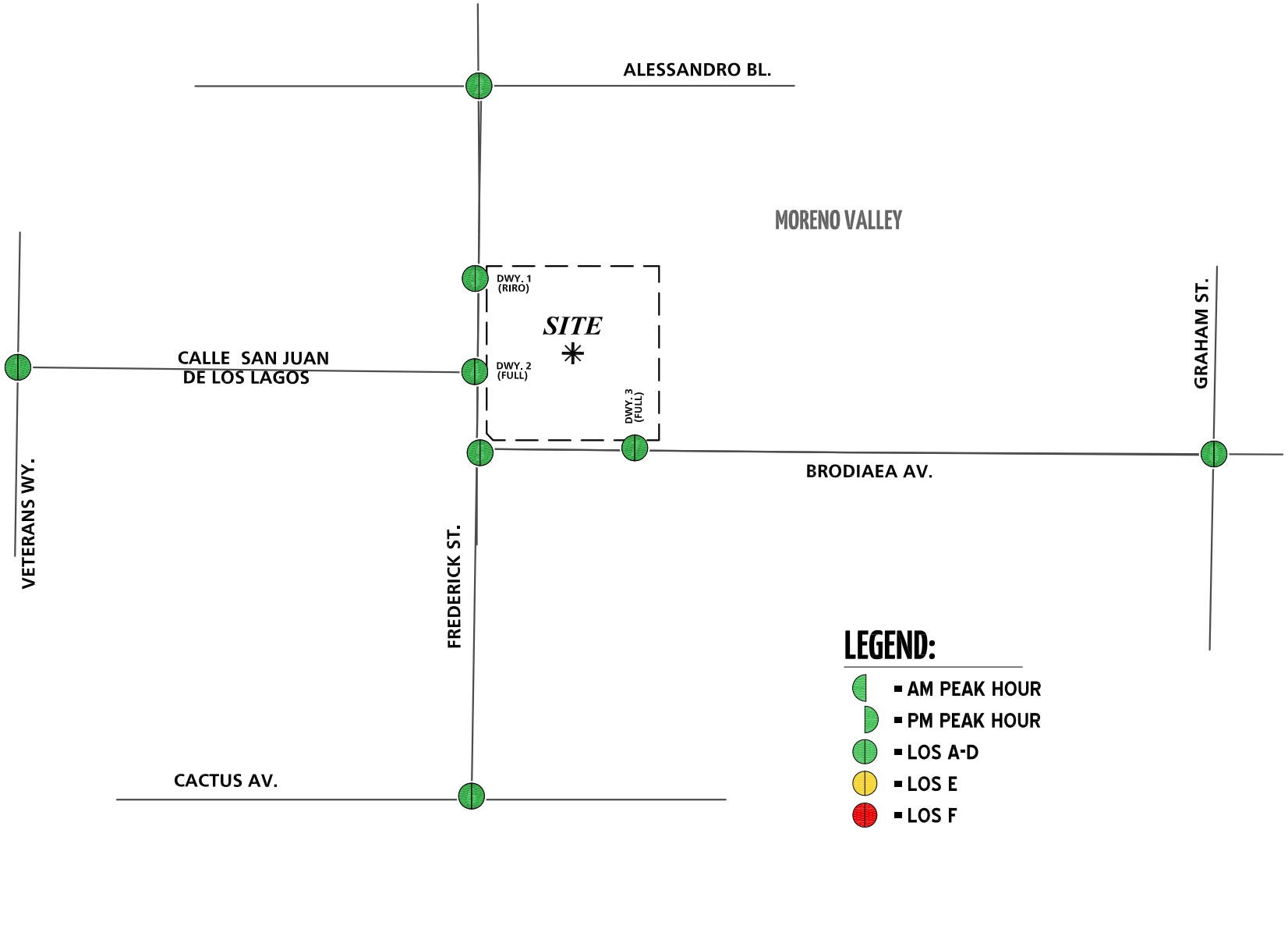


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Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2018) Delay[1] (secs.) AM	Existing (2018) Delay[1] (secs.) PM	Existing (2018) Level of Service AM	Existing (2018) Level of Service PM	E+P Delay[1] (secs.) AM	E+P Delay[1] (secs.) PM	E+P Level of Service AM	E+P Level of Service PM
1	Veterans Wy. & Calle San Juan de Los Lagos	CSS	9.7	9.7	A	A	9.8	9.7	A	A
2	Frederick St. & Alessandro Bl.	TS	38.8	48.6	D	D	39.5	49.0	D	D
3	Frederick St. & Driveway 1	**CSS**	Future Intersection				9.3	9.8	A	A
4	Frederick St. & Calle San Juan de Los Lagos/Driveway 2	TS	6.4	11.7	A	B	9.1	12.5	B	B
5	Frederick St. & Brodiaea Av.	CSS	9.6	10.0	A	B	9.6	10.0	A	B
6	Frederick St. & Cactus Av.	TS	14.1	12.1	B	B	14.2	12.5	B	B
7	Driveway 3 & Brodiaea Av.	**CSS**	Future Intersection				9.1	9.1	A	A
8	Graham St. & Brodiaea Av.	TS	13.2	13.3	B	B	13.5	14.2	B	B

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] TS = Traffic Signal; CSS = Cross-Street Stop; **CSS** = Improvement

Table 5-2

Peak Hour Queuing Summary for E+P Conditions

Intersection	Movement[4]	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM
Veterans Wy. & Calle San Juan de Los Lagos	NBR	1,050	0	0	Yes	Yes
	SBL	115	18	14	Yes	Yes
	WBL	100	37	37	Yes	Yes
	WBR	380	27	32	Yes	Yes
Frederick St. & Alessandro Bl.	NBL	135	59	73	Yes	Yes
	NBL	135	75	91	Yes	Yes
	SBL	120	50	**193**	Yes	**No**
	SBL	120	116	214	Yes	Yes[2]
	SBR	100	93	61	Yes	Yes
	EBL	250	145	**321**	Yes	**No**
	EBR	1,600	27	74	Yes	Yes
	WBL	130	**232**	119	**No**	Yes
Frederick St. & Calle San Juan de Los Lagos/Driveway 2	NBL	150	70	47	Yes	Yes
	SBL	**100**	36	18	Yes	Yes
	EBL	120	48	134	Yes	Yes[3]
Frederick St. & Brodiaea Av.	WBR	490	45	43	Yes	Yes
Frederick St. & Cactus Av.	SBL	140	65	162	Yes	Yes[2]
	SBL	810	86	192	Yes	Yes
	SBR	810	58	61	Yes	Yes
	EBL	300	150	91	Yes	Yes
	WBR	265	52	51	Yes	Yes
Driveway 3 & Brodiaea Av.	EBL	**100**	6	0	Yes	Yes
Graham St. & Brodiaea Av.	NBL	160	25	19	Yes	Yes
	SBL	150	48	71	Yes	Yes
	EBL	210	13	15	Yes	Yes
	EBR	180	16	30	Yes	Yes
	WBL	150	40	43	Yes	Yes
	WBR	180	48	48	Yes	Yes

* **BOLD** = Queue length exceeds available stacking distance.

NOTE: The Project is anticipated to contribute less than 50 peak hour trips to the study area intersections. As such, the Project's impact to the identified queuing issues are less than significant.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, however, there is sufficient storage within the striped median for vehicles to continue to stack without blocking the adjacent through lane.

[3] An additional 15 feet of stacking, which is assumed to be provided in the transition for turn pockets, is reflected in the stacking distance shown on this table, where applicable.

[4] **100** = Improvement

5.6 RECOMMENDED IMPROVEMENTS

5.6.1 INTERSECTION IMPROVEMENTS

All study area intersections are anticipated to operate at an acceptable LOS (LOS C/D or better) for E+P traffic conditions. As the Project is anticipated to contribute less than 50 peak hour trips and the increase to the pre-project delay is less than 1.0 second, it is anticipated that the addition of Project traffic would result in a less than significant impact at the study area intersections. As such, no intersection improvements have been recommended to address peak hour operations.

5.6.2 QUEUING IMPROVEMENTS

As previously shown in Table 5-2, there are 3 movements that experience queuing issues during the AM or PM peak hours. However, the Project is not anticipated to contribute trips to every movement. As such, improvement strategies have only been recommended at the location where the Project is anticipated to contribute trips during the AM or PM peak hours (also currently experiencing queuing issues for Existing (2018) traffic conditions):

- Frederick Street & Alessandro Boulevard, westbound left turn lane (AM peak hour only)

Recommended improvements to address queuing issues for E+P traffic conditions are described below and shown in Table 5-3. Although the Project's impact is less-than-significant, the following improvement has been identified to address the queuing issue for E+P traffic conditions at the request of City staff:

Improvement – Frederick Street & Alessandro Boulevard (#2)

- Modify the existing landscaped median to provide a 265-foot westbound left turn pocket with a 90-foot transition. The back-to-back left with the adjacent driveway would modify the left turn storage to 75-feet.

6 OPENING YEAR CUMULATIVE (2023) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative (2023) traffic forecasts and the resulting intersection operations, queuing, and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative (2023) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

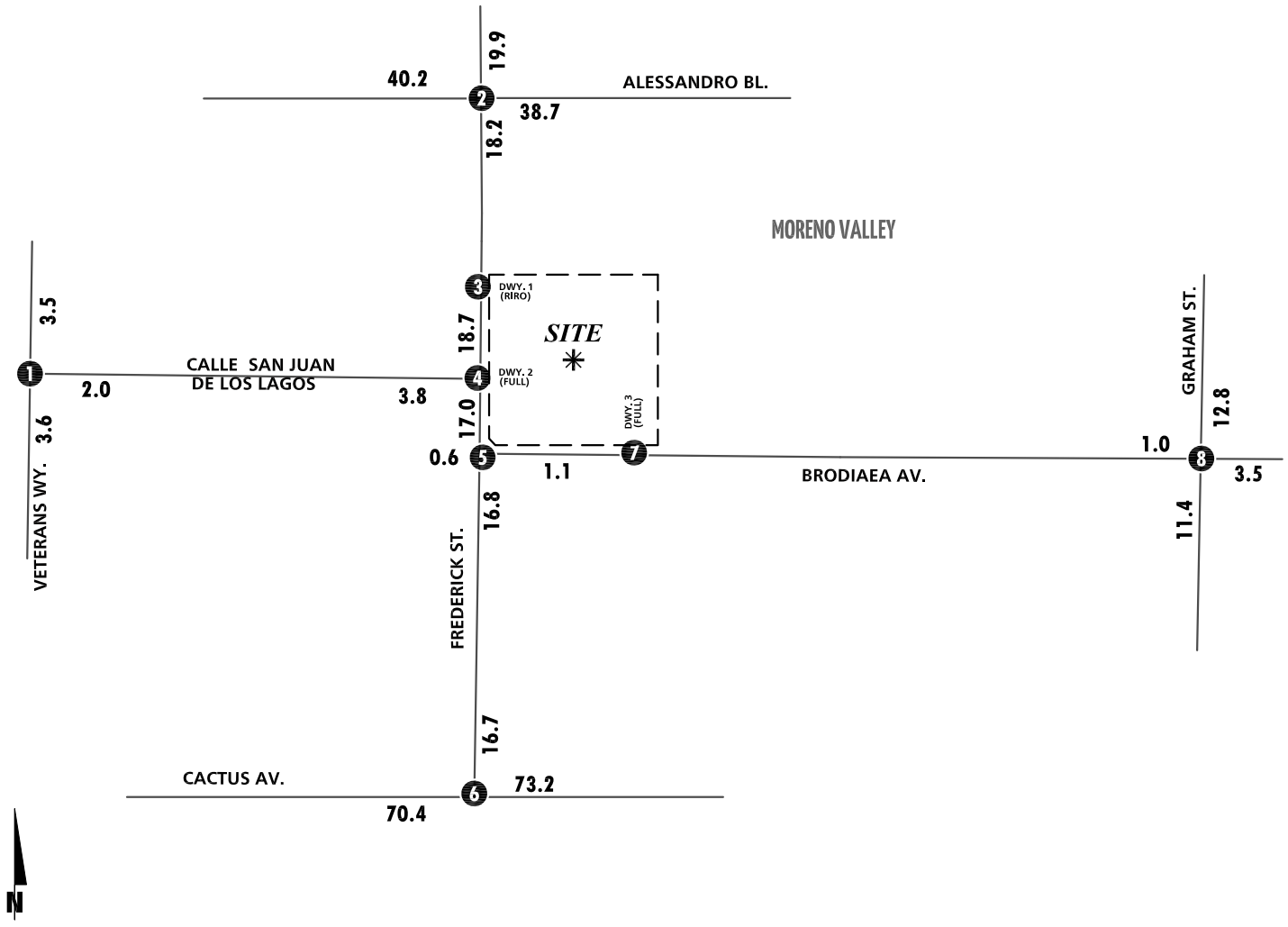
6.2 OPENING YEAR CUMULATIVE (2023) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

To account for background traffic, other known cumulative development projects in the study area were included in addition to 10.41% of ambient growth for Opening Year Cumulative traffic conditions. The weekday ADT and weekday AM and PM peak hour volumes (in PCE) which can be expected for Opening Year Cumulative (2023) Without Project traffic conditions are shown on Exhibit 6-1.

6.3 OPENING YEAR CUMULATIVE (2023) WITH PROJECT TRAFFIC VOLUME FORECASTS

To account for background traffic, other known cumulative development projects in the study area were included in addition to 10.41% of ambient growth for Opening Year Cumulative traffic conditions in conjunction with traffic associated with the proposed Project. The weekday ADT and weekday AM and PM peak hour volumes (in PCE) which can be expected for Opening Year Cumulative (2023) With Project traffic conditions are shown on Exhibit 6-2.

EXHIBIT 6-1: OPENING YEAR CUMULATIVE (2023) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)



1 Veterans Wy. & Calle San Jaun De Los Lagos	2 Frederick St. & Alessandro Bl.	3 Frederick St. & Dwy. 1	4 Frederick St. & Calle San Jaun De Los Lagos / Dwy. 2	5 Frederick St. & Brodiaea Av.
46(120) 44(30) 24(46) 36(46) 125(99) 67(31)	228(134) 293(337) 110(290) 116(179) 1475(892) 102(108) 125(240) 485(1375) 77(237) 135(151) 263(317) 38(98)	Future Intersection	84(61) 359(650) 26(150) 19(63) 85(31) 422(423)	14(11) 364(702) 75(54) 6(31) 432(400) 8(20)

6 Frederick St. & Cactus Av.	7 Dwy. 3 & Brodiaea Av.	8 Graham St. & Brodiaea Av.
111(193) 209(618) 252(231) 2880(2011) 209(103) 1695(3090)	Future Intersection	6(3) 393(532) 46(83) 83(75) 58(52) 22(22) 2(3) 7(12) 3(3) 3(3) 339(504) 19(24)

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

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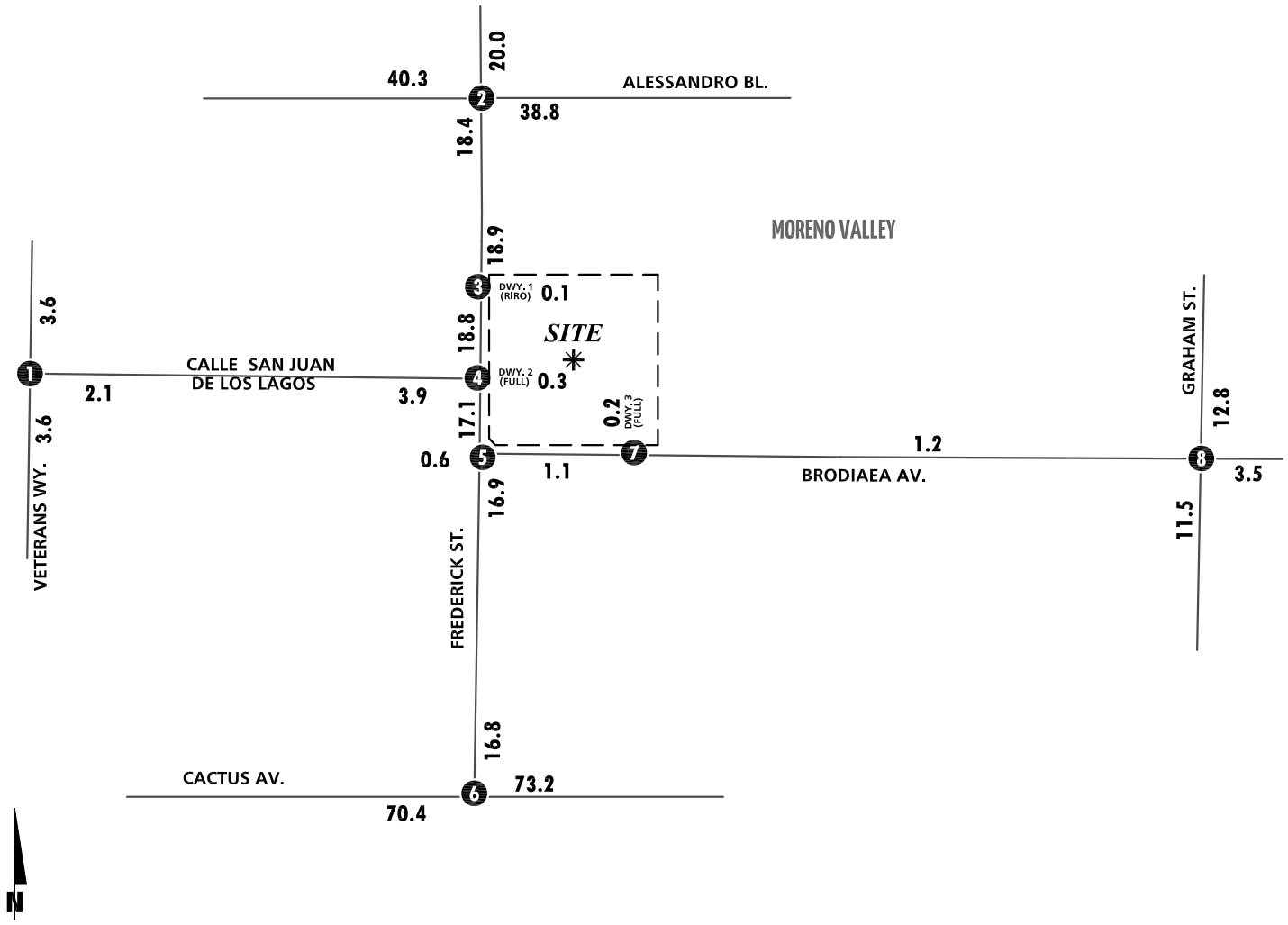
EXHIBIT 6-2: OPENING YEAR CUMULATIVE (2023) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



1 Veterans Wy. & Calle San Jaun De Los Lagos	2 Frederick St. & Alessandro Bl.	3 Frederick St. & Dwy. 1	4 Frederick St. & Calle San Jaun De Los Lagos / Dwy. 2	5 Frederick St. & Brodiaea Av.
46(120) 48(31) 25(50) 37(50) 125(99) 71(32)	228(134) 297(338) 110(290) 116(179) 1475(892) 106(109) 125(240) 485(1375) 81(238) 138(166) 264(323) 39(102)	455(714) 2(12) 451(586) 0(0)	84(61) 361(651) 9(3) 2(9) 2(7) 2(11) 26(150) 7(2) 19(63) 85(31) 423(427) 11(3)	14(11) 366(713) 76(58) 6(31) 443(403) 8(20)

6 Frederick St. & Cactus Av.	7 Dwy. 3 & Brodiaea Av.	8 Graham St. & Brodiaea Av.
113(200) 210(622) 256(232) 2880(2011) 216(105) 1695(3090)	1(4) 3(16) 12(3) 75(54) 2(1) 8(20)	6(3) 393(532) 46(83) 83(75) 63(53) 22(22) 2(3) 8(18) 5(14) 10(5) 339(504) 19(24)

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

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6.4 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, the study area intersections are anticipated to operate at an acceptable LOS during the peak hours under Opening Year Cumulative (2023) Without Project traffic conditions, with the exception of the following study area intersection:

- Frederick St. & Alessandro Bl. (#2) – LOS E PM Peak Hour only

No additional intersections are anticipated to operate at an unacceptable LOS under Opening Year (2023) With Project traffic conditions. A summary of the peak hour intersection LOS for Opening Year Cumulative (2023) Without Project conditions are shown on Exhibit 6-3 and on Exhibit 6-4 for Opening Year Cumulative (2023) With Project traffic conditions. The intersection operations analysis worksheets for Opening Year Cumulative (2023) Without and With Project traffic conditions are included in Appendix 6.1 and Appendix 6.2 of this TIA, respectively. Measures to address near-term cumulative deficiencies for Opening Year Cumulative traffic conditions are discussed in Section 6.7 *Opening Year Cumulative Deficiencies and Recommended Improvements.*

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no unsignalized study area intersections that are anticipated to meet either peak hour or planning level (ADT) volume-based traffic signal warrants for Opening Year Cumulative traffic conditions (see Appendix 6.3 and Appendix 6.4).

6.6 QUEUING ANALYSIS

A queuing analysis was conducted for all study area intersections for Opening Year Cumulative (2023) traffic conditions to determine if turn pocket lengths are adequate to accommodate near-term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The queuing analysis results are summarized on Table 6-2 indicates for Opening Year Cumulative (2023) With Project traffic conditions. Queuing worksheets are included in Appendix 6.5 and Opening Year Cumulative (2023) With Project traffic conditions.

Table 6-1

Intersection Analysis for Opening Year Cumulative (2023) Conditions

#	Intersection	Traffic Control[2]	2023 Without Project				2023 With Project			
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM
1	Veterans Wy. & Calle San Juan de Los Lagos	CSS	10.1	10.2	B	B	10.2	10.3	B	B
2	Frederick St. & Alessandro Bl.	TS	48.7	**72.1**	D	**E**	49.6	**72.9**	D	**E**
3	Frederick St. & Driveway 1	**CSS**	Future Intersection				9.7	10.4	A	B
4	Frederick St. & Calle San Juan de Los Lagos/Driveway 2	TS	7.5	11.8	A	B	10.3	12.7	B	B
5	Frederick St. & Brodiaea Av.	CSS	10.3	11.3	B	B	10.4	11.3	B	B
6	Frederick St. & Cactus Av.	TS	19.3	19.6	B	B	20.7	21.5	C	C
7	Driveway 3 & Brodiaea Av.	**CSS**	Future Intersection				9.1	9.1	A	A
8	Graham St. & Brodiaea Av.	TS	14.0	14.2	B	B	14.3	15.1	B	B

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] TS = Traffic Signal; CSS = Cross-Street Stop; **CSS** = Improvement

Table 6-2

Peak Hour Queuing Summary for Opening Year Cumulative (2023) With Project Conditions

Intersection	Movement[4]	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM
Veterans Wy. & Calle San Juan de Los Lagos	NBR	1,050	0	0	Yes	Yes
	SBL	115	19	16	Yes	Yes
	WBL	100	44	44	Yes	Yes
	WBR	380	28	31	Yes	Yes
Frederick St. & Alessandro Bl.	NBL	135	86	127	Yes	Yes
	NBL	135	92	131	Yes	Yes
	SBL	120	70	**191**	Yes	**No**
	SBL	120	120	244	Yes	Yes[2]
	SBR	100	153	69	Yes[2]	Yes
	EBL	250	167	**395**	Yes	**No**
	EBR	1,600	40	1,296	Yes	Yes
	WBL	130	**216**	**253**	**No**	**No**
Frederick St. & Calle San Juan de Los Lagos/Driveway 2	NBL	150	106	58	Yes	Yes
	SBL	**100**	34	27	Yes	Yes
	EBL	120	55	**143**	Yes	**No**
Frederick St. & Brodiaea Av.	WBR	490	46	47	Yes	Yes
Frederick St. & Cactus Av.	SBL	140	91	224	Yes	Yes[2]
	SBL	810	106	328	Yes	Yes
	SBR	810	99	145	Yes	Yes
	EBL	300	266	193	Yes	Yes
	WBR	265	**335**	62	**No**	Yes
Driveway 3 & Brodiaea Av.	EBL	**100**	0	0	Yes	Yes
Graham St. & Brodiaea Av.	NBL	160	28	20	Yes	Yes
	SBL	150	48	75	Yes	Yes
	EBL	210	15	16	Yes	Yes
	EBR	180	15	27	Yes	Yes
	WBL	150	42	43	Yes	Yes
	WBR	180	52	55	Yes	Yes

* **BOLD** = Queue length exceeds available stacking distance.

NOTE: The Project is anticipated to contribute less than 50 peak hour trips to the study area intersections. As such, the Project's impact to the identified queuing issues are less than significant.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, however, there is sufficient storage within the striped median for vehicles to continue to stack without blocking the adjacent through lane.

[4] **100** = Improvement

EXHIBIT 6-3: OPENING YEAR CUMULATIVE (2023) WITHOUT PROJECT SUMMARY OF LOS

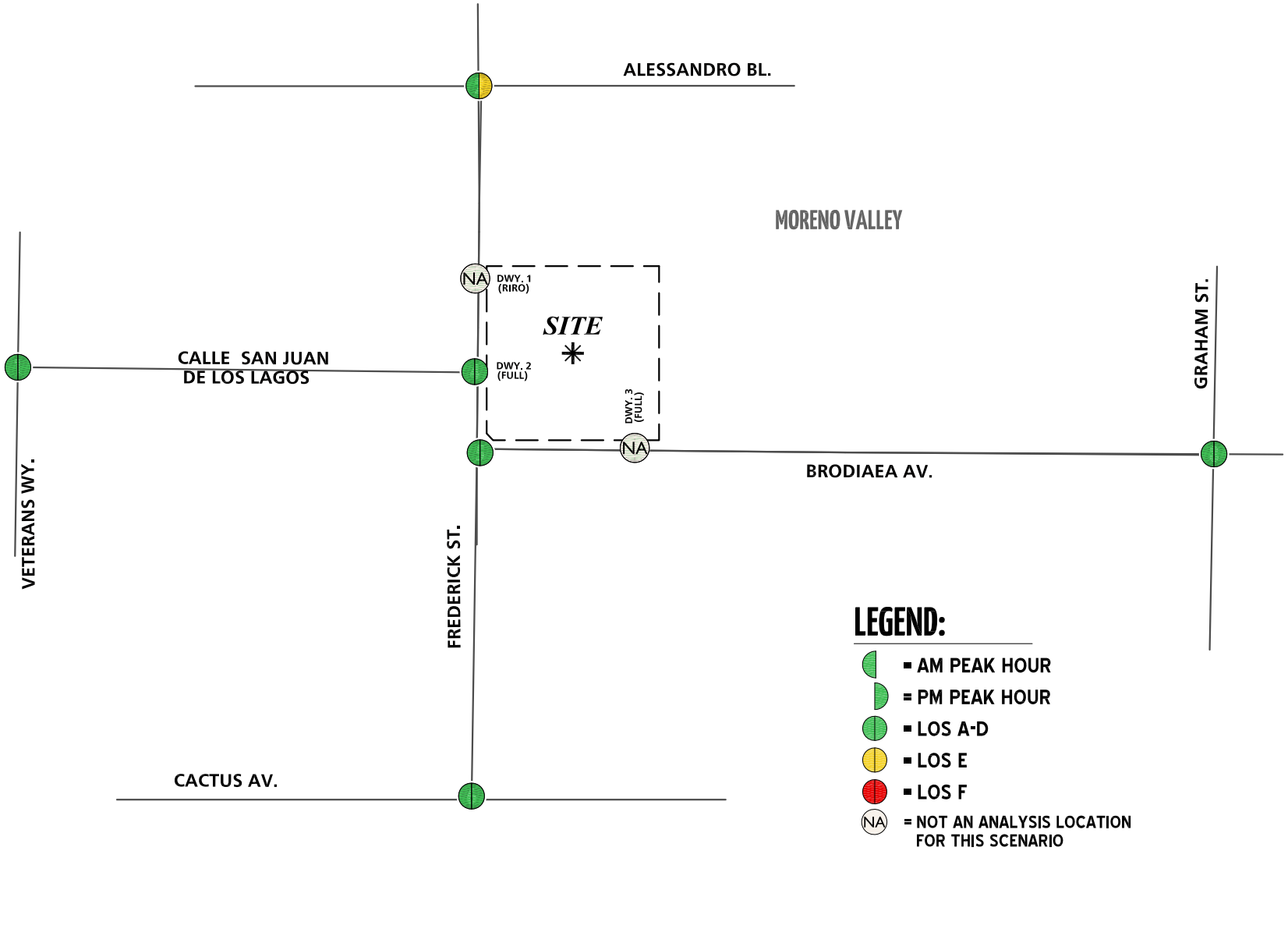

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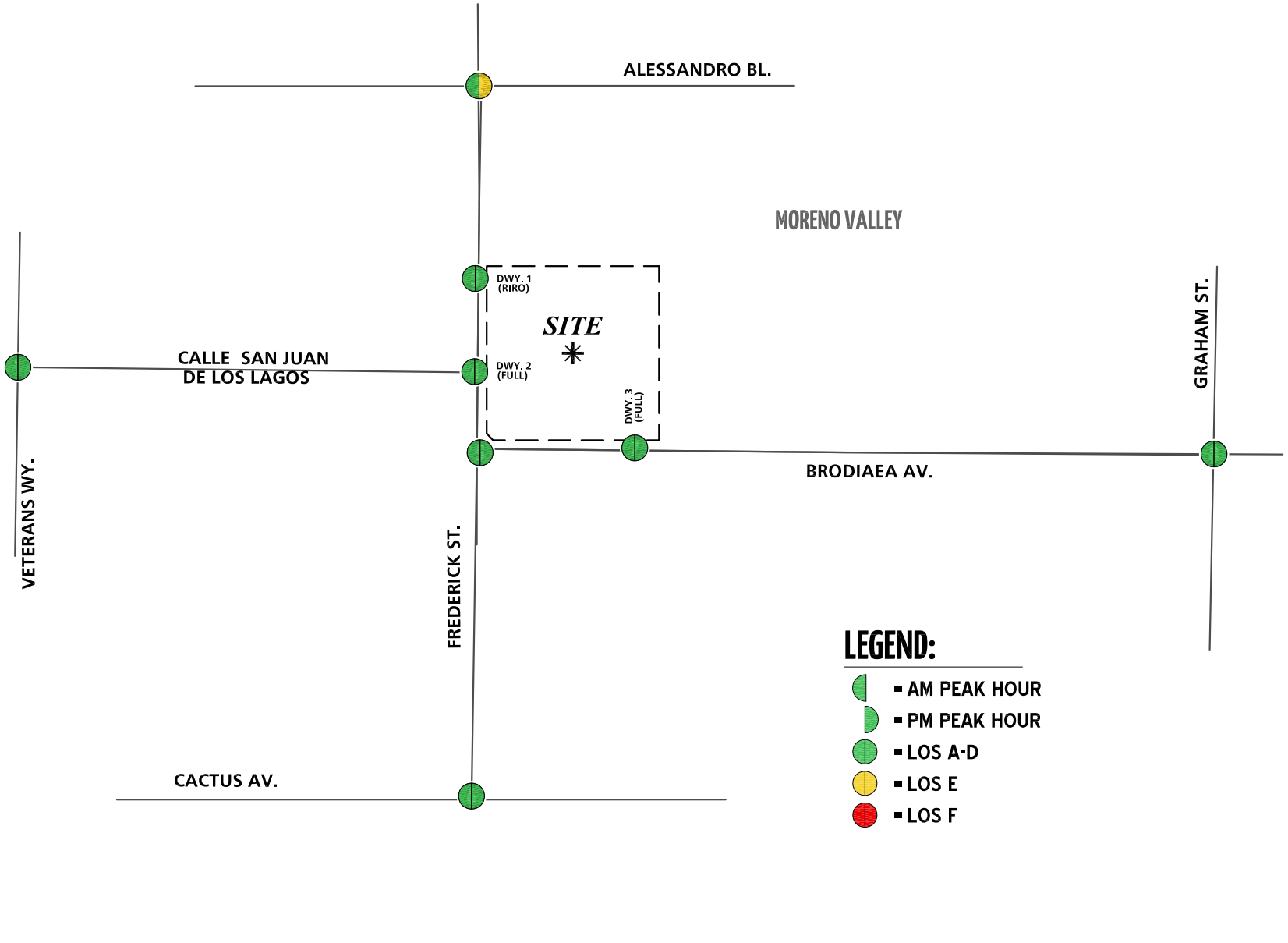
EXHIBIT 6-4: OPENING YEAR CUMULATIVE (2023) WITH PROJECT SUMMARY OF LOS



6.7 Opening Year Cumulative Deficiencies and Recommended Improvements

6.7.1 Intersection Improvements

Although the intersection of Frederick Street and Alessandro Boulevard is anticipated to operate at an unacceptable LOS during the PM peak hour under Opening Year Cumulative (2023) traffic conditions, the Project is anticipated to contribute less than 50 peak hour trips and the increase to the pre-project delay is less than 1.0 second. As such, it is anticipated that the addition of Project traffic would result in a less than significant impact at the study area intersections and no intersection improvements have been recommended to address peak hour operations.

6.7.2 Queuing Improvements

As previously shown in Table 6-2, there are 5 movements that experience queuing issues during the AM or PM peak hours. However, the Project is not anticipated to contribute trips to every movement. As such, improvement strategies have only been recommended at those locations where the Project is anticipated to contribute trips during the AM or PM peak hours:

- Frederick Street & Alessandro Boulevard, westbound left turn lane (AM and PM peak hours)
- Frederick Street & Cactus Avenue, westbound right turn lane (AM peak hour only)

Recommended improvements to address queuing issues for Opening Year Cumulative (2023) With Project traffic conditions are described below and shown in Table 6-3. Although the Project's impact is less-than-significant, the following improvements have been identified to address the queuing issues for Opening Year Cumulative (2023) traffic conditions at the request of City staff:

Improvement – Frederick Street & Alessandro Boulevard (#2)

- Modify the existing landscaped median to provide a 265-foot westbound left turn pocket with a 90-foot transition. The back-to-back left with the adjacent driveway would modify the left turn storage to 75-feet.

Improvement – Frederick Street & Cactus Avenue (#6)

- Restripe the westbound right turn lane to provide 500-feet of storage

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7 GENERAL PLAN BUILDOUT (POST-2040) TRAFFIC CONDITIONS

This section discusses the methods used to develop General Plan Buildout (Post-2040) Without and With Project traffic forecasts, and the resulting intersection operations, queuing, and traffic signal warrant analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for General Plan Buildout conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for General Plan Buildout conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for General Plan Buildout conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

7.2 GENERAL PLAN BUILDOUT (POST-2040) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the RivTAM. For additional information on the development of the General Plan Buildout Without Project traffic forecasts, see Section 4.8 *General Plan Buildout (Post-2040) Volume Development* of this TIA. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for General Plan Buildout Without Project traffic conditions are shown on Exhibit 7-1.

7.3 GENERAL PLAN BUILDOUT (POST-2040) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the RivTAM, plus Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for General Plan Buildout With Project traffic conditions are shown on Exhibit 7-2.

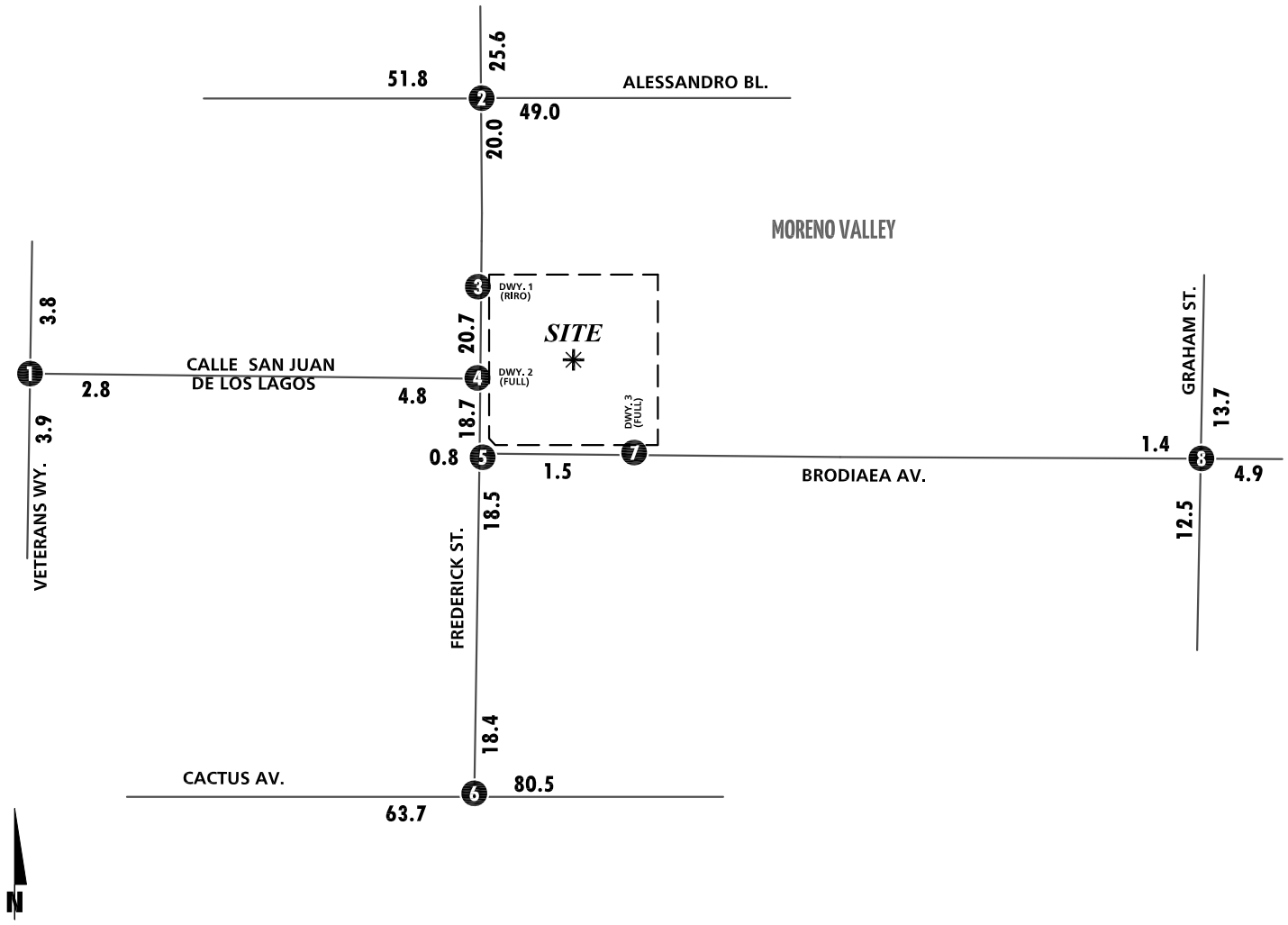
7.4 INTERSECTION OPERATIONS ANALYSIS

7.4.1 GENERAL PLAN BUILDOUT WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under General Plan Buildout Without Project conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown in Table 7-1, the study area intersections are anticipated to operate at acceptable LOS for General Plan Buildout (Post-2040) Without Project traffic conditions, with the exception of the following study area intersection:

- Frederick St. & Alessandro Bl. (#2) – LOS F AM and PM Peak Hours

EXHIBIT 7-1: GENERAL PLAN BUILDOUT (POST-2040) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)



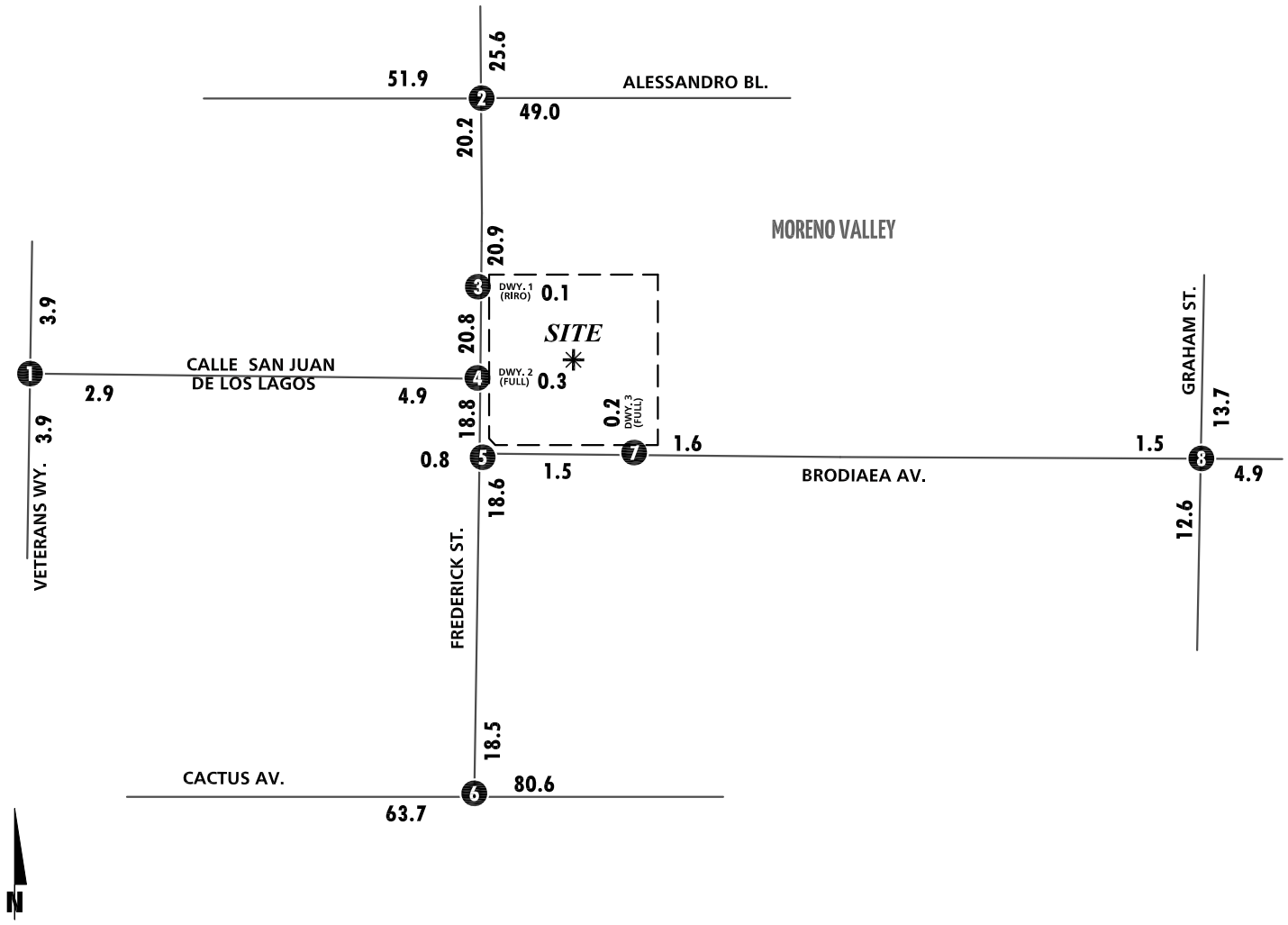
1 Veterans Wy. & Calle San Jaun De Los Lagos	2 Frederick St. & Alessandro Bl.	3 Frederick St. & Dwy. 1	4 Frederick St. & Calle San Jaun De Los Lagos / Dwy. 2	5 Frederick St. & Brodiaea Av.
48(132) 62(42) 33(64) 51(65) 137(120) 94(43)	288(182) 383(612) 230(498) 313(374) 1970(1359) 116(119) 211(303) 781(2140) 85(260) 149(166) 337(412) 42(107)	Future Intersection	118(85) 392(818) 36(210) 21(69) 93(33) 485(469)	20(15) 393(772) 104(74) 8(43) 475(428) 12(28)

6 Frederick St. & Cactus Av.	7 Dwy. 3 & Brodiaea Av.	8 Graham St. & Brodiaea Av.
140(275) 229(631) 277(254) 3168(2212) 253(126) 1865(3379)	Future Intersection	8(5) 432(585) 65(116) 116(104) 80(71) 30(30) 2(5) 9(17) 4(5) 5(5) 373(554) 27(34)

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

EXHIBIT 7-2: GENERAL PLAN BUILDOUT (POST-2040) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



1 Veterans Wy. & Calle San Jaun De Los Lagos	2 Frederick St. & Alessandro Bl.	3 Frederick St. & Dwy. 1	4 Frederick St. & Calle San Jaun De Los Lagos / Dwy. 2	5 Frederick St. & Brodiaea Av.
48(132) 66(43) 34(68) 52(69) 137(120) 98(44)	288(182) 387(613) 230(498) 313(374) 1970(1359) 120(120) 211(303) 781(2140) 89(261) 152(181) 338(418) 43(111)	521(906) 2(12) 524(692) 0(0)	118(85) 394(819) 9(3) 2(9) 2(7) 2(11) 36(210) 7(2) 21(69) 93(33) 486(473) 11(3)	20(15) 395(783) 105(78) 8(43) 486(431) 12(28)

6 Frederick St. & Cactus Av.	7 Dwy. 3 & Brodiaea Av.	8 Graham St. & Brodiaea Av.
142(282) 230(635) 281(255) 3168(2212) 260(128) 1865(3379)	1(4) 3(16) 12(3) 104(74) 2(1) 12(28)	8(5) 432(585) 65(116) 116(104) 85(72) 30(30) 2(5) 10(23) 6(16) 12(7) 373(554) 27(34)

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

Table 7-1

Intersection Analysis for General Plan Buildout (Post-2040) Conditions

#	Intersection	Traffic Control[2]	Post-2040 Without Project				Post-2040 With Project			
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM
1	Veterans Wy. & Calle San Juan de Los Lagos	CSS	10.5	10.7	B	B	10.6	10.8	B	B
2	Frederick St. & Alessandro Bl.	TS	**112.1**	**>200.0**	**F**	**F**	**112.5**	**>200.0**	**F**	**F**
3	Frederick St. & Driveway 1	**CSS**	Future Intersection				10.0	10.9	B	B
4	Frederick St. & Calle San Juan de Los Lagos/Driveway 2	TS	7.9	13.7	A	B	11.2	15.1	B	B
5	Frederick St. & Brodiaea Av.	CSS	10.8	11.8	B	B	10.8	11.8	B	B
6	Frederick St. & Cactus Av.	TS	39.6	24.9	D	C	40.0	29.5	D	C
7	Driveway 3 & Brodiaea Av.	**CSS**	Future Intersection				9.3	9.2	A	A
8	Graham St. & Brodiaea Av.	TS	14.6	15.6	B	B	14.8	15.8	B	B

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] TS = Traffic Signal; CSS = Cross-Street Stop; **CSS** = Improvement

A summary of the peak hour intersection LOS for General Plan Buildout Without Project conditions are shown on Exhibit 7-3. The intersection operations analysis worksheets for General Plan Buildout Without Project traffic conditions are included in Appendix 7.1.

7.4.2 General Plan Buildout With Project Traffic Conditions

As shown on Table 7-1 and illustrated on Exhibit 7-4, there are no additional study area intersections anticipated to experience unacceptable LOS (LOS E or worse) with the addition of Project traffic during one or more peak hours in addition to those previously identified under General Plan Buildout Without Project traffic conditions. The intersection operations analysis worksheets for General Plan Buildout With Project traffic conditions are included in Appendix 7.2 of this TIA.

7.5 Traffic Signal Warrants Analysis

There are no unsignalized study area intersections that are anticipated to meet either peak hour or planning level (ADT) volume-based traffic signal warrants for General Plan Buildout (Post-2040) Without Project traffic conditions (see Appendix 7.3). The intersection of Frederick Street and Brodiaea Avenue is anticipated to meet the peak hour traffic signal warrant under General Plan Buildout (Post-2040) With Project traffic conditions (see Appendix 7.4). Although the warrant is met, this intersection is anticipated to operate at an acceptable LOS during both peak hours and the installation of a traffic signal may not be appropriate for this intersection as access is currently restricted to right-in/right-out access only. Installation of a traffic signal is dependent on several factors, such as pedestrian traffic and other traffic warrants, not just peak hour volume-based warrants. As such, the intersection of Frederick Street and Brodiaea Avenue should be monitored and a traffic signal should be installed at the City Traffic Engineer's discretion.

7.6 Queuing Analysis

A queuing analysis was conducted for all study area intersections for General Plan Buildout (Post-2040) With Project traffic conditions to determine if turn pocket lengths are adequate to accommodate long-term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The queuing analysis results are summarized on Table 7-2 for General Plan Buildout (Post-2040) With Project traffic conditions. Queuing worksheets are included in Appendix 7.5 for General Plan Buildout (Post-2040) With Project traffic conditions.

EXHIBIT 7-3: GENERAL PLAN BUILDOUT (POST-2040) WITHOUT PROJECT SUMMARY OF LOS

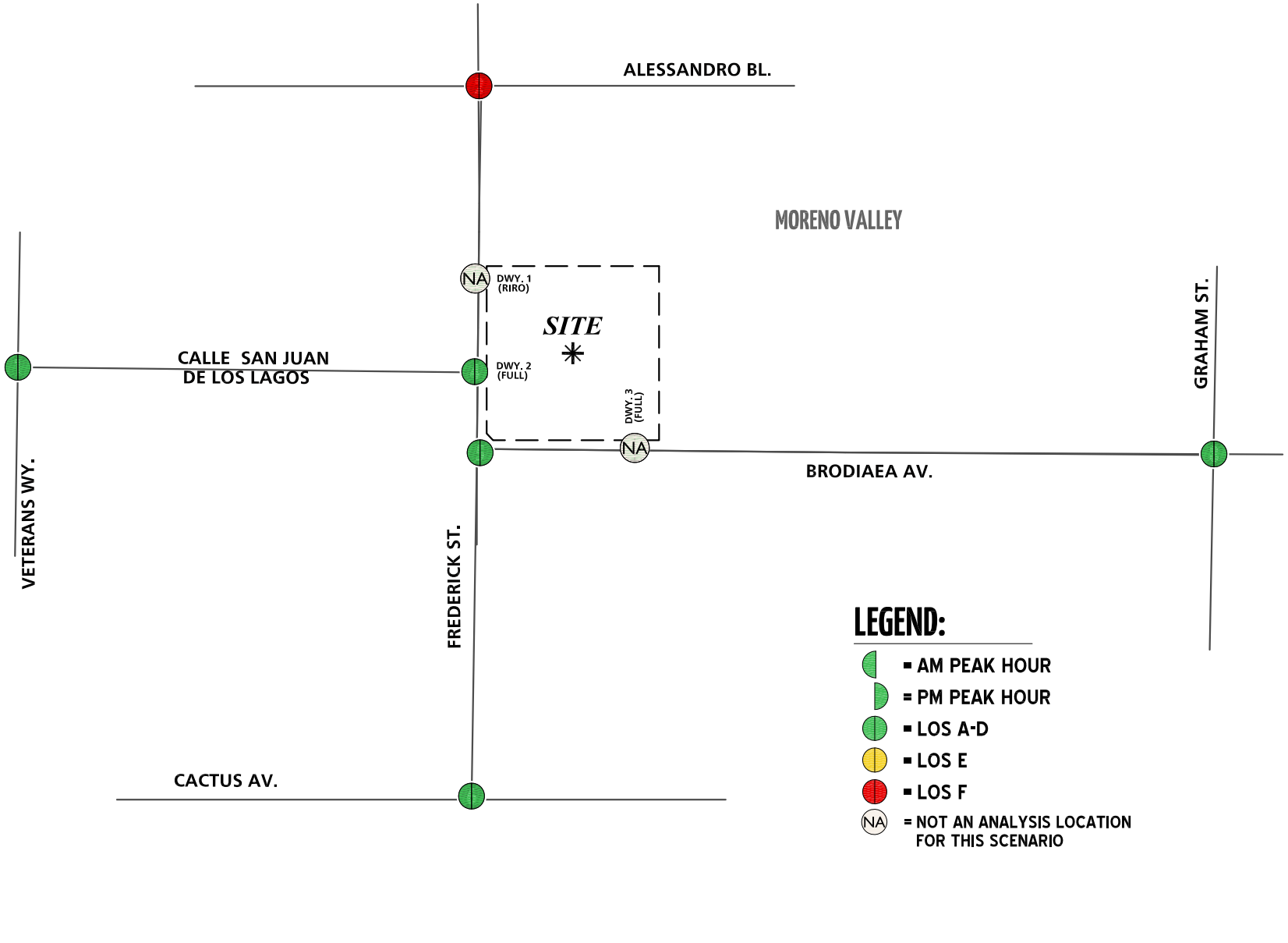


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EXHIBIT 7-4: GENERAL PLAN BUILDOUT (POST-2040) WITH PROJECT SUMMARY OF LOS

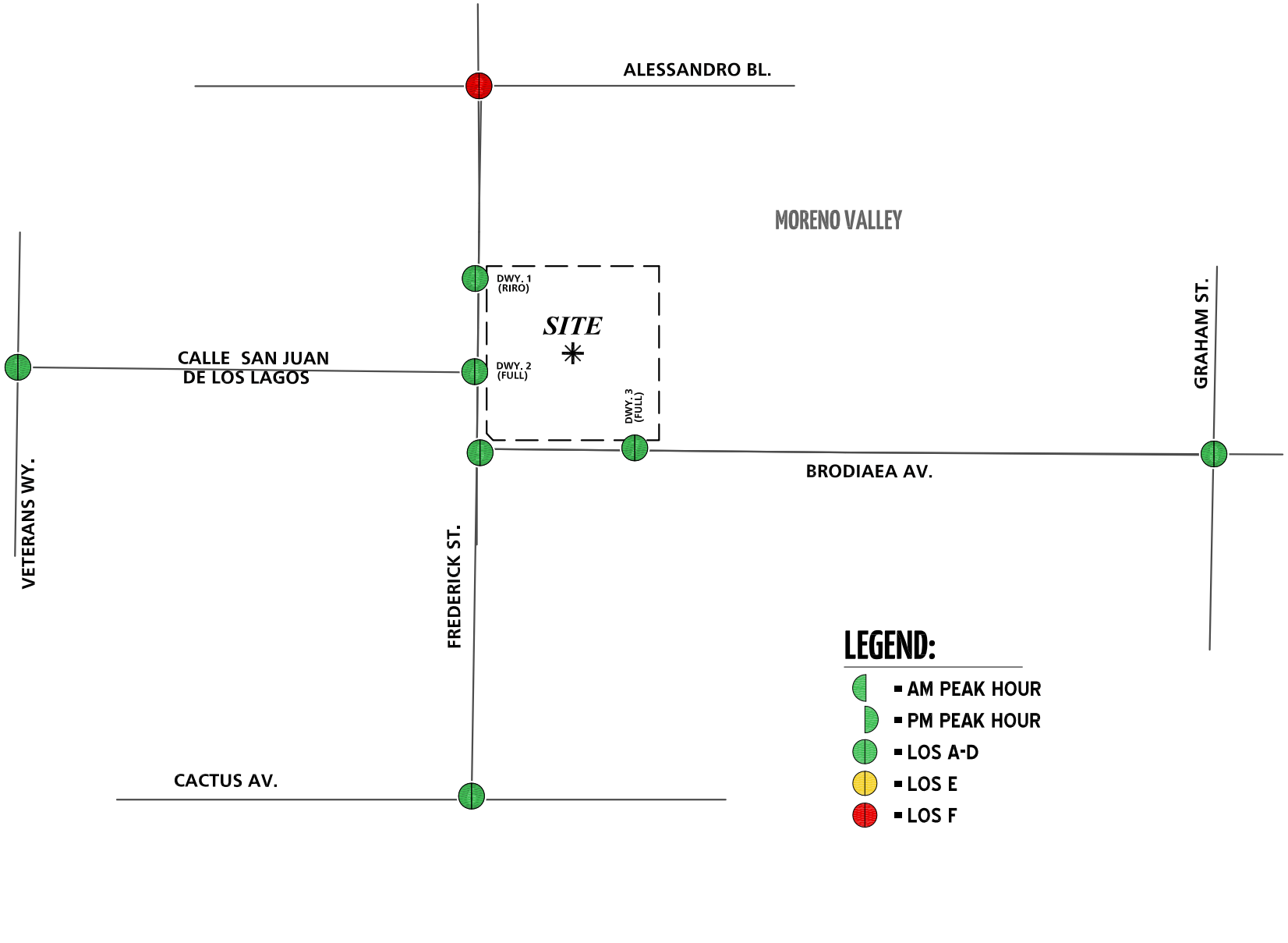

Table 7-2

Peak Hour Queuing Summary for General Plan Buildout (Post-2040) With Project Conditions

Intersection	Movement[4]	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM
Veterans Wy. & Calle San Juan de Los Lagos	NBR	1,050	5	0	Yes	Yes
	SBL	115	34	24	Yes	Yes
	WBL	100	40	44	Yes	Yes
	WBR	380	30	31	Yes	Yes
Frederick St. & Alessandro Bl.	NBL	135	91	106	Yes	Yes
	NBL	135	109	125	Yes	Yes
	SBL	120	**183**	**164**	**No**	**No**
	SBL	120	193	220	Yes[2]	Yes[2]
	SBR	100	**150**	61	**No**	Yes
	EBL	250	**367**	**421**	**No**	**No**
	EBR	1,600	40	**3,710**	Yes	**No**
	WBL	130	**262**	**222**	**No**	**No**
Frederick St. & Calle San Juan de Los Lagos/Driveway 2	NBL	150	108	55	Yes	Yes
	SBL	**100**	33	10	Yes	Yes
	EBL	120	60	**165**	Yes	**No**
Frederick St. & Brodiaea Av.	WBR	490	60	58	Yes	Yes
Frederick St. & Cactus Av.	SBL	140	105	161	Yes	Yes[2]
	SBL	810	110	196	Yes	Yes
	SBR	810	117	123	Yes	Yes
	EBL	300	**446**	260	**No**	Yes
	WBR	265	**476**	**445**	**No**	**No**
Driveway 3 & Brodiaea Av.	EBL	**100**	8	0	Yes	Yes
Graham St. & Brodiaea Av.	NBL	160	24	24	Yes	Yes
	SBL	150	68	86	Yes	Yes
	EBL	210	14	21	Yes	Yes
	EBR	180	18	29	Yes	Yes
	WBL	150	49	55	Yes	Yes
	WBR	180	55	52	Yes	Yes

* **BOLD** = Queue length exceeds available stacking distance.

NOTE: The Project is anticipated to contribute less than 50 peak hour trips to the study area intersections. As such, the Project's impact to the identified queuing issues are less than significant.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, however, there is sufficient storage within the striped median for vehicles to continue to stack without blocking the adjacent through lane.

[4] **100** = Improvement

7.7 General Plan Buildout Deficiencies and Recommended Improvements

7.7.1 Intersection Improvements

Although the intersection of Frederick Street and Alessandro Boulevard is anticipated to operate at an unacceptable LOS during the PM peak hour under General Plan Buildout (Post-2040) traffic conditions, the Project is anticipated to contribute less than 50 peak hour trips and the increase to the pre-project delay is less than 1.0 second. As such, it is anticipated that the addition of Project traffic would result in a less than significant impact at the study area intersections and no intersection improvements have been recommended to address peak hour operations.

Furthermore, although the Project will have a less than significant impact at the intersection of Frederick Street and Alessandro Boulevard, the Project applicant will still be required to pay TUMF and City of Moreno Valley DIF fees. Alessandro Boulevard is a six lane TUMF Facility while Frederick Street from the Alessandro Boulevard intersection is a four lane TUMF facility. The intersection of Alessandro Boulevard and Frederick Street is also identified in the DIF as an existing signalized intersection with a future controller upgrade location. The payment of the TUMF and DIF fees will allow the respective jurisdictions to ensure that regional highways and arterial expansions with the projected population increases.

7.7.2 Queuing Improvements

As previously shown in Table 7-2, there are 8 movements that experience queuing issues during the AM or PM peak hours. However, the Project is not anticipated to contribute trips to every movement. As such, improvement strategies have only been recommended at those locations where the Project is anticipated to contribute trips during the AM or PM peak hours:

- Frederick Street & Alessandro Boulevard, eastbound right turn lane (PM peak hour only)
- Frederick Street & Alessandro Boulevard, westbound left turn lane (AM and PM peak hours)
- Frederick Street & Cactus Avenue, eastbound left turn lane (AM peak hour only)
- Frederick Street & Cactus Avenue, westbound right turn lane (AM and PM peak hours)

Recommended improvements to address queuing issues for General Plan Buildout (Post-2040) With Project traffic conditions are described below and shown in Table 7-3. Although the Project's impact is less-than-significant, the following improvements have been identified to address the queuing issues for General Plan Buildout (Post-2040) traffic conditions at the request of City staff:

Improvements – Frederick Street & Alessandro Boulevard (#2)

- Add a 200-foot eastbound right turn pocket (with the existing eastbound right turn restriped as a 3rd eastbound through lane, consistent with the City of Moreno Valley General Plan)
- Add a 2nd westbound left turn lane

Improvements – Frederick Street & Cactus Avenue (#6)

- Restripe the eastbound left turn lane to provide 450-feet of storage
- Restripe the westbound right turn lane to provide 500-feet of storage

Queuing worksheets for General Plan Buildout (Post-2040) With Project traffic conditions with improvements are included in Appendix 7.6.

Table 7-3

Peak Hour Queuing Summary for General Plan Buildout (Post-2040) With Project Conditions With Improvements

Intersection	Movement[3]	Available Stacking Distance (Feet)[4]	95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM
Frederick St. & Alessandro Bl.	EBR	**200**	57	200	Yes	Yes
	WBL	130	99	145	Yes	Yes[2]
Frederick St. & Cactus Av.	EBL	**450**	408	177	Yes	Yes
	WBR	**500**	477	136	Yes	Yes

* **BOLD** = Queue length exceeds available stacking distance.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[3] **NBR** = Improvement

[4] **100** = Improvement

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8 REFERENCES

1. **City of Moreno Valley Transportation Engineering Division.** *Traffic Impact Analysis Preparation Guide.* Moreno Valley : s.n., August 2007.

2. **Institute of Transportation Engineers.** *Trip Generation.* 9th Edition. 2017.

3. **City of Moreno Valley.** *City of Moreno Valley General Plan.* Moreno Valley : s.n., July 11, 2006.

4. **Riverside County Transportation Commission.** *2011 Riverside County Congestion Management Program.* County of Riverside : RCTC, December 14, 2011.

5. **Transportation Research Board.** *Highway Capacity Manual (HCM).* s.l. : National Academy of Sciences, 2016.

6. **California Department of Transportation.** Manual on Uniform Traffic Control Devices (MUTCD). [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CAMUTCD).* 2014.

7. **San Bernardino Associated Governments.** *Congestion Management Program for County of San Bernardino.* County of San Bernardino : s.n., Updated June 2016.

8. **Institute of Transportation Engineers.** *Trip Generation Handbook.* 3rd Edition. September 2017.

9. **South Coast Air Quality Managment District (SCAQMD).** *Warehouse Truck Trip Study Data Results and Usage.* June 2014.

10. **City of Fontana.** *Truck Trip Generation Study.* Fontana : s.n., August 2003.

11. **Southern California Association of Governments.** *2016 Regional Transportation Plan/Sustainable Communities Strategy.* April 2016.

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APPENDIX 1.1:

APPROVED TRAFFIC STUDY SCOPING AGREEMENT

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URBAN CROSSROADS

260 E. Baker St. | Suite 200 | Costa Mesa, CA 92626 | (949) 660-1994
urbanxroads.com

Date: March 14, 2018

This letter acknowledges the City of Moreno Valley Transportation Engineering Division requirements for the traffic impact analysis of the following project:

Case No.	PP (PEN 18-0023); GPA (PEN 18-0024); ZC (PEN 18-0025)
Project Name:	Centerpointe
Project Address:	Northeast corner of Frederick Street and Brodiaea Avenue
Project Description:	Total building is 203,712 square feet of Warehouse Without Cold Storage use
Related Cases:	

	Consultant	Developer Representative
Name:	URBAN CROSSROADS, INC. Attn: Aric Evatt	T&B Planning, Inc. Attn: David Ornelas
Address:	260 E. Baker Street, Suite 200 Costa Mesa, CA 92626	17542 E. 17th Street Suite 100 Tustin, CA 92780
Telephone:	949-336-5978	714-505-6360

I. Background

The proposed Centerpointe development (referred to as "Project") is located on the northeast corner of Frederick Street and Brodiaea Avenue in the City of Moreno Valley. The Project is proposed to consist of a total of 203,712 square feet of Warehouse Without Cold Storage use within a single building.

The Project is anticipated to be built in a single phase and the opening year of 2023 will be evaluated for the purposes of this analysis (minimum five-year opening year per Moreno Valley traffic study guidelines). In addition, Horizon Year (2040) traffic conditions will also be evaluated as the site is currently zoned for Office (O) and will be modified to Light Industrial (LI). See preliminary site plan on **Exhibit 1**. **Exhibit 2** illustrates the study area and proposed intersection analysis locations.

II. Trip Geographic Distribution and Assignment

The project trip distribution patterns were developed based on an understanding of existing travel patterns in the area, the geographical location of the site, the site's proximity to the local arterial and regional state highway system:

- **Exhibit 3:** Project Passenger Car Trip Distribution
- **Exhibit 4:** Project Trucks Trip Distribution

III. Site Trip Generation Forecast

A. Source for trip generation rates: Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition (2017) for ITE Land Use Code 150 (Warehousing) using ITE *Trip Generation Handbook* 3rd Edition (2017) recommended vehicle mix (80% cars and 20% trucks) and SCAQMD *Warehouse Truck Trip Study Data Results and Usage* (2014) recommended truck mix.

B. Weekday AM Peak: 7:00-9:00 AM

C. Weekday PM Peak: 4:00-6:00 PM

D. Intersection and link acceptable Level of Service D for some intersections and links and Level of Service C for others based upon the current City policy. (Use Highway Capacity Manual 6 operations procedures; parameters per County of Riverside Traffic Impact Analysis Guidelines)

Proposed Use Rates [(1)] (See attached **Table 1 and Table 2**)

Warehouse (per TSF)	Daily: 1.740	AM: 0.170	PM: 0.190

Internal Trip Allowance:	Yes: _____	No: X	Percentage: _____
Pass-by Trip Allowance:	Yes: _____	No: X	Percentage: _____

(1) Institute of Transportation Engineers 10th Edition *Trip Generation Manual* (2017).

E. As noted on **Table 1 and Table 2**, refinements to raw trip generation estimates have been made to provide a more detailed breakdown of trips by vehicle type. Trip generation rates for Warehousing were obtained from the ITE's most current Trip Generation Manual.

Warehouse: Total vehicle mix percentages were obtained from the ITE Trip Generation Handbook (3rd Edition) in conjunction with the South Coast Air Quality Management District's (SCAQMD) recommended truck mix, by axle type for non-cold storage uses. The recommended SCAQMD truck mix was utilized as the ITE only provides guidance on the vehicle split between passenger cars and trucks, but not between the different axle types (2-axle, 3-axle, 4+-axle) PCE factors were applied to the trip generation rates for heavy

trucks (large 2-axles, 3-axles, 4+-axles). PCE factors are consistent with the recommended PCE factors by the San Bernardino County Transportation Authority (SBCTA) as they are more conservative than the PCE factor of 2.0 utilized for all heavy vehicles per the Riverside County traffic guidelines.

F. As shown on **Table 1**, the proposed Project is anticipated to generate a net total of 464 PCE trip-ends per day with 44 PCE AM peak hour trips and 51 PCE PM peak hour trips. Table 2 also shows the Project trip generation based on actual vehicles. Consistent with other studies prepared for projects in the City, the PCE trip generation will be utilized for the purposes of the peak hour intersection operations analysis.

IV. Specific Project Issues to be Analyzed

A. The traffic study will address the adequacy of site access and identify specific near-term circulation improvements required at study area intersections and roadways to maintain acceptable peak hour and daily levels of service (LOS).

B. The traffic study shall address the project traffic impacts at all study intersections listed in Section VI and provide appropriate mitigation measures if applicable. Peak-hour traffic signal warrants shall be evaluated for all intersections that are not currently signalized.

C. Qualitative assessment of existing and planned non-motorized facilities (e.g., pedestrians, bike routes, trails, etc.) within the study area. The site plan will be modified to include the bus turnout required on the east side of Frederick Street along the Project's frontage starting from the northeast corner of Frederick Street & Calle San Juan de Los Lagos. Although not currently available, the revised site plan reflecting the bus turnout will be included in the traffic study.

D. The traffic study shall provide a detail analysis of each driveway location based on Table 9.11.080-14 of the City of Moreno Valley Municipal Code - Design Guidelines, by preparing a table or an exhibit to show the required minimum spacing distance between the Project driveways and whether each proposed driveway location can meet the minimum distance. The location of Driveway 3 will be revised on the final site plan used in the traffic study to meet the City's minimum 150-foot spacing for full access. Although not currently available, the revised site plan reflecting the bus turnout will be included in the traffic study.

E. The traffic study will include fair share calculations for any potentially impacted study area intersection.

F. The traffic study shall provide a Queuing Analysis section to determine the 95th percentile queues for turning movements based on forecasted E+P, Opening Year Cumulative (2023) With Project, and Horizon Year (2040) With Project traffic volumes using the Synchro Version 10 software at the Project driveways and the study area intersections. If there is not sufficient queuing storage length available, the traffic study shall provide mitigation measures to resolve such issue.

G. The traffic study shall include a section that discusses the difference in trip generation between the existing land use and the proposed project, if applicable.

V. Study Horizon Year

A. Existing (2018)
B. Existing (2018) Plus Project
C. Opening Year Cumulative (2023) Without Project (existing to opening year-2023, assuming a growth rate of 2% per year and includes the traffic from other cumulative development projects in the vicinity)
D. Opening Year Cumulative (2023) With Project
E. Horizon Year (2040) Without Project
F. Horizon Year (2040) With Project

VI. Facilities to be Studied

A. Analysis Locations: (See **Exhibit 2**)
   1. Veterans Way & Calle San Juan de Los Lagos
   2. Frederick Street & Alessandro Boulevard
   3. Frederick Street & Driveway 1 – Right-in/Right-out Only
   4. Frederick Street & Calle San Juan de Los Lagos/Driveway 2 – Full Access
   5. Frederick Street & Brodiaea Avenue
   6. Frederick Street & Cactus Avenue
   7. Driveway 3 & Brodiaea Avenue – Full Access
   8. Graham Street & Brodiaea Avenue

B. Roadway Segments:
   No roadway segments will be evaluated as the Project is anticipated to contribute fewer than 50 peak hour trips on all roadway segments adjacent to intersection analysis locations.

VII. Open Items

A. **Cumulative Development Projects:** There is a list of cumulative projects provided on **Table 3** (also shown graphically on **Exhibit 5**) and is consistent with the cumulative lists on other recent projects. It is requested that the list of cumulative development projects be reviewed by the City and projects be removed/added, where applicable.

B. **Signal Timing:** It is requested that the City provide us with the existing signal timing for use in the traffic impact analysis for the applicable study area intersections.

VIII. Deliverables

a. Draft traffic impact studies (2 hard copies plus PDF on a CD or USB drive)
b. Final traffic impact studies (4 hard copies plus PDF on a CD or USB drive)

All draft and final traffic impact studies shall be delivered with the appropriate review fee to the Permit Technician, Land Development Division - Moreno Valley City Hall, 14177 Frederick Street, Moreno Valley, CA 92552. Please contact the Land Development Division at 951-413-3110 prior to the delivery of the traffic study.

A review fee of $3,118 will be required upon submittal of the traffic study. **A signed copy of this *Scoping Agreement* must be included in the submitted draft and final traffic impact studies.** If you have any questions regarding this *Scoping Agreement*, please contact Eric Lewis at 951-413-3140.

If you have any questions regarding this *Scoping Agreement*, please contact Eric Lewis at 951-413-3140.

Recommended By:

Charlene So

Charlene So, PE
Senior Associate
Urban Crossroads, Inc.

Approved By:

Eric Lewis, City of Moreno Valley

* NOTE: This scoping agreement was reviewed and approved based on the information submitted by Urban Crossroads, Inc. on 3/14/2018. Urban Crossroads and the Project Applicant acknowledge that any changes to the Project (zoning, size, type of use, number or location of access points, etc.) after 3/14/2018 may require this scoping agreement to be revised and resubmitted for review and approval by the City of Moreno Valley.

Attachments

EXHIBIT 1: PRELIMINARY SITE PLAN

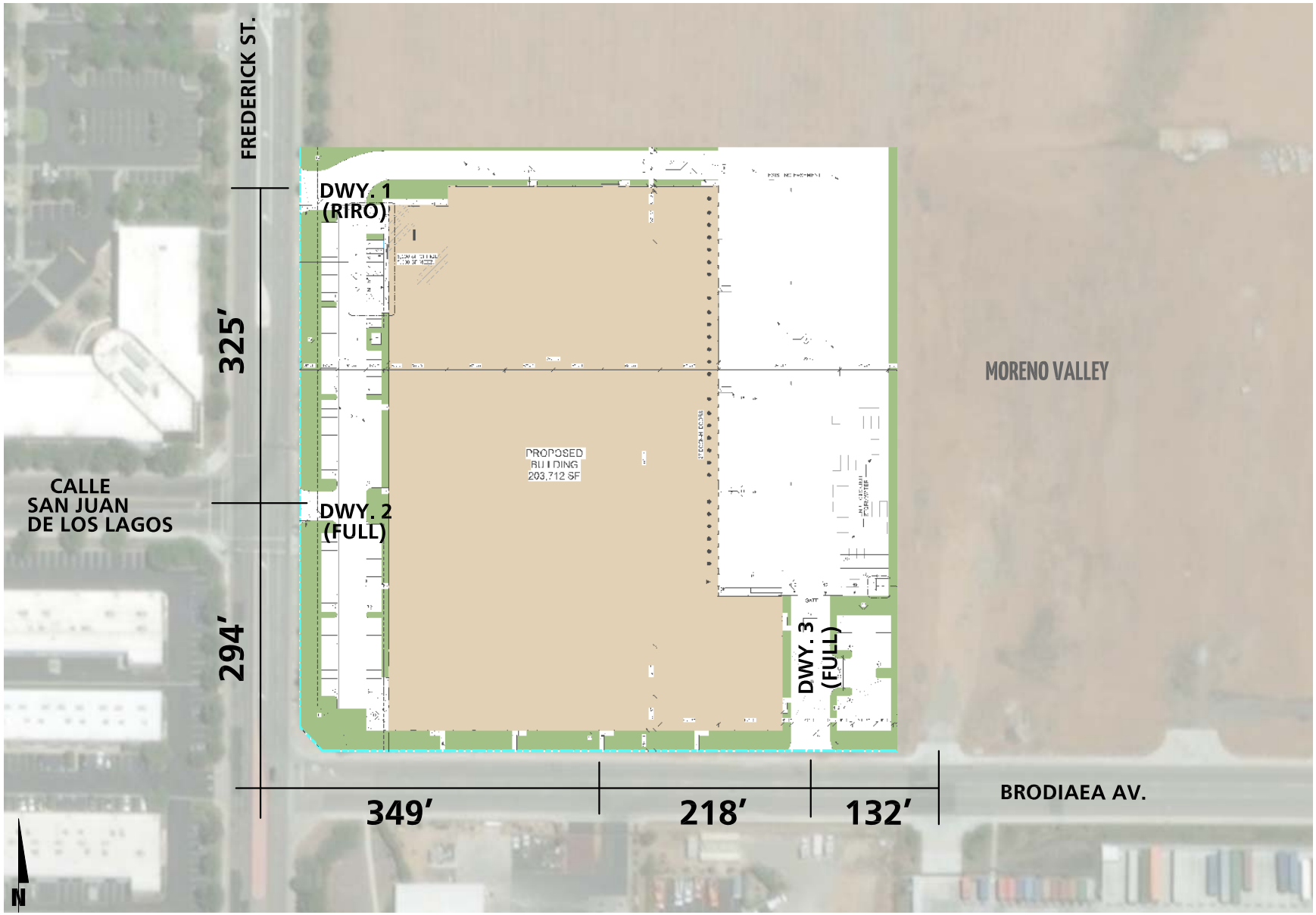

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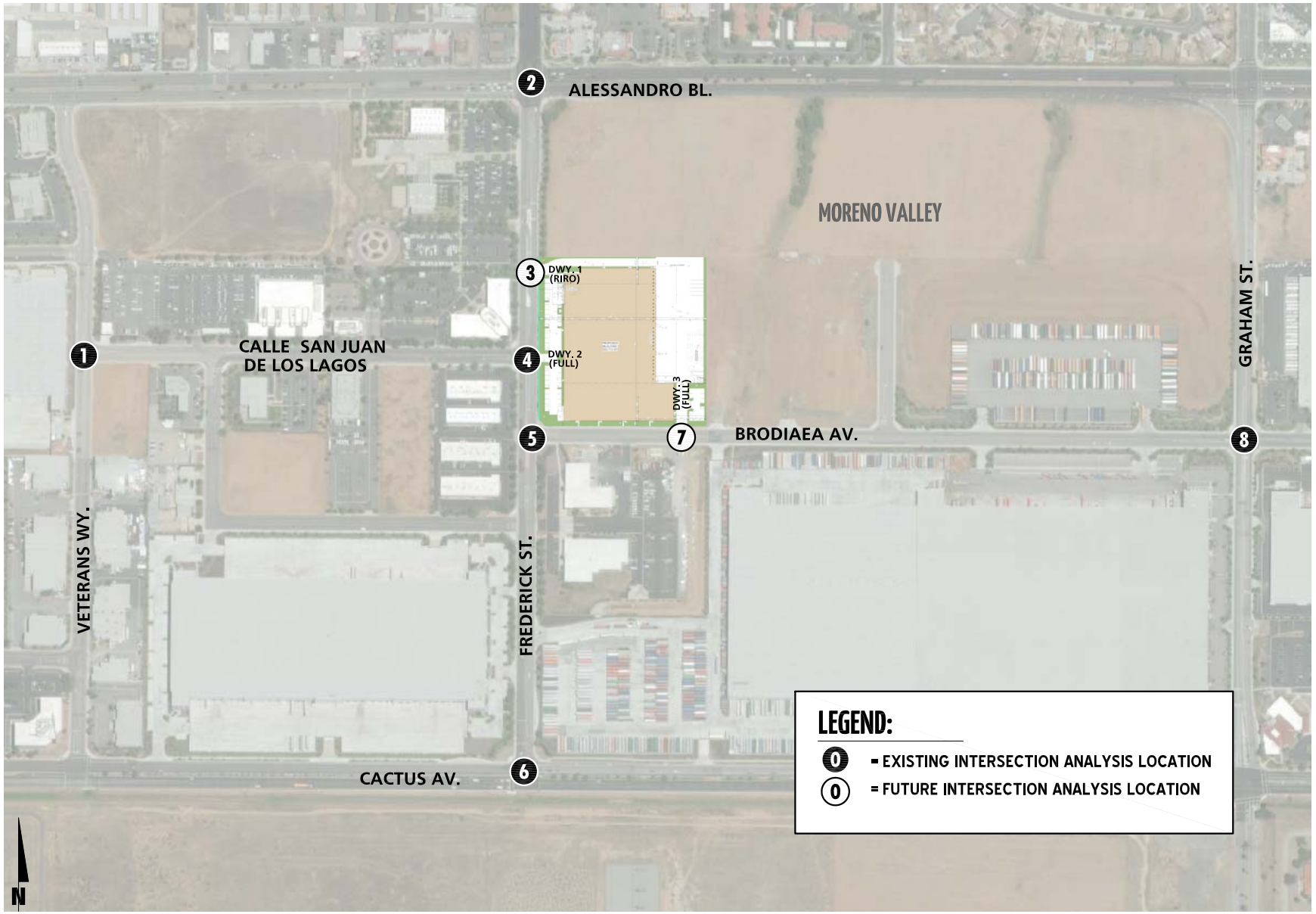
EXHIBIT 2: LOCATION MAP



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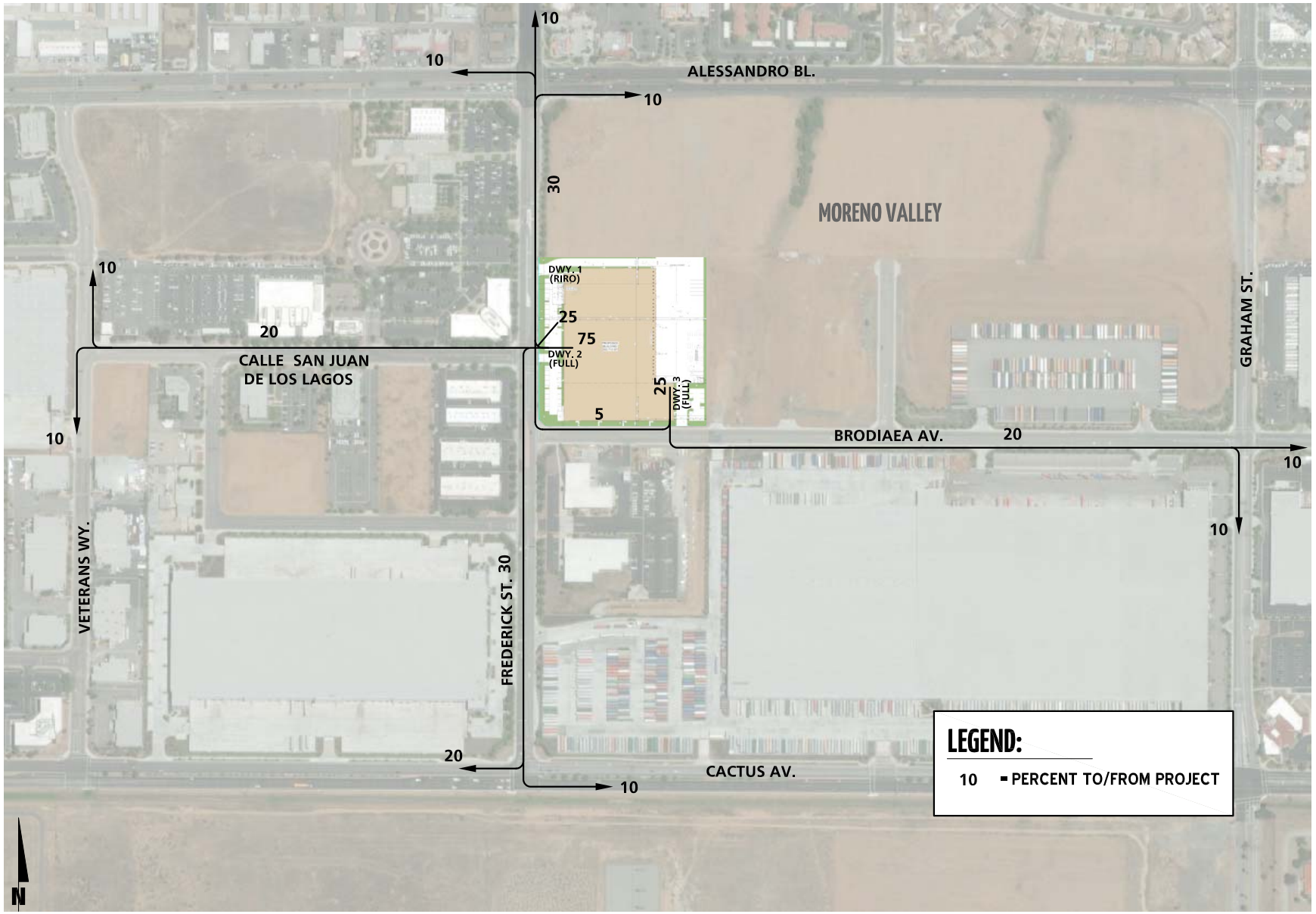
URBAN CROSSROADS

EXHIBIT 3: PROJECT (PASSENGER CAR) TRIP DISTRIBUTION



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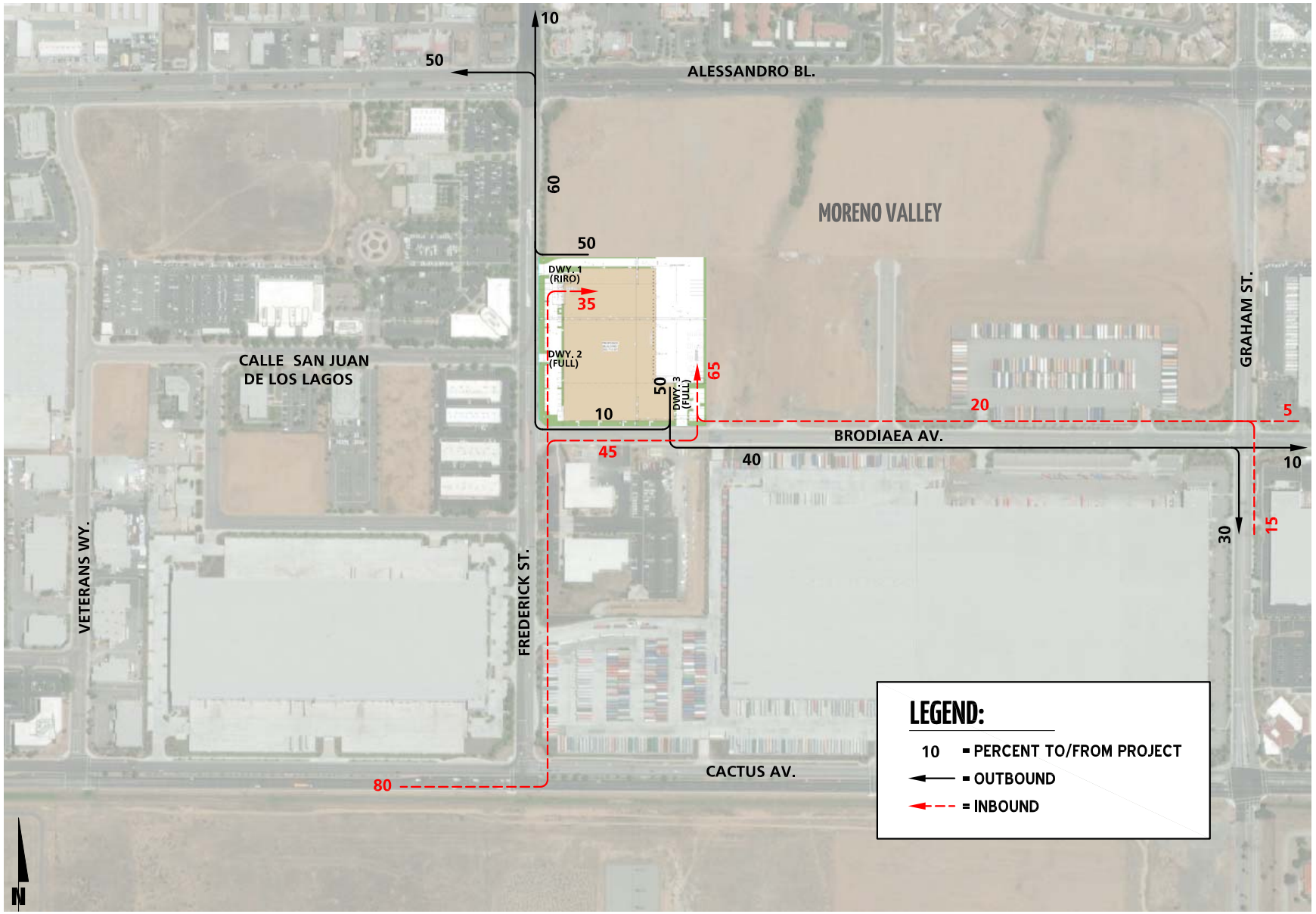
URBAN CROSSROADS

EXHIBIT 4: PROJECT (TRUCKS) TRIP DISTRIBUTION



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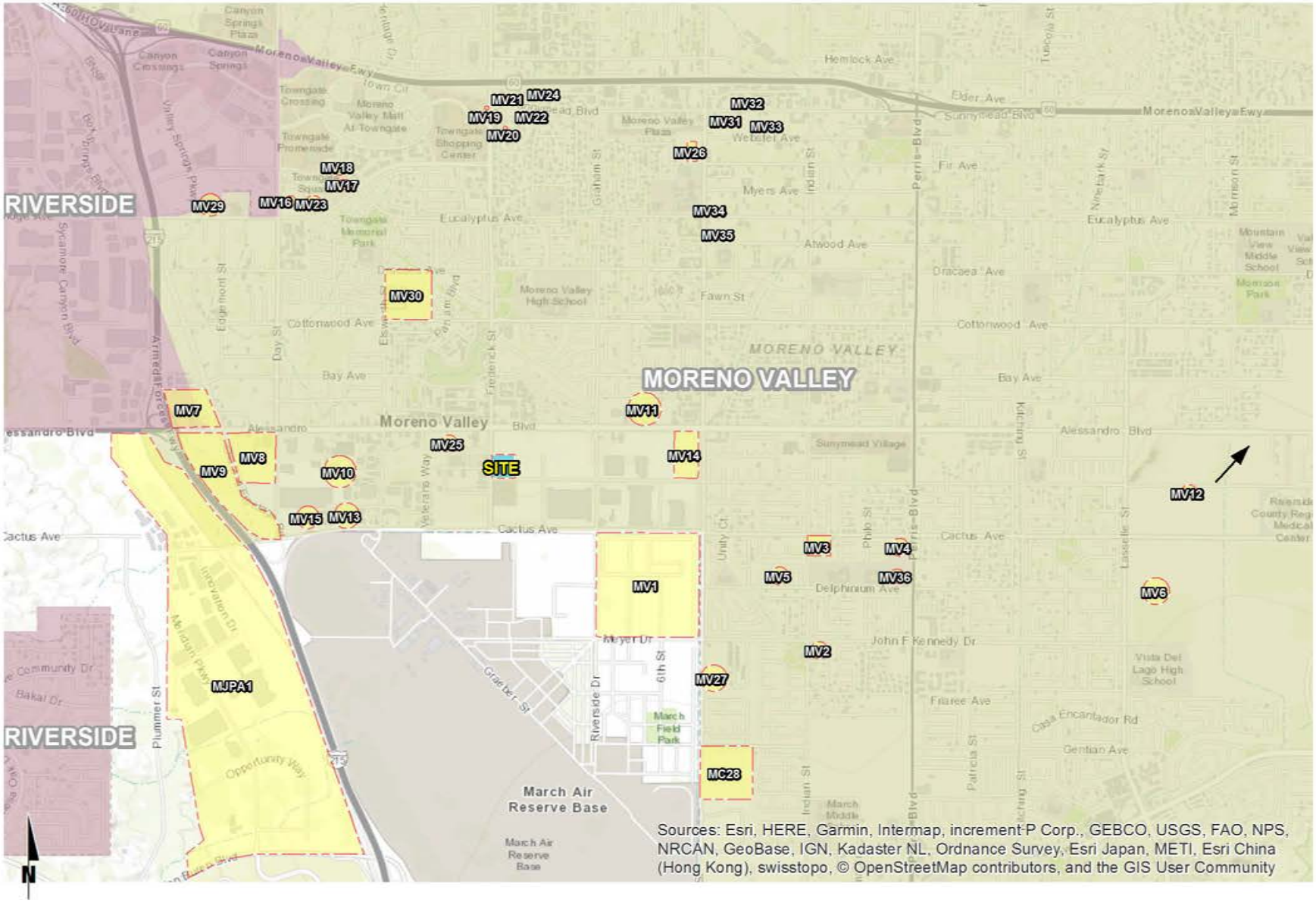
URBAN CROSSROADS

EXHIBIT 5: CUMULATIVE DEVELOPMENT LOCATION MAP



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URBAN CROSSROADS

Table 1

Project Trip Generation Summary (PCE)

Land Use	ITE LU Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Rates[1]									
Warehousing Without Cold Storage[3,4]	150	TSF	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.00%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%) (PCE = 1.5)[5]			0.007	0.002	0.009	0.003	0.007	0.010	0.087
3-Axle Trucks (4.14%) (PCE = 2.0)[5]			0.011	0.003	0.014	0.004	0.011	0.016	0.144
4-Axle+ Trucks (12.52%) (PCE = 3.0)[5]			0.049	0.015	0.064	0.019	0.052	0.071	0.654

Project	Quantity	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Summary									
Centerpointe	203.712	TSF							
Passenger Cars:			21	6	27	8	23	31	284
Truck Trips:									
2-axle:			1	0	1	1	1	2	18
3-axle:			2	1	3	1	2	3	29
4+-axle:			10	3	13	4	11	15	133
- Net Truck Trips			*13*	*4*	*17*	*6*	*14*	*20*	*180*
TOTAL NET TRIPS			***34***	***10***	***44***	***14***	***37***	***51***	***464***

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[2] TSF = Thousand Square Feet

[3] Vehicle Mix Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[4] Truck Mix Source: SCAQMD Warehouse Truck Trip Study Data Results and Usage (2014).

Normalized % - Without Cold Storage:

16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.5% 4-Axle trucks

[5] PCE rates are per SBCTA (more conservative than Riverside County).

Table 2

Project Trip Generation Summary (Actual Vehicles)

Land Use	ITE LU Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Rates[1]									
Warehousing Without Cold Storage[3,4]	150	TSF	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.00%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%)			0.004	0.001	0.006	0.002	0.005	0.006	0.058
3-Axle Trucks (4.14%)			0.005	0.002	0.007	0.002	0.006	0.008	0.072
4-Axle+ Trucks (12.52%)			0.016	0.005	0.021	0.006	0.017	0.024	0.218

Project	Quantity	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Summary									
Centerpointe	203.712	TSF							
Passenger Cars:			21	6	27	8	23	31	284
Truck Trips:									
2-axle:			1	0	1	0	1	1	12
3-axle:			1	0	1	0	1	1	15
4+-axle:			3	1	4	1	4	5	44
- Net Truck Trips			*5*	*1*	*6*	*1*	*6*	*7*	*71*
TOTAL NET TRIPS			***26***	***7***	***33***	***9***	***29***	***38***	***355***

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[2] TSF = Thousand Square Feet

[3] Vehicle Mix Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[4] Truck Mix Source: SCAQMD Warehouse Truck Trip Study Data Results and Usage (2014).

Normalized % - Without Cold Storage:

16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.5% 4-Axle trucks

Table 3
Page 1 of 2

Cumulative Development Land Use Summary

ID	Project Name	Land Use[1]	Quantity	Units[2]
MV1	March Lifecare Campus Specific Plan[3]	Medical Offices	190.000	TSF
		Commercial Retail	210.000	TSF
		Research & Education	200.000	TSF
		Hospital	50	Beds
		Institutional Residential	660	Beds
MV2	O'Reilly Automotive	Automobile Parts Sale	7.500	TSF
	PA15-004	Retail/Restaurant/Fast Food	2.973	TSF
MV3	TM 33417	Condo/Townhomes	60	DU
MV4	TM 33607	Condo/Townhomes	52	DU
MV5	32711 Isaac Genah	SFDR	9	DU
MV6	a Moreno Medical Campus	Medical Offices	80.000	TSF
	b Aqua Bella Specific Plan	SFDR	2,922	DU
	c TR 34329 (Granite Capitol)	SFDR	90	DU
	d Cresta Bella	General Office	30.000	TSF
MV7	P07-0102; and P09-0416, -0418, -0419	General Light Industrial	652.018	TSF
	Alessandro Bl. (APN 263-091-008; 263-100-019; 263-100-005; P14-0841 to 0848)	Commercial and Industrial Complex	101.580	TSF
MV8	Alessandro Metrolink Station	Light Rail Transit Station	300	SP
MV9	Freeway Business Center	High-Cube Warehouse	709.083	TSF
MV10	PA 08-0047-0052 (Komar Cactus Plaza)[3]	Hotel	110	Rooms
		Fast Food w/Drive Thru	8.000	TSF
		Commercial	42.400	TSF
MV11	PA 09-0031	Gas Station	12	VFP
MV12	Prologis	High-Cube Warehouse	1916.19	TSF
		High-Cube Warehouse	328.448	TSF
	World Logistics Center	High-Cube Warehouse	41400	TSF
		Warehousing	200	TSF
		Gas Station w/ Market	12	VFP
		Existing SFDR	7	DU
MV13	Moreno Valley Cactus Center (PEN16-0131)	Warehouse	36.95	TSF
		Fast Food w/Drive Thru	7.9	TSF
		Gas Station w/Car Wash	28	VFP
MV14	Brodiaea Commerce Center	High-Cube Warehouse	262.398	TSF
MV15	Hawthorne Inn	Hotel	79	RM
MV16	The Quarter	Hotel	216	RM
MV17	Ayres Hotel & Spa	Hotel	127	RM
MV18	Hampton Inn & Suites	Hotel	115	RM
MV19	La Quinta Inn & Suites	Hotel	58	RM
MV20	Travelers Inn	Hotel	55	RM
MV21	Comfort Inn	Hotel	92	RM
MV22	Sleep Inn & Suites	Hotel	66	RM

Table 3

Cumulative Development Land Use Summary

ID	Project Name	Land Use[1]	Quantity	Units[2]
MV23	TownGate Square	Office	170.000	TSF
MV24	Olivewood Plaza	Office	22.758	TSF
MV25	Centerpointe Office Area	Office	258.000	TSF
MV26	Riverside County Office Building	Office	52.000	TSF
MV27	Invermex, Inc.	SFDR	32	DU
MV28	Rados	SFDR	135	DU
MV29	Latco SC Inc.	Multifamily Housing	112	DU
MV30	Winchester Associates "Scottish Village"	Multifamily Housing	194	DU
MV31	33771 Jian Qiang Liu	Multifamily Housing	12	DU
MV32	Cal Choice Inv. Inc.	Multifamily Housing	12	DU
MV33	35663 Jimmy Lee	Multifamily Housing	12	DU
MV34	35769 Michael Chen	Multifamily Housing	16	DU
MV35	PA09-0006 Jim Nydam	Multifamily Housing	15	DU
MV36	Nova Homes	Multifamily Housing	122	DU
MJPA1	Meridian Business Park North	Industrial Park	5,985.000	TSF

[1] SFDR = Single Family Detached Residential

[2] DU = Dwelling Units; TSF = Thousand Square Feet; SP = Spaces; VFP = Vehicle Fueling Positions

APPENDIX 1.2:

TUMF TRANSPORTATION IMPROVEMENT PROGRAM FOR MORENO VALLEY

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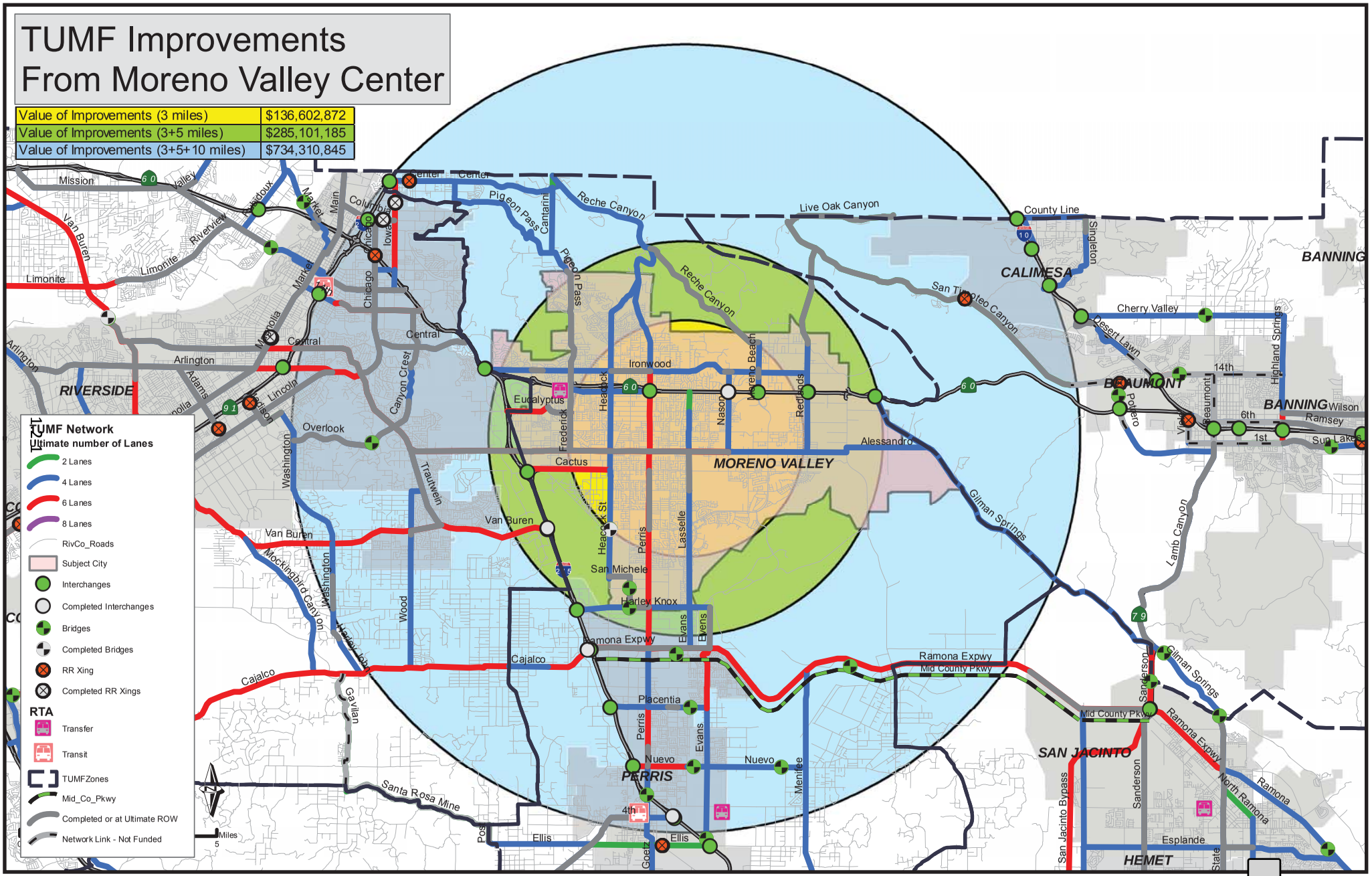
TUMF Improvements
From Moreno Valley Center
Value of Improvements (3 miles) $136,602,872
Value of Improvements (3+5 miles) $285,101,185
Value of Improvements (3+5+10 miles) $734,310,845
TUMF Network
Ultimate number of Lanes
2 Lanes
4 Lanes
6 Lanes
8 Lanes
RivCo_Roads
Subject City
Interchanges
Completed Interchanges
Bridges
Completed Bridges
RR Xing
Completed RR Xings
RTA
Transfer
Transit
TUMFZones
Mid_Co_Pkwy
Completed or at Ultimate ROW
Network Link - Not Funded
Miles
5
RIVERSIDE
MORENO VALLEY
CALIMESA
BEAUMONT
BANNING
PERRIS
SAN JACINTO
HEMET
Mission
Van Buren
Limonite
Arlington
Central
Overlook
Cactus
Alessandro
Ironwood
Eucalyptus
Harley Knox
San Michele
Ramona Expwy
Mid County Pkwy
Cajalco
Placentia
Nuevo
Ellis
4th
Santa Rosa Mine
Gilman Springs
Lamb Canyon
Live Oak Canyon
County Line
Cherry Valley
Desert Lawn
Pigeon Pass
Reche Canyon
Cantarini
Canyon Crest
Trautwein
Washington
Wood
Mockingbird Canyon
Gavilan
Evans
Perris
Lasselle
Heacock St
Frederick
Redlands
Nason
Moreno Beach
Sanderson
Menifee
Singleton
Potrero
Beaumont
14th
6th
1st
Highland Springs
Wilson
Ramsey
Sun Lakes
San Jacinto Bypass
North Ramona
Ramona
Esplande
State
Ellis
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APPENDIX 1.3:

SITE ADJACENT QUEUING ANALYSIS

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Queuing and Blocking Report
General Plan Buildout (Post-2040) With Project - AM Peak Hour

Centerpointe (JN: 11410)
05/15/2018

Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	R	L
Maximum Queue (ft)	49	28	4	9	35
Average Queue (ft)	22	14	0	0	12
95th Queue (ft)	43	31	3	4	35
Link Distance (ft)		1530	1143	1143	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				115
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	330	1066	1043	57	215	2589	2589	2589	119	124	144	168
Average Queue (ft)	322	764	728	19	134	2589	2589	2589	52	73	83	98
95th Queue (ft)	373	1222	1207	41	259	2589	2589	2589	99	112	136	148
Link Distance (ft)		3252	3252	3252		2574	2574	2574			571	571
Upstream Blk Time (%)						89	96	97				
Queuing Penalty (veh)						0	0	0				
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)	90	0			12	66			0	0	1	
Queuing Penalty (veh)	350	1			77	80			0	0	2	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	160	197	192	186	167
Average Queue (ft)	92	135	116	111	85
95th Queue (ft)	180	194	179	169	142
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)	5	39	9	12	5
Queuing Penalty (veh)	9	76	20	36	10

Intersection: 3: Frederick St. & Dwy. 1

Movement	WB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	2
95th Queue (ft)	16
Link Distance (ft)	345
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	72	52	31	128	112	108	34	142	188
Average Queue (ft)	28	19	6	58	27	35	7	47	61
95th Queue (ft)	61	47	25	104	78	83	28	114	134
Link Distance (ft)		1530	288		230	230		276	276
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	120			150			100		
Storage Blk Time (%)				0	0			2	
Queuing Penalty (veh)				0	0			0	

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB	SB
Directions Served	R	R	LT
Maximum Queue (ft)	31	90	16
Average Queue (ft)	6	37	1
95th Queue (ft)	26	66	9
Link Distance (ft)	167	481	230
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	374	632	602	300	2544	2544	2544	340	126	139	161
Average Queue (ft)	266	209	156	68	2532	2535	2527	299	62	72	64
95th Queue (ft)	407	534	436	181	2664	2638	2696	470	111	124	135
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)					56	60	83				
Queuing Penalty (veh)					0	0	0				
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)	23	0					42		0	0	
Queuing Penalty (veh)	140	0					117		0	0	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	6	31
Average Queue (ft)	0	4
95th Queue (ft)	4	20
Link Distance (ft)		326
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	18	31	29	56	94	72	41	114	77	80	125	84
Average Queue (ft)	1	7	4	19	37	31	10	60	28	31	55	28
95th Queue (ft)	10	27	20	47	77	52	32	101	62	63	96	64
Link Distance (ft)		2009			828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210		100	150			160			150		
Storage Blk Time (%)											0	
Queuing Penalty (veh)											0	

Network Summary

Network wide Queuing Penalty: 918

Queuing and Blocking Report
General Plan Buildout (Post-2040) With Project - PM Peak Hour

Centerpointe (JN: 11410)
05/15/2018

Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	51	38	28
Average Queue (ft)	22	17	4
95th Queue (ft)	42	34	20
Link Distance (ft)		1530	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		115
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	330	3710	3710	3710	215	1084	1066	1109	180	224	484	462
Average Queue (ft)	286	3710	3710	3710	195	666	663	664	148	181	298	220
95th Queue (ft)	416	3710	3710	3710	264	1222	1205	1184	224	279	586	446
Link Distance (ft)		3695	3695	3695		2574	2574	2574			571	571
Upstream Blk Time (%)		99	98	94							7	0
Queuing Penalty (veh)		0	0	0							26	0
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)	25	57			67	56			49	68	4	
Queuing Penalty (veh)	265	173			301	67			102	141	8	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	160	220	1199	1199	166
Average Queue (ft)	158	219	1199	1198	51
95th Queue (ft)	164	220	1199	1205	124
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)			95	48	
Queuing Penalty (veh)			0	0	
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)	85	90	12	18	0
Queuing Penalty (veh)	261	276	58	32	1

Intersection: 3: Frederick St. & Dwy. 1

Movement	WB	NB	NB
Directions Served	R	T	TR
Maximum Queue (ft)	39	78	55
Average Queue (ft)	12	16	7
95th Queue (ft)	37	100	74
Link Distance (ft)	345	276	276
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		1	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	172	210	66	72	124	107	30	227	233
Average Queue (ft)	116	44	20	28	45	46	3	81	75
95th Queue (ft)	171	126	53	63	95	97	17	183	181
Link Distance (ft)		1530	288		230	230		276	276
Upstream Blk Time (%)								0	0
Queuing Penalty (veh)								0	0
Storage Bay Dist (ft)	120			150			100		
Storage Blk Time (%)	14	0			0			5	
Queuing Penalty (veh)	10	0			0			0	

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB	NB	SB
Directions Served	R	R	T	LT
Maximum Queue (ft)	50	55	11	6
Average Queue (ft)	23	28	0	0
95th Queue (ft)	48	49	8	4
Link Distance (ft)	167	481	1150	230
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	335	518	489	494	425	424	416	338	199	269	171
Average Queue (ft)	123	270	269	248	253	251	229	56	125	153	79
95th Queue (ft)	271	458	453	434	367	366	354	191	203	243	155
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)		5					4		7	13	
Queuing Penalty (veh)		6					10		21	42	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	15
95th Queue (ft)	40
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	30	44	39	60	85	73	25	162	160	110	124	112
Average Queue (ft)	4	16	11	22	30	30	6	89	60	49	64	42
95th Queue (ft)	19	43	34	52	65	57	24	144	123	88	108	89
Link Distance (ft)		2009			828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210		100	150			160			150		
Storage Blk Time (%)								0		0	0	
Queuing Penalty (veh)								0		0	0	

Network Summary

Network wide Queuing Penalty: 1801

APPENDIX 3.1:

EXISTING TRAFFIC COUNTS – APRIL 2018

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Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Moreno Valley
N/S: Veterans Way
E/W: Calle San Juan De Los Lagos
Weather: Clear

File Name : 01_MRV_Veterans_Calle SJDLL AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	15	4	19	6	1	7	4	15	19	45
07:15 AM	16	7	23	9	3	12	4	27	31	66
07:30 AM	11	9	20	8	6	14	10	11	21	55
07:45 AM	4	9	13	8	1	9	16	10	26	48
Total	46	29	75	31	11	42	34	63	97	214
08:00 AM	9	3	12	7	10	17	19	12	31	60
08:15 AM	10	11	21	6	4	10	23	12	35	66
08:30 AM	7	12	19	6	7	13	11	6	17	49
08:45 AM	13	6	19	6	8	14	12	9	21	54
Total	39	32	71	25	29	54	65	39	104	229
Grand Total	85	61	146	56	40	96	99	102	201	443
Apprch %	58.2	41.8		58.3	41.7		49.3	50.7		
Total %	19.2	13.8	33	12.6	9	21.7	22.3	23	45.4	
Passenger Vehicles	84	56	140	54	34	88	97	99	196	424
% Passenger Vehicles	98.8	91.8	95.9	96.4	85	91.7	98	97.1	97.5	95.7
Large 2 Axle Vehicles	1	3	4	1	6	7	2	3	5	16
% Large 2 Axle Vehicles	1.2	4.9	2.7	1.8	15	7.3	2	2.9	2.5	3.6
3 Axle Vehicles	0	1	1	1	0	1	0	0	0	2
% 3 Axle Vehicles	0	1.6	0.7	1.8	0	1	0	0	0	0.5
4+ Axle Trucks	0	1	1	0	0	0	0	0	0	1
% 4+ Axle Trucks	0	1.6	0.7	0	0	0	0	0	0	0.2

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**16**	7	**23**	**9**	3	12	4	**27**	**31**	**66**
07:30 AM	11	**9**	20	8	6	14	10	11	21	55
07:45 AM	4	9	13	8	1	9	16	10	26	48
08:00 AM	9	3	12	7	**10**	**17**	**19**	12	31	60
Total Volume	40	28	68	32	20	52	49	60	109	229
% App. Total	58.8	41.2		61.5	38.5		45	55		
PHF	.625	.778	.739	.889	.500	.765	.645	.556	.879	.867

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City of Moreno Valley
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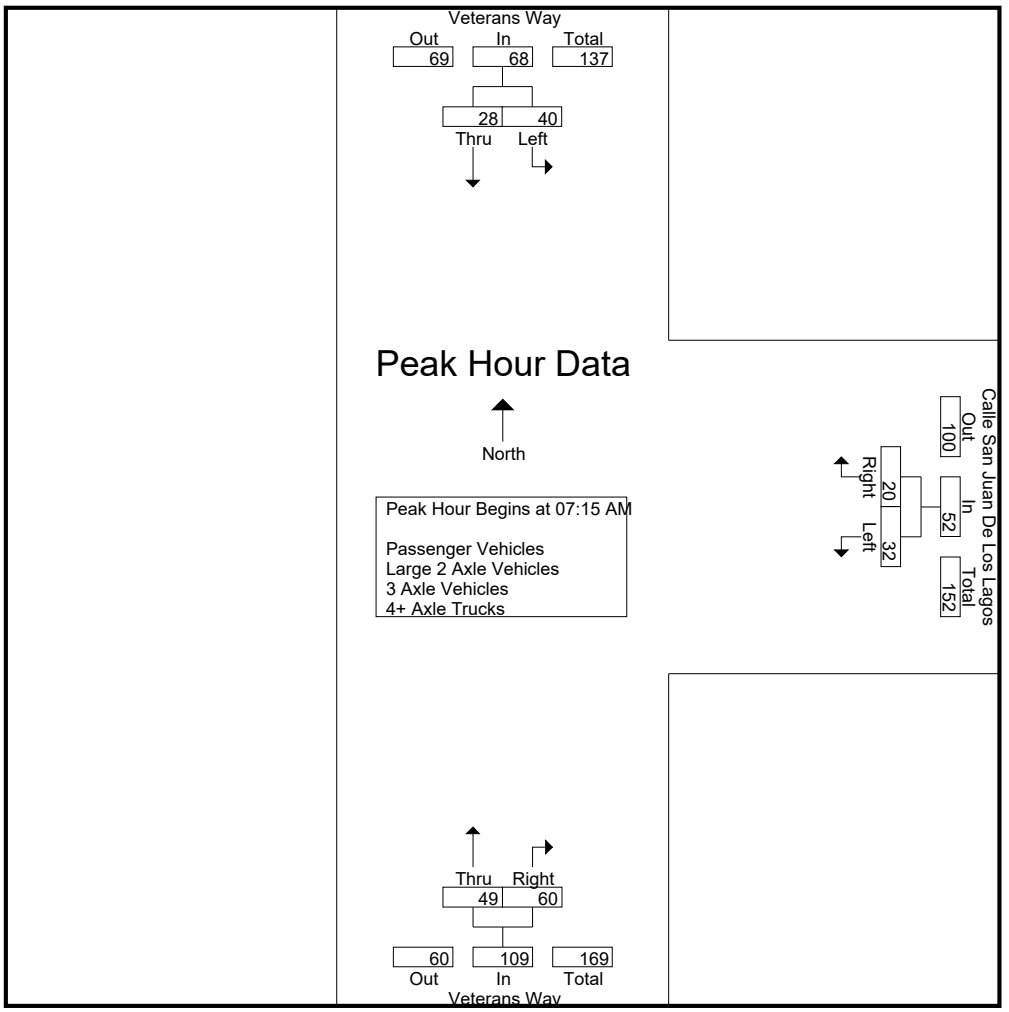
File Name : 01_MRV_Veterans_Calle SJDLL AM
Site Code : 05118259
Start Date : 4/3/2018



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			08:00 AM			07:30 AM		
+0 mins.	15	4	19	**7**	**10**	**17**	10	11	21
+15 mins.	**16**	7	**23**	6	4	10	16	10	26
+30 mins.	11	**9**	20	6	7	13	19	**12**	31
+45 mins.	4	9	13	6	8	14	**23**	12	**35**
Total Volume	46	29	75	25	29	54	68	45	113
% App. Total	61.3	38.7		46.3	53.7		60.2	39.8	
PHF	.719	.806	.815	.893	.725	.794	.739	.938	.807

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City of Moreno Valley
N/S: Veterans Way
E/W: Calle San Juan De Los Lagos
Weather: Clear

File Name : 01_MRV_Veterans_Calle SJDLL AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	15	3	18	5	1	6	4	15	19	43
07:15 AM	16	6	22	9	2	11	4	27	31	64
07:30 AM	11	8	19	8	5	13	9	10	19	51
07:45 AM	4	9	13	7	1	8	16	10	26	47
Total	46	26	72	29	9	38	33	62	95	205
08:00 AM	9	2	11	7	9	16	19	12	31	58
08:15 AM	9	11	20	6	4	10	22	11	33	63
08:30 AM	7	11	18	6	6	12	11	5	16	46
08:45 AM	13	6	19	6	6	12	12	9	21	52
Total	38	30	68	25	25	50	64	37	101	219
Grand Total	84	56	140	54	34	88	97	99	196	424
Apprch %	60	40		61.4	38.6		49.5	50.5		
Total %	19.8	13.2	33	12.7	8	20.8	22.9	23.3	46.2	

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**16**	6	**22**	**9**	2	11	4	**27**	**31**	**64**
07:30 AM	11	8	19	8	5	13	9	10	19	51
07:45 AM	4	**9**	13	7	1	8	16	10	26	47
08:00 AM	9	2	11	7	**9**	**16**	**19**	12	31	58
Total Volume	40	25	65	31	17	48	48	59	107	220
% App. Total	61.5	38.5		64.6	35.4		44.9	55.1		
PHF	.625	.694	.739	.861	.472	.750	.632	.546	.863	.859

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City of Moreno Valley
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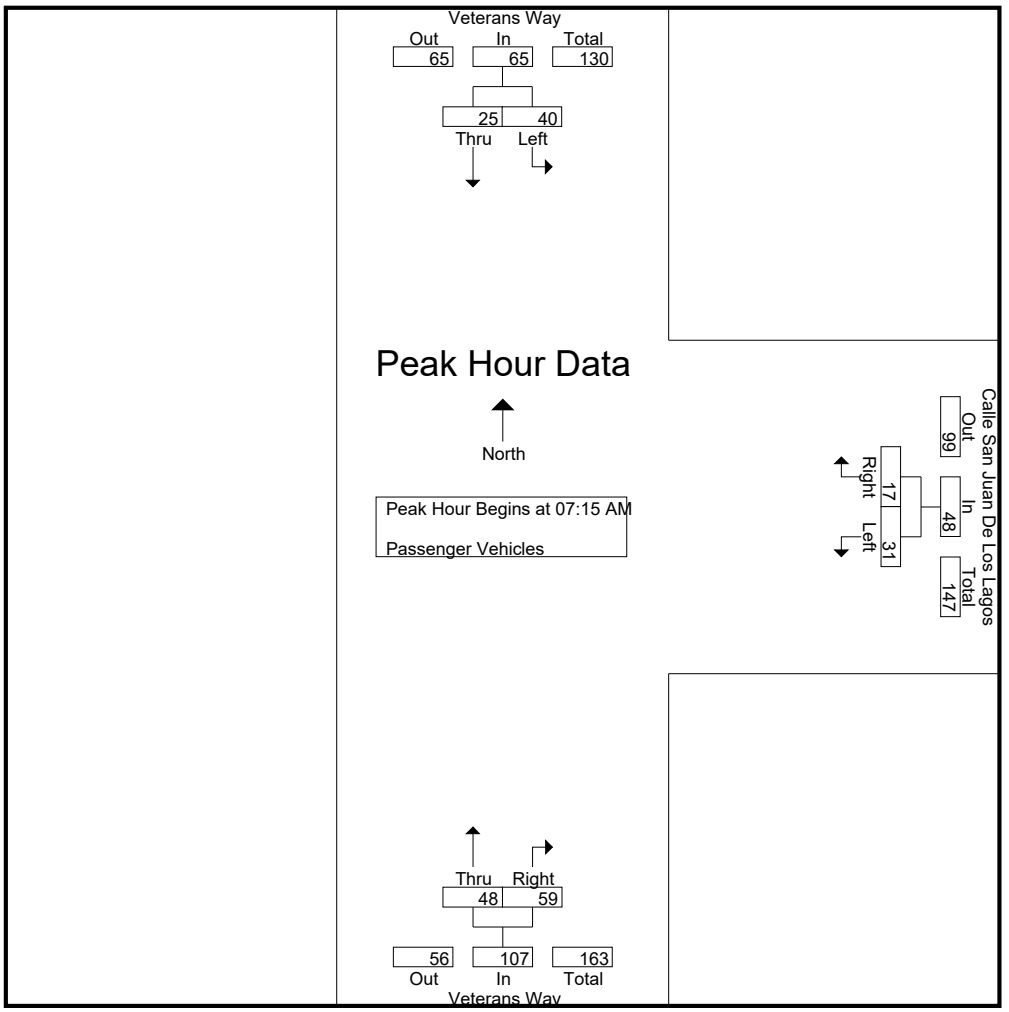
Weather: Clear

File Name : 01_MRV_Veterans_Calle SJDLL AM
Site Code : 05118259
Start Date : 4/3/2018



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	**16**	6	**22**	**9**	2	11	4	**27**	**31**
+15 mins.	11	8	19	8	5	13	9	10	19
+30 mins.	4	**9**	13	7	1	8	16	10	26
+45 mins.	9	2	11	7	**9**	**16**	**19**	12	31
Total Volume	40	25	65	31	17	48	48	59	107
% App. Total	61.5	38.5		64.6	35.4		44.9	55.1	
PHF	.625	.694	.739	.861	.472	.750	.632	.546	.863

Counts Unlimited
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City of Moreno Valley
N/S: Veterans Way
E/W: Calle San Juan De Los Lagos
Weather: Clear

File Name : 01_MRV_Veterans_Calle SJDLL AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	1	0	1	0	0	0	1
07:15 AM	0	1	1	0	1	1	0	0	0	2
07:30 AM	0	0	0	0	1	1	1	1	2	3
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	1	1	1	2	3	1	1	2	6
08:00 AM	0	1	1	0	1	1	0	0	0	2
08:15 AM	1	0	1	0	0	0	1	1	2	3
08:30 AM	0	1	1	0	1	1	0	1	1	3
08:45 AM	0	0	0	0	2	2	0	0	0	2
Total	1	2	3	0	4	4	1	2	3	10
Grand Total	1	3	4	1	6	7	2	3	5	16
Apprch %	25	75		14.3	85.7		40	60		
Total %	6.2	18.8	25	6.2	37.5	43.8	12.5	18.8	31.2	

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	**1**	**1**	0	**1**	**1**	0	0	0	2
07:30 AM	0	0	0	0	1	1	**1**	**1**	**2**	**3**
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	1	1	0	1	1	0	0	0	2
Total Volume	0	2	2	0	3	3	1	1	2	7
% App. Total	0	100		0	100		50	50		
PHF	.000	.500	.500	.000	.750	.750	.250	.250	.250	.583

Counts Unlimited
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Corona, CA 92878
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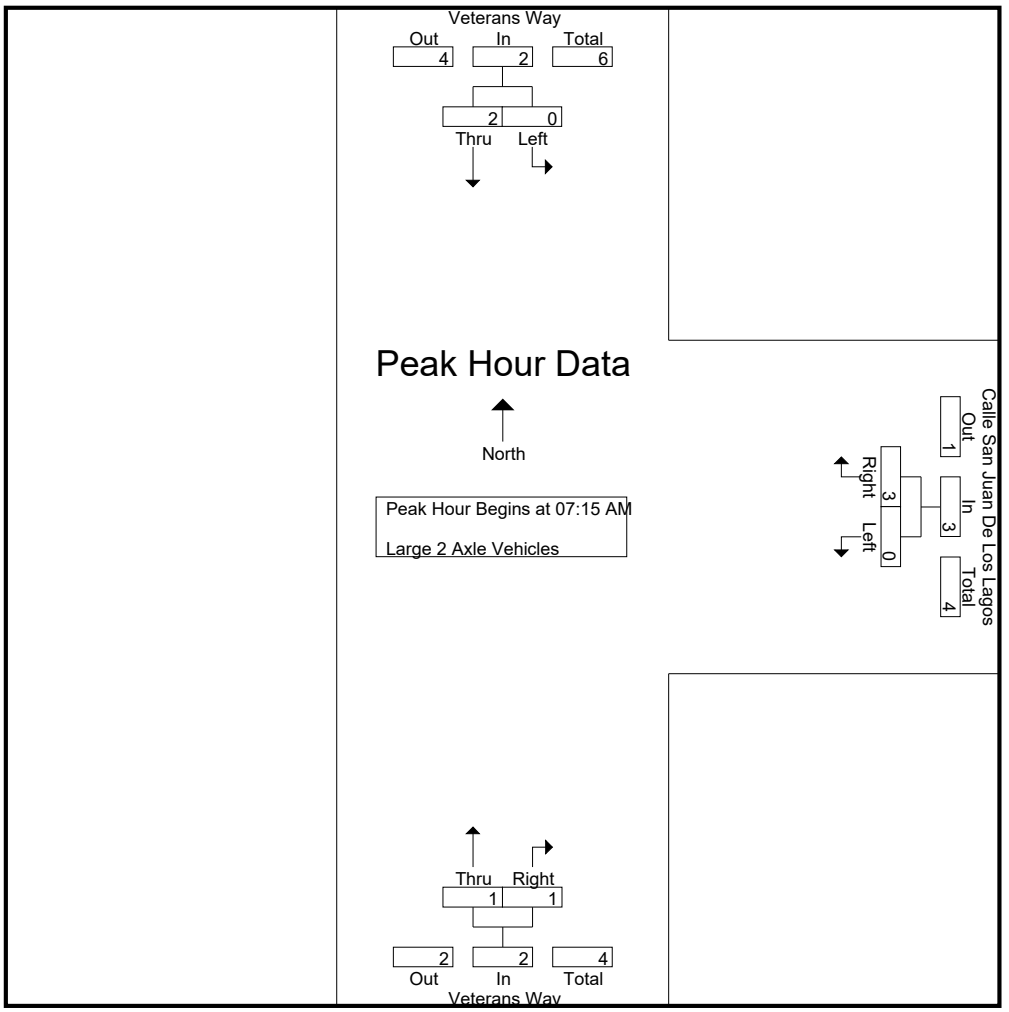
City of Moreno Valley
N/S: Veterans Way
E/W: Calle San Juan De Los Lagos
Weather: Clear

File Name : 01_MRV_Veterans_Calle SJDLL AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	0	**1**	**1**	0	**1**	**1**	0	0	0
+15 mins.	0	0	0	0	1	1	**1**	**1**	**2**
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	1	1	0	1	1	0	0	0
Total Volume	0	2	2	0	3	3	1	1	2
% App. Total	0	100		0	100		50	50	
PHF	.000	.500	.500	.000	.750	.750	.250	.250	.250

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Moreno Valley
N/S: Veterans Way
E/W: Calle San Juan De Los Lagos
Weather: Clear

File Name : 01_MRV_Veterans_Calle SJDLL AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 3 Axle Vehicles

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	0	1	1	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	1	0	1	0	0	0	1
Total	0	1	1	1	0	1	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	1	1	0	1	0	0	0	2
Apprch %	0	100		100	0		0	0		
Total %	0	50	50	50	0	50	0	0	0	

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	**1**	0	**1**	0	0	0	**1**
08:00 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	1	0	1	0	0	0	1
% App. Total	0	0		100	0		0	0		
PHF	.000	.000	.000	.250	.000	.250	.000	.000	.000	.250

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Weather: Clear

File Name : 01_MRV_Veterans_Calle SJDLL AM
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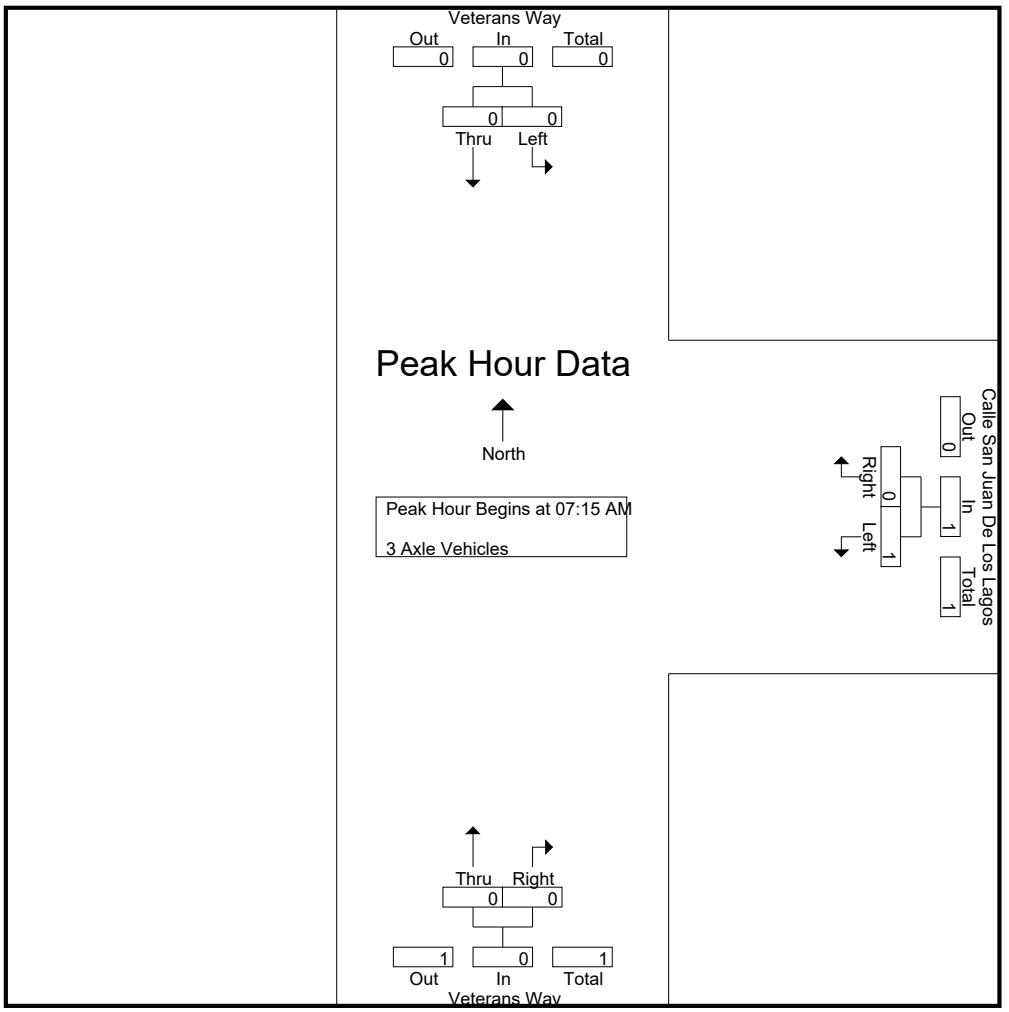

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	**1**	0	**1**	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	1	0	1	0	0	0
% App. Total	0	0		100	0		0	0	
PHF	.000	.000	.000	.250	.000	.250	.000	.000	.000

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File Name : 01_MRV_Veterans_Calle SJDLL AM
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Groups Printed- 4+ Axle Trucks

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	1	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	1	1	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	1	0	0	0	0	0	0	1
Apprch %	0	100		0	0		0	0		
Total %	0	100	100	0	0	0	0	0	0	

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	**1**	**1**	0	0	0	0	0	0	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	1	0	0	0	0	0	0	1
% App. Total	0	100		0	0		0	0		
PHF	.000	.250	.250	.000	.000	.000	.000	.000	.000	.250

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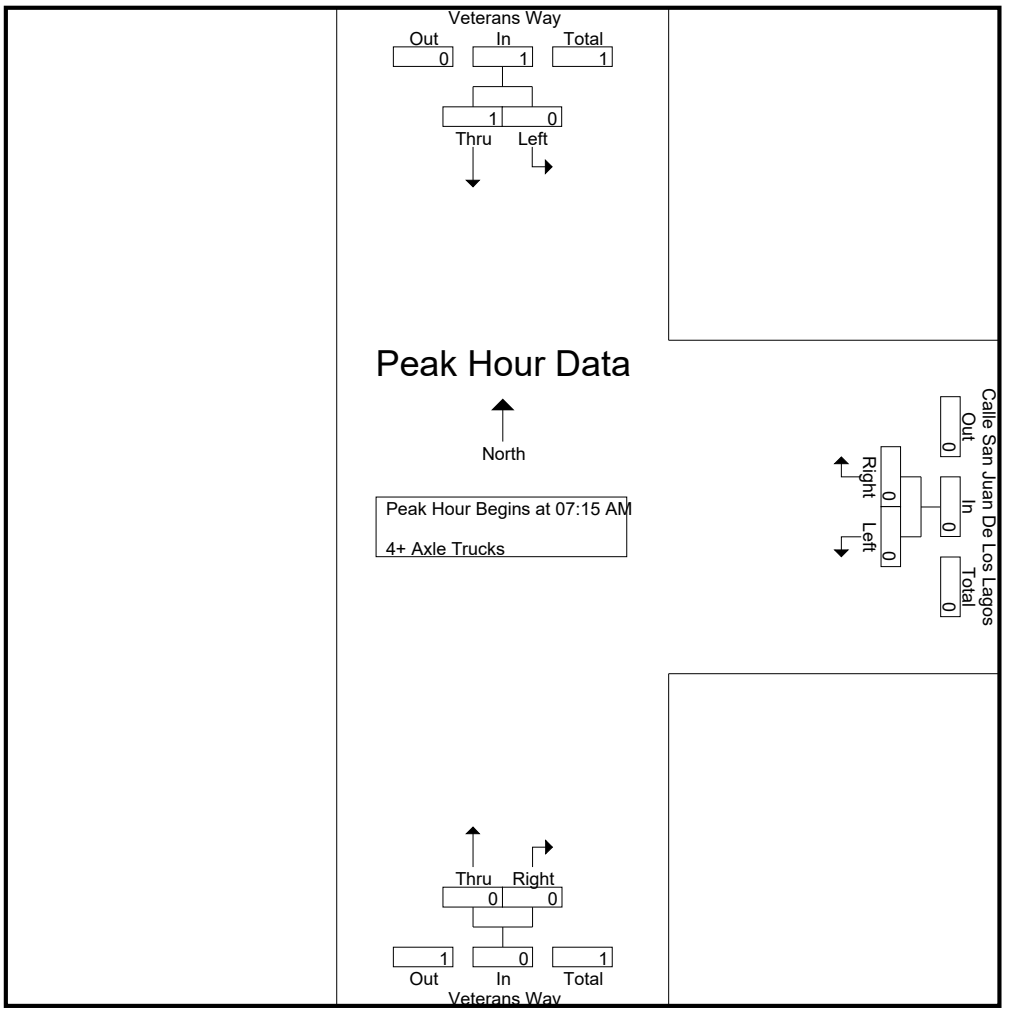

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	**1**	**1**	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	1	1	0	0	0	0	0	0
% App. Total	0	100		0	0		0	0	
PHF	.000	.250	.250	.000	.000	.000	.000	.000	.000

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File Name : 01_MRV_Veterans_Calle SJDLL PM
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	3	14	17	19	16	35	22	5	27	79
04:15 PM	2	7	9	10	11	21	12	6	18	48
04:30 PM	7	9	16	9	11	20	26	3	29	65
04:45 PM	2	12	14	10	9	19	13	7	20	53
Total	14	42	56	48	47	95	73	21	94	245
05:00 PM	7	12	19	15	15	30	18	4	22	71
05:15 PM	10	10	20	8	6	14	17	12	29	63
05:30 PM	5	7	12	13	10	23	9	4	13	48
05:45 PM	3	4	7	16	14	30	11	7	18	55
Total	25	33	58	52	45	97	55	27	82	237
Grand Total	39	75	114	100	92	192	128	48	176	482
Apprch %	34.2	65.8		52.1	47.9		72.7	27.3		
Total %	8.1	15.6	23.7	20.7	19.1	39.8	26.6	10	36.5	
Passenger Vehicles	37	71	108	100	91	191	120	41	161	460
% Passenger Vehicles	94.9	94.7	94.7	100	98.9	99.5	93.8	85.4	91.5	95.4
Large 2 Axle Vehicles	2	4	6	0	1	1	4	6	10	17
% Large 2 Axle Vehicles	5.1	5.3	5.3	0	1.1	0.5	3.1	12.5	5.7	3.5
3 Axle Vehicles	0	0	0	0	0	0	2	1	3	3
% 3 Axle Vehicles	0	0	0	0	0	0	1.6	2.1	1.7	0.6
4+ Axle Trucks	0	0	0	0	0	0	2	0	2	2
% 4+ Axle Trucks	0	0	0	0	0	0	1.6	0	1.1	0.4

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	7	9	16	9	11	20	**26**	3	**29**	65
04:45 PM	2	**12**	14	10	9	19	13	7	20	53
05:00 PM	7	12	19	**15**	**15**	**30**	18	4	22	**71**
05:15 PM	**10**	10	**20**	8	6	14	17	**12**	29	63
Total Volume	26	43	69	42	41	83	74	26	100	252
% App. Total	37.7	62.3		50.6	49.4		74	26		
PHF	.650	.896	.863	.700	.683	.692	.712	.542	.862	.887

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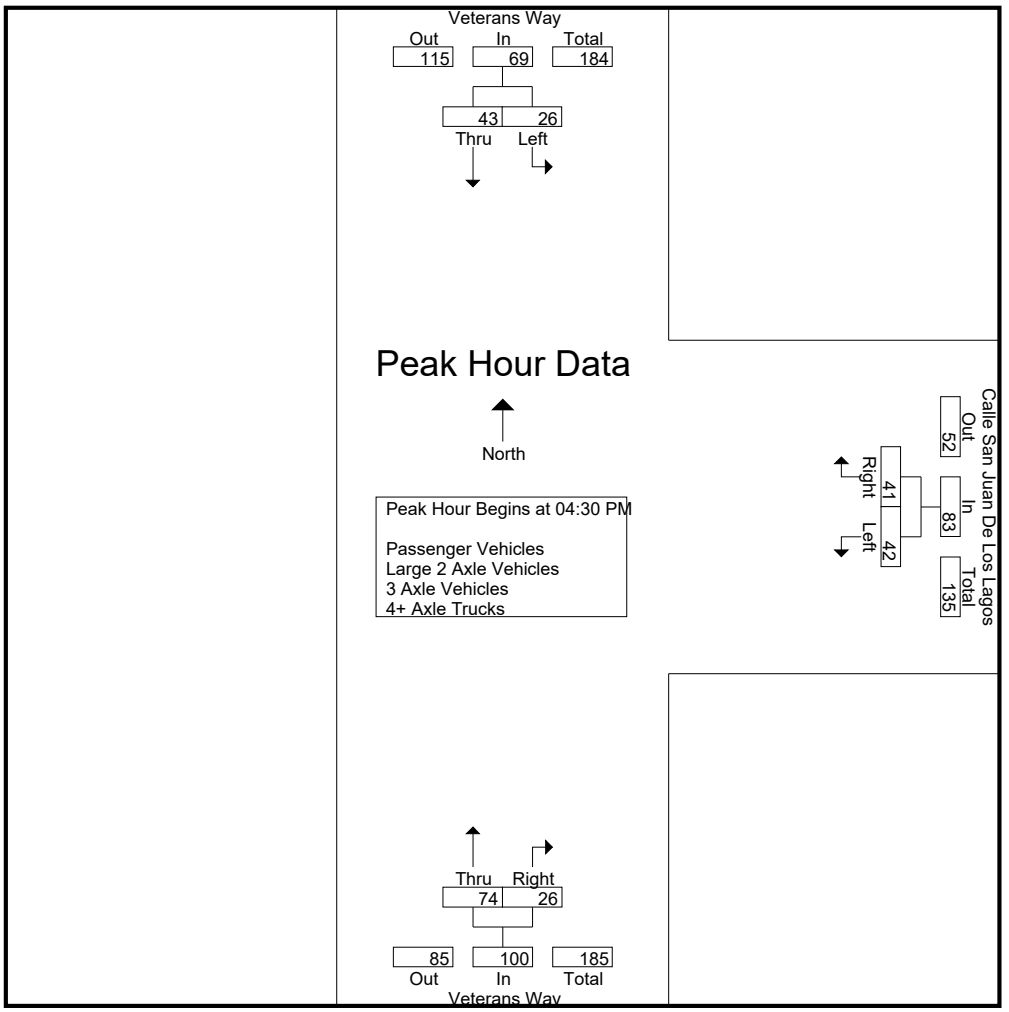

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			05:00 PM			04:30 PM		
+0 mins.	7	9	16	15	**15**	**30**	**26**	3	**29**
+15 mins.	2	**12**	14	8	6	14	13	7	20
+30 mins.	7	12	19	13	10	23	18	4	22
+45 mins.	**10**	10	**20**	**16**	14	30	17	**12**	29
Total Volume	26	43	69	52	45	97	74	26	100
% App. Total	37.7	62.3		53.6	46.4		74	26	
PHF	.650	.896	.863	.813	.750	.808	.712	.542	.862

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Groups Printed- Passenger Vehicles

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	3	14	17	19	16	35	20	5	25	77
04:15 PM	2	7	9	10	11	21	10	5	15	45
04:30 PM	6	9	15	9	11	20	25	3	28	63
04:45 PM	2	11	13	10	8	18	13	4	17	48
Total	13	41	54	48	46	94	68	17	85	233
05:00 PM	6	11	17	15	15	30	16	4	20	67
05:15 PM	10	9	19	8	6	14	17	11	28	61
05:30 PM	5	6	11	13	10	23	8	4	12	46
05:45 PM	3	4	7	16	14	30	11	5	16	53
Total	24	30	54	52	45	97	52	24	76	227
Grand Total	37	71	108	100	91	191	120	41	161	460
Apprch %	34.3	65.7		52.4	47.6		74.5	25.5		
Total %	8	15.4	23.5	21.7	19.8	41.5	26.1	8.9	35	

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	6	9	15	9	11	20	**25**	3	**28**	63
04:45 PM	2	**11**	13	10	8	18	13	4	17	48
05:00 PM	6	11	17	**15**	**15**	**30**	16	4	20	**67**
05:15 PM	**10**	9	**19**	8	6	14	17	**11**	28	61
Total Volume	24	40	64	42	40	82	71	22	93	239
% App. Total	37.5	62.5		51.2	48.8		76.3	23.7		
PHF	.600	.909	.842	.700	.667	.683	.710	.500	.830	.892

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File Name : 01_MRV_Veterans_Calle SJDLL PM
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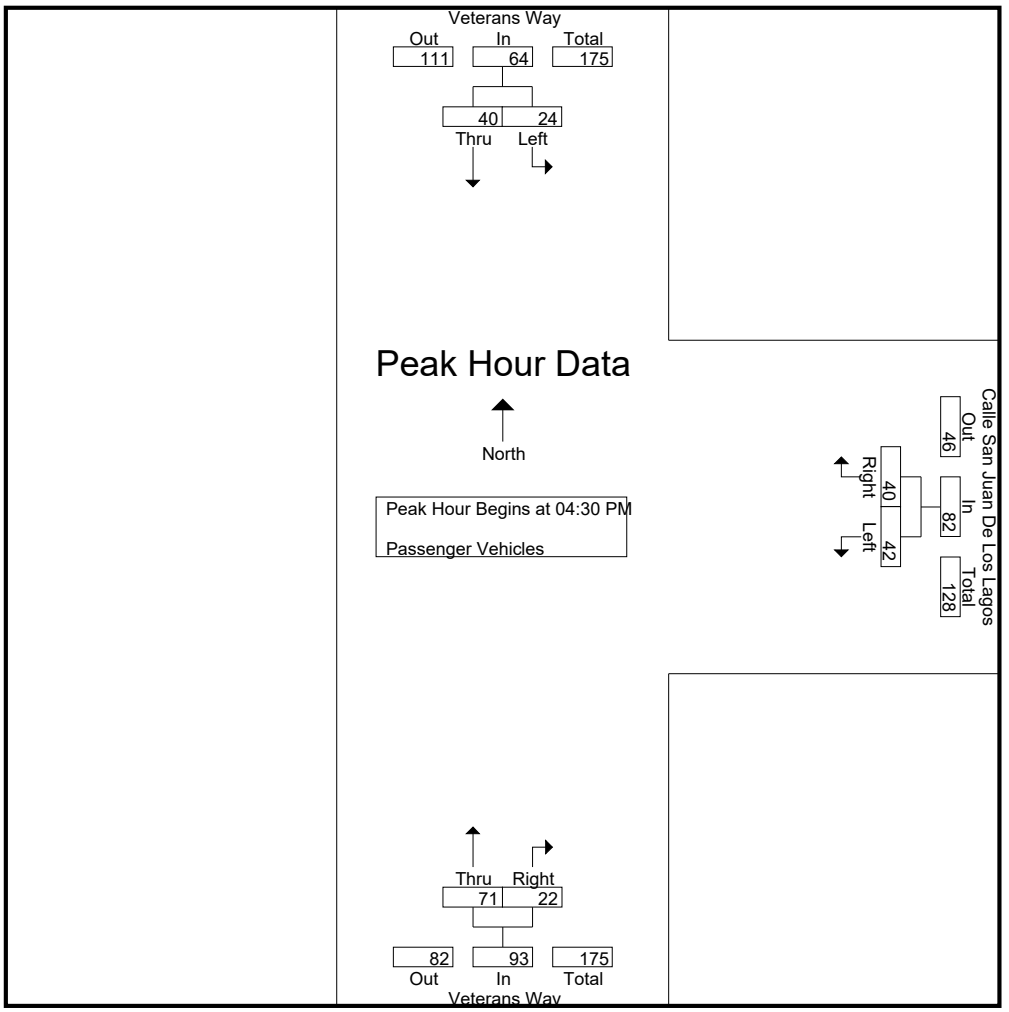

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:30 PM			04:30 PM		
+0 mins.	6	9	15	9	11	20	**25**	3	**28**
+15 mins.	2	**11**	13	10	8	18	13	4	17
+30 mins.	6	11	17	**15**	**15**	**30**	16	4	20
+45 mins.	**10**	9	**19**	8	6	14	17	**11**	28
Total Volume	24	40	64	42	40	82	71	22	93
% App. Total	37.5	62.5		51.2	48.8		76.3	23.7	
PHF	.600	.909	.842	.700	.667	.683	.710	.500	.830

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City of Moreno Valley
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Weather: Clear

File Name : 01_MRV_Veterans_Calle SJDLL PM
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Groups Printed- Large 2 Axle Vehicles

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	0	0	0	0	0	1	1	2	2
04:30 PM	1	0	1	0	0	0	0	0	0	1
04:45 PM	0	1	1	0	1	1	0	3	3	5
Total	1	1	2	0	1	1	2	4	6	9
05:00 PM	1	1	2	0	0	0	1	0	1	3
05:15 PM	0	1	1	0	0	0	0	1	1	2
05:30 PM	0	1	1	0	0	0	1	0	1	2
05:45 PM	0	0	0	0	0	0	0	1	1	1
Total	1	3	4	0	0	0	2	2	4	8
Grand Total	2	4	6	0	1	1	4	6	10	17
Apprch %	33.3	66.7		0	100		40	60		
Total %	11.8	23.5	35.3	0	5.9	5.9	23.5	35.3	58.8	

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	**1**	0	1	0	0	0	0	0	0	1
04:45 PM	0	**1**	1	0	**1**	**1**	0	**3**	**3**	**5**
05:00 PM	1	1	**2**	0	0	0	**1**	0	1	3
05:15 PM	0	1	1	0	0	0	0	1	1	2
Total Volume	2	3	5	0	1	1	1	4	5	11
% App. Total	40	60		0	100		20	80		
PHF	.500	.750	.625	.000	.250	.250	.250	.333	.417	.550

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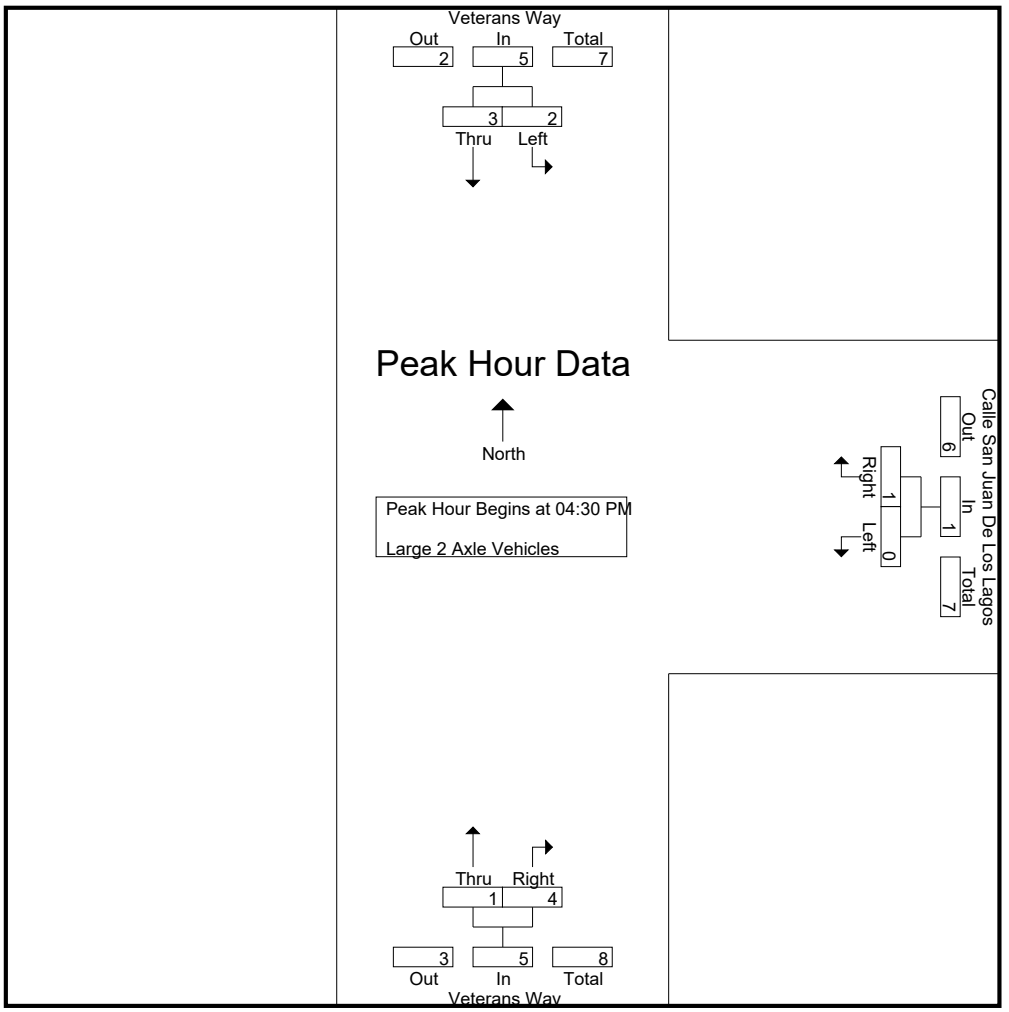

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:30 PM			04:30 PM		
+0 mins.	**1**	0	1	0	0	0	0	0	0
+15 mins.	0	**1**	1	0	**1**	**1**	0	**3**	**3**
+30 mins.	1	1	**2**	0	0	0	**1**	0	1
+45 mins.	0	1	1	0	0	0	0	1	1
Total Volume	2	3	5	0	1	1	1	4	5
% App. Total	40	60		0	100		20	80	
PHF	.500	.750	.625	.000	.250	.250	.250	.333	.417

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File Name : 01_MRV_Veterans_Calle SJDLL PM
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Groups Printed- 3 Axle Vehicles

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	1	1
05:00 PM	0	0	0	0	0	0	1	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	1	1	1
Total	0	0	0	0	0	0	1	1	2	2
Grand Total	0	0	0	0	0	0	2	1	3	3
Apprch %	0	0		0	0		66.7	33.3		
Total %	0	0	0	0	0	0	66.7	33.3	100	

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	**1**	0	**1**	**1**
05:15 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

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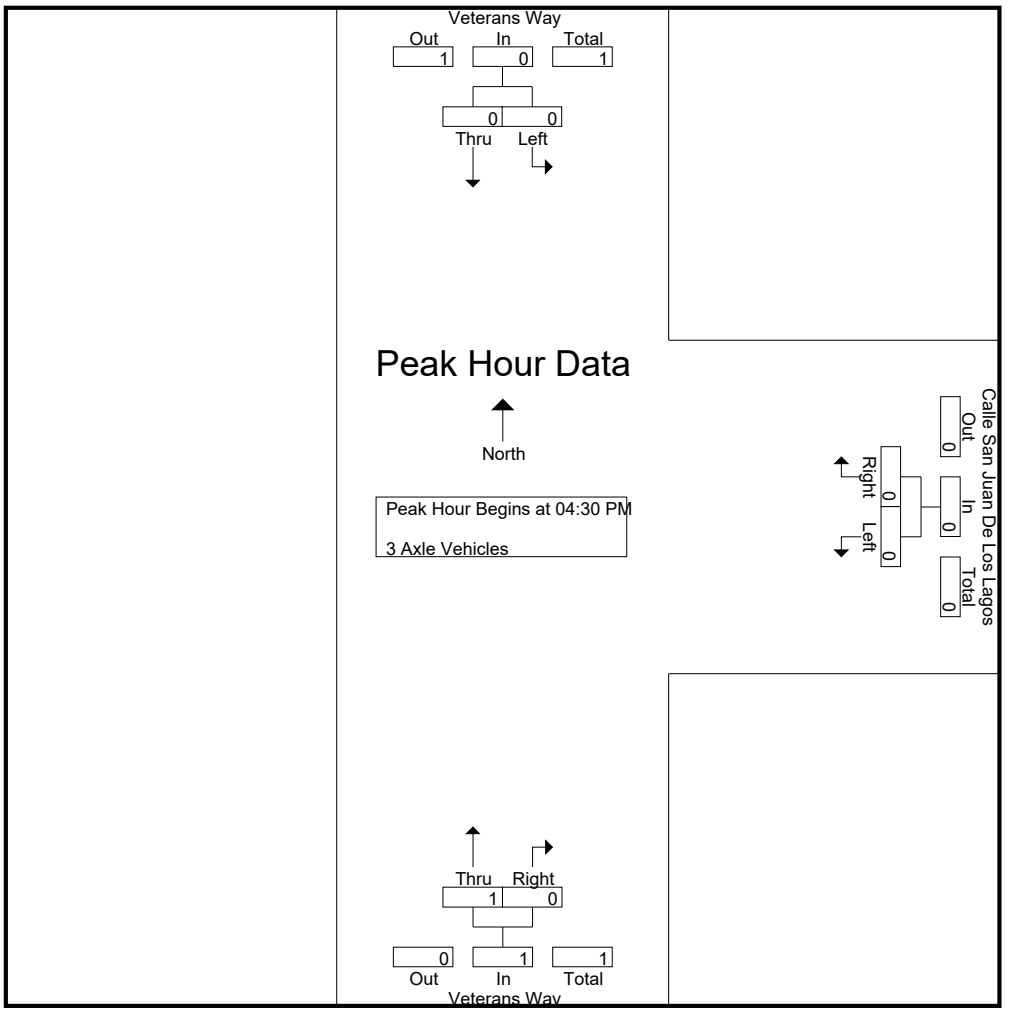

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:30 PM			04:30 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	**1**	0	**1**
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	1
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

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Groups Printed- 4+ Axle Trucks

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	2	2
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	2	0	2	2
Apprch %	0	0		0	0		100	0		
Total %	0	0	0	0	0	0	100	0	100	

	Veterans Way Southbound			Calle San Juan De Los Lagos Westbound			Veterans Way Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	0	0	0	0	0	**1**	0	**1**	**1**
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

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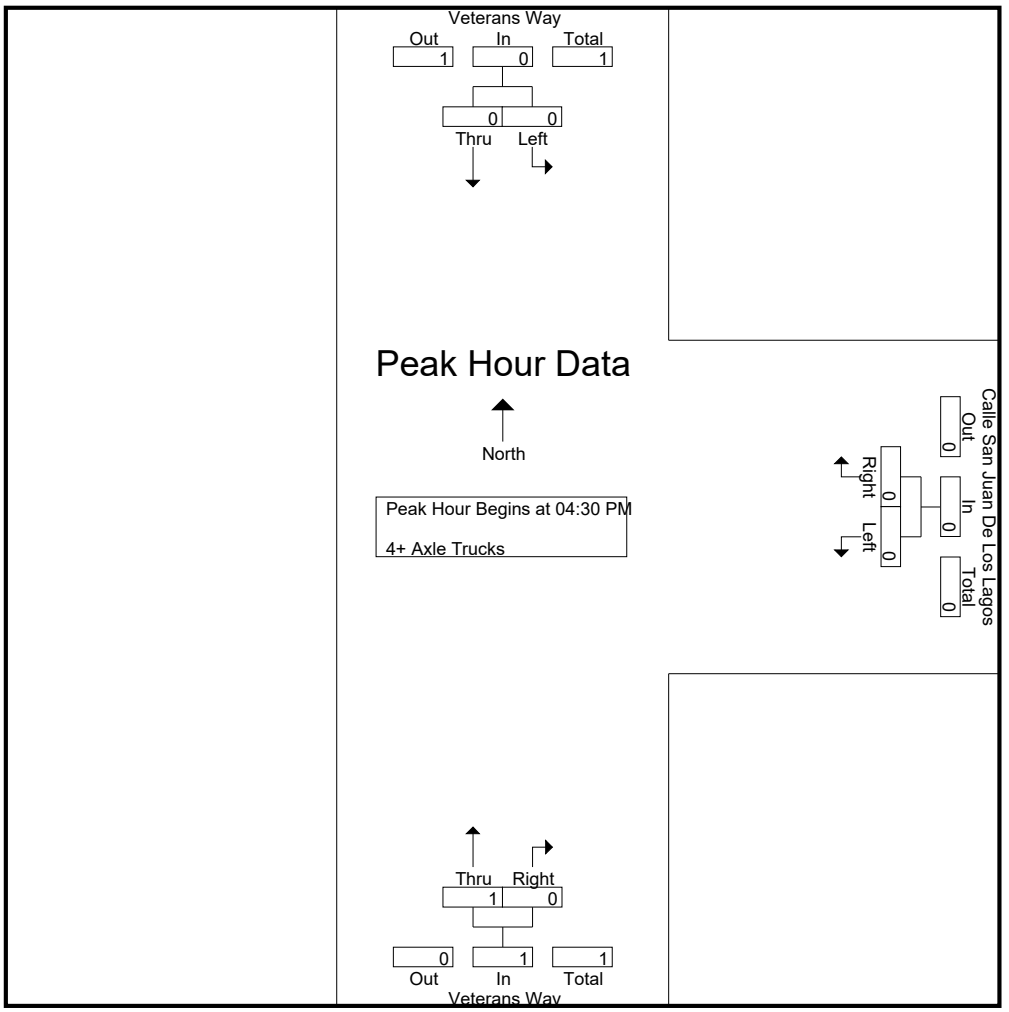
City of Moreno Valley
N/S: Veterans Way
E/W: Calle San Juan De Los Lagos
Weather: Clear

File Name : 01_MRV_Veterans_Calle SJDLL PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:30 PM			04:30 PM		
+0 mins.	0	0	0	0	0	0	**1**	0	**1**
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	1
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

Location: Moreno Valley
N/S: Veterans Way
E/W: Calle San Juan De Los Lagos

Date: 4/3/2018
Date: Tuesday

PEDESTRIANS

	North Leg Veterans Way Pedestrians	East Leg Calle San Juan De Los Lagos Pedestrians	South Leg Veterans Way Pedestrians	West Leg Dead End Pedestrians	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	1	0	0	0	1
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	1	0	0	0	1

	North Leg Veterans Way Pedestrians	East Leg Calle San Juan De Los Lagos Pedestrians	South Leg Veterans Way Pedestrians	West Leg Dead End Pedestrians	
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	1	0	1	0	2
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	1	0	1	0	2

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Location: Moreno Valley
N/S: Veterans Way
E/W: Calle San Juan De Los Lagos

Date: 4/3/2018
Date: Tuesday

BICYCLES

	Southbound Veterans Way			Westbound Calle San Juan De Los Lagos			Northbound Veterans Way			Eastbound Dead End			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	1	0	0	0	0	0	0	0	0	0	0	1

	Southbound Veterans Way			Westbound Calle San Juan De Los Lagos			Northbound Veterans Way			Eastbound Dead End			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	1	0	0	0	0	1

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City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandro
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	13	47	40	13	100	15	337	26	5	378	10	30	2	1	42	14	63	9	6	86	25	606	63
07:15 AM	21	61	32	12	114	21	317	23	8	361	19	57	5	3	81	25	96	9	7	130	30	686	71
07:30 AM	34	65	58	17	157	22	301	25	7	348	13	56	3	1	72	25	107	11	6	143	31	720	75
07:45 AM	25	71	42	10	138	18	347	31	2	396	25	50	5	4	80	20	93	5	3	118	19	732	75
Total	93	244	172	52	509	76	1302	105	22	1483	67	193	15	9	275	84	359	34	22	477	105	2744	284
08:00 AM	17	46	48	17	111	14	315	26	6	355	18	43	3	0	64	36	108	5	4	149	27	679	70
08:15 AM	34	66	39	10	139	10	241	26	6	277	21	46	1	0	68	32	92	7	6	131	22	615	63
08:30 AM	28	32	33	13	93	21	239	14	5	274	6	45	6	0	57	31	103	5	4	139	22	563	58
08:45 AM	19	56	21	4	96	22	189	25	6	236	13	52	6	2	71	28	100	9	8	137	20	540	56
Total	98	200	141	44	439	67	984	91	23	1142	58	186	16	2	260	127	403	26	22	556	91	2397	248
Grand Total	191	444	313	96	948	143	2286	196	45	2625	125	379	31	11	535	211	762	60	44	1033	196	5141	533
Apprch %	20.1	46.8	33			5.4	87.1	7.5			23.4	70.8	5.8			20.4	73.8	5.8					
Total %	3.7	8.6	6.1		18.4	2.8	44.5	3.8		51.1	2.4	7.4	0.6		10.4	4.1	14.8	1.2		20.1	3.7	96.3	
Passenger Vehicles	184	426	304		1007	140	2195	195		2575	113	356	29		508	203	700	54		997	0	0	508
% Passenger Vehicles	96.3	95.9	97.1	96.9	96.5	97.9	96	99.5	100	96.4	90.4	93.9	93.5	90.9	93	96.2	91.9	90	90.9	92.6	0	0	95
Large 2 Axle Vehicles	4	10	4		21	3	34	0		37	3	13	2		19	5	24	3		35	0	0	11
% Large 2 Axle Vehicles	2.1	2.3	1.3	3.1	2	2.1	1.5	0	0	1.4	2.4	3.4	6.5	9.1	3.5	2.4	3.1	5	6.8	3.2	0	0	2
3 Axle Vehicles	1	6	3		10	0	47	0		47	3	7	0		10	1	33	1		36	0	0	10
% 3 Axle Vehicles	0.5	1.4	1	0	1	0	2.1	0	0	1.8	2.4	1.8	0	0	1.8	0.5	4.3	1.7	2.3	3.3	0	0	1
4+ Axle Trucks	2	2	2		6	0	10	1		11	6	3	0		9	2	5	2		9	0	0	3
% 4+ Axle Trucks	1	0.5	0.6	0	0.6	0	0.4	0.5	0	0.4	4.8	0.8	0	0	1.6	0.9	0.7	3.3	0	0.8	0	0	0

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	21	61	32	114	21	317	23	361	19	**57**	**5**	**81**	25	96	9	130	6
07:30 AM	**34**	65	**58**	**157**	**22**	301	25	348	13	56	3	72	25	107	**11**	143	7
07:45 AM	25	**71**	42	138	18	**347**	**31**	**396**	**25**	50	5	80	20	93	5	118	**7**
08:00 AM	17	46	48	111	14	315	26	355	18	43	3	64	**36**	**108**	5	**149**	6
Total Volume	97	243	180	520	75	1280	105	1460	75	206	16	297	106	404	30	540	28
% App. Total	18.7	46.7	34.6		5.1	87.7	7.2		25.3	69.4	5.4		19.6	74.8	5.6		
PHF	.713	.856	.776	.828	.852	.922	.847	.922	.750	.904	.800	.917	.736	.935	.682	.906	.9

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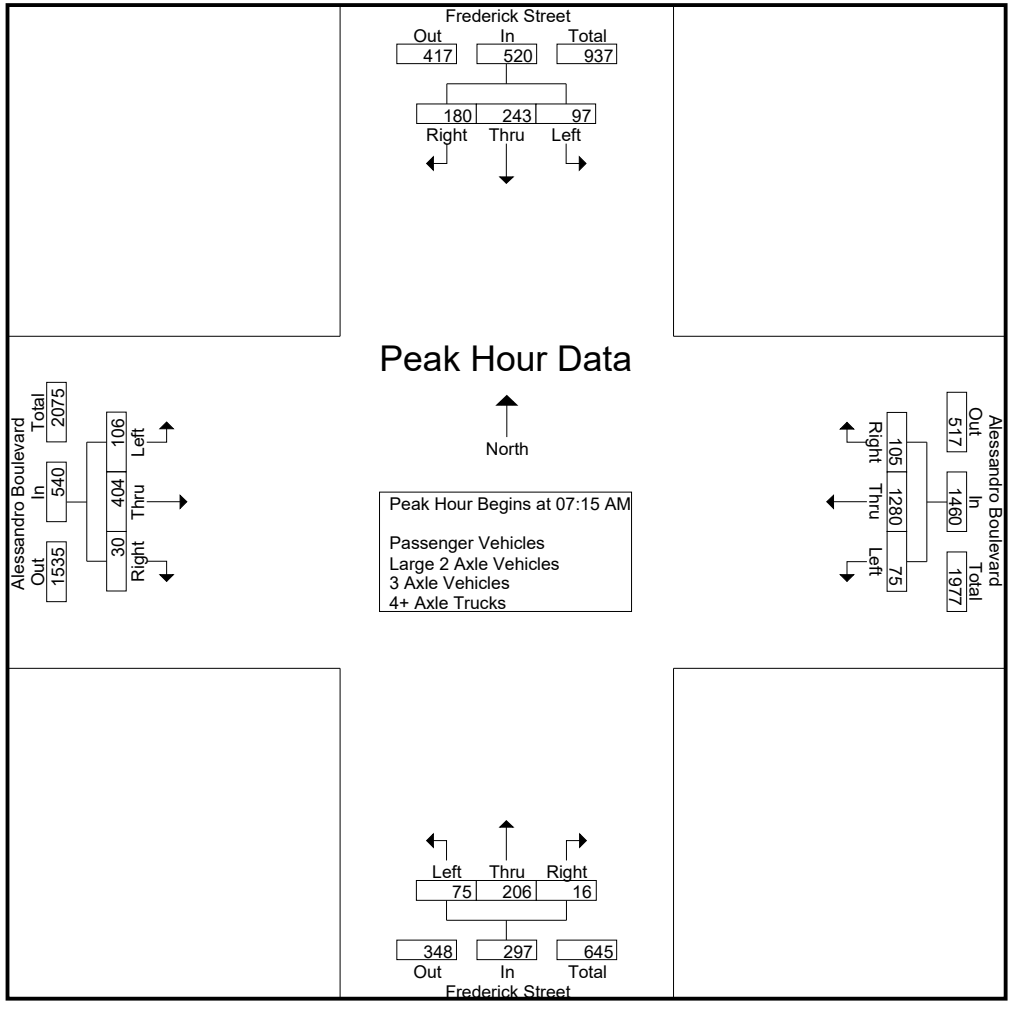
City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Frederick Street
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File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:30 AM				07:00 AM				07:15 AM				08:00 AM				
+0 mins.	**34**	65	**58**	**157**	15	337	26	378	19	**57**	**5**	**81**	**36**	**108**	5	**149**	
+15 mins.	25	**71**	42	138	21	317	23	361	13	56	3	72	32	92	7	131	
+30 mins.	17	46	48	111	**22**	301	25	348	**25**	50	5	80	31	103	5	139	
+45 mins.	34	66	39	139	18	**347**	**31**	**396**	18	43	3	64	28	100	**9**	137	
Total Volume	110	248	187	545	76	1302	105	1483	75	206	16	297	127	403	26	556	
% App. Total	20.2	45.5	34.3		5.1	87.8	7.1		25.3	69.4	5.4		22.8	72.5	4.7		
PHF	.809	.873	.806	.868	.864	.938	.847	.936	.750	.904	.800	.917	.882	.933	.722	.933	

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City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandro
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	13	46	38	12	97	15	325	25	5	365	9	28	2	1	39	14	52	8	5	74	23	575	59
07:15 AM	20	59	31	11	110	21	310	23	8	354	14	54	5	3	73	25	87	8	6	120	28	657	68
07:30 AM	34	65	55	17	154	22	290	25	7	337	13	51	3	1	67	23	97	10	6	130	31	688	71
07:45 AM	24	70	41	10	135	18	335	31	2	384	23	46	4	3	73	19	84	4	3	107	18	699	71
Total	91	240	165	50	496	76	1260	104	22	1440	59	179	14	8	252	81	320	30	20	431	100	2619	271
08:00 AM	16	44	47	17	107	14	303	26	6	343	17	41	3	0	61	35	104	5	4	144	27	655	68
08:15 AM	33	60	39	10	132	10	228	26	6	264	20	45	0	0	65	31	84	7	6	122	22	583	60
08:30 AM	27	28	32	12	87	18	224	14	5	256	5	43	6	0	54	28	96	5	4	129	21	526	54
08:45 AM	17	54	21	4	92	22	180	25	6	227	12	48	6	2	66	28	96	7	6	131	18	516	53
Total	93	186	139	43	418	64	935	91	23	1090	54	177	15	2	246	122	380	24	20	526	88	2280	236
Grand Total	184	426	304	93	914	140	2195	195	45	2530	113	356	29	10	498	203	700	54	40	957	188	4899	508
Apprch %	20.1	46.6	33.3			5.5	86.8	7.7			22.7	71.5	5.8			21.2	73.1	5.6					
Total %	3.8	8.7	6.2		18.7	2.9	44.8	4		51.6	2.3	7.3	0.6		10.2	4.1	14.3	1.1		19.5	3.7	96.3	

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	20	59	31	110	21	310	23	354	14	**54**	**5**	**73**	25	87	8	120	6
07:30 AM	**34**	65	**55**	**154**	**22**	290	25	337	13	51	3	67	23	97	**10**	130	6
07:45 AM	24	**70**	41	135	18	**335**	**31**	**384**	**23**	46	4	73	19	84	4	107	**6**
08:00 AM	16	44	47	107	14	303	26	343	17	41	3	61	**35**	**104**	5	**144**	6
Total Volume	94	238	174	506	75	1238	105	1418	67	192	15	274	102	372	27	501	26
% App. Total	18.6	47	34.4		5.3	87.3	7.4		24.5	70.1	5.5		20.4	74.3	5.4		
PHF	.691	.850	.791	.821	.852	.924	.847	.923	.728	.889	.750	.938	.729	.894	.675	.870	.9

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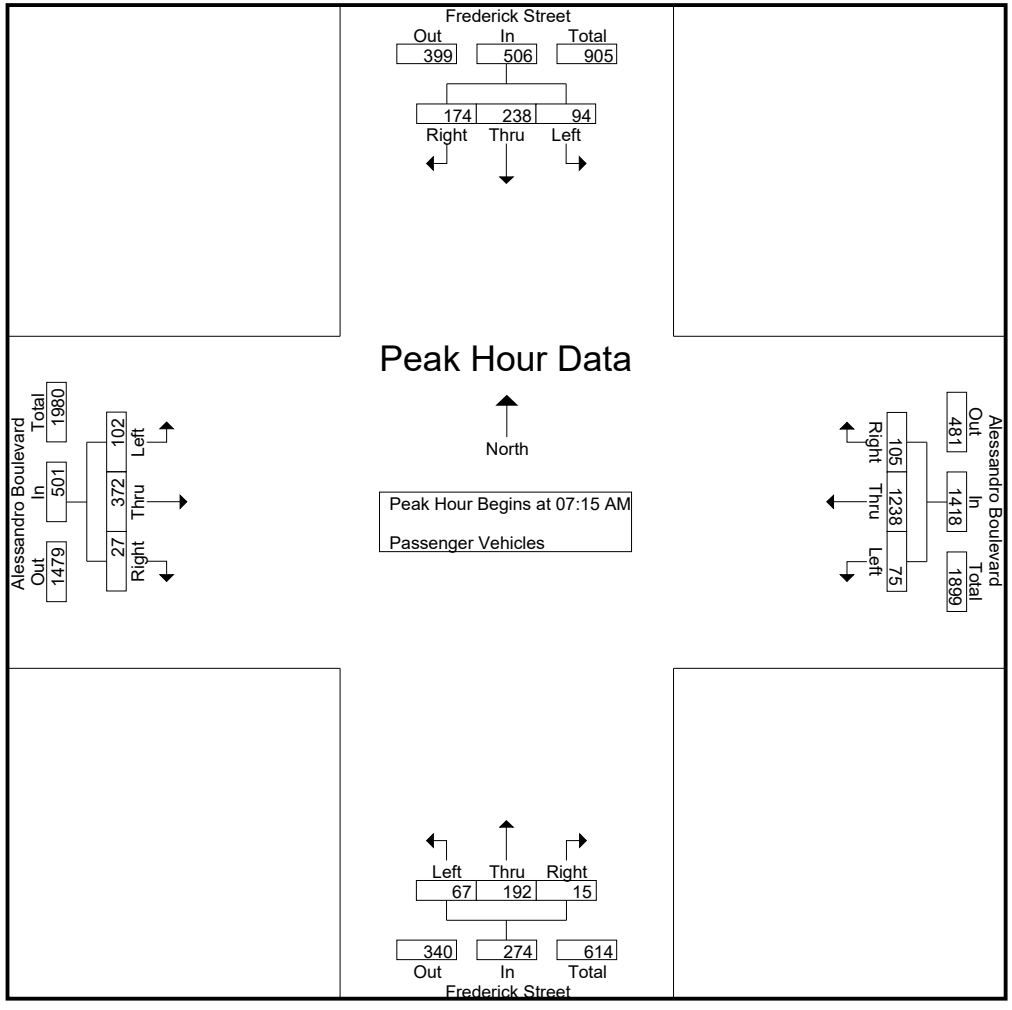
City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Frederick Street
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File Name : 02_MRV_Frederick_Alessandrc
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Page No : 3

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:15 AM				07:15 AM				07:15 AM				07:15 AM				
+0 mins.	20	59	31	110	21	310	23	354	14	**54**	**5**	**73**	25	87	8	120	
+15 mins.	**34**	65	**55**	**154**	**22**	290	25	337	13	51	3	67	23	97	**10**	130	
+30 mins.	24	**70**	41	135	18	**335**	**31**	**384**	**23**	46	4	73	19	84	4	107	
+45 mins.	16	44	47	107	14	303	26	343	17	41	3	61	**35**	**104**	5	**144**	
Total Volume	94	238	174	506	75	1238	105	1418	67	192	15	274	102	372	27	501	
% App. Total	18.6	47	34.4		5.3	87.3	7.4		24.5	70.1	5.5		20.4	74.3	5.4		
PHF	.691	.850	.791	.821	.852	.924	.847	.923	.728	.889	.750	.938	.729	.894	.675	.870	

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City of Moreno Valley
N/S: Frederick Street
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File Name : 02_MRV_Frederick_Alessandro
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	1	1	1	2	0	1	0	0	1	0	2	0	0	2	0	7	1	1	8	2	13	1
07:15 AM	0	0	1	1	1	0	4	0	0	4	1	3	0	0	4	0	1	1	1	2	2	11	1
07:30 AM	0	0	0	0	0	0	4	0	0	4	0	2	0	0	2	1	3	0	0	4	0	10	1
07:45 AM	1	1	1	0	3	0	6	0	0	6	2	2	1	1	5	1	3	0	0	4	1	18	1
Total	1	2	3	2	6	0	15	0	0	15	3	9	1	1	13	2	14	2	2	18	5	52	5
08:00 AM	1	1	0	0	2	0	8	0	0	8	0	1	0	0	1	1	2	0	0	3	0	14	1
08:15 AM	1	3	0	0	4	0	4	0	0	4	0	1	1	0	2	0	4	0	0	4	0	14	1
08:30 AM	0	3	1	1	4	3	4	0	0	7	0	0	0	0	0	2	2	0	0	4	1	15	1
08:45 AM	1	1	0	0	2	0	3	0	0	3	0	2	0	0	2	0	2	1	1	3	1	10	1
Total	3	8	1	1	12	3	19	0	0	22	0	4	1	0	5	3	10	1	1	14	2	53	5
Grand Total	4	10	4	3	18	3	34	0	0	37	3	13	2	1	18	5	24	3	3	32	7	105	11
Apprch %	22.2	55.6	22.2			8.1	91.9	0			16.7	72.2	11.1			15.6	75	9.4					
Total %	3.8	9.5	3.8		17.1	2.9	32.4	0		35.2	2.9	12.4	1.9		17.1	4.8	22.9	2.9		30.5	6.2	93.8	

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	**1**	1	0	4	0	4	1	**3**	0	4	0	1	**1**	2	
07:30 AM	0	0	0	0	0	4	0	4	0	2	0	2	**1**	**3**	0	**4**	
07:45 AM	**1**	**1**	1	**3**	0	6	0	6	**2**	2	**1**	**5**	1	3	0	4	
08:00 AM	1	1	0	2	0	**8**	0	**8**	0	1	0	1	1	2	0	3	
Total Volume	2	2	2	6	0	22	0	22	3	8	1	12	3	9	1	13	
% App. Total	33.3	33.3	33.3		0	100	0		25	66.7	8.3		23.1	69.2	7.7		
PHF	.500	.500	.500	.500	.000	.688	.000	.688	.375	.667	.250	.600	.750	.750	.250	.813	.7

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City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
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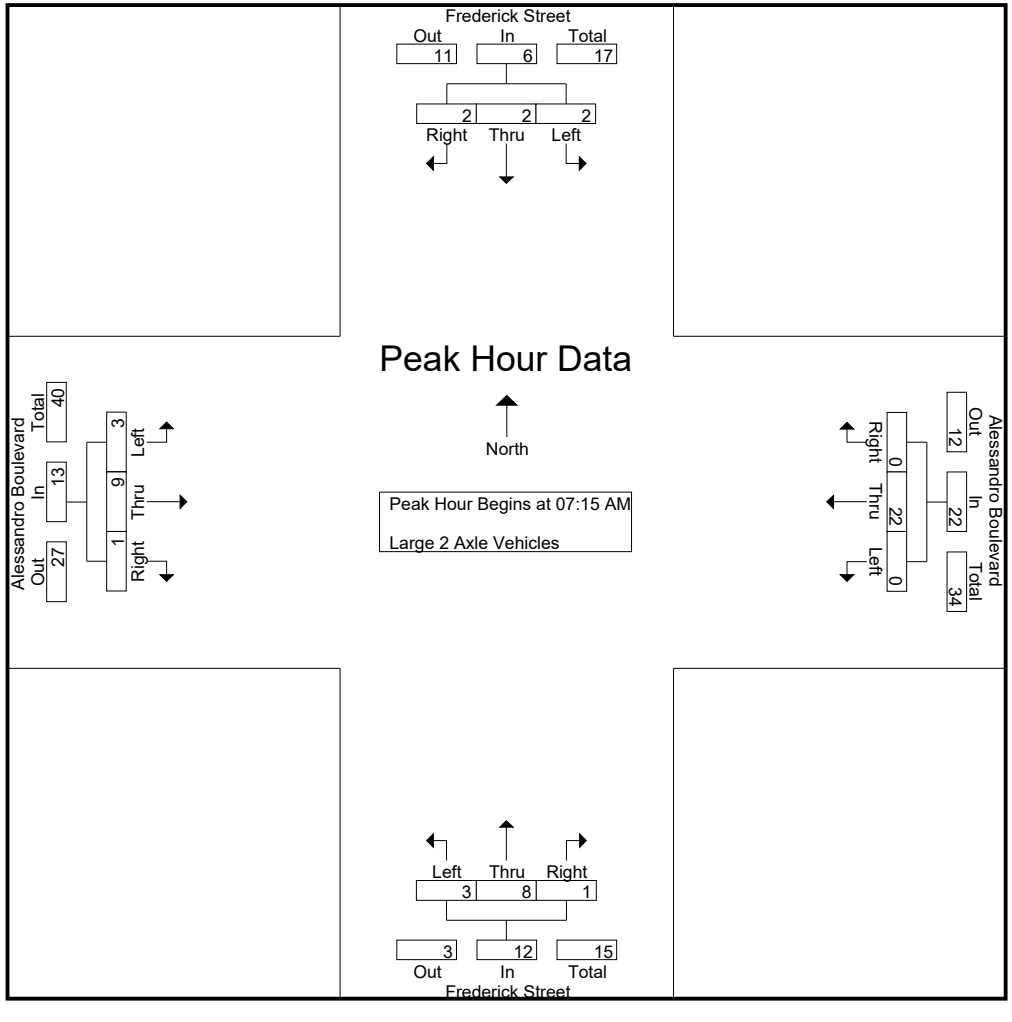

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City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
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	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:15 AM				07:15 AM				07:15 AM				07:15 AM				
+0 mins.	0	0	**1**	1	0	4	0	4	1	**3**	0	4	0	1	**1**	2	
+15 mins.	0	0	0	0	0	4	0	4	0	2	0	2	**1**	**3**	0	**4**	
+30 mins.	**1**	**1**	1	**3**	0	6	0	6	**2**	2	**1**	**5**	1	3	0	4	
+45 mins.	1	1	0	2	0	**8**	0	**8**	0	1	0	1	1	2	0	3	
Total Volume	2	2	2	6	0	22	0	22	3	8	1	12	3	9	1	13	
% App. Total	33.3	33.3	33.3		0	100	0		25	66.7	8.3		23.1	69.2	7.7		
PHF	.500	.500	.500	.500	.000	.688	.000	.688	.375	.667	.250	.600	.750	.750	.250	.813	

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City of Moreno Valley
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E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 3 Axle Vehicles

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	3	0	0	3	0	12	1
07:15 AM	1	2	0	0	3	0	3	0	0	3	1	0	0	0	1	0	7	0	0	7	0	14	1
07:30 AM	0	0	2	0	2	0	4	0	0	4	0	1	0	0	1	0	7	0	0	7	0	14	1
07:45 AM	0	0	0	0	0	0	5	0	0	5	0	2	0	0	2	0	3	0	0	3	0	10	1
Total	1	2	2	0	5	0	21	0	0	21	1	3	0	0	4	0	20	0	0	20	0	50	5
08:00 AM	0	0	1	0	1	0	4	0	0	4	1	1	0	0	2	0	2	0	0	2	0	9	
08:15 AM	0	2	0	0	2	0	8	0	0	8	1	0	0	0	1	1	4	0	0	5	0	16	1
08:30 AM	0	1	0	0	1	0	9	0	0	9	0	2	0	0	2	0	5	0	0	5	0	17	1
08:45 AM	0	1	0	0	1	0	5	0	0	5	0	1	0	0	1	0	2	1	1	3	1	10	1
Total	0	4	1	0	5	0	26	0	0	26	2	4	0	0	6	1	13	1	1	15	1	52	5
Grand Total	1	6	3	0	10	0	47	0	0	47	3	7	0	0	10	1	33	1	1	35	1	102	10
Apprch %	10	60	30			0	100	0			30	70	0			2.9	94.3	2.9					
Total %	1	5.9	2.9		9.8	0	46.1	0		46.1	2.9	6.9	0		9.8	1	32.4	1		34.3	1	99	

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**1**	**2**	0	**3**	0	3	0	3	**1**	0	0	1	0	**7**	0	**7**	
07:30 AM	0	0	**2**	2	0	4	0	4	0	1	0	1	0	7	0	7	
07:45 AM	0	0	0	0	0	**5**	0	**5**	0	**2**	0	**2**	0	3	0	3	
08:00 AM	0	0	1	1	0	4	0	4	1	1	0	2	0	2	0	2	
Total Volume	1	2	3	6	0	16	0	16	2	4	0	6	0	19	0	19	
% App. Total	16.7	33.3	50		0	100	0		33.3	66.7	0		0	100	0		
PHF	.250	.250	.375	.500	.000	.800	.000	.800	.500	.500	.000	.750	.000	.679	.000	.679	.8

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Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
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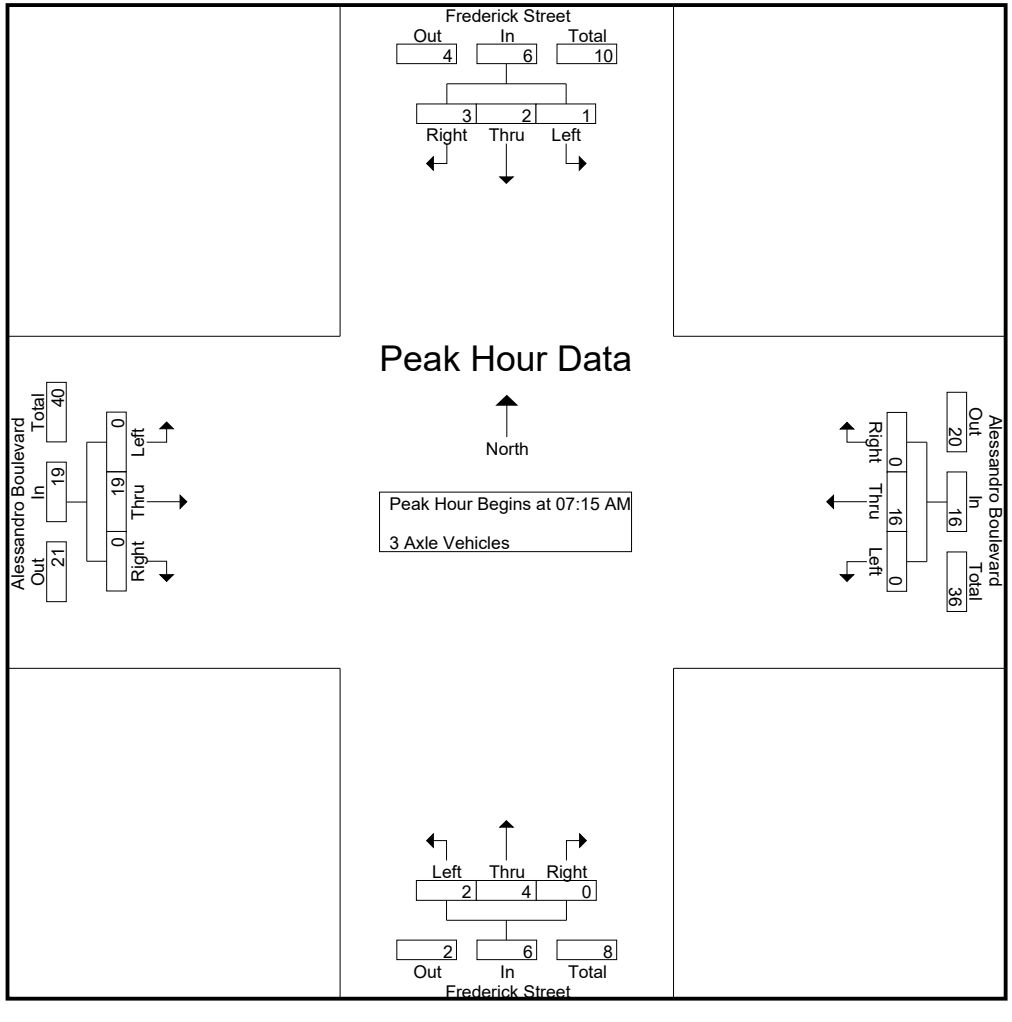

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City of Moreno Valley
N/S: Frederick Street
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Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
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	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:15 AM				07:15 AM				07:15 AM				07:15 AM				
+0 mins.	**1**	**2**	0	**3**	0	3	0	3	**1**	0	0	1	0	**7**	0	**7**	
+15 mins.	0	0	**2**	2	0	4	0	4	0	1	0	1	0	7	0	7	
+30 mins.	0	0	0	0	0	**5**	0	**5**	0	**2**	0	**2**	0	3	0	3	
+45 mins.	0	0	1	1	0	4	0	4	1	1	0	2	0	2	0	2	
Total Volume	1	2	3	6	0	16	0	16	2	4	0	6	0	19	0	19	
% App. Total	16.7	33.3	50		0	100	0		33.3	66.7	0		0	100	0		
PHF	.250	.250	.375	.500	.000	.800	.000	.800	.500	.500	.000	.750	.000	.679	.000	.679	

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File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
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Groups Printed- 4+ Axle Trucks

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	0	1	0	1	0	2	1	0	3	1	0	0	0	1	0	1	0	0	1	0	6	
07:15 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	1	0	0	1	0	4	
07:30 AM	0	0	1	0	1	0	3	0	0	3	0	2	0	0	2	1	0	1	0	2	0	8	
07:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	1	0	4	0	5	
Total	0	0	2	0	2	0	6	1	0	7	4	2	0	0	6	1	5	2	0	8	0	23	2
08:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
08:15 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	
08:30 AM	1	0	0	0	1	0	2	0	0	2	1	0	0	0	1	1	0	0	0	1	0	5	
08:45 AM	1	0	0	0	1	0	1	0	0	1	1	1	0	0	2	0	0	0	0	0	0	4	
Total	2	2	0	0	4	0	4	0	0	4	2	1	0	0	3	1	0	0	0	1	0	12	1
Grand Total	2	2	2	0	6	0	10	1	0	11	6	3	0	0	9	2	5	2	0	9	0	35	3
Apprch %	33.3	33.3	33.3			0	90.9	9.1			66.7	33.3	0			22.2	55.6	22.2					
Total %	5.7	5.7	5.7		17.1	0	28.6	2.9		31.4	17.1	8.6	0		25.7	5.7	14.3	5.7		25.7	0	100	

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	0	0	0	**3**	0	0	**3**	0	1	0	1	
07:30 AM	0	0	**1**	**1**	0	**3**	0	**3**	0	**2**	0	2	**1**	0	**1**	2	
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	**3**	1	**4**	
08:00 AM	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	1	1	2	0	4	0	4	3	2	0	5	1	4	2	7	
% App. Total	0	50	50		0	100	0		60	40	0		14.3	57.1	28.6		
PHF	.000	.250	.250	.500	.000	.333	.000	.333	.250	.250	.000	.417	.250	.333	.500	.438	.5

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Site Code : 05118259
Start Date : 4/3/2018
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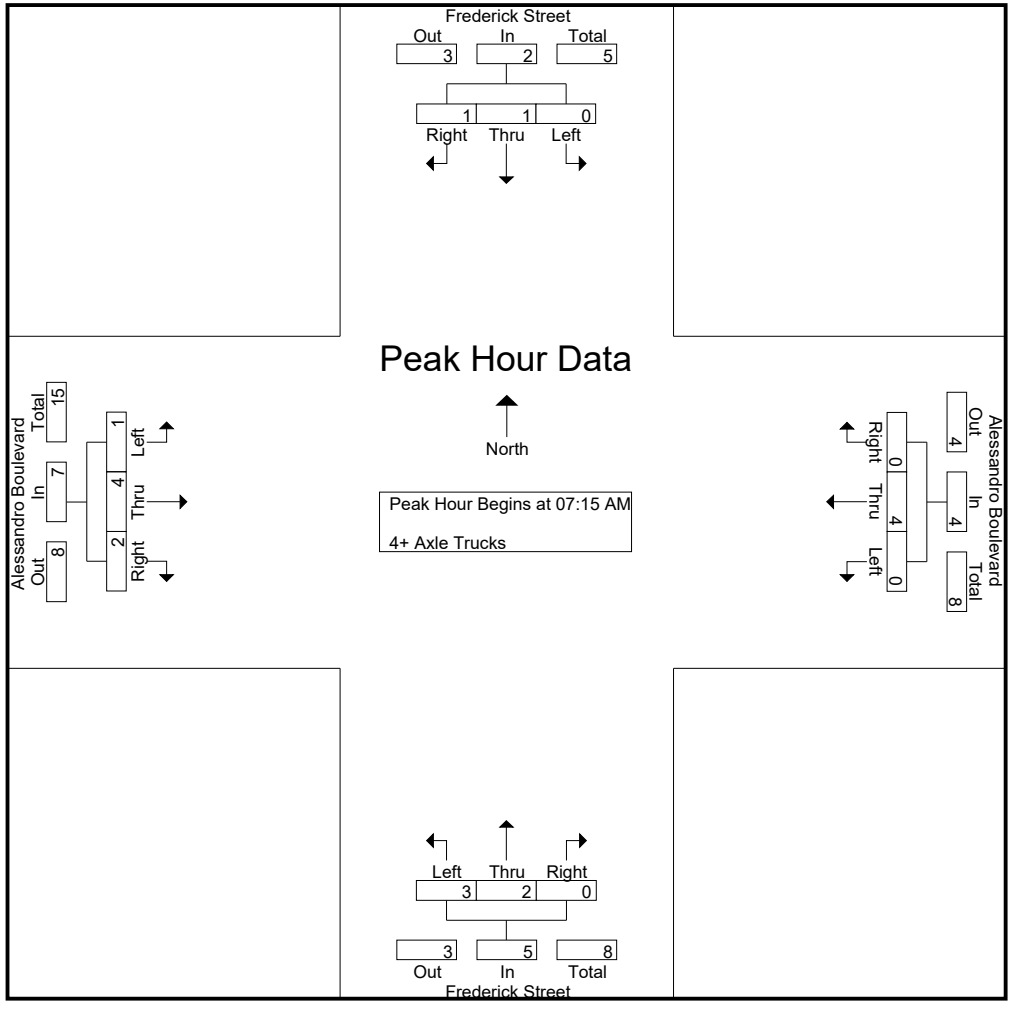

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City of Moreno Valley
N/S: Frederick Street
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File Name : 02_MRV_Frederick_Alessandrc
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Start Date : 4/3/2018
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	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:15 AM				07:15 AM				07:15 AM				07:15 AM				
+0 mins.	0	0	0	0	0	0	0	0	**3**	0	0	**3**	0	1	0	1	
+15 mins.	0	0	**1**	**1**	0	**3**	0	**3**	0	**2**	0	2	**1**	0	**1**	2	
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	**3**	1	**4**	
+45 mins.	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	1	1	2	0	4	0	4	3	2	0	5	1	4	2	7	
% App. Total	0	50	50		0	100	0		60	40	0		14.3	57.1	28.6		
PHF	.000	.250	.250	.500	.000	.333	.000	.333	.250	.250	.000	.417	.250	.333	.500	.438	

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File Name : 02_MRV_Frederick_Alessandro
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	51	64	35	12	150	15	220	40	12	275	31	75	21	3	127	54	307	39	12	400	39	952	99
04:15 PM	65	68	36	10	169	16	188	44	13	248	23	71	25	6	119	45	297	39	4	381	33	917	95
04:30 PM	85	67	25	13	177	15	159	40	25	214	21	66	15	5	102	56	277	26	4	359	47	852	89
04:45 PM	61	63	21	12	145	12	222	38	17	272	21	50	8	5	79	41	330	29	4	400	38	896	93
Total	262	262	117	47	641	58	789	162	67	1009	96	262	69	19	427	196	1211	133	24	1540	157	3617	377
05:00 PM	79	89	21	8	189	16	178	25	15	219	14	65	13	3	92	42	282	22	2	346	28	846	87
05:15 PM	67	84	31	22	182	12	197	37	19	246	11	59	5	2	75	49	338	37	5	424	48	927	97
05:30 PM	68	88	23	12	179	10	154	40	14	204	15	68	8	1	91	50	326	23	1	399	28	873	90
05:45 PM	68	78	24	15	170	12	156	37	22	205	13	45	7	2	65	38	301	28	5	367	44	807	85
Total	282	339	99	57	720	50	685	139	70	874	53	237	33	8	323	179	1247	110	13	1536	148	3453	360
Grand Total	544	601	216	104	1361	108	1474	301	137	1883	149	499	102	27	750	375	2458	243	37	3076	305	7070	737
Apprch %	40	44.2	15.9			5.7	78.3	16			19.9	66.5	13.6			12.2	79.9	7.9					
Total %	7.7	8.5	3.1		19.3	1.5	20.8	4.3		26.6	2.1	7.1	1.4		10.6	5.3	34.8	3.4		43.5	4.1	95.9	
Passenger Vehicles	544	593	215		1455	105	1447	300		1989	145	492	100		764	373	2426	240		3076	0	0	728
% Passenger Vehicles	100	98.7	99.5	99	99.3	97.2	98.2	99.7	100	98.5	97.3	98.6	98	100	98.3	99.5	98.7	98.8	100	98.8	0	0	98
Large 2 Axle Vehicles	0	6	1		8	3	18	1		22	1	4	1		6	2	24	1		27	0	0	6
% Large 2 Axle Vehicles	0	1	0.5	1	0.5	2.8	1.2	0.3	0	1.1	0.7	0.8	1	0	0.8	0.5	1	0.4	0	0.9	0	0	0
3 Axle Vehicles	0	1	0		1	0	2	0		2	0	2	1		3	0	4	0		4	0	0	1
% 3 Axle Vehicles	0	0.2	0	0	0.1	0	0.1	0	0	0.1	0	0.4	1	0	0.4	0	0.2	0	0	0.1	0	0	0
4+ Axle Trucks	0	1	0		1	0	7	0		7	3	1	0		4	0	4	2		6	0	0	1
% 4+ Axle Trucks	0	0.2	0	0	0.1	0	0.5	0	0	0.3	2	0.2	0	0	0.5	0	0.2	0.8	0	0.2	0	0	0

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	51	64	35	150	15	220	40	**275**	**31**	**75**	21	**127**	54	307	**39**	**400**	**9**
04:15 PM	65	**68**	**36**	169	**16**	188	**44**	248	23	71	**25**	119	45	297	39	381	9
04:30 PM	**85**	67	25	**177**	15	159	40	214	21	66	15	102	**56**	277	26	359	8
04:45 PM	61	63	21	145	12	**222**	38	272	21	50	8	79	41	**330**	29	400	8
Total Volume	262	262	117	641	58	789	162	1009	96	262	69	427	196	1211	133	1540	36
% App. Total	40.9	40.9	18.3		5.7	78.2	16.1		22.5	61.4	16.2		12.7	78.6	8.6		
PHF	.771	.963	.813	.905	.906	.889	.920	.917	.774	.873	.690	.841	.875	.917	.853	.963	.9

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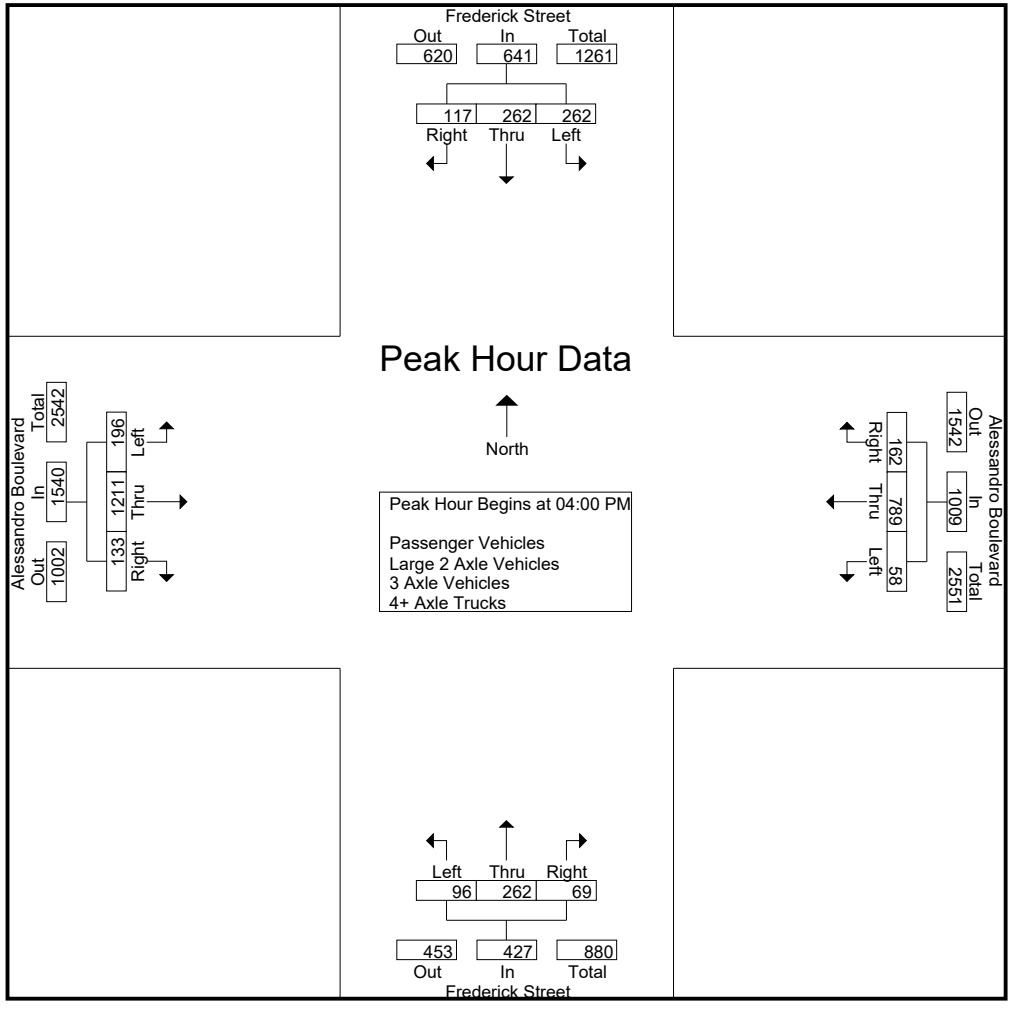

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	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	05:00 PM				04:00 PM				04:00 PM				04:45 PM				
+0 mins.	**79**	**89**	21	**189**	15	220	40	**275**	**31**	**75**	21	**127**	41	330	29	400	
+15 mins.	67	84	**31**	182	**16**	188	**44**	248	23	71	**25**	119	42	282	22	346	
+30 mins.	68	88	23	179	15	159	40	214	21	66	15	102	49	**338**	**37**	**424**	
+45 mins.	68	78	24	170	12	**222**	38	272	21	50	8	79	**50**	326	23	399	
Total Volume	282	339	99	720	58	789	162	1009	96	262	69	427	182	1276	111	1569	
% App. Total	39.2	47.1	13.8		5.7	78.2	16.1		22.5	61.4	16.2		11.6	81.3	7.1		
PHF	.892	.952	.798	.952	.906	.889	.920	.917	.774	.873	.690	.841	.910	.944	.750	.925	

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City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandro
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	51	64	35	12	150	15	217	40	12	272	31	72	21	3	124	54	302	39	12	395	39	941	98
04:15 PM	65	65	36	10	166	15	181	44	13	240	22	71	25	6	118	45	292	37	4	374	33	898	93
04:30 PM	85	66	25	13	176	15	155	40	25	210	21	65	15	5	101	56	275	26	4	357	47	844	89
04:45 PM	61	62	20	11	143	11	220	38	17	269	21	49	7	5	77	41	328	29	4	398	37	887	92
Total	262	257	116	46	635	56	773	162	67	991	95	257	68	19	420	196	1197	131	24	1524	156	3570	372
05:00 PM	79	89	21	8	189	16	174	25	15	215	13	65	13	3	91	42	275	22	2	339	28	834	86
05:15 PM	67	82	31	22	180	11	193	37	19	241	11	58	5	2	74	48	333	36	5	417	48	912	96
05:30 PM	68	87	23	12	178	10	152	39	14	201	14	68	8	1	90	49	322	23	1	394	28	863	89
05:45 PM	68	78	24	15	170	12	155	37	22	204	12	44	6	2	62	38	299	28	5	365	44	801	84
Total	282	336	99	57	717	49	674	138	70	861	50	235	32	8	317	177	1229	109	13	1515	148	3410	355
Grand Total	544	593	215	103	1352	105	1447	300	137	1852	145	492	100	27	737	373	2426	240	37	3039	304	6980	728
Apprch %	40.2	43.9	15.9			5.7	78.1	16.2			19.7	66.8	13.6			12.3	79.8	7.9					
Total %	7.8	8.5	3.1		19.4	1.5	20.7	4.3		26.5	2.1	7	1.4		10.6	5.3	34.8	3.4		43.5	4.2	95.8	

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	51	64	35	150	**15**	217	40	**272**	**31**	**72**	21	**124**	54	302	**39**	395	**9**
04:15 PM	65	65	**36**	166	15	181	**44**	240	22	71	**25**	118	45	292	37	374	8
04:30 PM	**85**	**66**	25	**176**	15	155	40	210	21	65	15	101	**56**	275	26	357	8
04:45 PM	61	62	20	143	11	**220**	38	269	21	49	7	77	41	**328**	29	**398**	8
Total Volume	262	257	116	635	56	773	162	991	95	257	68	420	196	1197	131	1524	35
% App. Total	41.3	40.5	18.3		5.7	78	16.3		22.6	61.2	16.2		12.9	78.5	8.6		
PHF	.771	.973	.806	.902	.933	.878	.920	.911	.766	.892	.680	.847	.875	.912	.840	.957	.9

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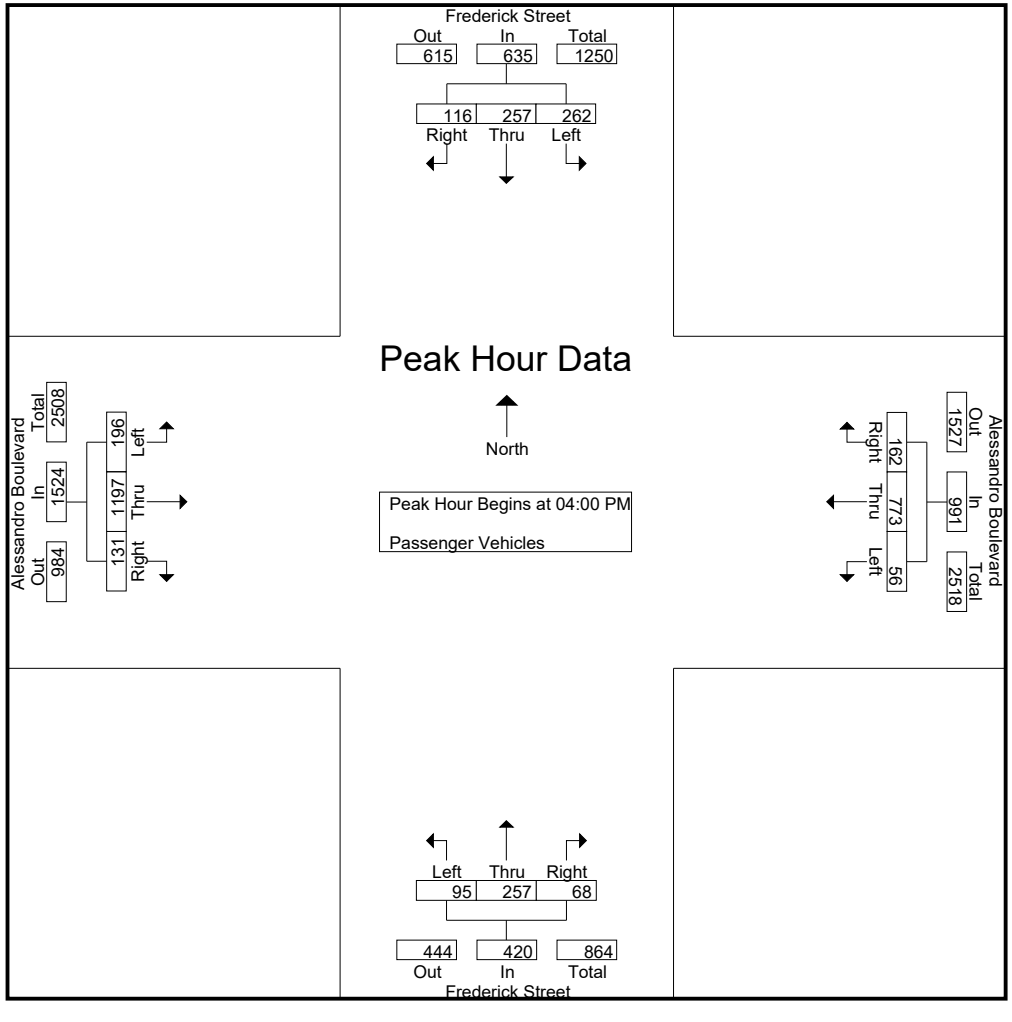
City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
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	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	51	64	35	150	**15**	217	40	**272**	**31**	**72**	21	**124**	54	302	**39**	395	
+15 mins.	65	65	**36**	166	15	181	**44**	240	22	71	**25**	118	45	292	37	374	
+30 mins.	**85**	**66**	25	**176**	15	155	40	210	21	65	15	101	**56**	275	26	357	
+45 mins.	61	62	20	143	11	**220**	38	269	21	49	7	77	41	**328**	29	**398**	
Total Volume	262	257	116	635	56	773	162	991	95	257	68	420	196	1197	131	1524	
% App. Total	41.3	40.5	18.3		5.7	78	16.3		22.6	61.2	16.2		12.9	78.5	8.6		
PHF	.771	.973	.806	.902	.933	.878	.920	.911	.766	.892	.680	.847	.875	.912	.840	.957	

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City of Moreno Valley
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File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
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Groups Printed- Large 2 Axle Vehicles

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	0	0	0	0	0	2	0	0	2	0	3	0	0	3	0	2	0	0	2	0	7	
04:15 PM	0	2	0	0	2	1	6	0	0	7	1	0	0	0	1	0	5	1	0	6	0	16	1
04:30 PM	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	
04:45 PM	0	0	1	1	1	1	0	0	0	1	0	0	1	0	1	0	2	0	0	2	1	5	
Total	0	3	1	1	4	2	10	0	0	12	1	3	1	0	5	0	9	1	0	10	1	31	3
05:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	7	0	0	7	0	10	1
05:15 PM	0	2	0	0	2	1	2	0	0	3	0	1	0	0	1	1	3	0	0	4	0	10	1
05:30 PM	0	1	0	0	1	0	2	1	0	3	0	0	0	0	0	1	3	0	0	4	0	8	
05:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	3	
Total	0	3	0	0	3	1	8	1	0	10	0	1	0	0	1	2	15	0	0	17	0	31	3
Grand Total	0	6	1	1	7	3	18	1	0	22	1	4	1	0	6	2	24	1	0	27	1	62	6
Apprch %	0	85.7	14.3			13.6	81.8	4.5			16.7	66.7	16.7			7.4	88.9	3.7					
Total %	0	9.7	1.6		11.3	4.8	29	1.6		35.5	1.6	6.5	1.6		9.7	3.2	38.7	1.6		43.5	1.6	98.4	

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	2	0	2	0	**3**	0	**3**	0	2	0	2	
04:15 PM	0	**2**	0	**2**	**1**	**6**	0	**7**	**1**	0	0	1	0	**5**	**1**	**6**	
04:30 PM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	
04:45 PM	0	0	**1**	1	1	0	0	1	0	0	**1**	1	0	2	0	2	
Total Volume	0	3	1	4	2	10	0	12	1	3	1	5	0	9	1	10	
% App. Total	0	75	25		16.7	83.3	0		20	60	20		0	90	10		
PHF	.000	.375	.250	.500	.500	.417	.000	.429	.250	.250	.250	.417	.000	.450	.250	.417	.4

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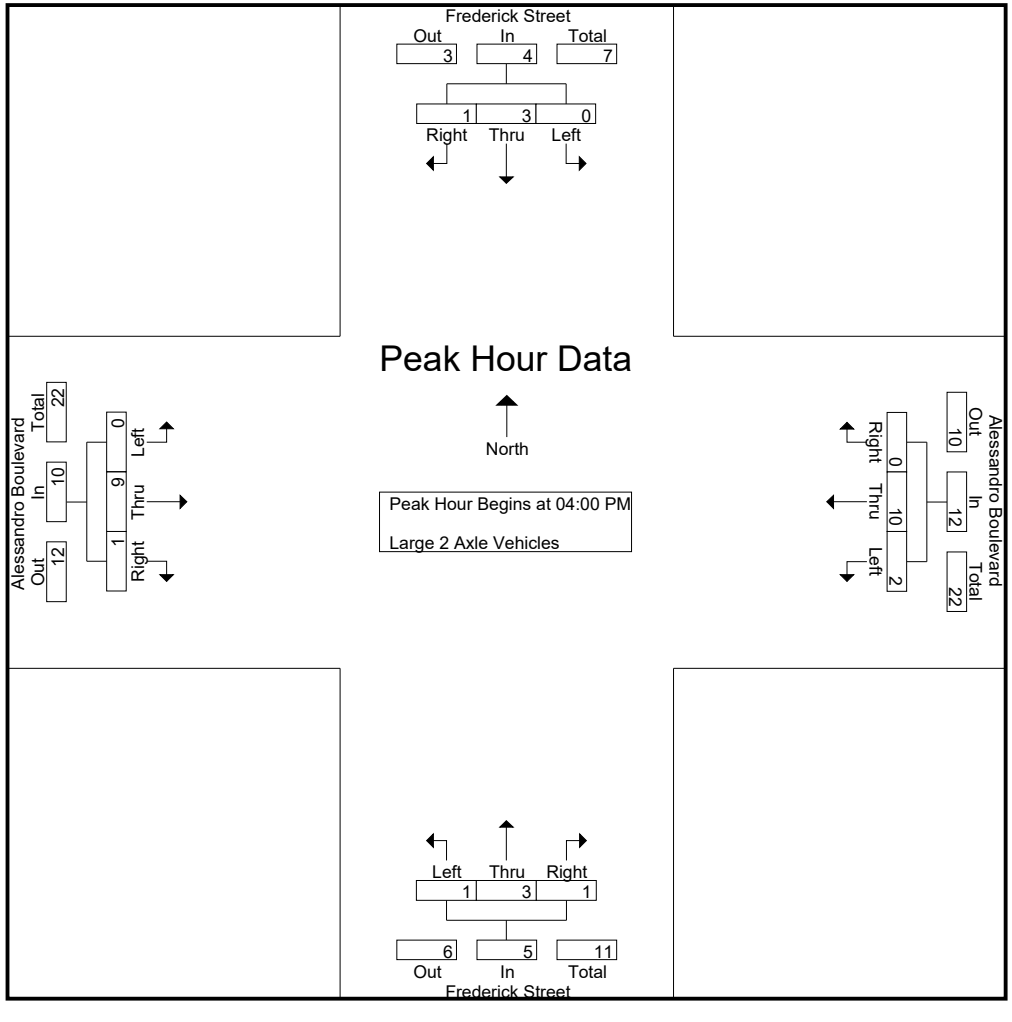
City of Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard
Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
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	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	0	0	0	0	2	0	2	0	**3**	0	**3**	0	2	0	2	
+15 mins.	0	**2**	0	**2**	**1**	**6**	0	**7**	**1**	0	0	1	0	**5**	**1**	**6**	
+30 mins.	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	
+45 mins.	0	0	**1**	1	1	0	0	1	0	0	**1**	1	0	2	0	2	
Total Volume	0	3	1	4	2	10	0	12	1	3	1	5	0	9	1	10	
% App. Total	0	75	25		16.7	83.3	0		20	60	20		0	90	10		
PHF	.000	.375	.250	.500	.500	.417	.000	.429	.250	.250	.250	.417	.000	.450	.250	.417	

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City of Moreno Valley
N/S: Frederick Street
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Weather: Clear

File Name : 02_MRV_Frederick_Alessandrc
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 3 Axle Vehicles

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	2	
04:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	
Total	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	0	2	0	0	2	0	6	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	2	
Total	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	2	0	0	2	0	4	
Grand Total	0	1	0	0	1	0	2	0	0	2	0	2	1	0	3	0	4	0	0	4	0	10	1
Apprch %	0	100	0			0	100	0			0	66.7	33.3			0	100	0					
Total %	0	10	0		10	0	20	0		20	0	20	10		30	0	40	0		40	0	100	

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	
04:15 PM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	
04:30 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	
04:45 PM	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0	
Total Volume	0	1	0	1	0	2	0	2	0	1	0	1	0	2	0	2	
% App. Total	0	100	0		0	100	0		0	100	0		0	100	0		
PHF	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	.7

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City of Moreno Valley
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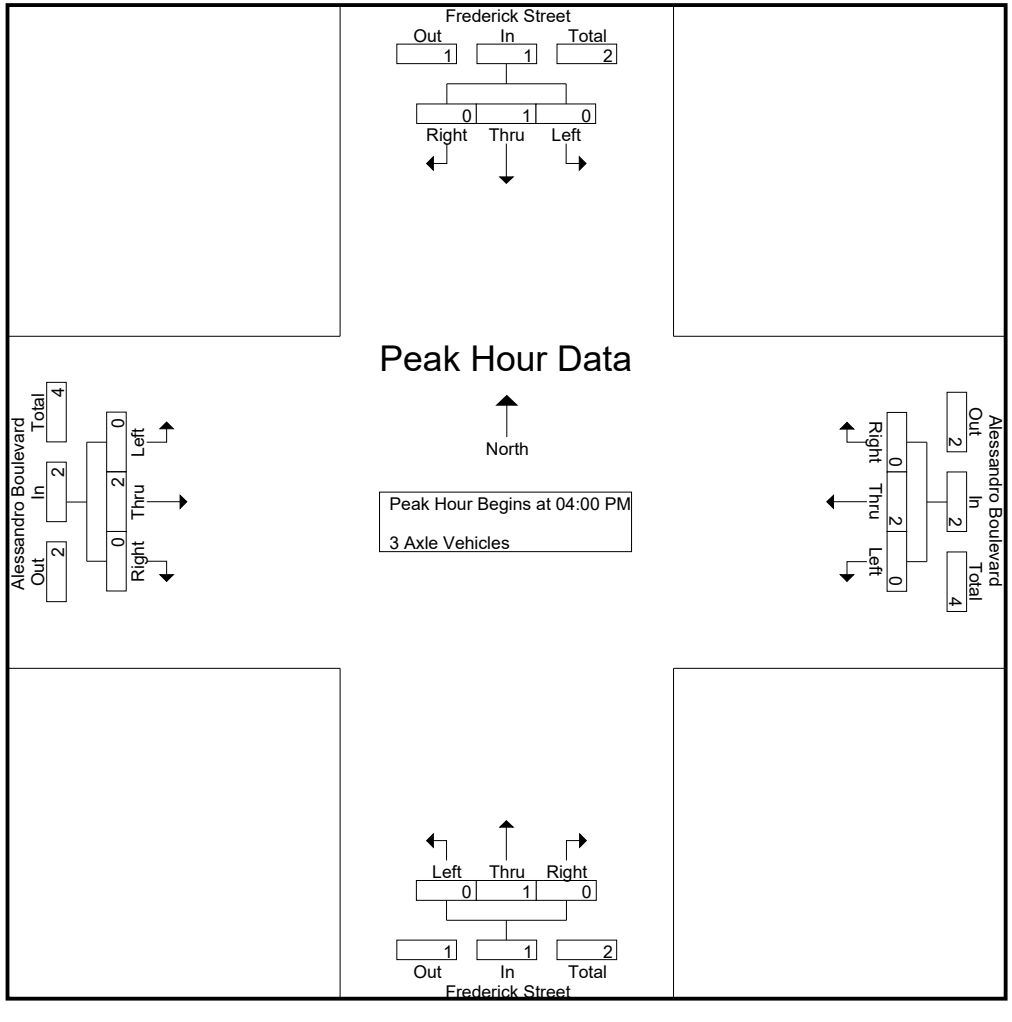

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City of Moreno Valley
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	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	
+15 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	
+45 mins.	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0	
Total Volume	0	1	0	1	0	2	0	2	0	1	0	1	0	2	0	2	
% App. Total	0	100	0		0	100	0		0	100	0		0	100	0		
PHF	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	

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Groups Printed- 4+ Axle Trucks

	Frederick Street Southbound					Alessandro Boulevard Westbound					Frederick Street Northbound					Alessandro Boulevard Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	2	
04:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	4	
04:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	
Total	0	1	0	0	1	0	4	0	0	4	0	1	0	0	1	0	3	1	0	4	0	10	1
05:00 PM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	2	
05:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	1	0	2	0	4	
05:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	
Total	0	0	0	0	0	0	3	0	0	3	3	0	0	0	3	0	1	1	0	2	0	8	
Grand Total	0	1	0	0	1	0	7	0	0	7	3	1	0	0	4	0	4	2	0	6	0	18	1
Apprch %	0	100	0			0	100	0			75	25	0			0	66.7	33.3					
Total %	0	5.6	0		5.6	0	38.9	0		38.9	16.7	5.6	0		22.2	0	22.2	11.1		33.3	0	100	

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	
04:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	**1**	1	
04:30 PM	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	**2**	0	**2**	
04:45 PM	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	0	0	0	0	
Total Volume	0	1	0	1	0	4	0	4	0	1	0	1	0	3	1	4	
% App. Total	0	100	0		0	100	0		0	100	0		0	75	25		
PHF	.000	.250	.000	.250	.000	.500	.000	.500	.000	.250	.000	.250	.000	.375	.250	.500	.6

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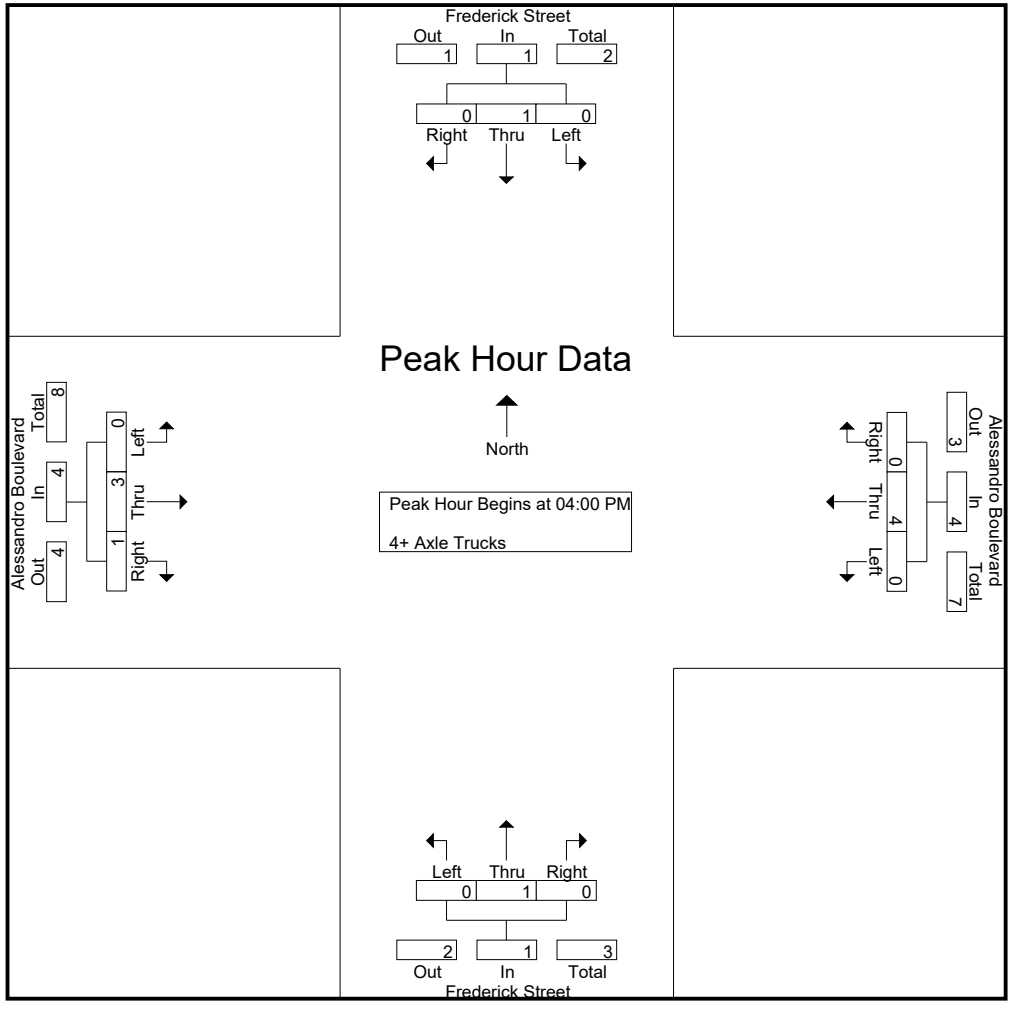

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Page No : 3

	Frederick Street Southbound				Alessandro Boulevard Westbound				Frederick Street Northbound				Alessandro Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	**1**	1	
+30 mins.	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	**2**	0	**2**	
+45 mins.	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	0	0	0	0	
Total Volume	0	1	0	1	0	4	0	4	0	1	0	1	0	3	1	4	
% App. Total	0	100	0		0	100	0		0	100	0		0	75	25		
PHF	.000	.250	.000	.250	.000	.500	.000	.500	.000	.250	.000	.250	.000	.375	.250	.500	

Location: Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard

Date: 4/3/2018
Date: Tuesday

PEDESTRIANS

	North Leg Frederick Street	East Leg Alessandro Boulevard	South Leg Frederick Street	West Leg Alessandro Boulevard	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	1	1	0	0	2
7:15 AM	0	0	0	0	0
7:30 AM	3	0	0	0	3
7:45 AM	1	1	0	0	2
8:00 AM	0	1	0	2	3
8:15 AM	2	0	0	0	2
8:30 AM	0	0	1	2	3
8:45 AM	1	0	0	3	4
TOTAL VOLUMES:	8	3	1	7	19

	North Leg Frederick Street	East Leg Alessandro Boulevard	South Leg Frederick Street	West Leg Alessandro Boulevard	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	8	0	0	4	12
4:15 PM	1	4	2	1	8
4:30 PM	1	1	0	1	3
4:45 PM	1	0	0	0	1
5:00 PM	0	2	1	1	4
5:15 PM	3	1	0	2	6
5:30 PM	3	0	0	2	5
5:45 PM	1	0	1	2	4
TOTAL VOLUMES:	18	8	4	13	43

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Location: Moreno Valley
N/S: Frederick Street
E/W: Alessandro Boulevard

Date: 4/3/2018
Date: Tuesday

BICYCLES

	Southbound Frederick Street			Westbound Alessandro Boulevard			Northbound Frederick Street			Eastbound Alessandro Boulevard			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	1	0	0	0	0	0	0	1	2
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL VOLUMES:	1	0	1	1	2	0	0	1	0	0	1	1	8

	Southbound Frederick Street			Westbound Alessandro Boulevard			Northbound Frederick Street			Eastbound Alessandro Boulevard			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	1	1	0	1	0	0	2	0	5

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City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	50	14	2	64	0	0	0	0	0	5	44	0	0	49	4	0	2	2	6	4	119	12
07:15 AM	0	57	22	1	79	0	0	0	0	0	8	77	0	0	85	6	0	5	3	11	4	175	17
07:30 AM	0	69	16	1	85	0	0	0	0	0	11	70	0	0	81	6	0	1	0	7	1	173	17
07:45 AM	0	69	20	3	89	0	0	0	0	0	12	77	0	0	89	4	0	3	2	7	5	185	19
Total	0	245	72	7	317	0	0	0	0	0	36	268	0	0	304	20	0	11	7	31	14	652	66
08:00 AM	0	49	18	0	67	0	0	0	0	0	13	59	0	0	72	6	0	3	1	9	1	148	14
08:15 AM	0	64	15	1	79	0	0	0	0	0	10	58	0	0	68	7	0	4	1	11	2	158	16
08:30 AM	0	39	16	0	55	0	0	0	0	0	12	53	0	0	65	2	0	2	1	4	1	124	12
08:45 AM	0	39	27	0	66	0	0	0	0	0	11	65	0	0	76	10	0	3	0	13	0	155	15
Total	0	191	76	1	267	0	0	0	0	0	46	235	0	0	281	25	0	12	3	37	4	585	58
Grand Total	0	436	148	8	584	0	0	0	0	0	82	503	0	0	585	45	0	23	10	68	18	1237	125
Apprch %	0	74.7	25.3			0	0	0			14	86	0			66.2	0	33.8					
Total %	0	35.2	12		47.2	0	0	0		0	6.6	40.7	0		47.3	3.6	0	1.9		5.5	1.4	98.6	
Passenger Vehicles	0	412	143		562	0	0	0		0	79	471	0		550	42	0	22		74	0	0	118
% Passenger Vehicles	0	94.5	96.6	87.5	94.9	0	0	0	0	0	96.3	93.6	0	0	94	93.3	0	95.7	100	94.9	0	0	94
Large 2 Axle Vehicles	0	13	5		19	0	0	0		0	3	15	0		18	2	0	0		2	0	0	3
% Large 2 Axle Vehicles	0	3	3.4	12.5	3.2	0	0	0	0	0	3.7	3	0	0	3.1	4.4	0	0	0	2.6	0	0	3
3 Axle Vehicles	0	7	0		7	0	0	0		0	0	8	0		8	1	0	0		1	0	0	1
% 3 Axle Vehicles	0	1.6	0	0	1.2	0	0	0	0	0	0	1.6	0	0	1.4	2.2	0	0	0	1.3	0	0	1
4+ Axle Trucks	0	4	0		4	0	0	0		0	0	9	0		9	0	0	1		1	0	0	1
% 4+ Axle Trucks	0	0.9	0	0	0.7	0	0	0	0	0	0	1.8	0	0	1.5	0	0	4.3	0	1.3	0	0	1

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	57	**22**	79	0	0	0	0	8	**77**	0	85	**6**	0	**5**	**11**	1
07:30 AM	0	**69**	16	85	0	0	0	0	11	70	0	81	6	0	1	7	1
07:45 AM	0	69	20	**89**	0	0	0	0	12	77	0	**89**	4	0	3	7	**1**
08:00 AM	0	49	18	67	0	0	0	0	**13**	59	0	72	6	0	3	9	1
Total Volume	0	244	76	320	0	0	0	0	44	283	0	327	22	0	12	34	6
% App. Total	0	76.2	23.8		0	0	0		13.5	86.5	0		64.7	0	35.3		
PHF	.000	.884	.864	.899	.000	.000	.000	.000	.846	.919	.000	.919	.917	.000	.600	.773	.9

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City of Moreno Valley
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E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
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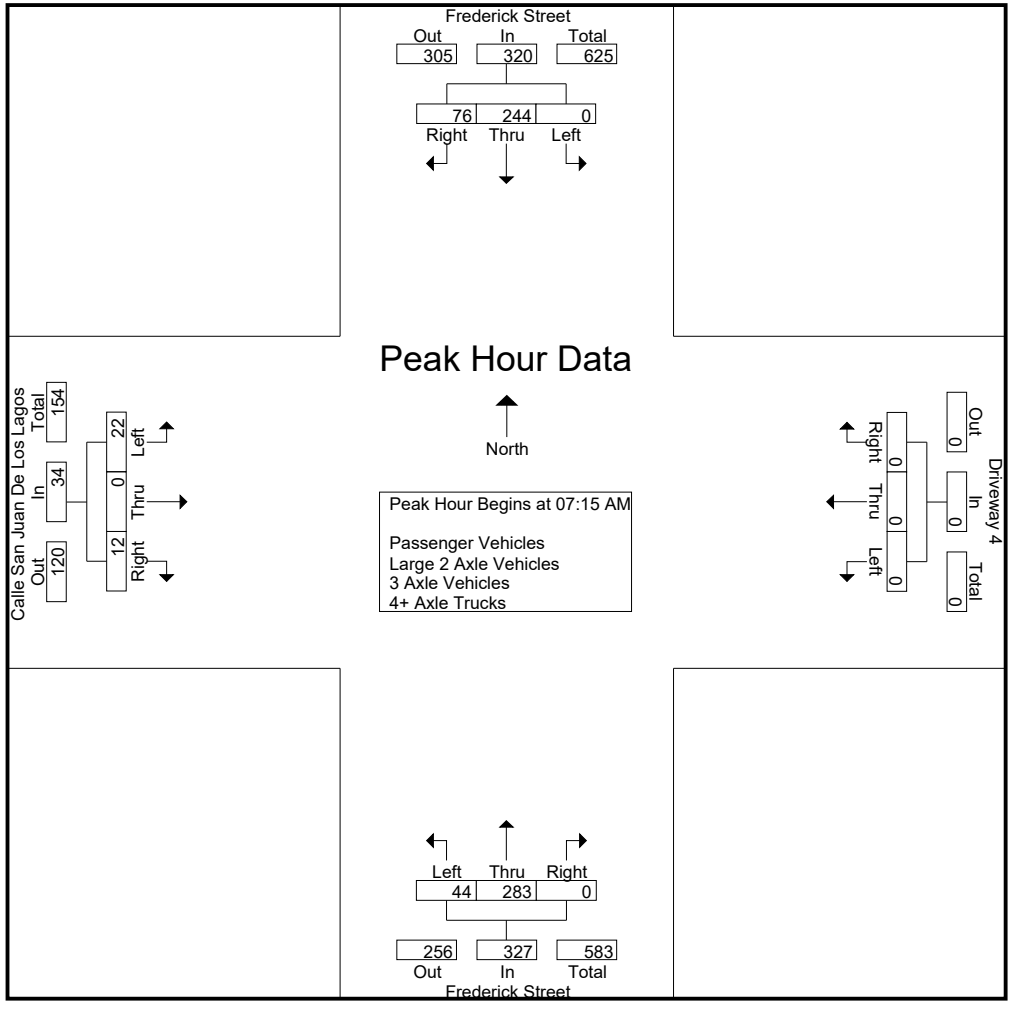

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Page No : 3

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:15 AM				07:00 AM				07:15 AM				08:00 AM				
+0 mins.	0	57	**22**	79	0	0	0	0	8	**77**	0	85	6	0	3	9	
+15 mins.	0	**69**	16	85	0	0	0	0	11	70	0	81	7	0	**4**	11	
+30 mins.	0	69	20	**89**	0	0	0	0	12	77	0	**89**	2	0	2	4	
+45 mins.	0	49	18	67	0	0	0	0	**13**	59	0	72	**10**	0	3	**13**	
Total Volume	0	244	76	320	0	0	0	0	44	283	0	327	25	0	12	37	
% App. Total	0	76.2	23.8		0	0	0		13.5	86.5	0		67.6	0	32.4		
PHF	.000	.884	.864	.899	.000	.000	.000	.000	.846	.919	.000	.919	.625	.000	.750	.712	

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File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	48	13	1	61	0	0	0	0	0	5	41	0	0	46	4	0	2	2	6	3	113	11
07:15 AM	0	55	21	1	76	0	0	0	0	0	7	69	0	0	76	6	0	5	3	11	4	163	16
07:30 AM	0	68	16	1	84	0	0	0	0	0	11	65	0	0	76	5	0	1	0	6	1	166	16
07:45 AM	0	67	20	3	87	0	0	0	0	0	12	71	0	0	83	3	0	3	2	6	5	176	18
Total	0	238	70	6	308	0	0	0	0	0	35	246	0	0	281	18	0	11	7	29	13	618	63
08:00 AM	0	44	18	0	62	0	0	0	0	0	12	58	0	0	70	6	0	3	1	9	1	141	14
08:15 AM	0	59	15	1	74	0	0	0	0	0	10	54	0	0	64	7	0	3	1	10	2	148	15
08:30 AM	0	32	15	0	47	0	0	0	0	0	12	51	0	0	63	2	0	2	1	4	1	114	11
08:45 AM	0	39	25	0	64	0	0	0	0	0	10	62	0	0	72	9	0	3	0	12	0	148	14
Total	0	174	73	1	247	0	0	0	0	0	44	225	0	0	269	24	0	11	3	35	4	551	55
Grand Total	0	412	143	7	555	0	0	0	0	0	79	471	0	0	550	42	0	22	10	64	17	1169	118
Apprch %	0	74.2	25.8			0	0	0			14.4	85.6	0			65.6	0	34.4					
Total %	0	35.2	12.2		47.5	0	0	0		0	6.8	40.3	0		47	3.6	0	1.9		5.5	1.4	98.6	

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	55	**21**	76	0	0	0	0	7	69	0	76	**6**	0	**5**	**11**	1
07:30 AM	0	**68**	16	84	0	0	0	0	11	65	0	76	5	0	1	6	1
07:45 AM	0	67	20	**87**	0	0	0	0	**12**	**71**	0	**83**	3	0	3	6	**1**
08:00 AM	0	44	18	62	0	0	0	0	12	58	0	70	6	0	3	9	1
Total Volume	0	234	75	309	0	0	0	0	42	263	0	305	20	0	12	32	6
% App. Total	0	75.7	24.3		0	0	0		13.8	86.2	0		62.5	0	37.5		
PHF	.000	.860	.893	.888	.000	.000	.000	.000	.875	.926	.000	.919	.833	.000	.600	.727	.9

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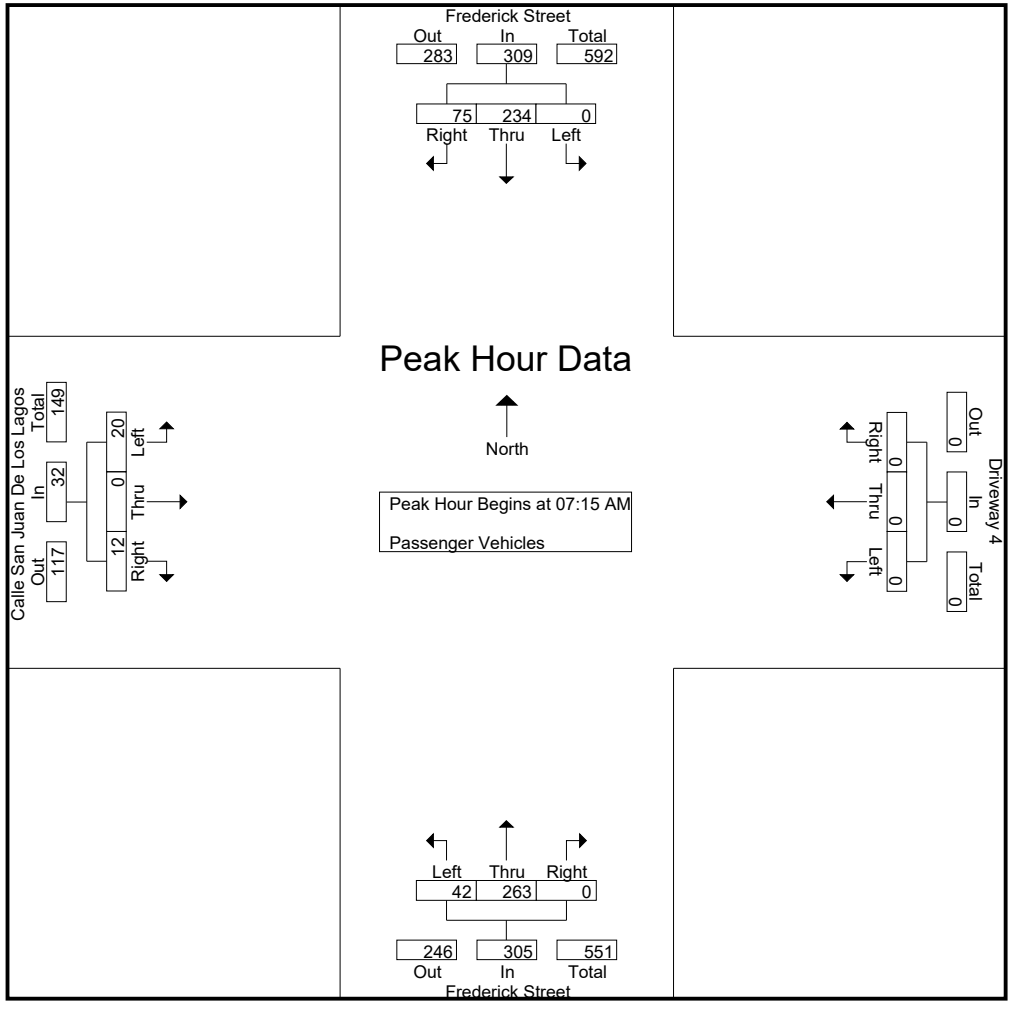
City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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Start Date : 4/3/2018
Page No : 3

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:15 AM				07:15 AM				07:15 AM				07:15 AM				
+0 mins.	0	55	**21**	76	0	0	0	0	7	69	0	76	**6**	0	**5**	**11**	
+15 mins.	0	**68**	16	84	0	0	0	0	11	65	0	76	5	0	1	6	
+30 mins.	0	67	20	**87**	0	0	0	0	**12**	**71**	0	**83**	3	0	3	6	
+45 mins.	0	44	18	62	0	0	0	0	12	58	0	70	6	0	3	9	
Total Volume	0	234	75	309	0	0	0	0	42	263	0	305	20	0	12	32	
% App. Total	0	75.7	24.3		0	0	0		13.8	86.2	0		62.5	0	37.5		
PHF	.000	.860	.893	.888	.000	.000	.000	.000	.875	.926	.000	.919	.833	.000	.600	.727	

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File Name : 04_MRV_Frederick_DW4_Calle SJDLL
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Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	2	1	1	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	5	
07:15 AM	0	0	1	0	1	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	5	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	3	
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	5	
Total	0	3	2	1	5	0	0	0	0	0	1	11	0	0	12	1	0	0	0	1	1	18	1
08:00 AM	0	2	0	0	2	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	4	
08:15 AM	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5	
08:30 AM	0	5	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
08:45 AM	0	0	2	0	2	0	0	0	0	0	1	1	0	0	2	1	0	0	0	1	0	5	
Total	0	10	3	0	13	0	0	0	0	0	2	4	0	0	6	1	0	0	0	1	0	20	2
Grand Total	0	13	5	1	18	0	0	0	0	0	3	15	0	0	18	2	0	0	0	2	1	38	3
Apprch %	0	72.2	27.8			0	0	0			16.7	83.3	0			100	0	0					
Total %	0	34.2	13.2		47.4	0	0	0		0	7.9	39.5	0		47.4	5.3	0	0		5.3	2.6	97.4	

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	**1**	1	0	0	0	0	**1**	3	0	**4**	0	0	0	0	
07:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	**1**	0	0	**1**	
07:45 AM	0	1	0	1	0	0	0	0	0	**4**	0	4	0	0	0	0	
08:00 AM	0	**2**	0	**2**	0	0	0	0	1	1	0	2	0	0	0	0	
Total Volume	0	3	1	4	0	0	0	0	2	10	0	12	1	0	0	1	
% App. Total	0	75	25		0	0	0		16.7	83.3	0		100	0	0		
PHF	.000	.375	.250	.500	.000	.000	.000	.000	.500	.625	.000	.750	.250	.000	.000	.250	.8

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City of Moreno Valley
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Weather: Clear

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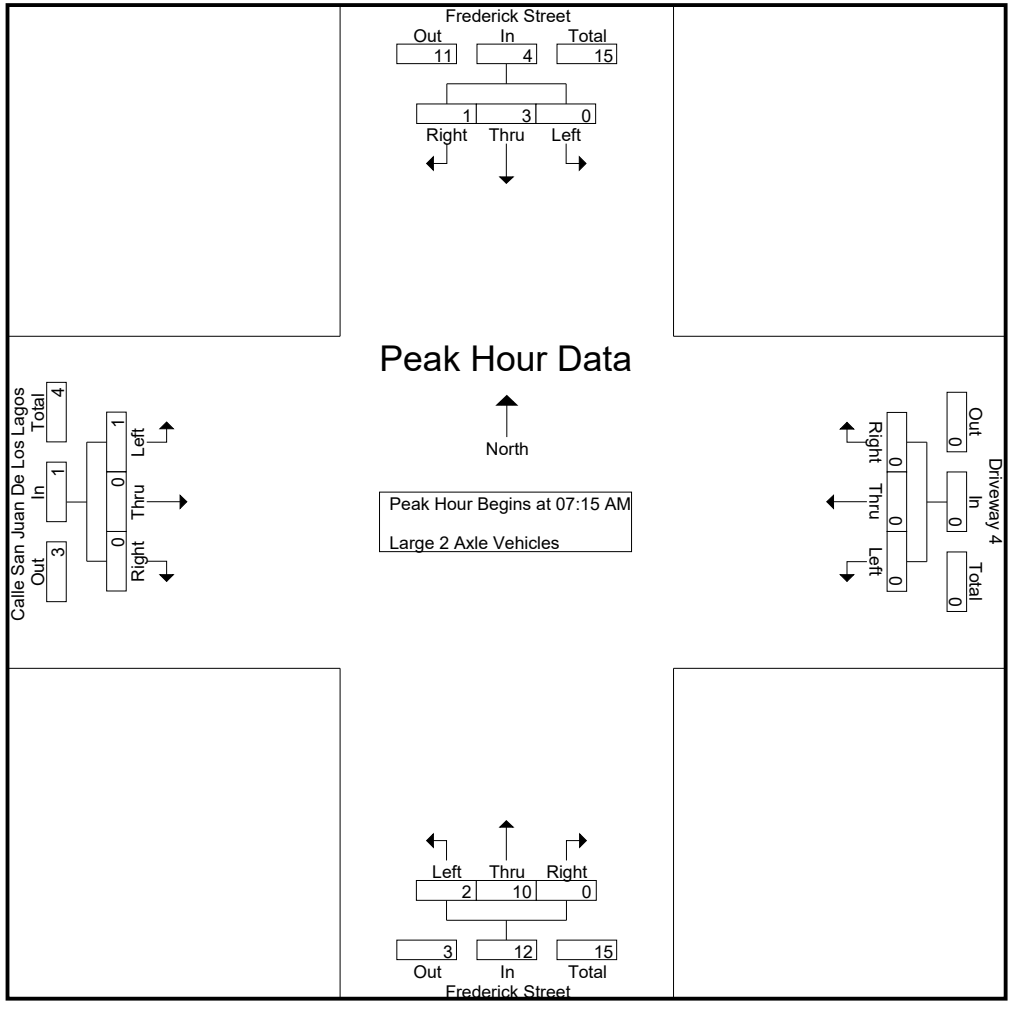
Page No : 2



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(951) 268-6268

City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
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	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:15 AM				07:15 AM				07:15 AM				07:15 AM				
+0 mins.	0	0	**1**	1	0	0	0	0	**1**	3	0	**4**	0	0	0	0	
+15 mins.	0	0	0	0	0	0	0	0	0	2	0	2	**1**	0	0	**1**	
+30 mins.	0	1	0	1	0	0	0	0	0	**4**	0	4	0	0	0	0	
+45 mins.	0	**2**	0	**2**	0	0	0	0	1	1	0	2	0	0	0	0	
Total Volume	0	3	1	4	0	0	0	0	2	10	0	12	1	0	0	1	
% App. Total	0	75	25		0	0	0		16.7	83.3	0		100	0	0		
PHF	.000	.375	.250	.500	.000	.000	.000	.000	.500	.625	.000	.750	.250	.000	.000	.250	

Counts Unlimited
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File Name : 04_MRV_Frederick_DW4_Calle SJDLL
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Groups Printed- 3 Axle Vehicles

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:15 AM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	3	
Total	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	8	
08:00 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	
08:30 AM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	8	
Grand Total	0	7	0	0	7	0	0	0	0	0	0	8	0	0	8	1	0	0	0	1	0	16	1
Apprch %	0	100	0			0	0	0			0	100	0			100	0	0					
Total %	0	43.8	0		43.8	0	0	0		0	0	50	0		50	6.2	0	0		6.2	0	100	

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**2**	0	**2**	0	0	0	0	0	1	0	1	0	0	0	0	
07:30 AM	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0	
07:45 AM	0	0	0	0	0	0	0	0	0	2	0	2	**1**	0	0	**1**	
08:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	4	0	4	0	0	0	0	0	5	0	5	1	0	0	1	
% App. Total	0	100	0		0	0	0		0	100	0		100	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.625	.000	.625	.250	.000	.000	.250	.8

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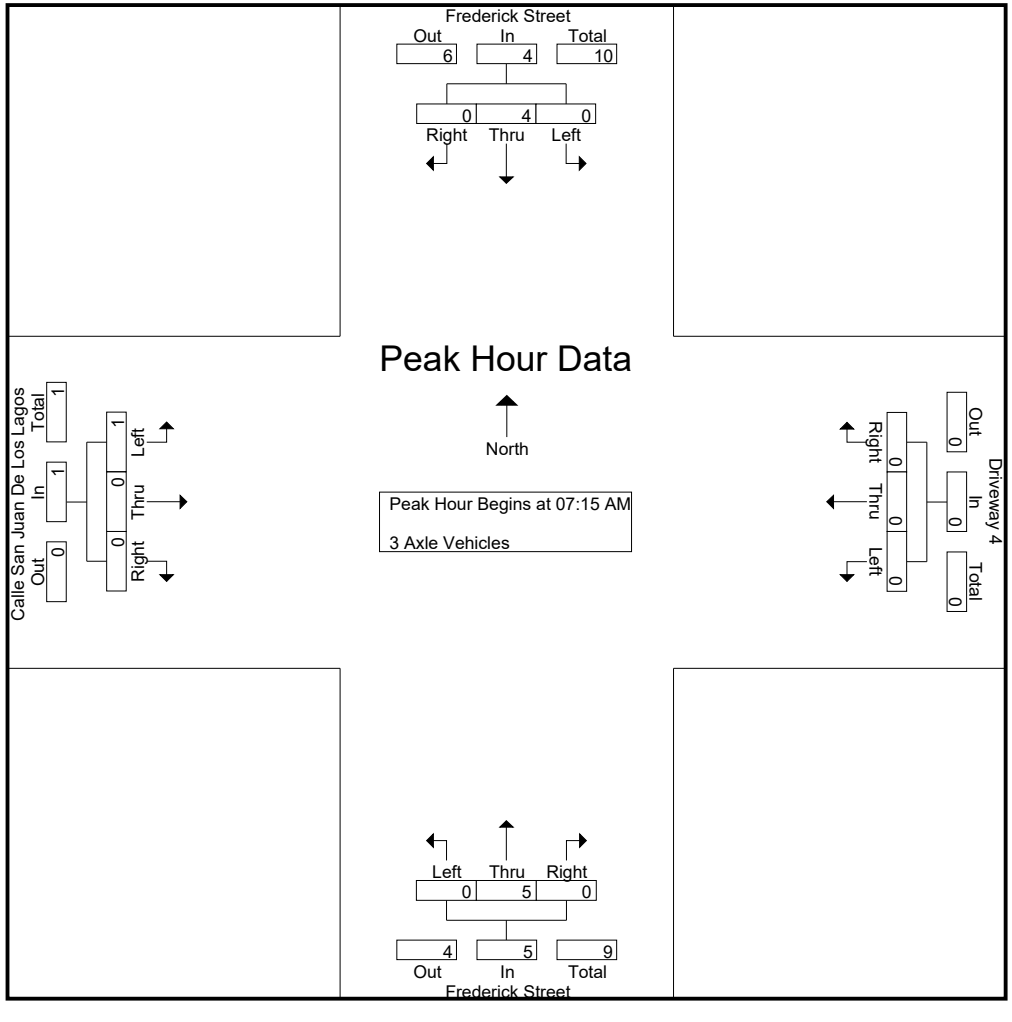

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	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:15 AM				07:15 AM				07:15 AM				07:15 AM				
+0 mins.	0	**2**	0	**2**	0	0	0	0	0	1	0	1	0	0	0	0	
+15 mins.	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	0	2	0	2	**1**	0	0	**1**	
+45 mins.	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	4	0	4	0	0	0	0	0	5	0	5	1	0	0	1	
% App. Total	0	100	0		0	0	0		0	100	0		100	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.625	.000	.625	.250	.000	.000	.250	

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Groups Printed- 4+ Axle Trucks

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	4	
07:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Total	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	8	
08:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	
Total	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	0	6	
Grand Total	0	4	0	0	4	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	0	14	1
Apprch %	0	100	0			0	0	0			0	100	0			0	0	100					
Total %	0	28.6	0		28.6	0	0	0		0	0	64.3	0		64.3	0	0	7.1		7.1	0	100	

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	0	0	0	0	**4**	0	**4**	0	0	0	0	
07:30 AM	0	**1**	0	**1**	0	0	0	0	0	1	0	1	0	0	0	0	
07:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
08:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	3	0	3	0	0	0	0	0	5	0	5	0	0	0	0	
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	.313	.000	.313	.000	.000	.000	.000	.5

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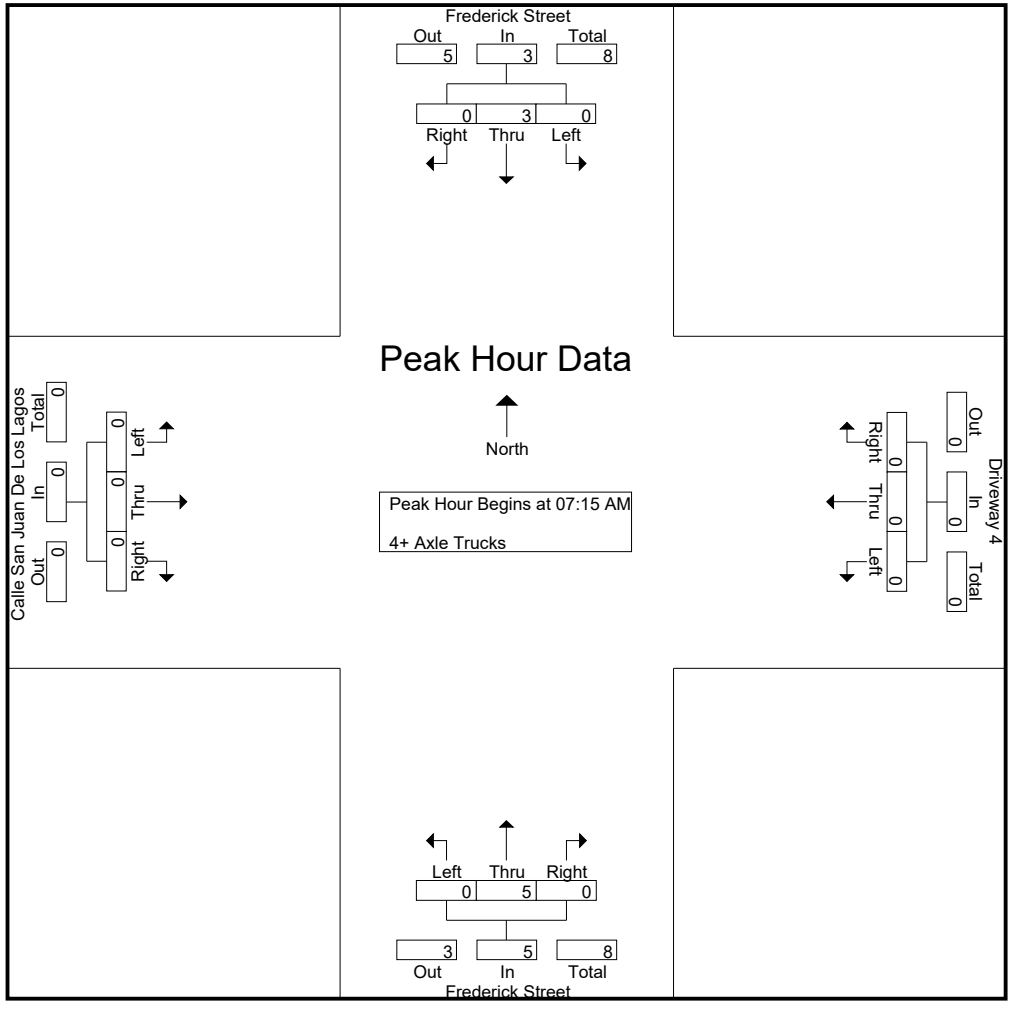

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	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:15 AM				07:15 AM				07:15 AM				07:15 AM				
+0 mins.	0	0	0	0	0	0	0	0	0	**4**	0	**4**	0	0	0	0	
+15 mins.	0	**1**	0	**1**	0	0	0	0	0	1	0	1	0	0	0	0	
+30 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
+45 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	3	0	3	0	0	0	0	0	5	0	5	0	0	0	0	
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	.313	.000	.313	.000	.000	.000	.000	

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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	111	17	1	128	0	0	0	0	0	6	79	0	0	85	47	0	1	0	48	1	261	26
04:15 PM	0	115	18	3	133	0	0	0	0	0	7	73	0	0	80	41	0	10	1	51	4	264	26
04:30 PM	0	86	8	0	94	0	0	0	0	0	4	80	0	0	84	30	0	7	3	37	3	215	21
04:45 PM	0	93	12	2	105	0	0	0	0	0	4	65	0	0	69	17	0	5	1	22	3	196	19
Total	0	405	55	6	460	0	0	0	0	0	21	297	0	0	318	135	0	23	5	158	11	936	94
05:00 PM	0	126	6	2	132	0	0	0	0	0	3	68	0	0	71	25	0	5	0	30	2	233	23
05:15 PM	0	124	8	1	132	0	0	0	0	0	5	67	0	0	72	18	0	6	2	24	3	228	23
05:30 PM	0	117	4	0	121	0	0	0	0	0	1	62	0	0	63	22	0	9	1	31	1	215	21
05:45 PM	0	99	9	1	108	0	0	0	0	0	2	53	0	0	55	15	0	6	0	21	1	184	18
Total	0	466	27	4	493	0	0	0	0	0	11	250	0	0	261	80	0	26	3	106	7	860	86
Grand Total	0	871	82	10	953	0	0	0	0	0	32	547	0	0	579	215	0	49	8	264	18	1796	181
Apprch %	0	91.4	8.6			0	0	0			5.5	94.5	0			81.4	0	18.6					
Total %	0	48.5	4.6		53.1	0	0	0		0	1.8	30.5	0		32.2	12	0	2.7		14.7	1	99	
Passenger Vehicles	0	857	82		949	0	0	0		0	31	536	0		567	213	0	47		268	0	0	178
% Passenger Vehicles	0	98.4	100	100	98.5	0	0	0	0	0	96.9	98	0	0	97.9	99.1	0	95.9	100	98.5	0	0	98
Large 2 Axle Vehicles	0	10	0		10	0	0	0		0	1	4	0		5	2	0	2		4	0	0	1
% Large 2 Axle Vehicles	0	1.1	0	0	1	0	0	0	0	0	3.1	0.7	0	0	0.9	0.9	0	4.1	0	1.5	0	0	
3 Axle Vehicles	0	1	0		1	0	0	0		0	0	3	0		3	0	0	0		0	0	0	
% 3 Axle Vehicles	0	0.1	0	0	0.1	0	0	0	0	0	0	0.5	0	0	0.5	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	3	0		3	0	0	0		0	0	4	0		4	0	0	0		0	0	0	
% 4+ Axle Trucks	0	0.3	0	0	0.3	0	0	0	0	0	0	0.7	0	0	0.7	0	0	0	0	0	0	0	0

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	111	17	128	0	0	0	0	6	79	0	**85**	**47**	0	1	48	2
04:15 PM	0	**115**	**18**	**133**	0	0	0	0	**7**	73	0	80	41	0	**10**	**51**	**2**
04:30 PM	0	86	8	94	0	0	0	0	4	**80**	0	84	30	0	7	37	2
04:45 PM	0	93	12	105	0	0	0	0	4	65	0	69	17	0	5	22	1
Total Volume	0	405	55	460	0	0	0	0	21	297	0	318	135	0	23	158	9
% App. Total	0	88	12		0	0	0		6.6	93.4	0		85.4	0	14.6		
PHF	.000	.880	.764	.865	.000	.000	.000	.000	.750	.928	.000	.935	.718	.000	.575	.775	.8

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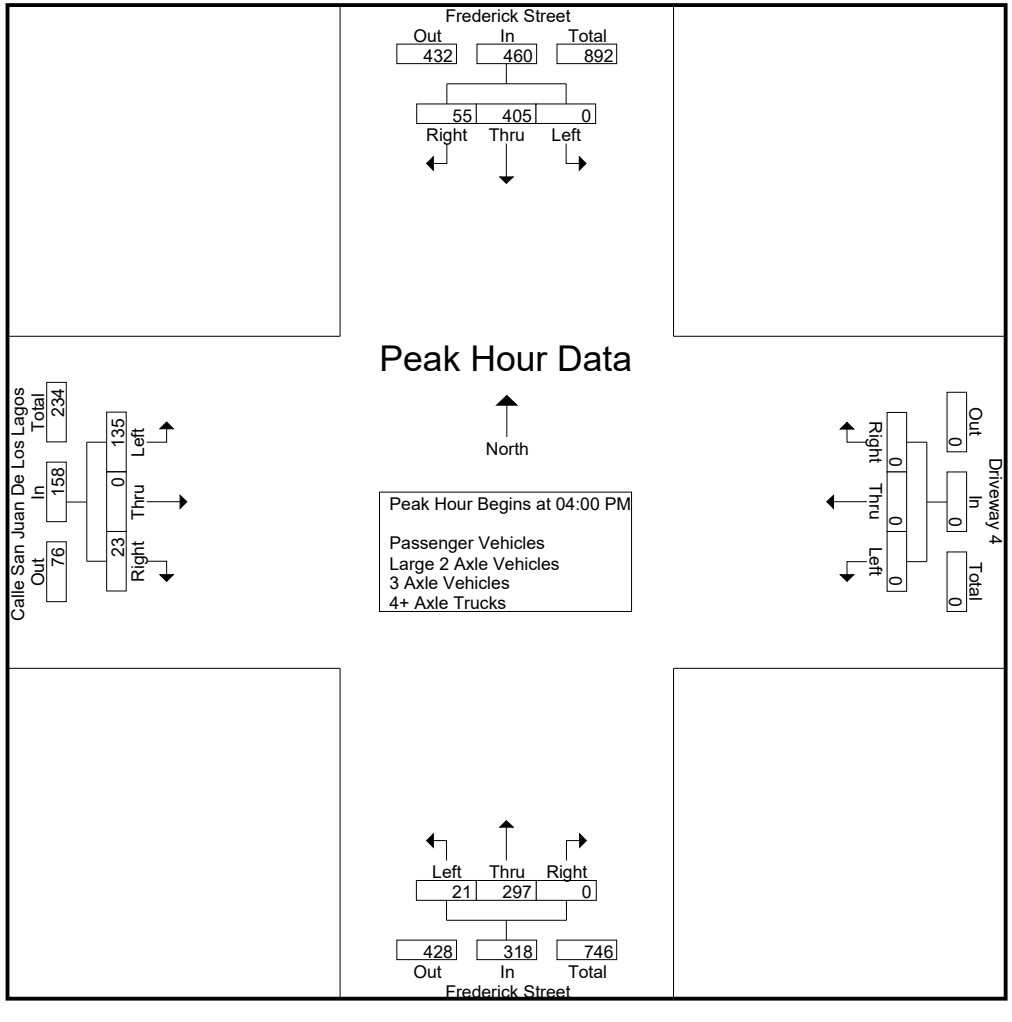

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	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	05:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	**126**	6	**132**	0	0	0	0	6	79	0	**85**	**47**	0	1	48	
+15 mins.	0	124	8	132	0	0	0	0	**7**	73	0	80	41	0	**10**	**51**	
+30 mins.	0	117	4	121	0	0	0	0	4	**80**	0	84	30	0	7	37	
+45 mins.	0	99	**9**	108	0	0	0	0	4	65	0	69	17	0	5	22	
Total Volume	0	466	27	493	0	0	0	0	21	297	0	318	135	0	23	158	
% App. Total	0	94.5	5.5		0	0	0		6.6	93.4	0		85.4	0	14.6		
PHF	.000	.925	.750	.934	.000	.000	.000	.000	.750	.928	.000	.935	.718	.000	.575	.775	

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Groups Printed- Passenger Vehicles

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	111	17	1	128	0	0	0	0	0	6	77	0	0	83	46	0	1	0	47	1	258	25
04:15 PM	0	109	18	3	127	0	0	0	0	0	7	71	0	0	78	41	0	10	1	51	4	256	26
04:30 PM	0	85	8	0	93	0	0	0	0	0	4	80	0	0	84	30	0	7	3	37	3	214	21
04:45 PM	0	90	12	2	102	0	0	0	0	0	3	64	0	0	67	16	0	3	1	19	3	188	19
Total	0	395	55	6	450	0	0	0	0	0	20	292	0	0	312	133	0	21	5	154	11	916	92
05:00 PM	0	126	6	2	132	0	0	0	0	0	3	67	0	0	70	25	0	5	0	30	2	232	23
05:15 PM	0	121	8	1	129	0	0	0	0	0	5	66	0	0	71	18	0	6	2	24	3	224	22
05:30 PM	0	116	4	0	120	0	0	0	0	0	1	61	0	0	62	22	0	9	1	31	1	213	21
05:45 PM	0	99	9	1	108	0	0	0	0	0	2	50	0	0	52	15	0	6	0	21	1	181	18
Total	0	462	27	4	489	0	0	0	0	0	11	244	0	0	255	80	0	26	3	106	7	850	85
Grand Total	0	857	82	10	939	0	0	0	0	0	31	536	0	0	567	213	0	47	8	260	18	1766	178
Apprch %	0	91.3	8.7			0	0	0			5.5	94.5	0			81.9	0	18.1					
Total %	0	48.5	4.6		53.2	0	0	0		0	1.8	30.4	0		32.1	12.1	0	2.7		14.7	1	99	

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**111**	17	**128**	0	0	0	0	6	77	0	83	**46**	0	1	47	**2**
04:15 PM	0	109	**18**	127	0	0	0	0	**7**	71	0	78	41	0	**10**	**51**	2
04:30 PM	0	85	8	93	0	0	0	0	4	**80**	0	**84**	30	0	7	37	2
04:45 PM	0	90	12	102	0	0	0	0	3	64	0	67	16	0	3	19	1
Total Volume	0	395	55	450	0	0	0	0	20	292	0	312	133	0	21	154	9
% App. Total	0	87.8	12.2		0	0	0		6.4	93.6	0		86.4	0	13.6		
PHF	.000	.890	.764	.879	.000	.000	.000	.000	.714	.913	.000	.929	.723	.000	.525	.755	.8

Counts Unlimited
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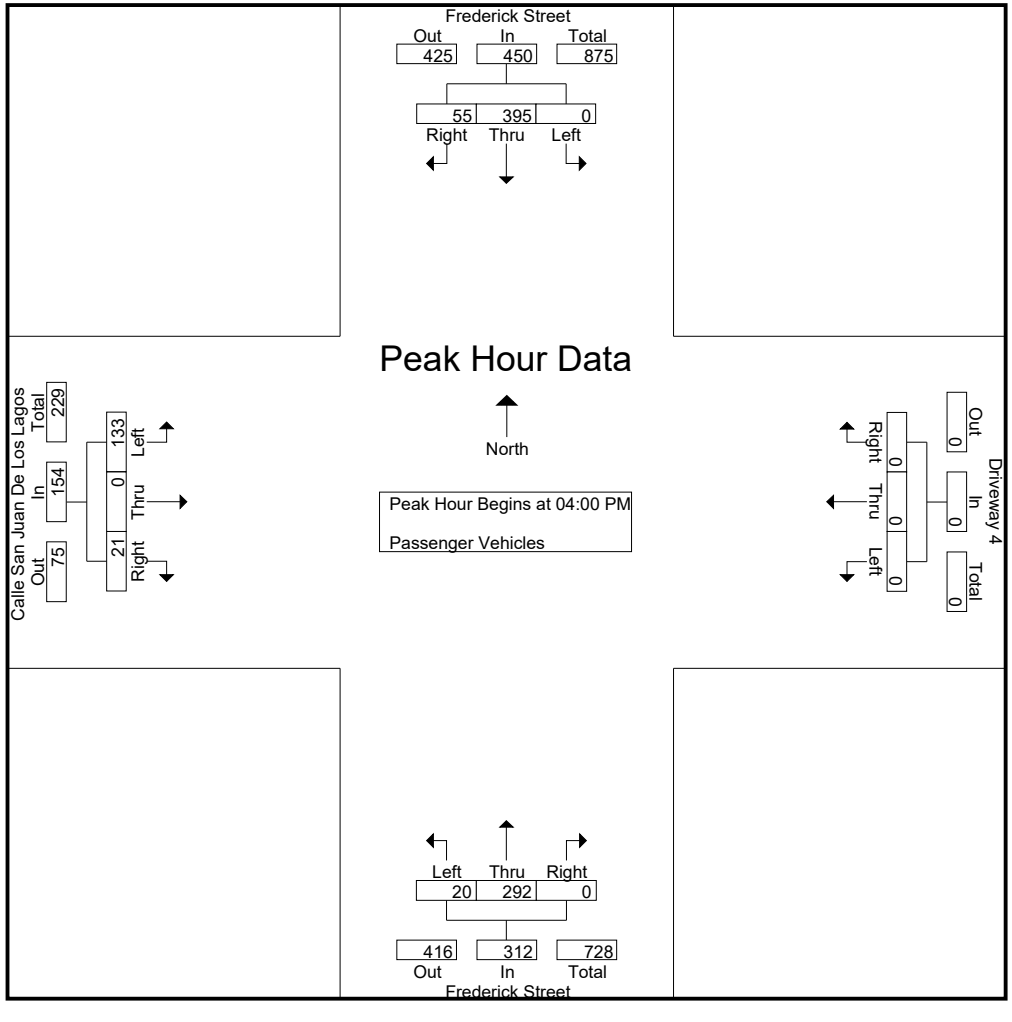
City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	**111**	17	**128**	0	0	0	0	6	77	0	83	**46**	0	1	47	
+15 mins.	0	109	**18**	127	0	0	0	0	**7**	71	0	78	41	0	**10**	**51**	
+30 mins.	0	85	8	93	0	0	0	0	4	**80**	0	**84**	30	0	7	37	
+45 mins.	0	90	12	102	0	0	0	0	3	64	0	67	16	0	3	19	
Total Volume	0	395	55	450	0	0	0	0	20	292	0	312	133	0	21	154	
% App. Total	0	87.8	12.2		0	0	0		6.4	93.6	0		86.4	0	13.6		
PHF	.000	.890	.764	.879	.000	.000	.000	.000	.714	.913	.000	.929	.723	.000	.525	.755	

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City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	3	
04:15 PM	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	5	
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
04:45 PM	0	2	0	0	2	0	0	0	0	0	1	0	0	0	1	1	0	2	0	3	0	6	
Total	0	7	0	0	7	0	0	0	0	0	1	3	0	0	4	2	0	2	0	4	0	15	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:15 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4	
Grand Total	0	10	0	0	10	0	0	0	0	0	1	4	0	0	5	2	0	2	0	4	0	19	1
Apprch %	0	100	0			0	0	0			20	80	0			50	0	50					
Total %	0	52.6	0		52.6	0	0	0		0	5.3	21.1	0		26.3	10.5	0	10.5		21.1	0	100	

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	**2**	0	**2**	**1**	0	0	1	
04:15 PM	0	**4**	0	**4**	0	0	0	0	0	1	0	1	0	0	0	0	
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
04:45 PM	0	2	0	2	0	0	0	0	**1**	0	0	1	1	0	**2**	**3**	
Total Volume	0	7	0	7	0	0	0	0	1	3	0	4	2	0	2	4	
% App. Total	0	100	0		0	0	0		25	75	0		50	0	50		
PHF	.000	.438	.000	.438	.000	.000	.000	.000	.250	.375	.000	.500	.500	.000	.250	.333	.6

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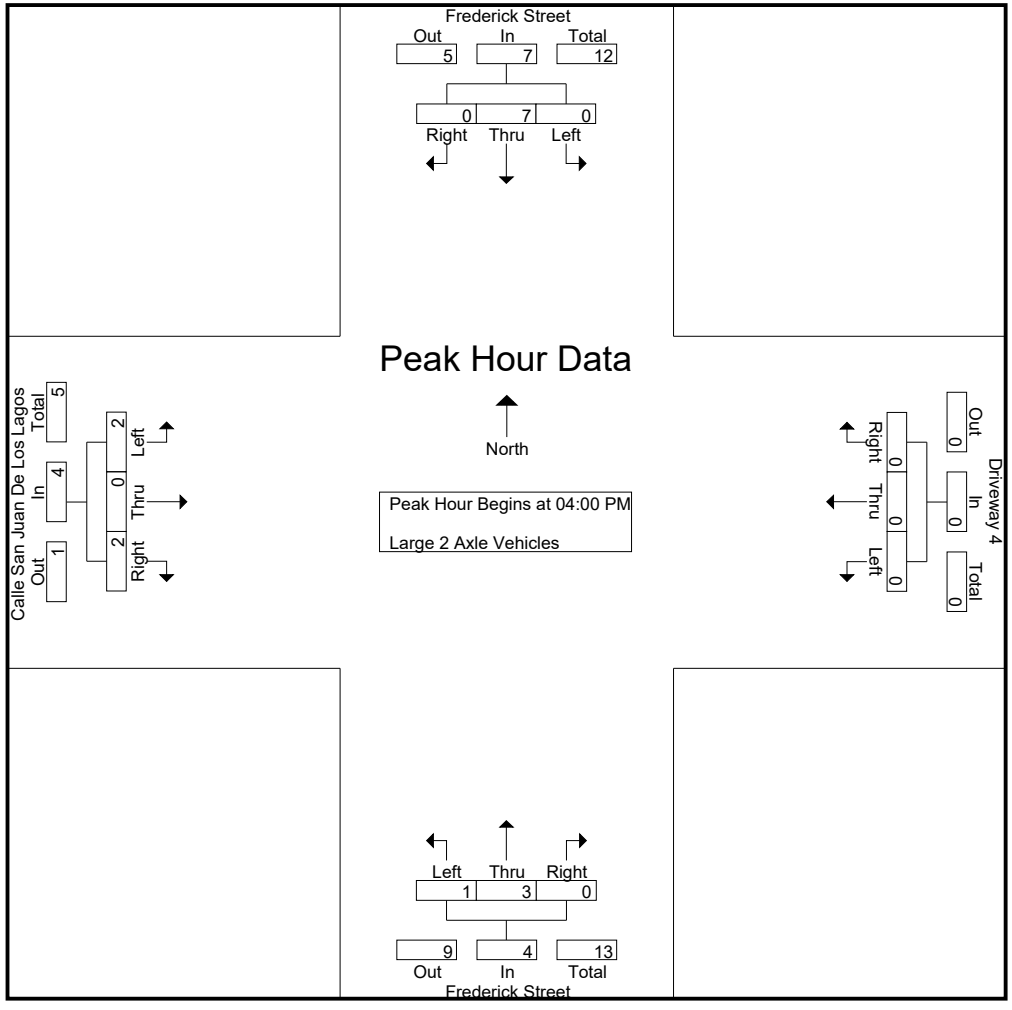
City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Frederick Street
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Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	0	0	0	0	0	0	0	0	**2**	0	**2**	**1**	0	0	1	
+15 mins.	0	**4**	0	**4**	0	0	0	0	0	1	0	1	0	0	0	0	
+30 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
+45 mins.	0	2	0	2	0	0	0	0	**1**	0	0	1	1	0	**2**	**3**	
Total Volume	0	7	0	7	0	0	0	0	1	3	0	4	2	0	2	4	
% App. Total	0	100	0		0	0	0		25	75	0		50	0	50		
PHF	.000	.438	.000	.438	.000	.000	.000	.000	.250	.375	.000	.500	.500	.000	.250	.333	

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City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 3 Axle Vehicles

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:15 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	
Grand Total	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	
Apprch %	0	100	0			0	0	0			0	100	0			0	0	0					
Total %	0	25	0		25	0	0	0		0	0	75	0		75	0	0	0		0	0	100	

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:15 PM	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	0	0	0	0	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.2

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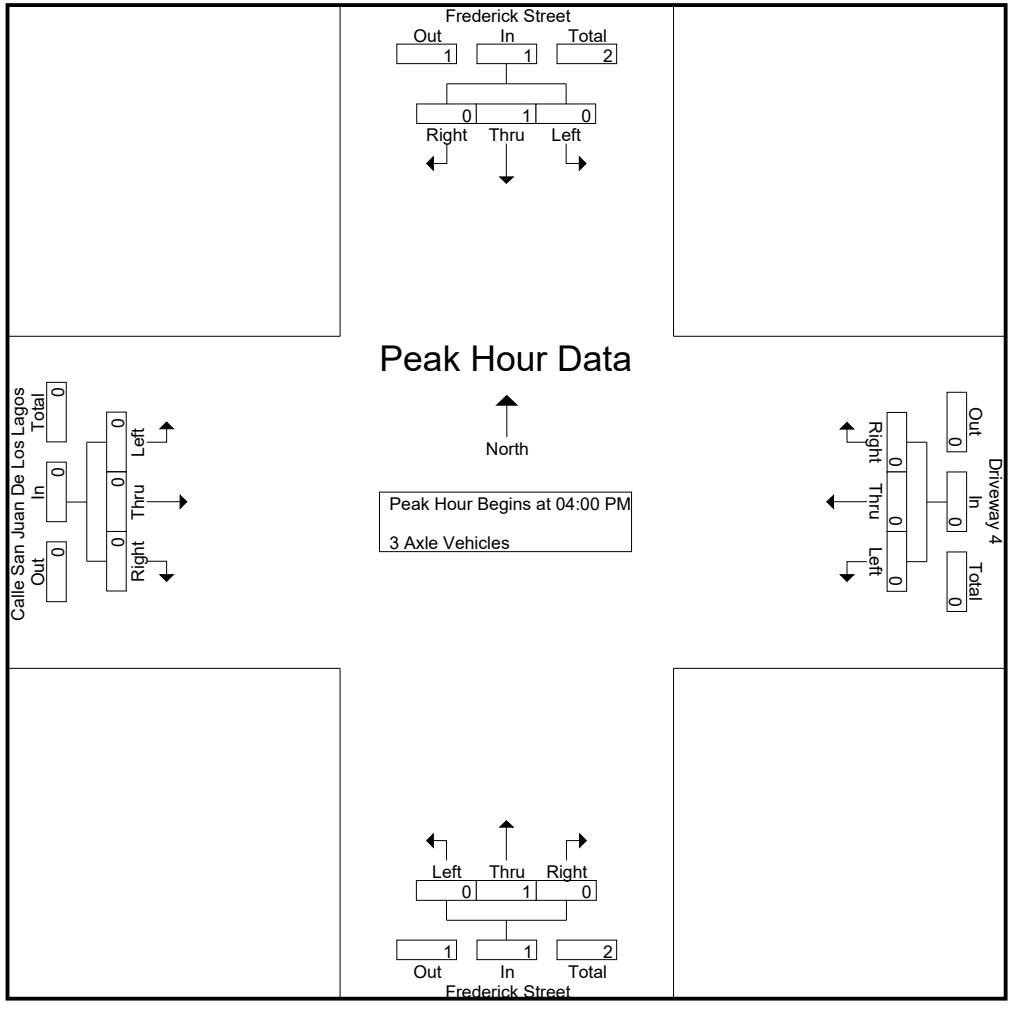
City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+15 mins.	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	

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City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 4+ Axle Trucks

	Frederick Street Southbound					Driveway 4 Westbound					Frederick Street Northbound					Calle San Juan De Los Lagos Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	
Total	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	
Total	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	
Grand Total	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	7	
Apprch %	0	100	0			0	0	0			0	100	0			0	0	0					
Total %	0	42.9	0		42.9	0	0	0		0	0	57.1	0		57.1	0	0	0		0	0	100	

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:15 PM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:45 PM	0	1	0	1	0	0	0	0	0	**1**	0	**1**	0	0	0	0	
Total Volume	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.3

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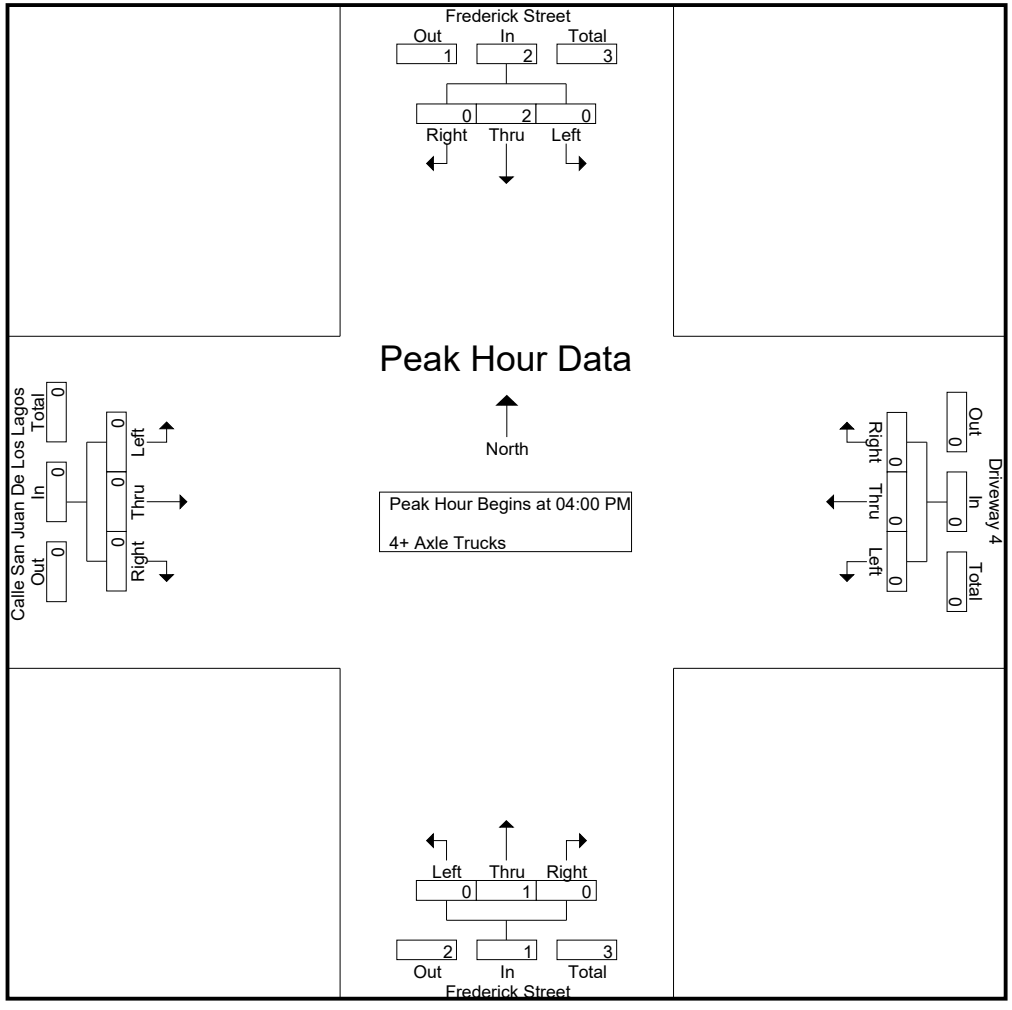
City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 4
Weather: Clear

File Name : 04_MRV_Frederick_DW4_Calle SJDLL
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Frederick Street Southbound				Driveway 4 Westbound				Frederick Street Northbound				Calle San Juan De Los Lagos Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+15 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+45 mins.	0	1	0	1	0	0	0	0	0	**1**	0	**1**	0	0	0	0	
Total Volume	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	

Location: Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW 3

Date: 4/3/2018
Date: Tuesday

PEDESTRIANS

	North Leg Frederick Street	East Leg Driveway 4	South Leg Frederick Street	West Leg Calle San Juan De Los Lagos	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	1	0	1
7:45 AM	0	0	3	0	3
8:00 AM	0	0	0	1	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	1	1	2
8:45 AM	0	0	0	5	5
TOTAL VOLUMES:	0	0	5	7	12

	North Leg Frederick Street	East Leg Driveway 4	South Leg Frederick Street	West Leg Calle San Juan De Los Lagos	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	0	0	3	3
4:15 PM	0	0	0	2	2
4:30 PM	0	0	0	4	4
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	1	1
5:30 PM	0	0	1	0	1
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	10	11

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Location: Moreno Valley
N/S: Frederick Street
E/W: Calle San Juan De Los Lagos/DW

Date: 4/3/2018
Date: Tuesday

BICYCLES

	Southbound Frederick Street			Westbound Driveway 4			Northbound Frederick Street			Eastbound Calle San Juan De Los Lagos			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	1	0	0	0	0	0	1	0	0	0	0	2

	Southbound Frederick Street			Westbound Driveway 4			Northbound Frederick Street			Eastbound Calle San Juan De Los Lagos			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	1	0	0	1

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City of Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue
Weather: Clear

File Name : 05_MRV_Frederick_Brodiea AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	49	4	53	0	0	12	12	0	37	0	37	0	0	0	0	102
07:15 AM	0	58	4	62	0	0	18	18	0	68	0	68	0	0	1	1	149
07:30 AM	0	66	4	70	0	0	12	12	0	67	2	69	0	0	2	2	153
07:45 AM	0	70	2	72	0	0	17	17	0	73	1	74	0	0	1	1	164
Total	0	243	14	257	0	0	59	59	0	245	3	248	0	0	4	4	568
08:00 AM	0	48	3	51	0	0	16	16	0	58	2	60	0	0	1	1	128
08:15 AM	0	67	2	69	0	0	12	12	0	57	3	60	0	0	2	2	143
08:30 AM	0	36	3	39	0	0	8	8	0	55	0	55	0	0	2	2	104
08:45 AM	0	38	3	41	0	0	13	13	0	64	0	64	0	0	4	4	122
Total	0	189	11	200	0	0	49	49	0	234	5	239	0	0	9	9	497
Grand Total	0	432	25	457	0	0	108	108	0	479	8	487	0	0	13	13	1065
Apprch %	0	94.5	5.5		0	0	100		0	98.4	1.6		0	0	100		
Total %	0	40.6	2.3	42.9	0	0	10.1	10.1	0	45	0.8	45.7	0	0	1.2	1.2	
Passenger Vehicles	0	408	24	432	0	0	101	101	0	450	6	456	0	0	10	10	999
% Passenger Vehicles	0	94.4	96	94.5	0	0	93.5	93.5	0	93.9	75	93.6	0	0	76.9	76.9	93.8
Large 2 Axle Vehicles	0	12	1	13	0	0	5	5	0	13	1	14	0	0	3	3	35
% Large 2 Axle Vehicles	0	2.8	4	2.8	0	0	4.6	4.6	0	2.7	12.5	2.9	0	0	23.1	23.1	3.3
3 Axle Vehicles	0	7	0	7	0	0	2	2	0	7	0	7	0	0	0	0	16
% 3 Axle Vehicles	0	1.6	0	1.5	0	0	1.9	1.9	0	1.5	0	1.4	0	0	0	0	1.5
4+ Axle Trucks	0	5	0	5	0	0	0	0	0	9	1	10	0	0	0	0	15
% 4+ Axle Trucks	0	1.2	0	1.1	0	0	0	0	0	1.9	12.5	2.1	0	0	0	0	1.4

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	58	**4**	62	0	0	**18**	**18**	0	68	0	68	0	0	1	1	149
07:30 AM	0	66	4	70	0	0	12	12	0	67	**2**	69	0	0	**2**	**2**	153
07:45 AM	0	**70**	2	**72**	0	0	17	17	0	**73**	1	**74**	0	0	1	1	**164**
08:00 AM	0	48	3	51	0	0	16	16	0	58	2	60	0	0	1	1	128
Total Volume	0	242	13	255	0	0	63	63	0	266	5	271	0	0	5	5	594
% App. Total	0	94.9	5.1		0	0	100		0	98.2	1.8		0	0	100		
PHF	.000	.864	.813	.885	.000	.000	.875	.875	.000	.911	.625	.916	.000	.000	.625	.625	.905

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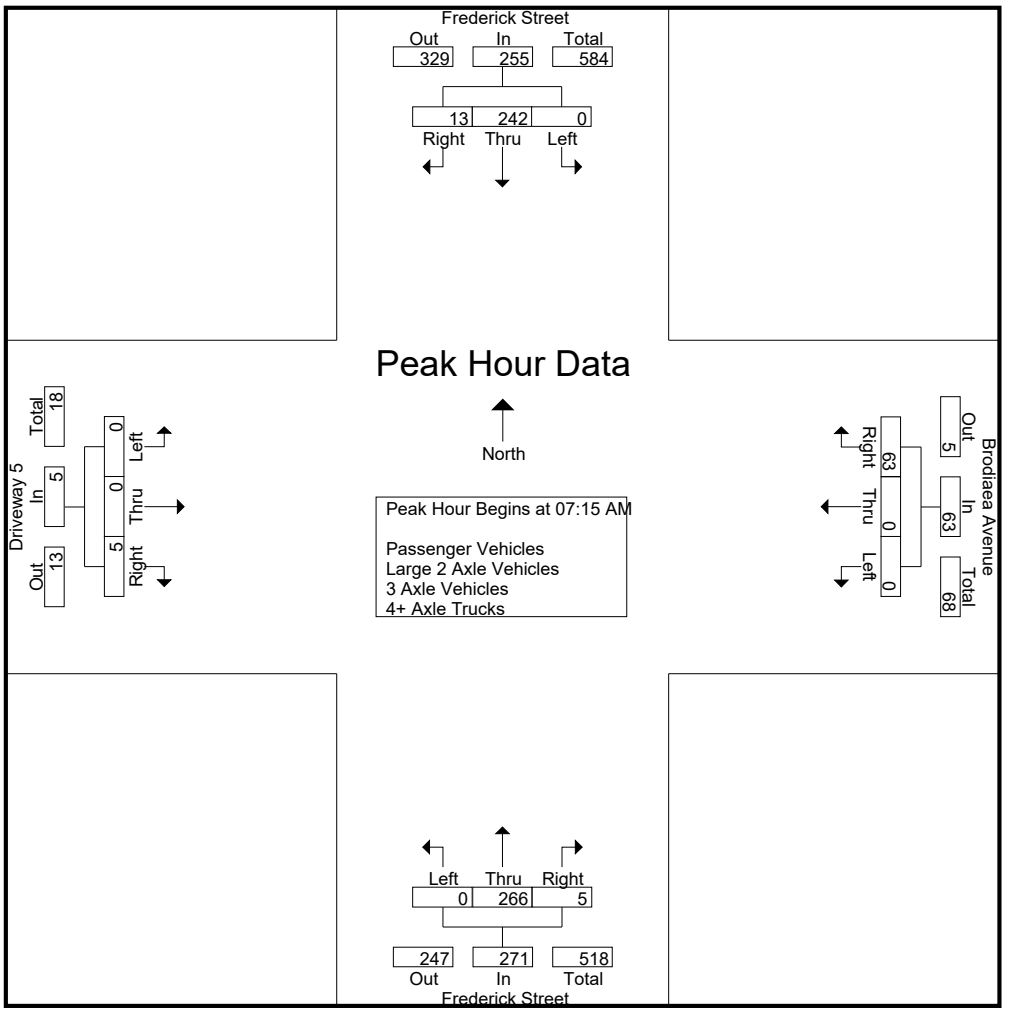
City of Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue
Weather: Clear

File Name : 05_MRV_Frederick_Brodiea AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				07:15 AM				08:00 AM			
+0 mins.	0	66	**4**	70	0	0	**18**	**18**	0	68	0	68	0	0	1	1
+15 mins.	0	**70**	2	**72**	0	0	12	12	0	67	**2**	69	0	0	2	2
+30 mins.	0	48	3	51	0	0	17	17	0	**73**	1	**74**	0	0	2	2
+45 mins.	0	67	2	69	0	0	16	16	0	58	2	60	0	0	**4**	**4**
Total Volume	0	251	11	262	0	0	63	63	0	266	5	271	0	0	9	9
% App. Total	0	95.8	4.2		0	0	100		0	98.2	1.8		0	0	100	
PHF	.000	.896	.688	.910	.000	.000	.875	.875	.000	.911	.625	.916	.000	.000	.563	.563

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City of Moreno Valley
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Weather: Clear

File Name : 05_MRV_Frederick_Brodiea AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	47	4	51	0	0	12	12	0	34	0	34	0	0	0	0	97
07:15 AM	0	56	4	60	0	0	15	15	0	62	0	62	0	0	1	1	138
07:30 AM	0	65	4	69	0	0	12	12	0	63	1	64	0	0	2	2	147
07:45 AM	0	68	2	70	0	0	16	16	0	68	0	68	0	0	1	1	155
Total	0	236	14	250	0	0	55	55	0	227	1	228	0	0	4	4	537
08:00 AM	0	45	3	48	0	0	14	14	0	56	2	58	0	0	1	1	121
08:15 AM	0	60	2	62	0	0	12	12	0	55	3	58	0	0	2	2	134
08:30 AM	0	31	2	33	0	0	8	8	0	52	0	52	0	0	2	2	95
08:45 AM	0	36	3	39	0	0	12	12	0	60	0	60	0	0	1	1	112
Total	0	172	10	182	0	0	46	46	0	223	5	228	0	0	6	6	462
Grand Total	0	408	24	432	0	0	101	101	0	450	6	456	0	0	10	10	999
Apprch %	0	94.4	5.6		0	0	100		0	98.7	1.3		0	0	100		
Total %	0	40.8	2.4	43.2	0	0	10.1	10.1	0	45	0.6	45.6	0	0	1	1	

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	56	**4**	60	0	0	15	15	0	62	0	62	0	0	1	1	138
07:30 AM	0	65	4	69	0	0	12	12	0	63	1	64	0	0	**2**	**2**	147
07:45 AM	0	**68**	2	**70**	0	0	**16**	**16**	0	**68**	0	**68**	0	0	1	1	**155**
08:00 AM	0	45	3	48	0	0	14	14	0	56	**2**	58	0	0	1	1	121
Total Volume	0	234	13	247	0	0	57	57	0	249	3	252	0	0	5	5	561
% App. Total	0	94.7	5.3		0	0	100		0	98.8	1.2		0	0	100		
PHF	.000	.860	.813	.882	.000	.000	.891	.891	.000	.915	.375	.926	.000	.000	.625	.625	.905

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City of Moreno Valley
N/S: Frederick Street
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File Name : 05_MRV_Frederick_Brodiea AM
Site Code : 05118259
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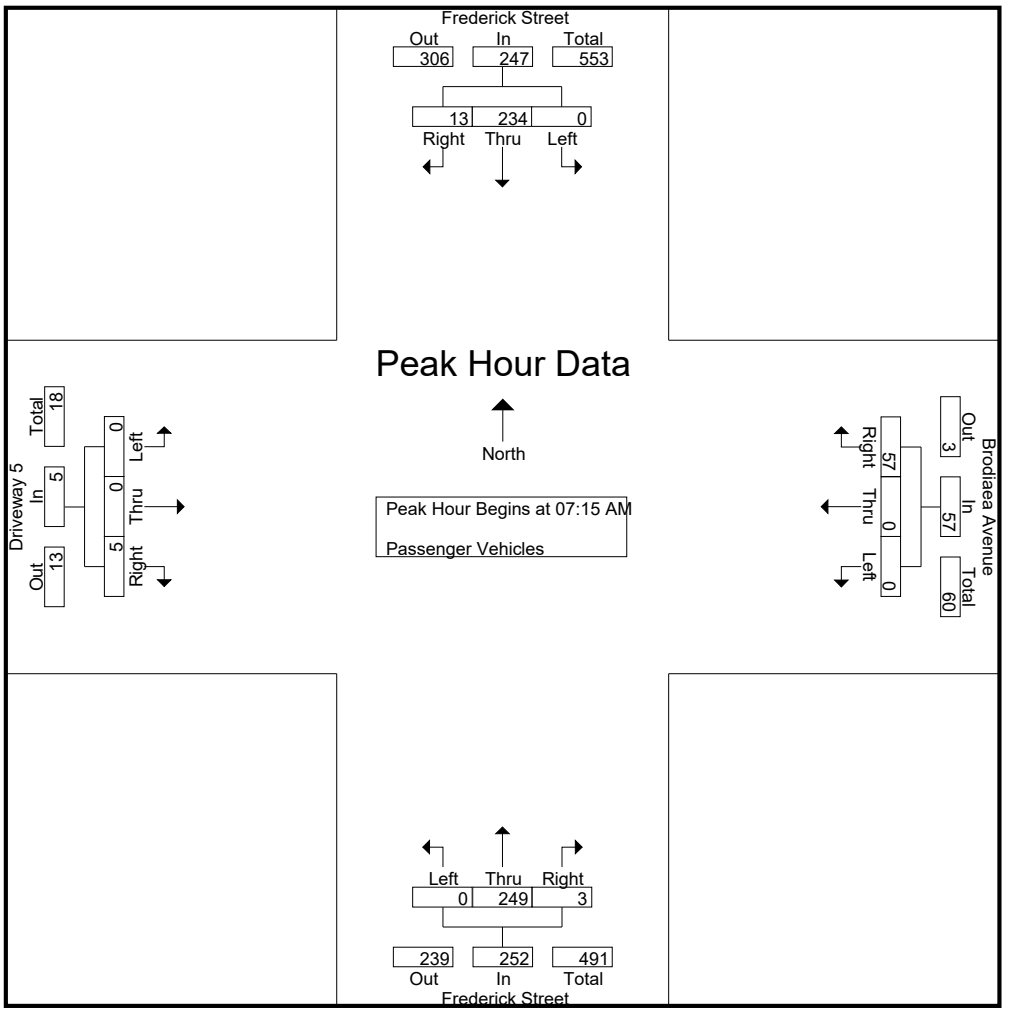

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	56	**4**	60	0	0	15	15	0	62	0	62	0	0	1	1
+15 mins.	0	65	4	69	0	0	12	12	0	63	1	64	0	0	**2**	**2**
+30 mins.	0	**68**	2	**70**	0	0	**16**	**16**	0	**68**	0	**68**	0	0	1	1
+45 mins.	0	45	3	48	0	0	14	14	0	56	**2**	58	0	0	1	1
Total Volume	0	234	13	247	0	0	57	57	0	249	3	252	0	0	5	5
% App. Total	0	94.7	5.3		0	0	100		0	98.8	1.2		0	0	100	
PHF	.000	.860	.813	.882	.000	.000	.891	.891	.000	.915	.375	.926	.000	.000	.625	.625

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City of Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue
Weather: Clear

File Name : 05_MRV_Frederick_Brodiea AM
Site Code : 05118259
Start Date : 4/3/2018
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Groups Printed- Large 2 Axle Vehicles

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
07:15 AM	0	0	0	0	0	0	2	2	0	2	0	2	0	0	0	0	4
07:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
07:45 AM	0	1	0	1	0	0	1	1	0	3	1	4	0	0	0	0	6
Total	0	3	0	3	0	0	3	3	0	9	1	10	0	0	0	0	16
08:00 AM	0	2	0	2	0	0	1	1	0	1	0	1	0	0	0	0	4
08:15 AM	0	3	0	3	0	0	0	0	0	2	0	2	0	0	0	0	5
08:30 AM	0	4	1	5	0	0	0	0	0	0	0	0	0	0	0	0	5
08:45 AM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	3	3	5
Total	0	9	1	10	0	0	2	2	0	4	0	4	0	0	3	3	19
Grand Total	0	12	1	13	0	0	5	5	0	13	1	14	0	0	3	3	35
Apprch %	0	92.3	7.7		0	0	100		0	92.9	7.1		0	0	100		
Total %	0	34.3	2.9	37.1	0	0	14.3	14.3	0	37.1	2.9	40	0	0	8.6	8.6	

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	0	**2**	**2**	0	2	0	2	0	0	0	0	4
07:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
07:45 AM	0	1	0	1	0	0	1	1	0	**3**	**1**	**4**	0	0	0	0	**6**
08:00 AM	0	**2**	0	**2**	0	0	1	1	0	1	0	1	0	0	0	0	4
Total Volume	0	3	0	3	0	0	4	4	0	8	1	9	0	0	0	0	16
% App. Total	0	100	0		0	0	100		0	88.9	11.1		0	0	0		
PHF	.000	.375	.000	.375	.000	.000	.500	.500	.000	.667	.250	.563	.000	.000	.000	.000	.667

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City of Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue
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File Name : 05_MRV_Frederick_Brodiea AM
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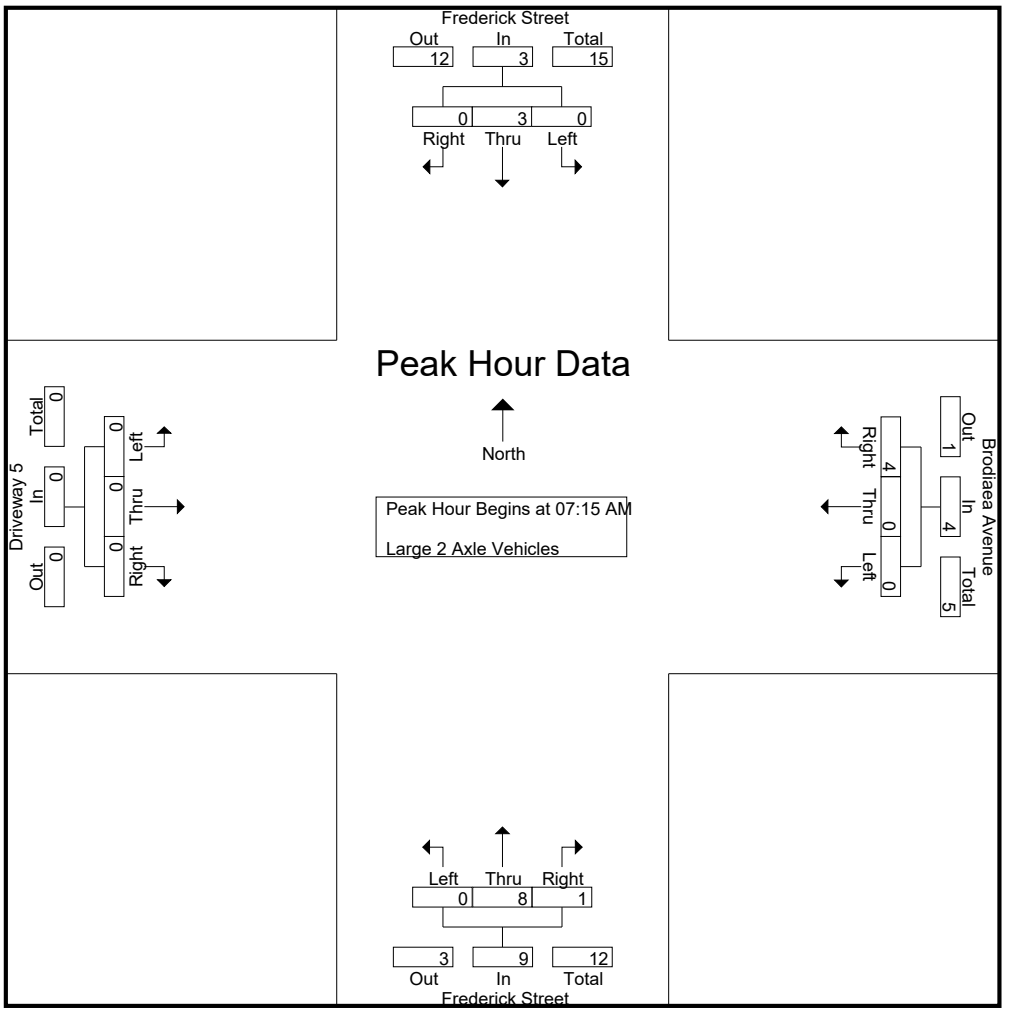

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	0	0	0	0	0	**2**	**2**	0	2	0	2	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0
+30 mins.	0	1	0	1	0	0	1	1	0	**3**	**1**	**4**	0	0	0	0
+45 mins.	0	**2**	0	**2**	0	0	1	1	0	1	0	1	0	0	0	0
Total Volume	0	3	0	3	0	0	4	4	0	8	1	9	0	0	0	0
% App. Total	0	100	0		0	0	100		0	88.9	11.1		0	0	0	
PHF	.000	.375	.000	.375	.000	.000	.500	.500	.000	.667	.250	.563	.000	.000	.000	.000

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City of Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue
Weather: Clear

File Name : 05_MRV_Frederick_Brodiea AM
Site Code : 05118259
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Groups Printed- 3 Axle Vehicles

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	2	0	2	0	0	1	1	0	0	0	0	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
Total	0	2	0	2	0	0	1	1	0	3	0	3	0	0	0	0	6
08:00 AM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
08:15 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:30 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
08:45 AM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
Total	0	5	0	5	0	0	1	1	0	4	0	4	0	0	0	0	10
Grand Total	0	7	0	7	0	0	2	2	0	7	0	7	0	0	0	0	16
Apprch %	0	100	0		0	0	100		0	100	0		0	0	0		
Total %	0	43.8	0	43.8	0	0	12.5	12.5	0	43.8	0	43.8	0	0	0	0	

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**2**	0	**2**	0	0	**1**	**1**	0	0	0	0	0	0	0	0	**3**
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0	2
08:00 AM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
Total Volume	0	2	0	2	0	0	2	2	0	4	0	4	0	0	0	0	8
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.500	.500	.000	.500	.000	.500	.000	.000	.000	.000	.667

Counts Unlimited
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City of Moreno Valley
N/S: Frederick Street
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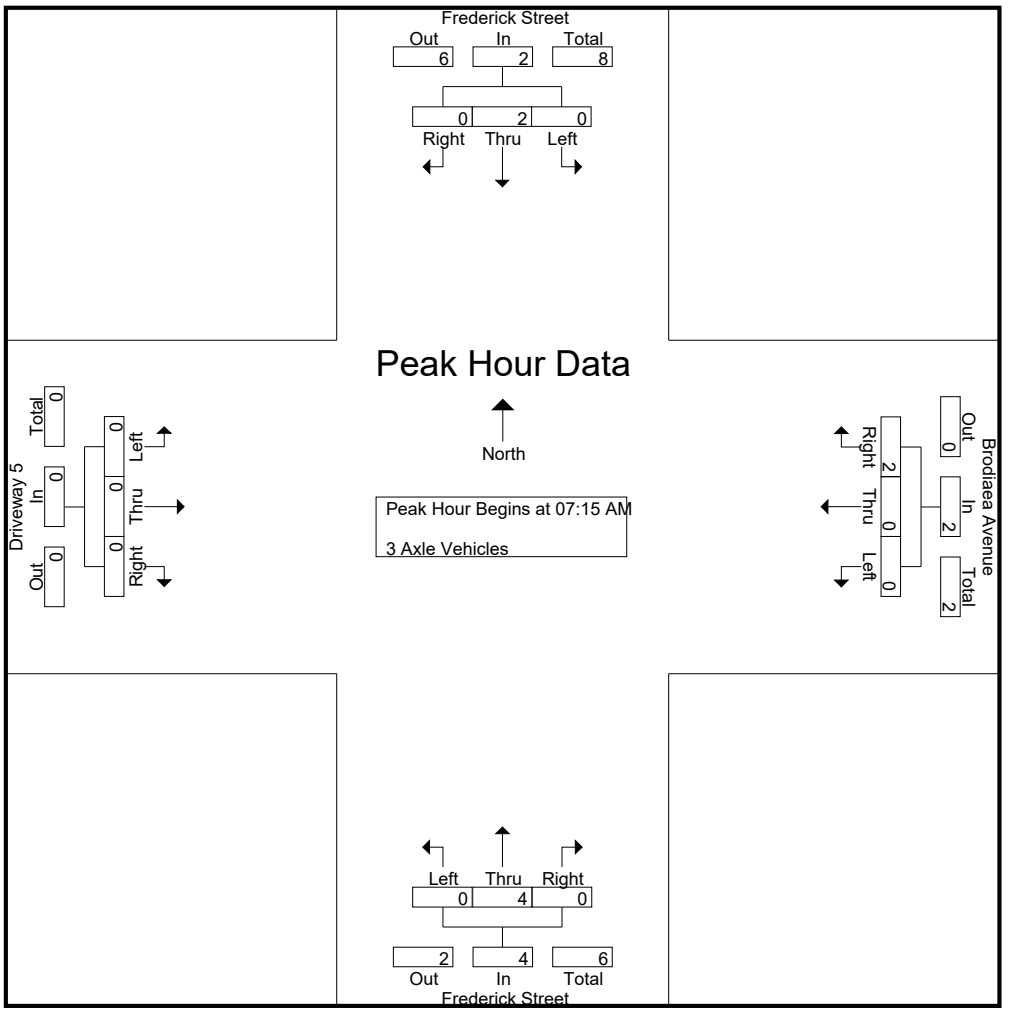

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	**2**	0	**2**	0	0	**1**	**1**	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0
Total Volume	0	2	0	2	0	0	2	2	0	4	0	4	0	0	0	0
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0	
PHF	.000	.250	.000	.250	.000	.000	.500	.500	.000	.500	.000	.500	.000	.000	.000	.000

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City of Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue
Weather: Clear

File Name : 05_MRV_Frederick_Brodiea AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 4+ Axle Trucks

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	4
07:30 AM	0	1	0	1	0	0	0	0	0	1	1	2	0	0	0	0	3
07:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	0	2	0	0	0	0	0	6	1	7	0	0	0	0	9
08:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
Total	0	3	0	3	0	0	0	0	0	3	0	3	0	0	0	0	6
Grand Total	0	5	0	5	0	0	0	0	0	9	1	10	0	0	0	0	15
Apprch %	0	100	0		0	0	0		0	90	10		0	0	0		
Total %	0	33.3	0	33.3	0	0	0	0	0	60	6.7	66.7	0	0	0	0	

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	0	0	0	0	**4**	0	**4**	0	0	0	0	**4**
07:30 AM	0	**1**	0	**1**	0	0	0	0	0	1	**1**	2	0	0	0	0	3
07:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	3	0	3	0	0	0	0	0	5	1	6	0	0	0	0	9
% App. Total	0	100	0		0	0	0		0	83.3	16.7		0	0	0		
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	.313	.250	.375	.000	.000	.000	.000	.563

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City of Moreno Valley
N/S: Frederick Street
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File Name : 05_MRV_Frederick_Brodiea AM
Site Code : 05118259
Start Date : 4/3/2018
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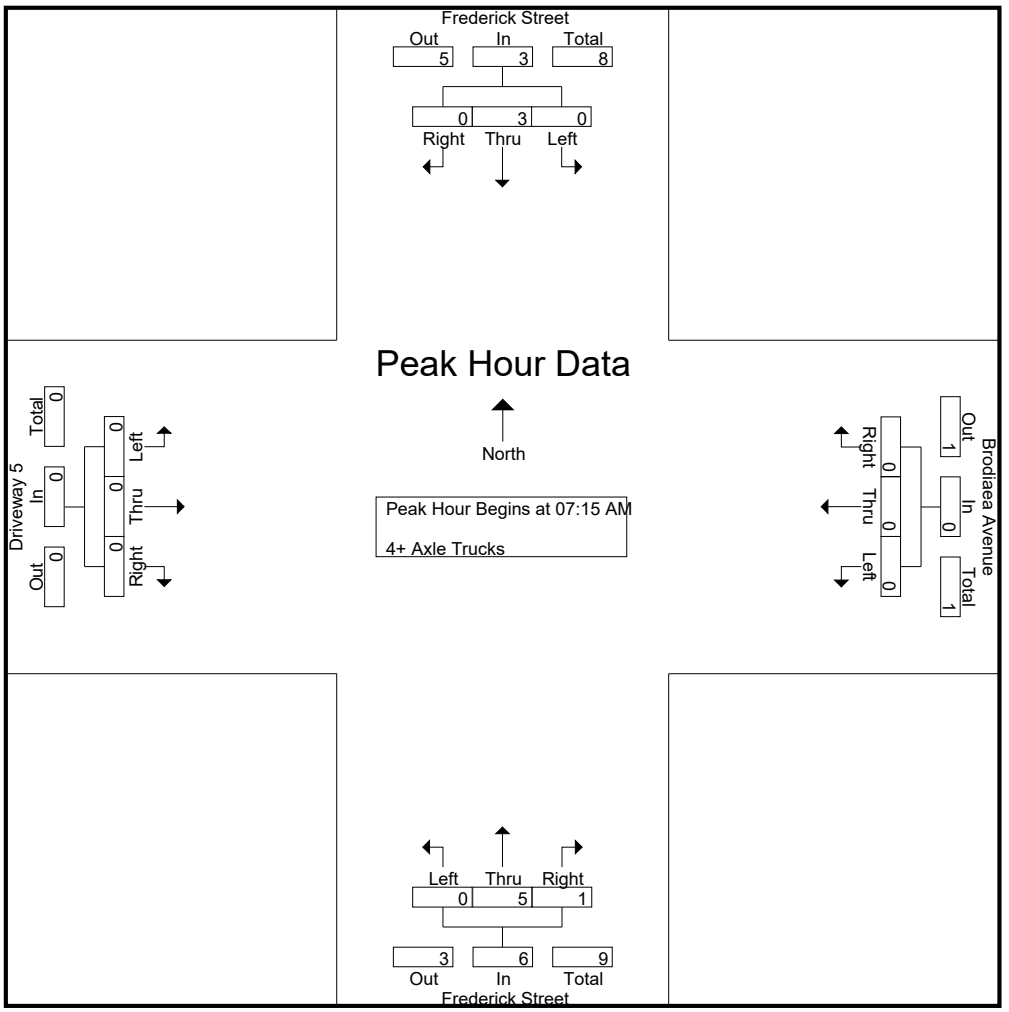

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	**4**	0	**4**	0	0	0	0
+15 mins.	0	**1**	0	**1**	0	0	0	0	0	1	**1**	2	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	3	0	3	0	0	0	0	0	5	1	6	0	0	0	0
% App. Total	0	100	0		0	0	0		0	83.3	16.7		0	0	0	
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	.313	.250	.375	.000	.000	.000	.000

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City of Moreno Valley
N/S: Frederick Street
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Weather: Clear

File Name : 05_MRV_Frederick_Brodiea PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	110	1	111	0	0	13	13	0	75	0	75	0	0	5	5	204
04:15 PM	0	119	2	121	0	0	15	15	0	62	5	67	0	0	15	15	218
04:30 PM	0	94	3	97	0	0	11	11	0	75	6	81	0	0	1	1	190
04:45 PM	0	97	2	99	0	0	11	11	0	58	2	60	0	0	3	3	173
Total	0	420	8	428	0	0	50	50	0	270	13	283	0	0	24	24	785
05:00 PM	0	127	3	130	0	0	8	8	0	66	3	69	0	0	9	9	216
05:15 PM	0	131	1	132	0	0	10	10	0	59	7	66	0	0	2	2	210
05:30 PM	0	128	0	128	0	0	15	15	0	48	1	49	0	0	1	1	193
05:45 PM	0	102	1	103	0	0	12	12	0	41	6	47	0	0	1	1	163
Total	0	488	5	493	0	0	45	45	0	214	17	231	0	0	13	13	782
Grand Total	0	908	13	921	0	0	95	95	0	484	30	514	0	0	37	37	1567
Apprch %	0	98.6	1.4		0	0	100		0	94.2	5.8		0	0	100		
Total %	0	57.9	0.8	58.8	0	0	6.1	6.1	0	30.9	1.9	32.8	0	0	2.4	2.4	
Passenger Vehicles	0	890	13	903	0	0	93	93	0	474	28	502	0	0	37	37	1535
% Passenger Vehicles	0	98	100	98	0	0	97.9	97.9	0	97.9	93.3	97.7	0	0	100	100	98
Large 2 Axle Vehicles	0	14	0	14	0	0	0	0	0	5	0	5	0	0	0	0	19
% Large 2 Axle Vehicles	0	1.5	0	1.5	0	0	0	0	0	1	0	1	0	0	0	0	1.2
3 Axle Vehicles	0	1	0	1	0	0	1	1	0	2	0	2	0	0	0	0	4
% 3 Axle Vehicles	0	0.1	0	0.1	0	0	1.1	1.1	0	0.4	0	0.4	0	0	0	0	0.3
4+ Axle Trucks	0	3	0	3	0	0	1	1	0	3	2	5	0	0	0	0	9
% 4+ Axle Trucks	0	0.3	0	0.3	0	0	1.1	1.1	0	0.6	6.7	1	0	0	0	0	0.6

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	119	2	121	0	0	**15**	**15**	0	62	5	67	0	0	**15**	**15**	**218**
04:30 PM	0	94	**3**	97	0	0	11	11	0	**75**	**6**	**81**	0	0	1	1	190
04:45 PM	0	97	2	99	0	0	11	11	0	58	2	60	0	0	3	3	173
05:00 PM	0	**127**	3	**130**	0	0	8	8	0	66	3	69	0	0	9	9	216
Total Volume	0	437	10	447	0	0	45	45	0	261	16	277	0	0	28	28	797
% App. Total	0	97.8	2.2		0	0	100		0	94.2	5.8		0	0	100		
PHF	.000	.860	.833	.860	.000	.000	.750	.750	.000	.870	.667	.855	.000	.000	.467	.467	.914

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Weather: Clear

File Name : 05_MRV_Frederick_Brodiea PM
Site Code : 05118259
Start Date : 4/3/2018
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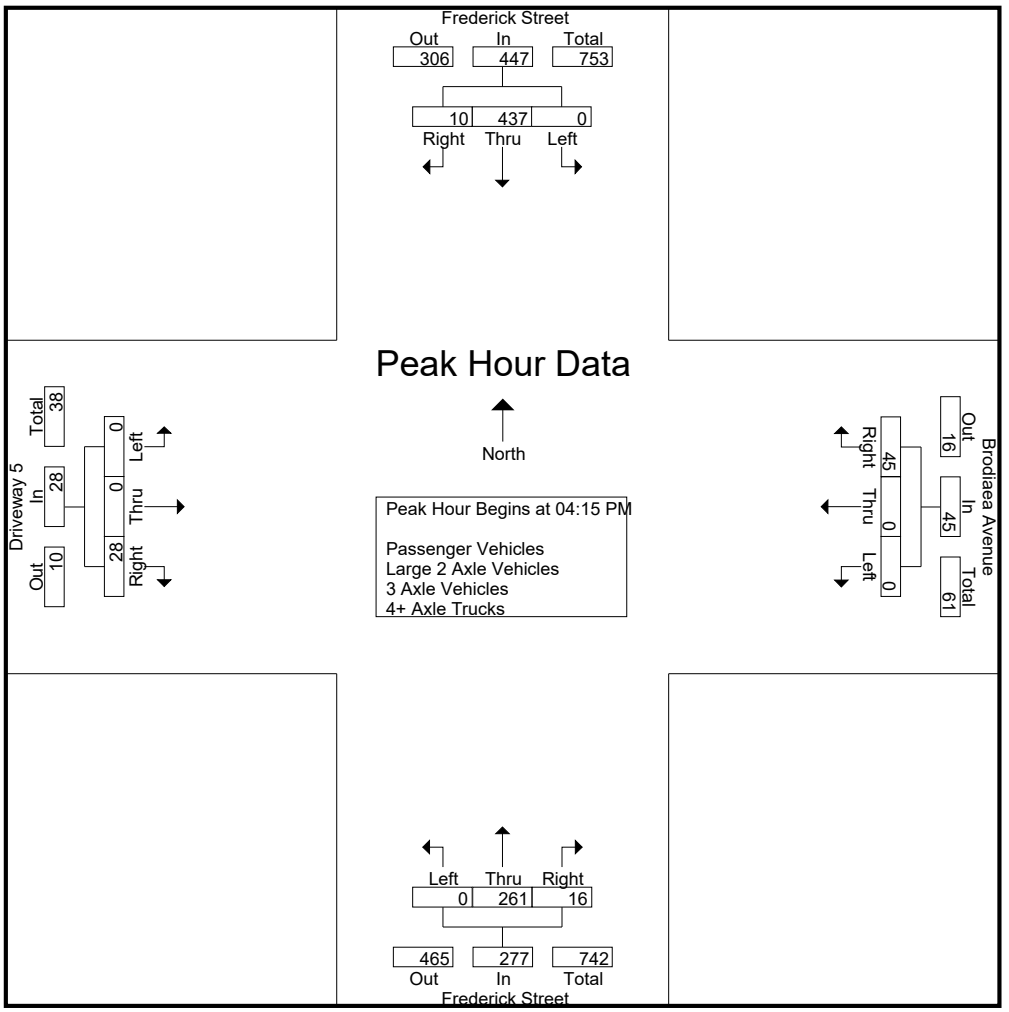

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				04:00 PM				04:15 PM			
+0 mins.	0	127	**3**	130	0	0	13	13	0	**75**	0	75	0	0	**15**	**15**
+15 mins.	0	**131**	1	**132**	0	0	**15**	**15**	0	62	5	67	0	0	1	1
+30 mins.	0	128	0	128	0	0	11	11	0	75	**6**	**81**	0	0	3	3
+45 mins.	0	102	1	103	0	0	11	11	0	58	2	60	0	0	9	9
Total Volume	0	488	5	493	0	0	50	50	0	270	13	283	0	0	28	28
% App. Total	0	99	1		0	0	100		0	95.4	4.6		0	0	100	
PHF	.000	.931	.417	.934	.000	.000	.833	.833	.000	.900	.542	.873	.000	.000	.467	.467

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File Name : 05_MRV_Frederick_Brodiea PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	110	1	111	0	0	13	13	0	73	0	73	0	0	5	5	202
04:15 PM	0	112	2	114	0	0	14	14	0	61	4	65	0	0	15	15	208
04:30 PM	0	93	3	96	0	0	11	11	0	75	6	81	0	0	1	1	189
04:45 PM	0	92	2	94	0	0	11	11	0	56	2	58	0	0	3	3	166
Total	0	407	8	415	0	0	49	49	0	265	12	277	0	0	24	24	765
05:00 PM	0	127	3	130	0	0	8	8	0	65	3	68	0	0	9	9	215
05:15 PM	0	127	1	128	0	0	10	10	0	58	6	64	0	0	2	2	204
05:30 PM	0	127	0	127	0	0	14	14	0	48	1	49	0	0	1	1	191
05:45 PM	0	102	1	103	0	0	12	12	0	38	6	44	0	0	1	1	160
Total	0	483	5	488	0	0	44	44	0	209	16	225	0	0	13	13	770
Grand Total	0	890	13	903	0	0	93	93	0	474	28	502	0	0	37	37	1535
Apprch %	0	98.6	1.4		0	0	100		0	94.4	5.6		0	0	100		
Total %	0	58	0.8	58.8	0	0	6.1	6.1	0	30.9	1.8	32.7	0	0	2.4	2.4	

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	112	2	114	0	0	**14**	**14**	0	61	4	65	0	0	**15**	**15**	208
04:30 PM	0	93	**3**	96	0	0	11	11	0	**75**	**6**	**81**	0	0	1	1	189
04:45 PM	0	92	2	94	0	0	11	11	0	56	2	58	0	0	3	3	166
05:00 PM	0	**127**	3	**130**	0	0	8	8	0	65	3	68	0	0	9	9	**215**
Total Volume	0	424	10	434	0	0	44	44	0	257	15	272	0	0	28	28	778
% App. Total	0	97.7	2.3		0	0	100		0	94.5	5.5		0	0	100		
PHF	.000	.835	.833	.835	.000	.000	.786	.786	.000	.857	.625	.840	.000	.000	.467	.467	.905

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File Name : 05_MRV_Frederick_Brodiea PM
Site Code : 05118259
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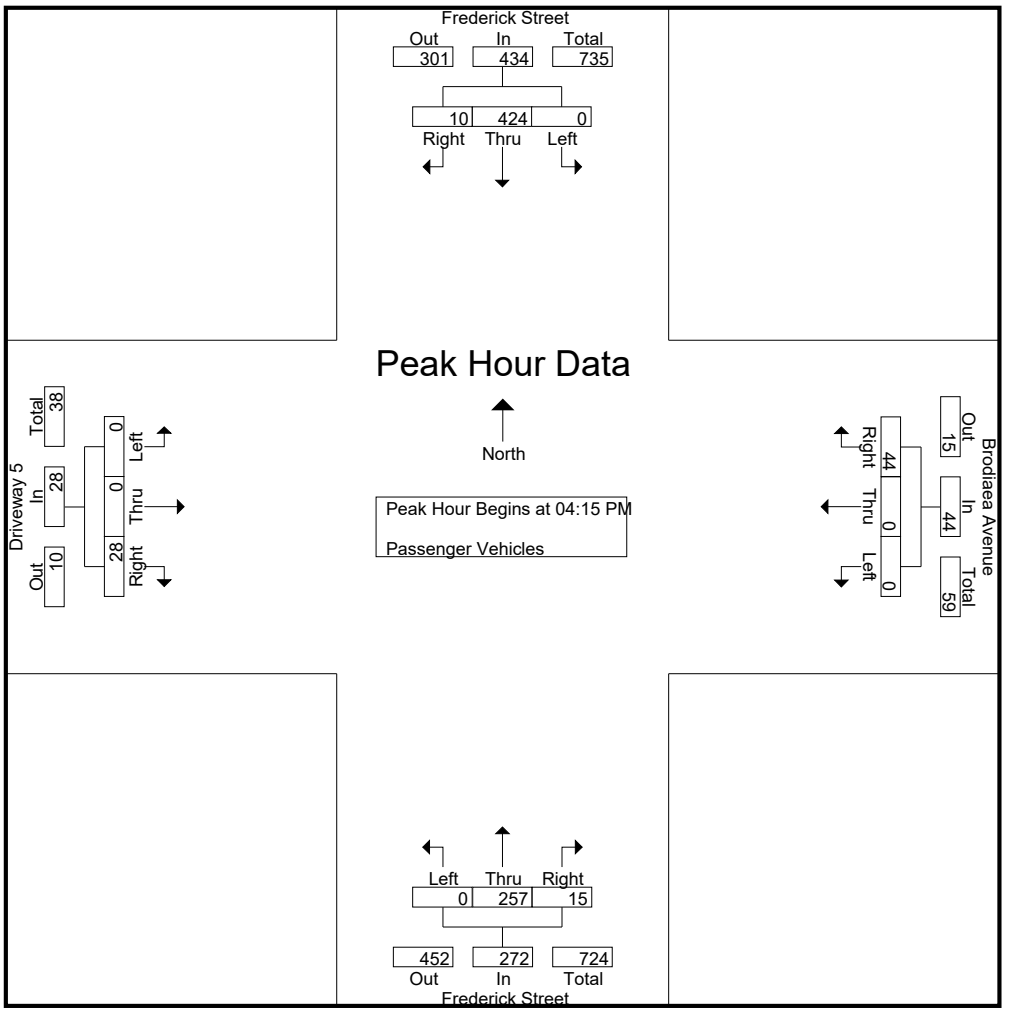

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:15 PM				04:15 PM			
+0 mins.	0	112	2	114	0	0	**14**	**14**	0	61	4	65	0	0	**15**	**15**
+15 mins.	0	93	**3**	96	0	0	11	11	0	**75**	**6**	**81**	0	0	1	1
+30 mins.	0	92	2	94	0	0	11	11	0	56	2	58	0	0	3	3
+45 mins.	0	**127**	3	**130**	0	0	8	8	0	65	3	68	0	0	9	9
Total Volume	0	424	10	434	0	0	44	44	0	257	15	272	0	0	28	28
% App. Total	0	97.7	2.3		0	0	100		0	94.5	5.5		0	0	100	
PHF	.000	.835	.833	.835	.000	.000	.786	.786	.000	.857	.625	.840	.000	.000	.467	.467

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City of Moreno Valley
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Weather: Clear

File Name : 05_MRV_Frederick_Brodiea PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
04:15 PM	0	5	0	5	0	0	0	0	0	1	0	1	0	0	0	0	6
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	4	0	4	0	0	0	0	0	1	0	1	0	0	0	0	5
Total	0	10	0	10	0	0	0	0	0	4	0	4	0	0	0	0	14
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0	4
05:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	4	0	4	0	0	0	0	0	1	0	1	0	0	0	0	5
Grand Total	0	14	0	14	0	0	0	0	0	5	0	5	0	0	0	0	19
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0		
Total %	0	73.7	0	73.7	0	0	0	0	0	26.3	0	26.3	0	0	0	0	

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	**5**	0	**5**	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**6**
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	4	0	4	0	0	0	0	0	1	0	1	0	0	0	0	5
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	10	0	10	0	0	0	0	0	2	0	2	0	0	0	0	12
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.500

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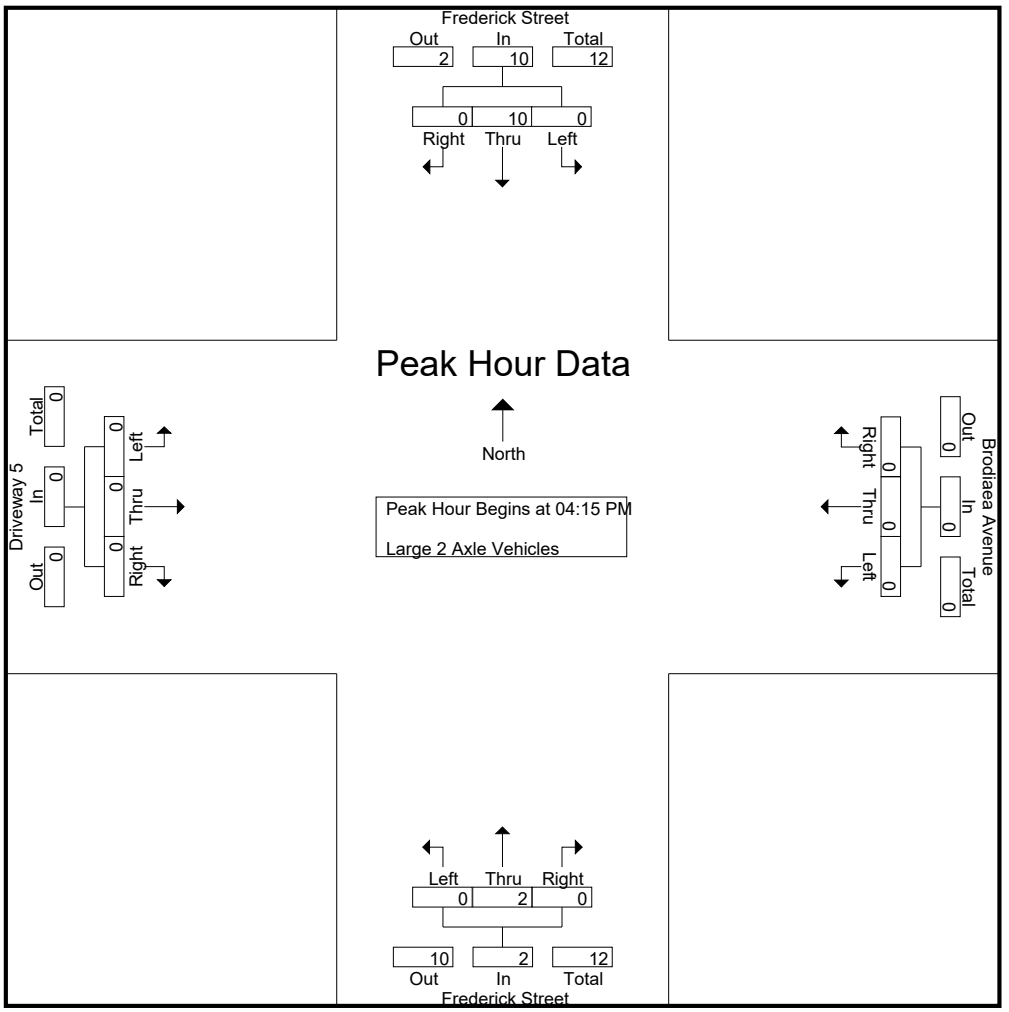

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:15 PM				04:15 PM			
+0 mins.	0	**5**	0	**5**	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+15 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	4	0	4	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	10	0	10	0	0	0	0	0	2	0	2	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000

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Weather: Clear

File Name : 05_MRV_Frederick_Brodiea PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 3 Axle Vehicles

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
Grand Total	0	1	0	1	0	0	1	1	0	2	0	2	0	0	0	0	4
Apprch %	0	100	0		0	0	100		0	100	0		0	0	0		
Total %	0	25	0	25	0	0	25	25	0	50	0	50	0	0	0	0	

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	**1**	0	**1**	0	0	**1**	**1**	0	0	0	0	0	0	0	0	**2**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
% App. Total	0	100	0		0	0	100		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

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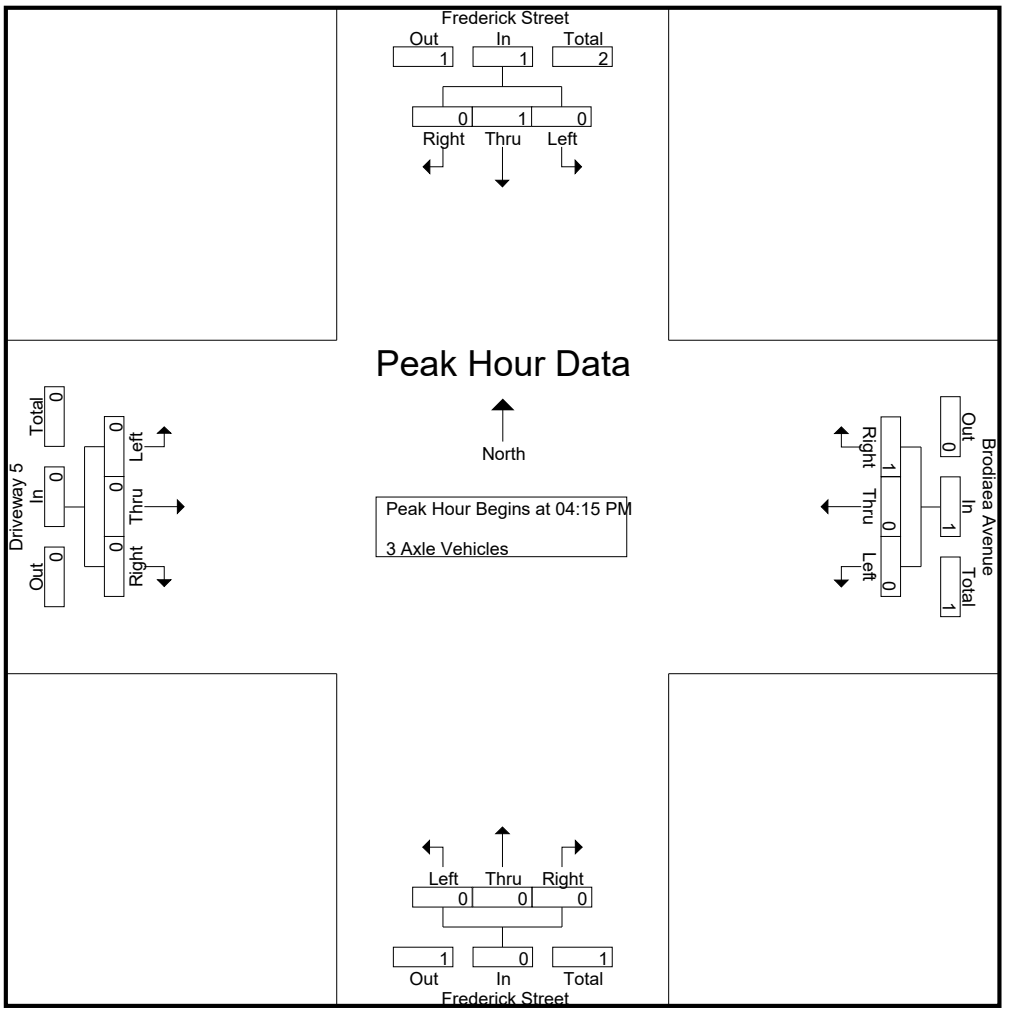
City of Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue
Weather: Clear

File Name : 05_MRV_Frederick_Brodiea PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:15 PM				04:15 PM			
+0 mins.	0	**1**	0	**1**	0	0	**1**	**1**	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0
% App. Total	0	100	0		0	0	100		0	0	0		0	0	0	
PHF	.000	.250	.000	.250	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000

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City of Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue
Weather: Clear

File Name : 05_MRV_Frederick_Brodiea PM
Site Code : 05118259
Start Date : 4/3/2018
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Groups Printed- 4+ Axle Trucks

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	2	0	2	0	0	0	0	0	1	1	2	0	0	0	0	4
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	1	0	1	0	0	1	1	0	2	1	3	0	0	0	0	5
Grand Total	0	3	0	3	0	0	1	1	0	3	2	5	0	0	0	0	9
Apprch %	0	100	0		0	0	100		0	60	40		0	0	0		
Total %	0	33.3	0	33.3	0	0	11.1	11.1	0	33.3	22.2	55.6	0	0	0	0	

	Frederick Street Southbound				Brodiaea Avenue Westbound				Frederick Street Northbound				Driveway 5 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	**1**	0	**1**	0	0	0	0	0	0	**1**	**1**	0	0	0	0	**2**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	1	0	0	0	0	0	**1**	0	1	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	2	0	2	0	0	0	0	0	2	1	3	0	0	0	0	5
% App. Total	0	100	0		0	0	0		0	66.7	33.3		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.500	.250	.750	.000	.000	.000	.000	.625

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City of Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue
Weather: Clear

File Name : 05_MRV_Frederick_Brodiea PM
Site Code : 05118259
Start Date : 4/3/2018
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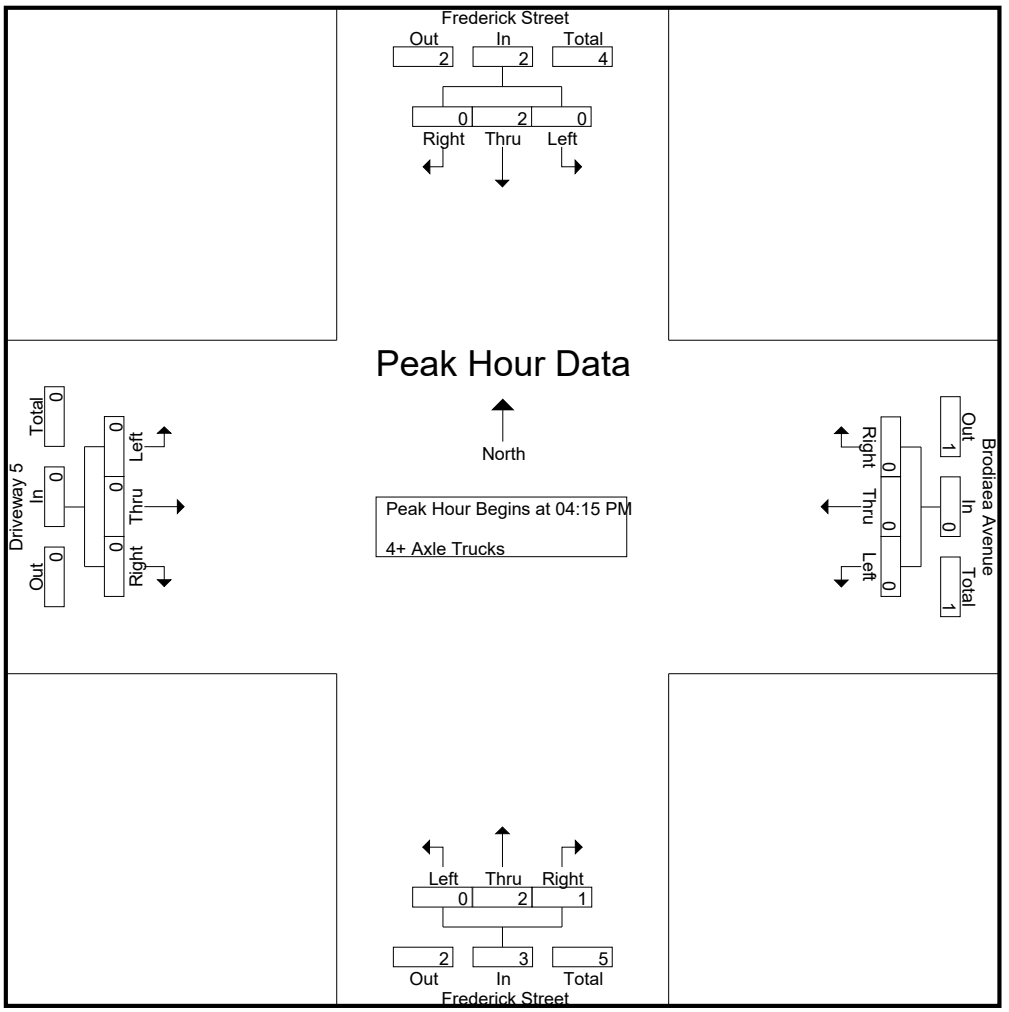

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:15 PM				04:15 PM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	0	**1**	**1**	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	**1**	0	1	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	0	2	0	2	0	0	0	0	0	2	1	3	0	0	0	0
% App. Total	0	100	0		0	0	0		0	66.7	33.3		0	0	0	
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.500	.250	.750	.000	.000	.000	.000

Location: Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue

Date: 4/3/2018
Date: Tuesday

PEDESTRIANS

	North Leg Frederick Street	East Leg Brodiaea Avenue	South Leg Frederick Street	West Leg Driveway 5	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	1	1
8:00 AM	0	1	0	0	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	1	1
8:45 AM	0	0	0	5	5
TOTAL VOLUMES:	0	1	0	7	8

	North Leg Frederick Street	East Leg Brodiaea Avenue	South Leg Frederick Street	West Leg Driveway 5	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	2	2
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	2	2

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Location: Moreno Valley
N/S: Frederick Street
E/W: Driveway 5/Brodiaea Avenue

Date: 4/3/2018
Date: Tuesday

BICYCLES

	Southbound Frederick Street			Westbound Brodiaea Avenue			Northbound Frederick Street			Eastbound Driveway 5			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	0	0	0	0	1	0	0	0	0	2

	Southbound Frederick Street			Westbound Brodiaea Avenue			Northbound Frederick Street			Eastbound Driveway 5			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

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City of Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue
Weather: Clear

File Name : 06_MRV_Frederick_Cactus AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	21	16	6	37	391	20	0	411	29	211	0	240	6	688	694
07:15 AM	32	14	10	46	382	34	0	416	44	246	0	290	10	752	762
07:30 AM	44	16	12	60	437	40	2	477	40	230	0	270	14	807	821
07:45 AM	31	32	10	63	422	45	4	467	42	220	0	262	14	792	806
Total	128	78	38	206	1632	139	6	1771	155	907	0	1062	44	3039	3083
08:00 AM	24	17	13	41	352	36	2	388	35	204	0	239	15	668	683
08:15 AM	34	32	22	66	365	36	2	401	28	199	0	227	24	694	718
08:30 AM	15	18	18	33	245	36	1	281	34	213	0	247	19	561	580
08:45 AM	31	17	13	48	270	43	2	313	24	187	0	211	15	572	587
Total	104	84	66	188	1232	151	7	1383	121	803	0	924	73	2495	2568
Grand Total	232	162	104	394	2864	290	13	3154	276	1710	0	1986	117	5534	5651
Apprch %	58.9	41.1			90.8	9.2			13.9	86.1					
Total %	4.2	2.9		7.1	51.8	5.2		57	5	30.9		35.9	2.1	97.9	
Passenger Vehicles	215	145		456	2777	270		3059	253	1597		1850	0	0	5365
% Passenger Vehicles	92.7	89.5	92.3	91.6	97	93.1	92.3	96.6	91.7	93.4	0	93.2	0	0	94.9
Large 2 Axle Vehicles	7	7		17	36	8		44	7	41		48	0	0	109
% Large 2 Axle Vehicles	3	4.3	2.9	3.4	1.3	2.8	0	1.4	2.5	2.4	0	2.4	0	0	1.9
3 Axle Vehicles	6	2		10	9	6		16	4	6		10	0	0	36
% 3 Axle Vehicles	2.6	1.2	1.9	2	0.3	2.1	7.7	0.5	1.4	0.4	0	0.5	0	0	0.6
4+ Axle Trucks	4	8		15	42	6		48	12	66		78	0	0	141
% 4+ Axle Trucks	1.7	4.9	2.9	3	1.5	2.1	0	1.5	4.3	3.9	0	3.9	0	0	2.5

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	21	16	37	391	20	411	29	211	240	688
07:15 AM	32	14	46	382	34	416	**44**	**246**	**290**	752
07:30 AM	**44**	16	60	**437**	40	**477**	40	230	270	**807**
07:45 AM	31	**32**	**63**	422	**45**	467	42	220	262	792
Total Volume	128	78	206	1632	139	1771	155	907	1062	3039
% App. Total	62.1	37.9		92.2	7.8		14.6	85.4		
PHF	.727	.609	.817	.934	.772	.928	.881	.922	.916	.941

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City of Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue
Weather: Clear

File Name : 06_MRV_Frederick_Cactus AM
Site Code : 05118259
Start Date : 4/3/2018
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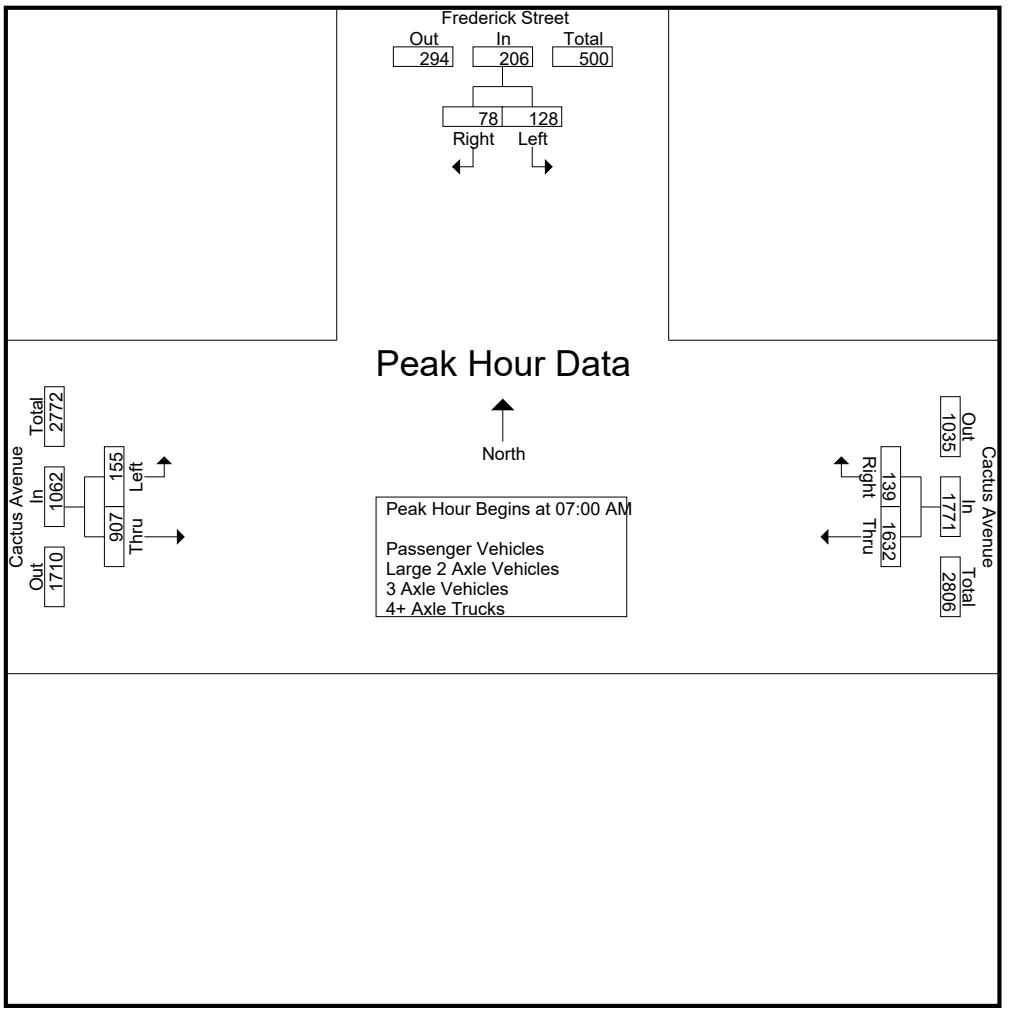

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:00 AM			07:00 AM		
+0 mins.	**44**	16	60	391	20	411	29	211	240
+15 mins.	31	**32**	63	382	34	416	**44**	**246**	**290**
+30 mins.	24	17	41	**437**	40	**477**	40	230	270
+45 mins.	34	32	**66**	422	**45**	467	42	220	262
Total Volume	133	97	230	1632	139	1771	155	907	1062
% App. Total	57.8	42.2		92.2	7.8		14.6	85.4	
PHF	.756	.758	.871	.934	.772	.928	.881	.922	.916

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City of Moreno Valley
N/S: Frederick Street
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Weather: Clear

File Name : 06_MRV_Frederick_Cactus AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	19	16	6	35	381	19	0	400	28	197	0	225	6	660	666
07:15 AM	32	13	10	45	376	32	0	408	43	234	0	277	10	730	740
07:30 AM	42	14	11	56	428	40	2	468	36	222	0	258	13	782	795
07:45 AM	31	31	10	62	410	39	4	449	39	206	0	245	14	756	770
Total	124	74	37	198	1595	130	6	1725	146	859	0	1005	43	2928	2971
08:00 AM	21	16	12	37	343	35	2	378	31	188	0	219	14	634	648
08:15 AM	30	28	21	58	345	32	2	377	25	185	0	210	23	645	668
08:30 AM	13	16	16	29	235	33	0	268	28	191	0	219	16	516	532
08:45 AM	27	11	10	38	259	40	2	299	23	174	0	197	12	534	546
Total	91	71	59	162	1182	140	6	1322	107	738	0	845	65	2329	2394
Grand Total	215	145	96	360	2777	270	12	3047	253	1597	0	1850	108	5257	5365
Apprch %	59.7	40.3			91.1	8.9			13.7	86.3					
Total %	4.1	2.8		6.8	52.8	5.1		58	4.8	30.4		35.2	2	98	

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	19	16	35	381	19	400	28	197	225	660
07:15 AM	32	13	45	376	32	408	**43**	**234**	**277**	730
07:30 AM	**42**	14	56	**428**	**40**	**468**	36	222	258	**782**
07:45 AM	31	**31**	**62**	410	39	449	39	206	245	756
Total Volume	124	74	198	1595	130	1725	146	859	1005	2928
% App. Total	62.6	37.4		92.5	7.5		14.5	85.5		
PHF	.738	.597	.798	.932	.813	.921	.849	.918	.907	.936

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City of Moreno Valley
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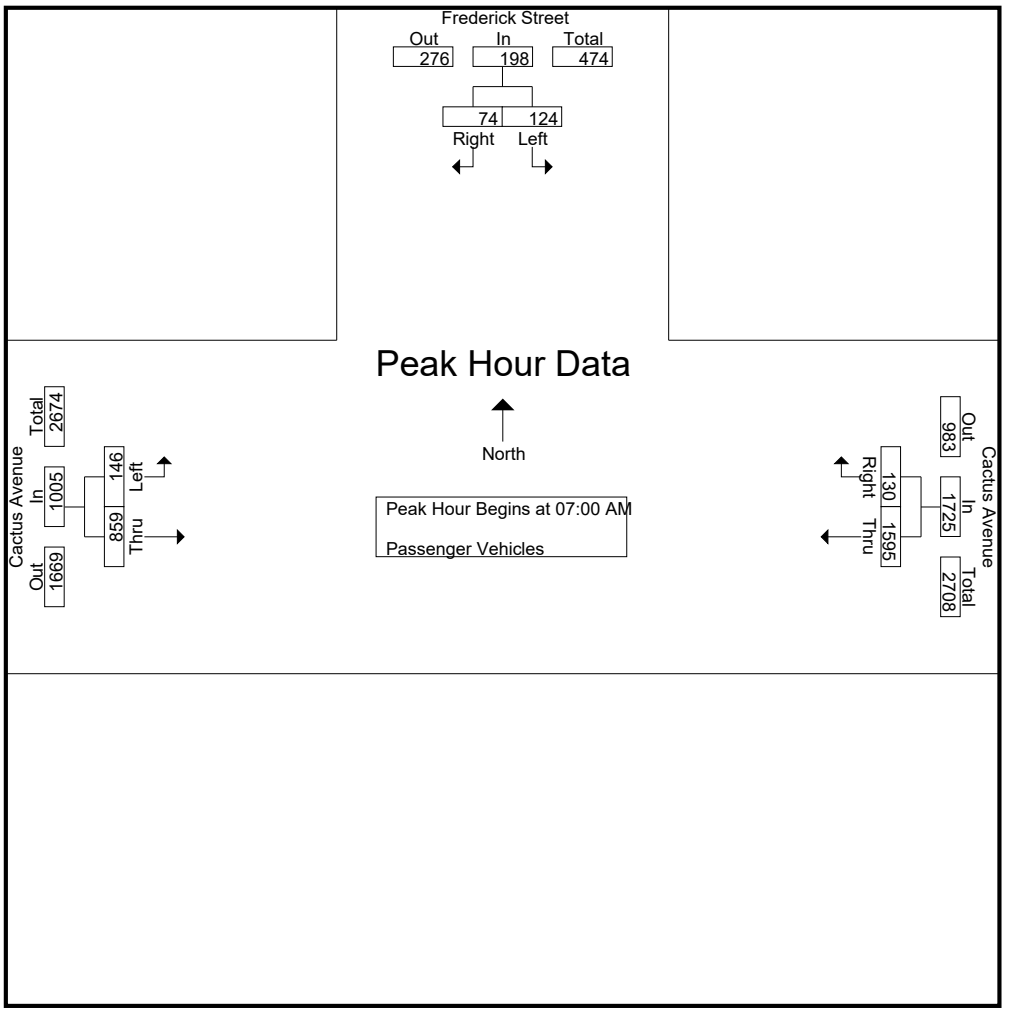

Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	19	16	35	381	19	400	28	197	225
+15 mins.	32	13	45	376	32	408	**43**	**234**	**277**
+30 mins.	**42**	14	56	**428**	**40**	**468**	36	222	258
+45 mins.	31	**31**	**62**	410	39	449	39	206	245
Total Volume	124	74	198	1595	130	1725	146	859	1005
% App. Total	62.6	37.4		92.5	7.5		14.5	85.5	
PHF	.738	.597	.798	.932	.813	.921	.849	.918	.907

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City of Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue
Weather: Clear

File Name : 06_MRV_Frederick_Cactus AM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	2	0	0	2	4	1	0	5	1	4	0	5	0	12	12
07:15 AM	0	0	0	0	2	2	0	4	0	7	0	7	0	11	11
07:30 AM	0	1	1	1	1	0	0	1	3	3	0	6	1	8	9
07:45 AM	0	1	0	1	7	2	0	9	1	6	0	7	0	17	17
Total	2	2	1	4	14	5	0	19	5	20	0	25	1	48	49
08:00 AM	1	0	0	1	5	1	0	6	1	3	0	4	0	11	11
08:15 AM	2	3	0	5	9	1	0	10	0	4	0	4	0	19	19
08:30 AM	1	0	0	1	4	0	0	4	1	9	0	10	0	15	15
08:45 AM	1	2	2	3	4	1	0	5	0	5	0	5	2	13	15
Total	5	5	2	10	22	3	0	25	2	21	0	23	2	58	60
Grand Total	7	7	3	14	36	8	0	44	7	41	0	48	3	106	109
Apprch %	50	50			81.8	18.2			14.6	85.4					
Total %	6.6	6.6		13.2	34	7.5		41.5	6.6	38.7		45.3	2.8	97.2	

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**2**	0	**2**	4	1	5	1	4	5	12
07:15 AM	0	0	0	2	**2**	4	0	**7**	**7**	11
07:30 AM	0	**1**	1	1	0	1	**3**	3	6	8
07:45 AM	0	1	1	**7**	2	**9**	1	6	7	**17**
Total Volume	2	2	4	14	5	19	5	20	25	48
% App. Total	50	50		73.7	26.3		20	80		
PHF	.250	.500	.500	.500	.625	.528	.417	.714	.893	.706

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Weather: Clear

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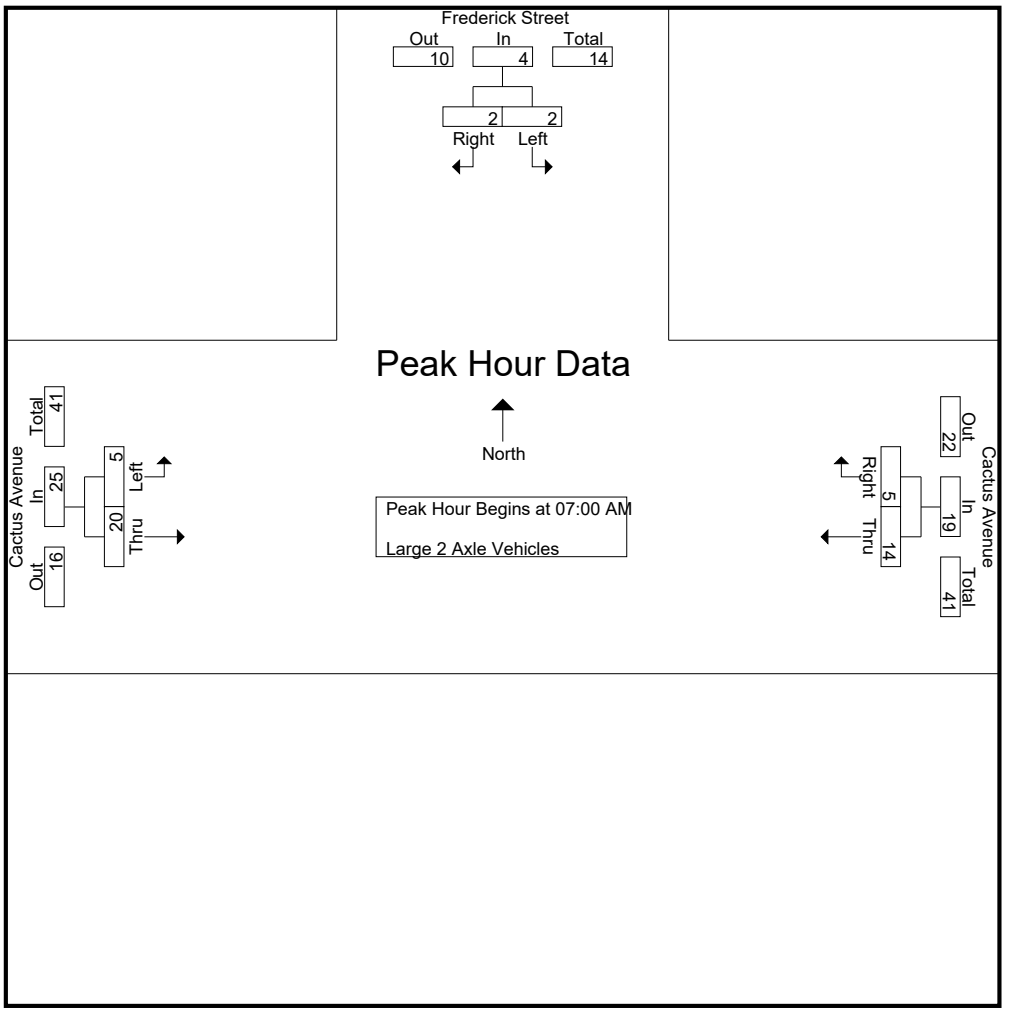

Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	**2**	0	**2**	4	1	5	1	4	5
+15 mins.	0	0	0	2	**2**	4	0	**7**	**7**
+30 mins.	0	**1**	1	1	0	1	**3**	3	6
+45 mins.	0	1	1	**7**	2	**9**	1	6	7
Total Volume	2	2	4	14	5	19	5	20	25
% App. Total	50	50		73.7	26.3		20	80	
PHF	.250	.500	.500	.500	.625	.528	.417	.714	.893

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Groups Printed- 3 Axle Vehicles

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	2	0	0	2	2	0	0	2	1	0	0	1	0	5	5
07:45 AM	0	0	0	0	1	3	0	4	1	1	0	2	0	6	6
Total	2	0	0	2	4	3	0	7	2	1	0	3	0	12	12
08:00 AM	0	1	1	1	2	0	0	2	1	3	0	4	1	7	8
08:15 AM	2	0	0	2	1	0	0	1	0	1	0	1	0	4	4
08:30 AM	1	0	0	1	1	2	1	3	1	1	0	2	1	6	7
08:45 AM	1	1	1	2	1	1	0	2	0	0	0	0	1	4	5
Total	4	2	2	6	5	3	1	8	2	5	0	7	3	21	24
Grand Total	6	2	2	8	9	6	1	15	4	6	0	10	3	33	36
Apprch %	75	25			60	40			40	60					
Total %	18.2	6.1		24.2	27.3	18.2		45.5	12.1	18.2		30.3	8.3	91.7	

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	1	0	1	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	**2**	0	**2**	**2**	0	2	**1**	0	1	5
07:45 AM	0	0	0	1	**3**	**4**	1	**1**	**2**	**6**
Total Volume	2	0	2	4	3	7	2	1	3	12
% App. Total	100	0		57.1	42.9		66.7	33.3		
PHF	.250	.000	.250	.500	.250	.438	.500	.250	.375	.500

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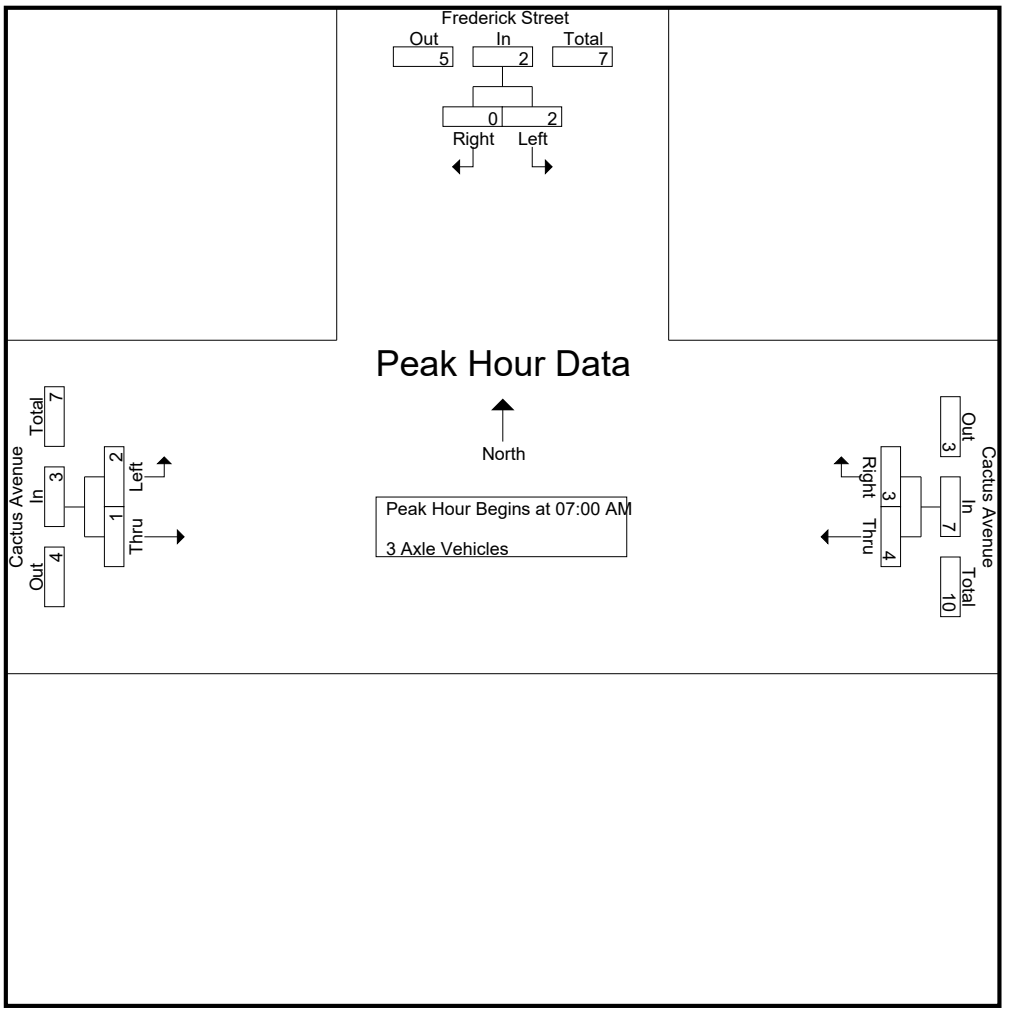

Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	1	0	1	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	**2**	0	**2**	**2**	0	2	**1**	0	1
+45 mins.	0	0	0	1	**3**	**4**	1	**1**	**2**
Total Volume	2	0	2	4	3	7	2	1	3
% App. Total	100	0		57.1	42.9		66.7	33.3	
PHF	.250	.000	.250	.500	.250	.438	.500	.250	.375

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Groups Printed- 4+ Axle Trucks

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	5	0	0	5	0	10	0	10	0	15	15
07:15 AM	0	1	0	1	4	0	0	4	1	5	0	6	0	11	11
07:30 AM	0	1	0	1	6	0	0	6	0	5	0	5	0	12	12
07:45 AM	0	0	0	0	4	1	0	5	1	7	0	8	0	13	13
Total	0	2	0	2	19	1	0	20	2	27	0	29	0	51	51
08:00 AM	2	0	0	2	2	0	0	2	2	10	0	12	0	16	16
08:15 AM	0	1	1	1	10	3	0	13	3	9	0	12	1	26	27
08:30 AM	0	2	2	2	5	1	0	6	4	12	0	16	2	24	26
08:45 AM	2	3	0	5	6	1	0	7	1	8	0	9	0	21	21
Total	4	6	3	10	23	5	0	28	10	39	0	49	3	87	90
Grand Total	4	8	3	12	42	6	0	48	12	66	0	78	3	138	141
Apprch %	33.3	66.7			87.5	12.5			15.4	84.6					
Total %	2.9	5.8		8.7	30.4	4.3		34.8	8.7	47.8		56.5	2.1	97.9	

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	5	0	5	0	**10**	**10**	**15**
07:15 AM	0	**1**	**1**	4	0	4	**1**	5	6	11
07:30 AM	0	1	1	**6**	0	**6**	0	5	5	12
07:45 AM	0	0	0	4	**1**	5	1	7	8	13
Total Volume	0	2	2	19	1	20	2	27	29	51
% App. Total	0	100		95	5		6.9	93.1		
PHF	.000	.500	.500	.792	.250	.833	.500	.675	.725	.850

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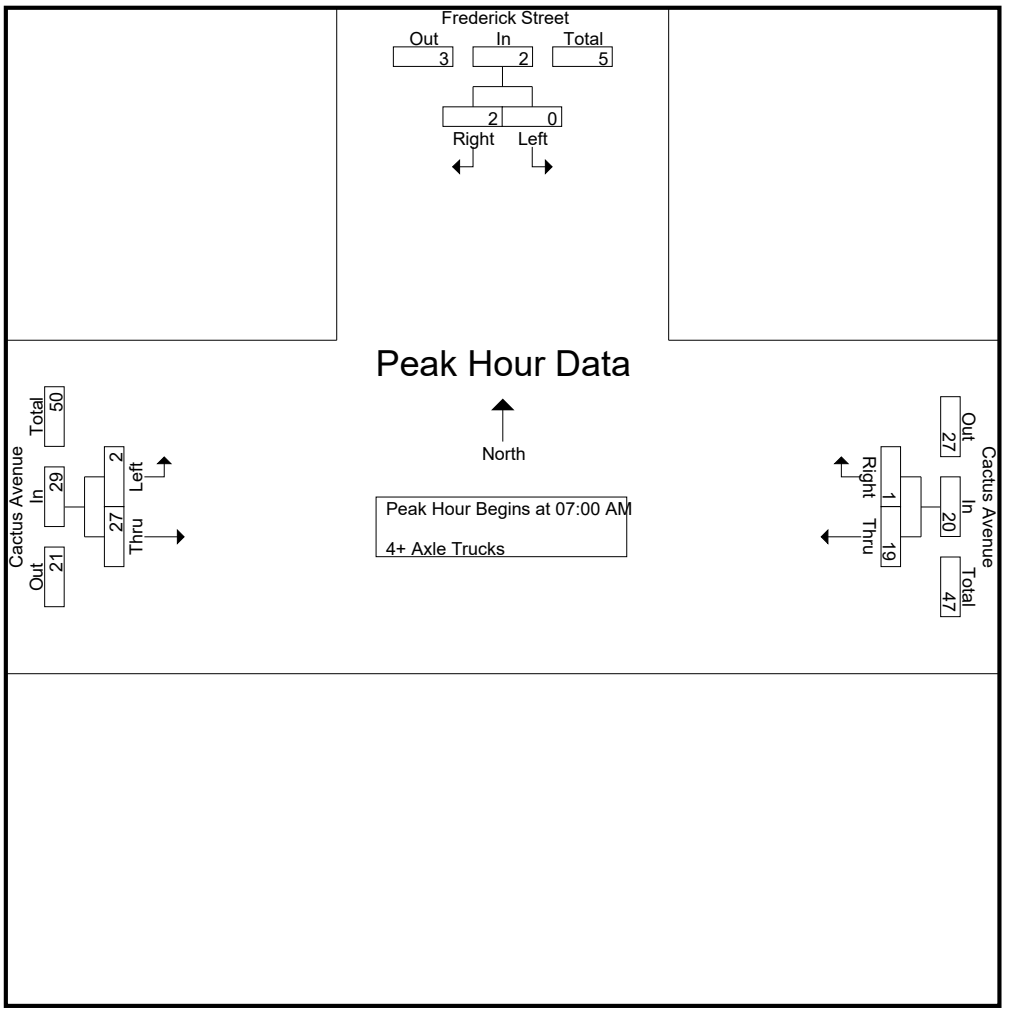

Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	5	0	5	0	**10**	**10**
+15 mins.	0	**1**	**1**	4	0	4	**1**	5	6
+30 mins.	0	1	1	**6**	0	**6**	0	5	5
+45 mins.	0	0	0	4	**1**	5	1	7	8
Total Volume	0	2	2	19	1	20	2	27	29
% App. Total	0	100		95	5		6.9	93.1	
PHF	.000	.500	.500	.792	.250	.833	.500	.675	.725

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File Name : 06_MRV_Frederick_Cactus PM
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	94	26	13	120	298	42	10	340	33	435	0	468	23	928	951
04:15 PM	100	37	20	137	228	31	9	259	28	415	0	443	29	839	868
04:30 PM	74	35	20	109	249	43	17	292	22	522	0	544	37	945	982
04:45 PM	96	18	11	114	245	36	6	281	22	414	0	436	17	831	848
Total	364	116	64	480	1020	152	42	1172	105	1786	0	1891	106	3543	3649
05:00 PM	94	44	33	138	255	38	7	293	17	469	0	486	40	917	957
05:15 PM	109	36	24	145	225	33	10	258	16	447	0	463	34	866	900
05:30 PM	115	24	15	139	243	30	11	273	23	481	0	504	26	916	942
05:45 PM	79	30	22	109	205	34	15	239	9	505	0	514	37	862	899
Total	397	134	94	531	928	135	43	1063	65	1902	0	1967	137	3561	3698
Grand Total	761	250	158	1011	1948	287	85	2235	170	3688	0	3858	243	7104	7347
Apprch %	75.3	24.7			87.2	12.8			4.4	95.6					
Total %	10.7	3.5		14.2	27.4	4		31.5	2.4	51.9		54.3	3.3	96.7	
Passenger Vehicles	744	237		1134	1875	273		2230	157	3581		3738	0	0	7102
% Passenger Vehicles	97.8	94.8	96.8	97	96.3	95.1	96.5	96.1	92.4	97.1	0	96.9	0	0	96.7
Large 2 Axle Vehicles	7	4		14	22	3		25	3	34		37	0	0	76
% Large 2 Axle Vehicles	0.9	1.6	1.9	1.2	1.1	1	0	1.1	1.8	0.9	0	1	0	0	1
3 Axle Vehicles	0	4		6	5	8		16	0	12		12	0	0	34
% 3 Axle Vehicles	0	1.6	1.3	0.5	0.3	2.8	3.5	0.7	0	0.3	0	0.3	0	0	0.5
4+ Axle Trucks	10	5		15	46	3		49	10	61		71	0	0	135
% 4+ Axle Trucks	1.3	2	0	1.3	2.4	1	0	2.1	5.9	1.7	0	1.8	0	0	1.8

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	94	**44**	138	**255**	**38**	**293**	17	469	486	**917**
05:15 PM	109	36	**145**	225	33	258	16	447	463	866
05:30 PM	**115**	24	139	243	30	273	**23**	481	504	916
05:45 PM	79	30	109	205	34	239	9	**505**	**514**	862
Total Volume	397	134	531	928	135	1063	65	1902	1967	3561
% App. Total	74.8	25.2		87.3	12.7		3.3	96.7		
PHF	.863	.761	.916	.910	.888	.907	.707	.942	.957	.971

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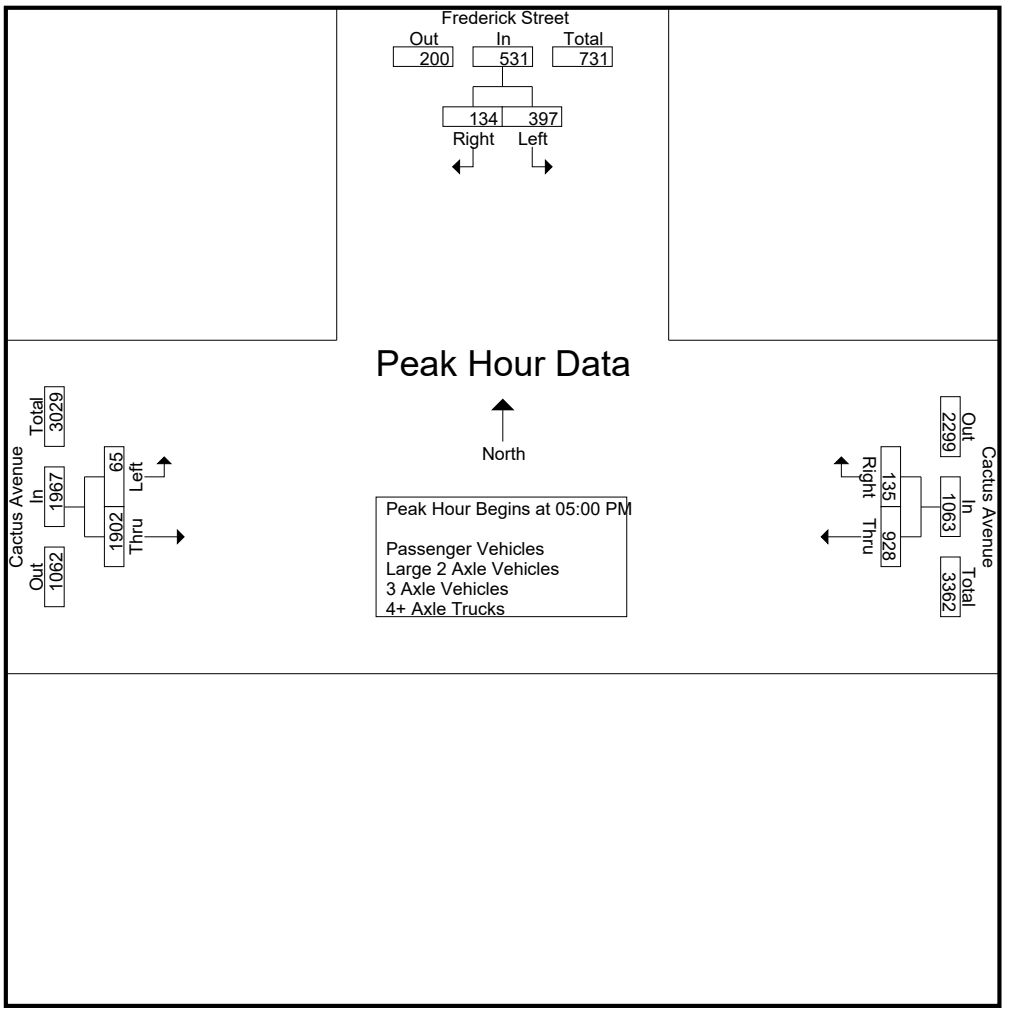

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			05:00 PM		
+0 mins.	96	18	114	**298**	42	**340**	17	469	486
+15 mins.	94	**44**	138	228	31	259	16	447	463
+30 mins.	109	36	**145**	249	**43**	292	**23**	481	504
+45 mins.	**115**	24	139	245	36	281	9	**505**	**514**
Total Volume	414	122	536	1020	152	1172	65	1902	1967
% App. Total	77.2	22.8		87	13		3.3	96.7	
PHF	.900	.693	.924	.856	.884	.862	.707	.942	.957

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Groups Printed- Passenger Vehicles

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	92	25	13	117	285	39	10	324	30	419	0	449	23	890	913
04:15 PM	96	33	19	129	218	29	9	247	25	406	0	431	28	807	835
04:30 PM	73	32	18	105	237	42	17	279	21	509	0	530	35	914	949
04:45 PM	93	17	11	110	234	34	6	268	22	397	0	419	17	797	814
Total	354	107	61	461	974	144	42	1118	98	1731	0	1829	103	3408	3511
05:00 PM	93	44	33	137	242	37	7	279	17	454	0	471	40	887	927
05:15 PM	106	33	22	139	222	31	9	253	14	440	0	454	31	846	877
05:30 PM	114	24	15	138	236	29	11	265	19	462	0	481	26	884	910
05:45 PM	77	29	22	106	201	32	13	233	9	494	0	503	35	842	877
Total	390	130	92	520	901	129	40	1030	59	1850	0	1909	132	3459	3591
Grand Total	744	237	153	981	1875	273	82	2148	157	3581	0	3738	235	6867	7102
Apprch %	75.8	24.2			87.3	12.7			4.2	95.8					
Total %	10.8	3.5		14.3	27.3	4		31.3	2.3	52.1		54.4	3.3	96.7	

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	93	**44**	137	**242**	**37**	**279**	17	454	471	**887**
05:15 PM	106	33	**139**	222	31	253	14	440	454	846
05:30 PM	**114**	24	138	236	29	265	**19**	462	481	884
05:45 PM	77	29	106	201	32	233	9	**494**	**503**	842
Total Volume	390	130	520	901	129	1030	59	1850	1909	3459
% App. Total	75	25		87.5	12.5		3.1	96.9		
PHF	.855	.739	.935	.931	.872	.923	.776	.936	.949	.975

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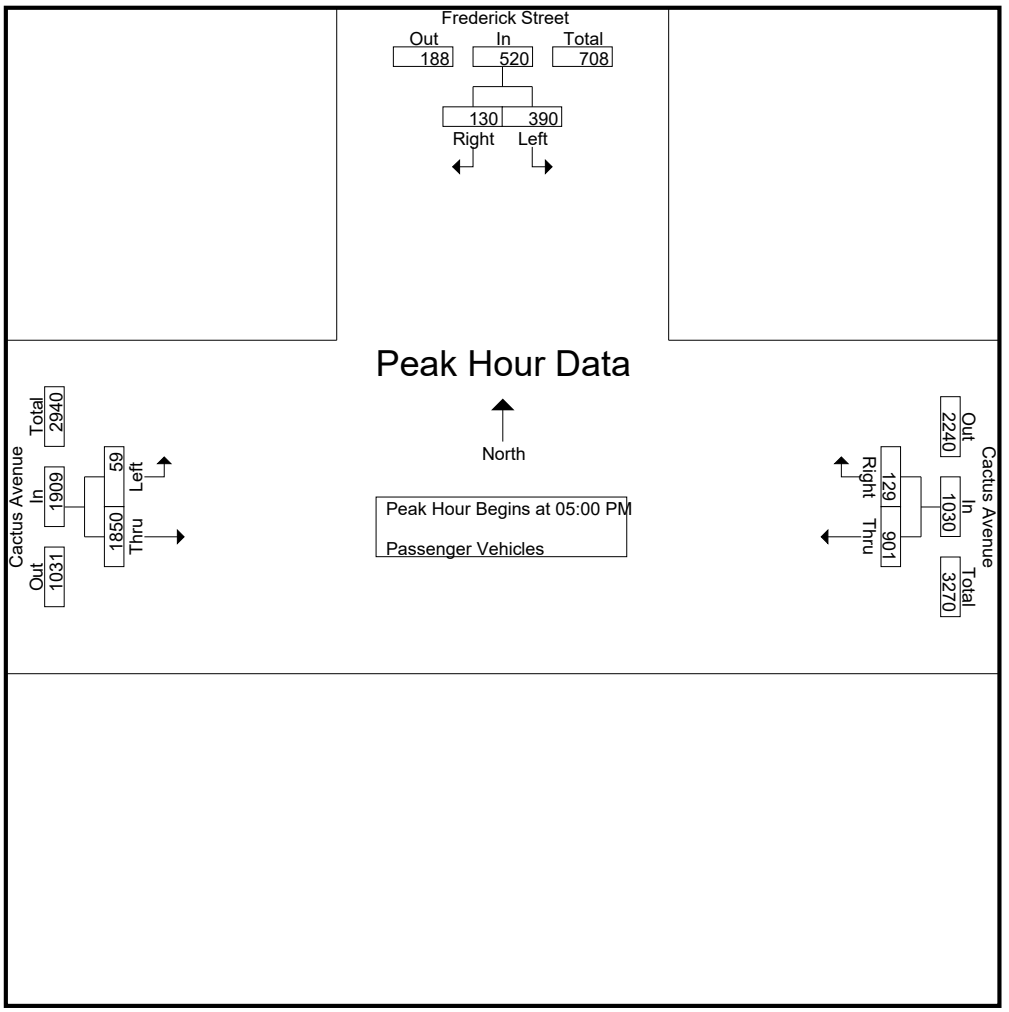

Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	93	**44**	137	**242**	**37**	**279**	17	454	471
+15 mins.	106	33	**139**	222	31	253	14	440	454
+30 mins.	**114**	24	138	236	29	265	**19**	462	481
+45 mins.	77	29	106	201	32	233	9	**494**	**503**
Total Volume	390	130	520	901	129	1030	59	1850	1909
% App. Total	75	25		87.5	12.5		3.1	96.9	
PHF	.855	.739	.935	.931	.872	.923	.776	.936	.949

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Groups Printed- Large 2 Axle Vehicles

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	0	0	1	3	1	0	4	0	6	0	6	0	11	11
04:15 PM	2	2	1	4	3	0	0	3	3	1	0	4	1	11	12
04:30 PM	0	1	1	1	6	0	0	6	0	6	0	6	1	13	14
04:45 PM	2	0	0	2	3	1	0	4	0	3	0	3	0	9	9
Total	5	3	2	8	15	2	0	17	3	16	0	19	2	44	46
05:00 PM	0	0	0	0	3	0	0	3	0	3	0	3	0	6	6
05:15 PM	1	1	1	2	1	1	0	2	0	2	0	2	1	6	7
05:30 PM	1	0	0	1	2	0	0	2	0	8	0	8	0	11	11
05:45 PM	0	0	0	0	1	0	0	1	0	5	0	5	0	6	6
Total	2	1	1	3	7	1	0	8	0	18	0	18	1	29	30
Grand Total	7	4	3	11	22	3	0	25	3	34	0	37	3	73	76
Apprch %	63.6	36.4			88	12			8.1	91.9					
Total %	9.6	5.5		15.1	30.1	4.1		34.2	4.1	46.6		50.7	3.9	96.1	

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	**3**	0	**3**	0	3	3	6
05:15 PM	**1**	**1**	**2**	1	**1**	2	0	2	2	6
05:30 PM	1	0	1	2	0	2	0	**8**	**8**	**11**
05:45 PM	0	0	0	1	0	1	0	5	5	6
Total Volume	2	1	3	7	1	8	0	18	18	29
% App. Total	66.7	33.3		87.5	12.5		0	100		
PHF	.500	.250	.375	.583	.250	.667	.000	.563	.563	.659

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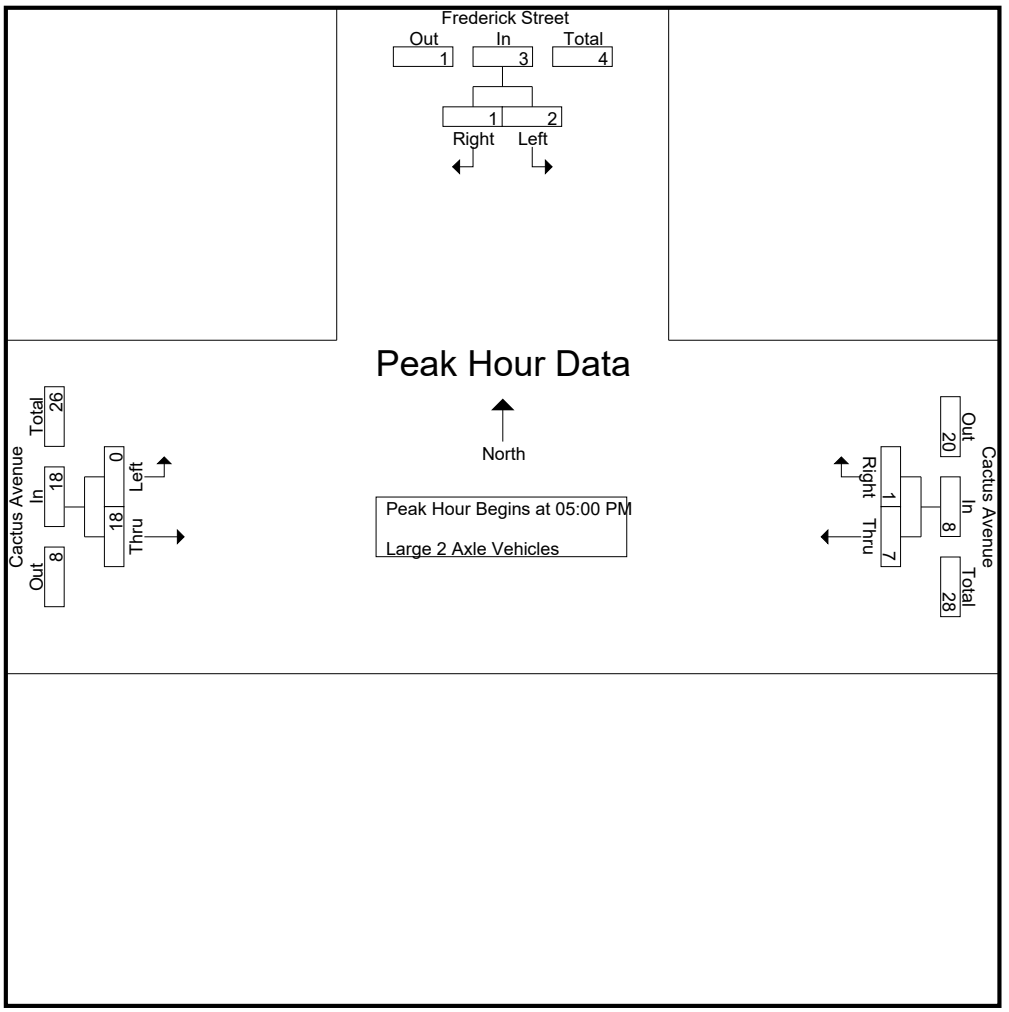
City of Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue
Weather: Clear

File Name : 06_MRV_Frederick_Cactus PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	0	0	0	**3**	0	**3**	0	3	3
+15 mins.	**1**	**1**	**2**	1	**1**	2	0	2	2
+30 mins.	1	0	1	2	0	2	0	**8**	**8**
+45 mins.	0	0	0	1	0	1	0	5	5
Total Volume	2	1	3	7	1	8	0	18	18
% App. Total	66.7	33.3		87.5	12.5		0	100	
PHF	.500	.250	.375	.583	.250	.667	.000	.563	.563

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City of Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue
Weather: Clear

File Name : 06_MRV_Frederick_Cactus PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 3 Axle Vehicles

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	2	0	0	2	0	1	0	1	0	3	3
04:15 PM	0	1	0	1	0	1	0	1	0	3	0	3	0	5	5
04:30 PM	0	1	1	1	0	1	0	1	0	3	0	3	1	5	6
04:45 PM	0	0	0	0	0	1	0	1	0	2	0	2	0	3	3
Total	0	2	1	2	2	3	0	5	0	9	0	9	1	16	17
05:00 PM	0	0	0	0	3	1	0	4	0	2	0	2	0	6	6
05:15 PM	0	2	1	2	0	1	1	1	0	0	0	0	2	3	5
05:30 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	2	2
05:45 PM	0	0	0	0	0	2	2	2	0	0	0	0	2	2	4
Total	0	2	1	2	3	5	3	8	0	3	0	3	4	13	17
Grand Total	0	4	2	4	5	8	3	13	0	12	0	12	5	29	34
Apprch %	0	100			38.5	61.5			0	100					
Total %	0	13.8		13.8	17.2	27.6		44.8	0	41.4		41.4	14.7	85.3	

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	**3**	1	**4**	0	**2**	**2**	**6**
05:15 PM	0	**2**	**2**	0	1	1	0	0	0	3
05:30 PM	0	0	0	0	1	1	0	1	1	2
05:45 PM	0	0	0	0	**2**	2	0	0	0	2
Total Volume	0	2	2	3	5	8	0	3	3	13
% App. Total	0	100		37.5	62.5		0	100		
PHF	.000	.250	.250	.250	.625	.500	.000	.375	.375	.542

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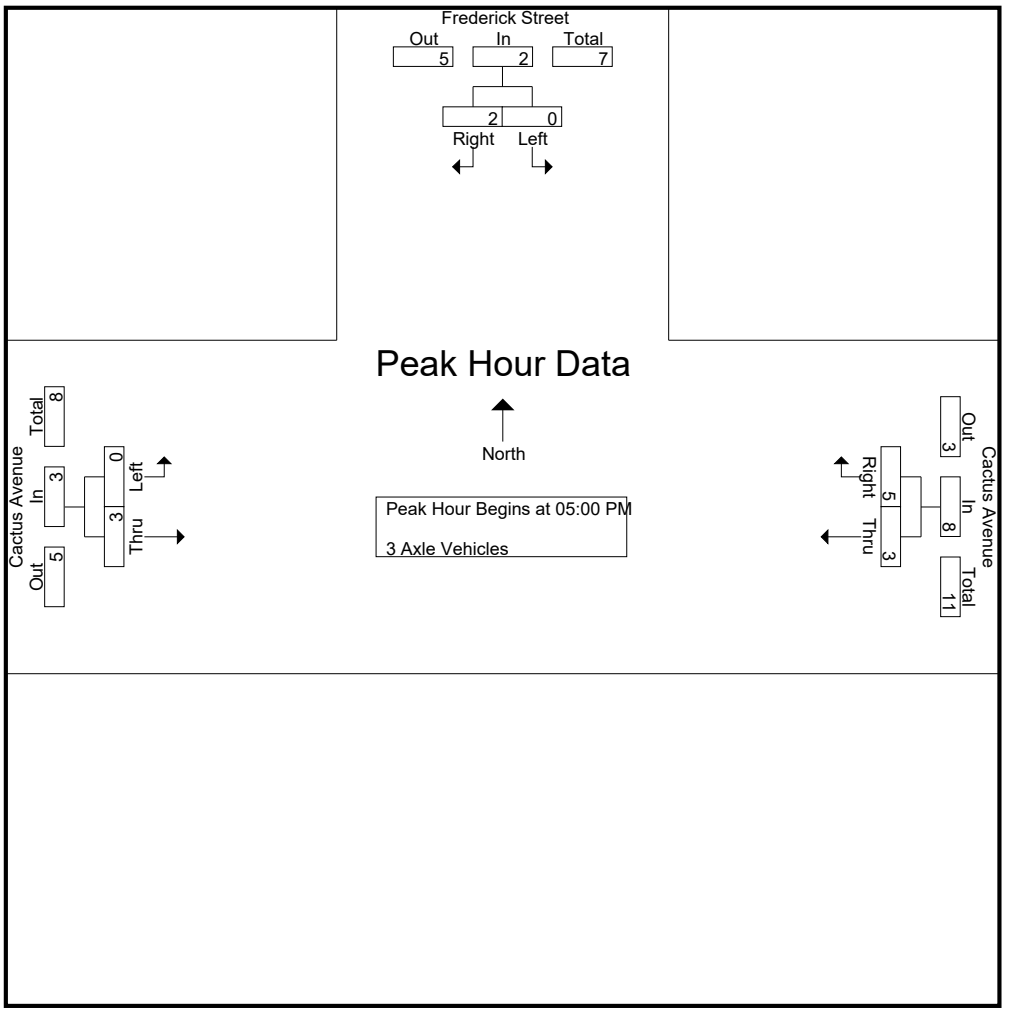
City of Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue
Weather: Clear

File Name : 06_MRV_Frederick_Cactus PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	0	0	0	**3**	1	**4**	0	**2**	**2**
+15 mins.	0	**2**	**2**	0	1	1	0	0	0
+30 mins.	0	0	0	0	1	1	0	1	1
+45 mins.	0	0	0	0	**2**	2	0	0	0
Total Volume	0	2	2	3	5	8	0	3	3
% App. Total	0	100		37.5	62.5		0	100	
PHF	.000	.250	.250	.250	.625	.500	.000	.375	.375

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City of Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue
Weather: Clear

File Name : 06_MRV_Frederick_Cactus PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 4+ Axle Trucks

	Frederick Street Southbound				Cactus Avenue Westbound				Cactus Avenue Eastbound						
Start Time	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	1	0	2	8	2	0	10	3	9	0	12	0	24	24
04:15 PM	2	1	0	3	7	1	0	8	0	5	0	5	0	16	16
04:30 PM	1	1	0	2	6	0	0	6	1	4	0	5	0	13	13
04:45 PM	1	1	0	2	8	0	0	8	0	12	0	12	0	22	22
Total	5	4	0	9	29	3	0	32	4	30	0	34	0	75	75
05:00 PM	1	0	0	1	7	0	0	7	0	10	0	10	0	18	18
05:15 PM	2	0	0	2	2	0	0	2	2	5	0	7	0	11	11
05:30 PM	0	0	0	0	5	0	0	5	4	10	0	14	0	19	19
05:45 PM	2	1	0	3	3	0	0	3	0	6	0	6	0	12	12
Total	5	1	0	6	17	0	0	17	6	31	0	37	0	60	60
Grand Total	10	5	0	15	46	3	0	49	10	61	0	71	0	135	135
Apprch %	66.7	33.3			93.9	6.1			14.1	85.9					
Total %	7.4	3.7		11.1	34.1	2.2		36.3	7.4	45.2		52.6	0	100	

	Frederick Street Southbound			Cactus Avenue Westbound			Cactus Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	1	0	1	**7**	0	**7**	0	**10**	10	18
05:15 PM	**2**	0	2	2	0	2	2	5	7	11
05:30 PM	0	0	0	5	0	5	**4**	10	**14**	**19**
05:45 PM	2	**1**	**3**	3	0	3	0	6	6	12
Total Volume	5	1	6	17	0	17	6	31	37	60
% App. Total	83.3	16.7		100	0		16.2	83.8		
PHF	.625	.250	.500	.607	.000	.607	.375	.775	.661	.789

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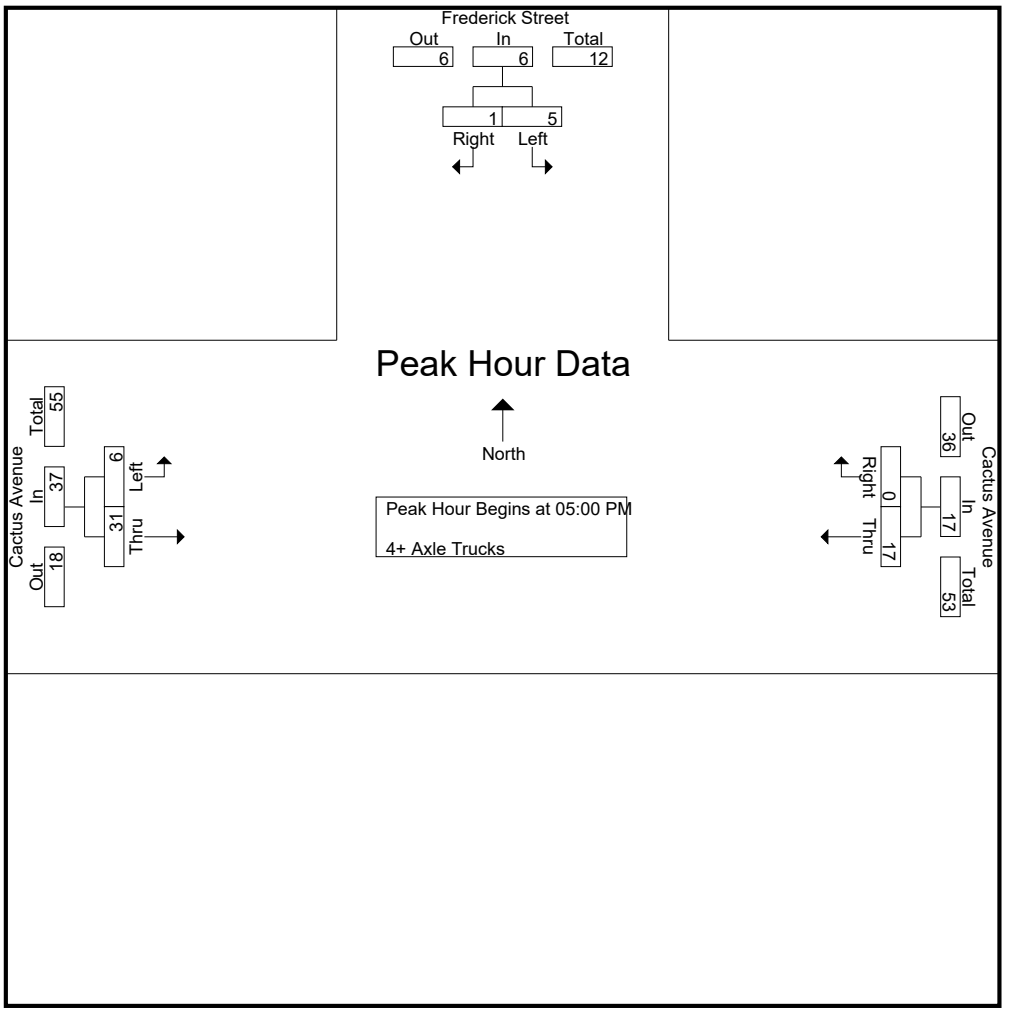
City of Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue
Weather: Clear

File Name : 06_MRV_Frederick_Cactus PM
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	1	0	1	**7**	0	**7**	0	**10**	10
+15 mins.	**2**	0	2	2	0	2	2	5	7
+30 mins.	0	0	0	5	0	5	**4**	10	**14**
+45 mins.	2	**1**	**3**	3	0	3	0	6	6
Total Volume	5	1	6	17	0	17	6	31	37
% App. Total	83.3	16.7		100	0		16.2	83.8	
PHF	.625	.250	.500	.607	.000	.607	.375	.775	.661

Location: Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue

Date: 4/3/2018
Date: Tuesday

PEDESTRIANS

	North Leg Frederick Street	East Leg Cactus Avenue	South Leg Dead End	West Leg Cactus Avenue	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg Frederick Street	East Leg Cactus Avenue	South Leg Dead End	West Leg Cactus Avenue	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

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Location: Moreno Valley
N/S: Frederick Street
E/W: Cactus Avenue

Date: 4/3/2018
Date: Tuesday

BICYCLES

	Southbound Frederick Street			Westbound Cactus Avenue			Northbound Dead End			Eastbound Cactus Avenue			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

	Southbound Frederick Street			Westbound Cactus Avenue			Northbound Dead End			Eastbound Cactus Avenue			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	1	0	0	0	1	0	0	0	0	0	1	0	3

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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	8	33	2	0	43	0	10	12	4	22	0	27	3	0	30	1	0	1	0	2	4	97	10
07:15 AM	7	54	1	0	62	1	16	12	5	29	1	23	6	1	30	1	0	0	0	1	6	122	12
07:30 AM	6	69	0	0	75	4	12	20	6	36	1	51	4	1	56	0	1	0	0	1	7	168	17
07:45 AM	18	77	0	0	95	5	15	18	9	38	1	58	4	1	63	0	0	0	0	0	10	196	20
Total	39	233	3	0	275	10	53	62	24	125	3	159	17	3	179	2	1	1	0	4	27	583	61
08:00 AM	4	40	2	0	46	5	15	12	4	32	0	39	5	0	44	0	1	2	1	3	5	125	13
08:15 AM	8	53	2	0	63	3	9	16	9	28	1	43	2	0	46	1	2	0	0	3	9	140	14
08:30 AM	7	45	1	0	53	4	6	7	3	17	2	32	1	1	35	1	0	1	0	2	4	107	11
08:45 AM	3	36	1	0	40	0	11	5	0	16	1	36	2	0	39	0	2	0	0	2	0	97	9
Total	22	174	6	0	202	12	41	40	16	93	4	150	10	1	164	2	5	3	1	10	18	469	48
Grand Total	61	407	9	0	477	22	94	102	40	218	7	309	27	4	343	4	6	4	1	14	45	1052	109
Apprch %	12.8	85.3	1.9			10.1	43.1	46.8			2	90.1	7.9			28.6	42.9	28.6					
Total %	5.8	38.7	0.9		45.3	2.1	8.9	9.7		20.7	0.7	29.4	2.6		32.6	0.4	0.6	0.4		1.3	4.1	95.9	
Passenger Vehicles	54	396	7		457	19	91	86		235	5	301	23		332	1	4	1		7	0	0	103
% Passenger Vehicles	88.5	97.3	77.8	0	95.8	86.4	96.8	84.3	97.5	91.1	71.4	97.4	85.2	75	95.7	25	66.7	25	100	46.7	0	0	9
Large 2 Axle Vehicles	0	9	2		11	1	0	2		3	1	6	1		8	2	1	3		6	0	0	2
% Large 2 Axle Vehicles	0	2.2	22.2	0	2.3	4.5	0	2	0	1.2	14.3	1.9	3.7	0	2.3	50	16.7	75	0	40	0	0	2
3 Axle Vehicles	2	2	0		4	0	2	4		6	0	2	0		2	1	0	0		1	0	0	1
% 3 Axle Vehicles	3.3	0.5	0	0	0.8	0	2.1	3.9	0	2.3	0	0.6	0	0	0.6	25	0	0	0	6.7	0	0	1
4+ Axle Trucks	5	0	0		5	2	1	10		14	1	0	3		5	0	1	0		1	0	0	2
% 4+ Axle Trucks	8.2	0	0	0	1	9.1	1.1	9.8	2.5	5.4	14.3	0	11.1	25	1.4	0	16.7	0	0	6.7	0	0	2

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	6	69	0	75	4	12	**20**	36	**1**	51	4	56	0	1	0	1	1
07:45 AM	**18**	**77**	0	**95**	**5**	**15**	18	**38**	1	**58**	4	**63**	0	0	0	0	**1**
08:00 AM	4	40	**2**	46	5	15	12	32	0	39	**5**	44	0	1	**2**	**3**	1
08:15 AM	8	53	2	63	3	9	16	28	1	43	2	46	**1**	**2**	0	3	1
Total Volume	36	239	4	279	17	51	66	134	3	191	15	209	1	4	2	7	6
% App. Total	12.9	85.7	1.4		12.7	38.1	49.3		1.4	91.4	7.2		14.3	57.1	28.6		
PHF	.500	.776	.500	.734	.850	.850	.825	.882	.750	.823	.750	.829	.250	.500	.250	.583	.8

Counts Unlimited
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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
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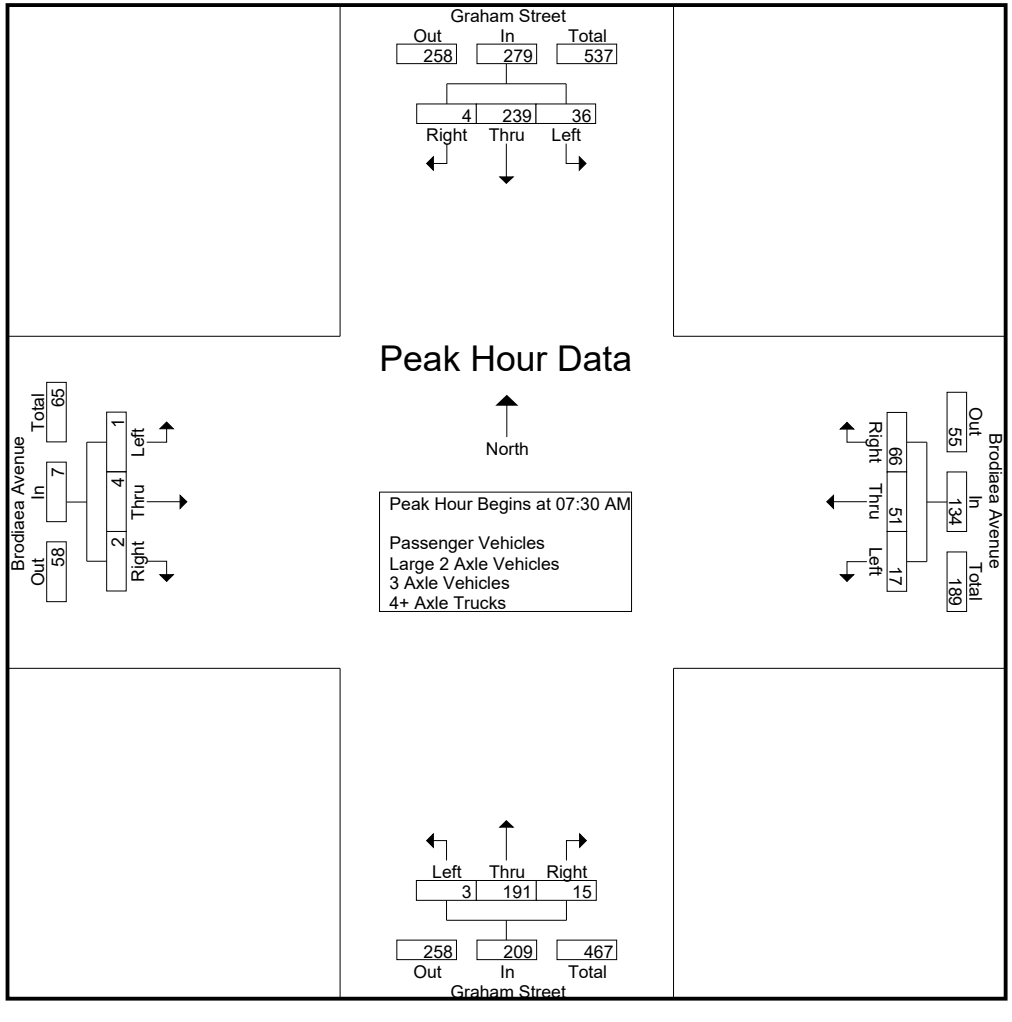

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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:30 AM				07:15 AM				07:30 AM				08:00 AM				
+0 mins.	6	69	0	75	1	**16**	12	29	**1**	51	4	56	0	1	**2**	**3**	
+15 mins.	**18**	**77**	0	**95**	4	12	**20**	36	1	**58**	4	**63**	**1**	**2**	0	3	
+30 mins.	4	40	**2**	46	**5**	15	18	**38**	0	39	**5**	44	1	0	1	2	
+45 mins.	8	53	2	63	5	15	12	32	1	43	2	46	0	2	0	2	
Total Volume	36	239	4	279	15	58	62	135	3	191	15	209	2	5	3	10	
% App. Total	12.9	85.7	1.4		11.1	43	45.9		1.4	91.4	7.2		20	50	30		
PHF	.500	.776	.500	.734	.750	.906	.775	.888	.750	.823	.750	.829	.500	.625	.375	.833	

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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	7	29	0	0	36	0	10	8	4	18	0	25	2	0	27	0	0	0	0	0	4	81	8
07:15 AM	5	52	1	0	58	1	15	8	4	24	0	23	6	1	29	0	0	0	0	0	5	111	11
07:30 AM	5	68	0	0	73	4	12	17	6	33	1	50	4	1	55	0	0	0	0	0	7	161	16
07:45 AM	15	77	0	0	92	5	15	18	9	38	1	58	3	1	62	0	0	0	0	0	10	192	20
Total	32	226	1	0	259	10	52	51	23	113	2	156	15	3	173	0	0	0	0	0	26	545	57
08:00 AM	4	40	2	0	46	3	14	12	4	29	0	36	4	0	40	0	1	1	1	2	5	117	12
08:15 AM	8	51	2	0	61	3	9	14	9	26	1	43	2	0	46	0	2	0	0	2	9	135	14
08:30 AM	7	44	1	0	52	3	6	6	3	15	2	30	0	0	32	1	0	0	0	1	3	100	10
08:45 AM	3	35	1	0	39	0	10	3	0	13	0	36	2	0	38	0	1	0	0	1	0	91	9
Total	22	170	6	0	198	9	39	35	16	83	3	145	8	0	156	1	4	1	1	6	17	443	46
Grand Total	54	396	7	0	457	19	91	86	39	196	5	301	23	3	329	1	4	1	1	6	43	988	103
Apprch %	11.8	86.7	1.5			9.7	46.4	43.9			1.5	91.5	7			16.7	66.7	16.7					
Total %	5.5	40.1	0.7		46.3	1.9	9.2	8.7		19.8	0.5	30.5	2.3		33.3	0.1	0.4	0.1		0.6	4.2	95.8	

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	68	0	73	4	12	17	33	**1**	50	**4**	55	0	0	0	0	1
07:45 AM	**15**	**77**	0	**92**	**5**	**15**	**18**	**38**	1	**58**	3	**62**	0	0	0	0	**1**
08:00 AM	4	40	**2**	46	3	14	12	29	0	36	4	40	0	1	**1**	**2**	1
08:15 AM	8	51	2	61	3	9	14	26	1	43	2	46	0	**2**	0	2	1
Total Volume	32	236	4	272	15	50	61	126	3	187	13	203	0	3	1	4	6
% App. Total	11.8	86.8	1.5		11.9	39.7	48.4		1.5	92.1	6.4		0	75	25		
PHF	.533	.766	.500	.739	.750	.833	.847	.829	.750	.806	.813	.819	.000	.375	.250	.500	.7

Counts Unlimited
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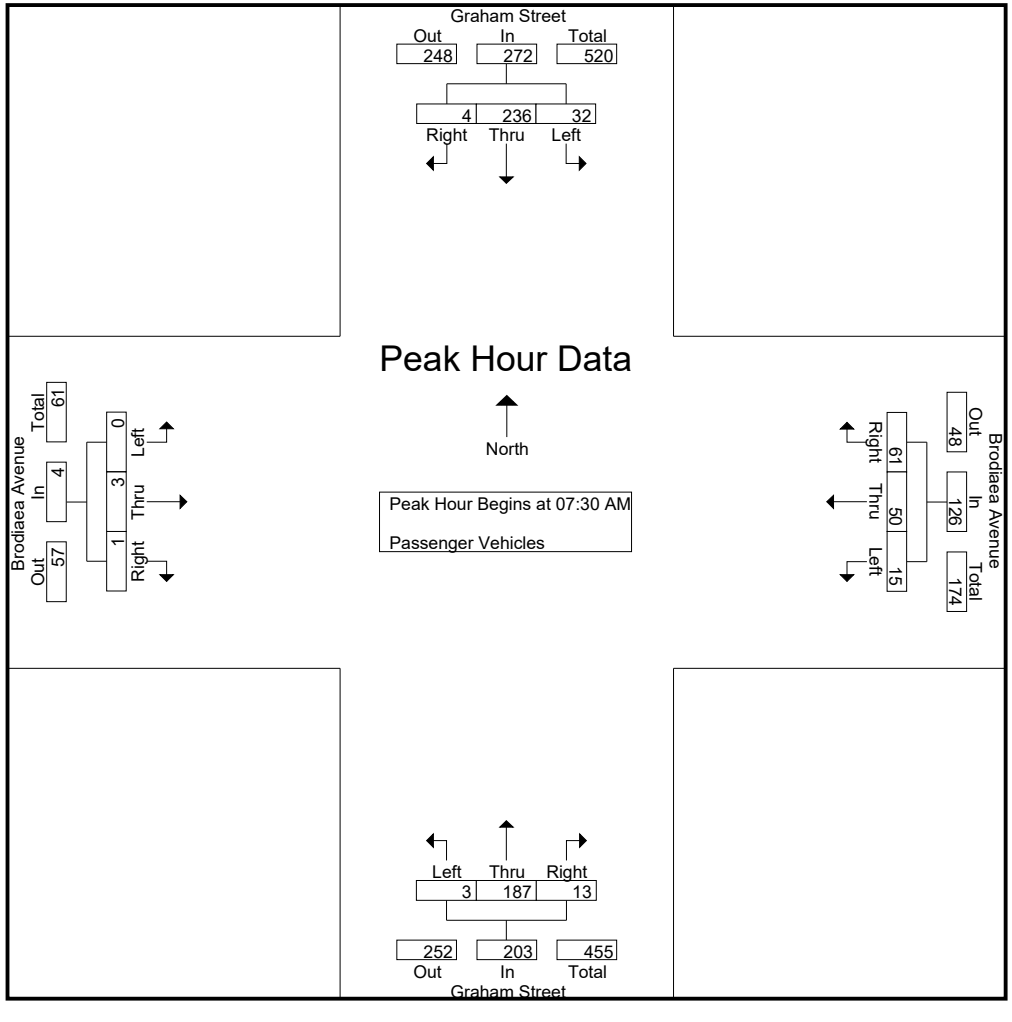
City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:30 AM				07:30 AM				07:30 AM				07:30 AM				
+0 mins.	5	68	0	73	4	12	17	33	**1**	50	**4**	55	0	0	0	0	
+15 mins.	**15**	**77**	0	**92**	**5**	**15**	**18**	**38**	1	**58**	3	**62**	0	0	0	0	
+30 mins.	4	40	**2**	46	3	14	12	29	0	36	4	40	0	1	**1**	**2**	
+45 mins.	8	51	2	61	3	9	14	26	1	43	2	46	0	**2**	0	2	
Total Volume	32	236	4	272	15	50	61	126	3	187	13	203	0	3	1	4	
% App. Total	11.8	86.8	1.5		11.9	39.7	48.4		1.5	92.1	6.4		0	75	25		
PHF	.533	.766	.500	.739	.750	.833	.847	.829	.750	.806	.813	.819	.000	.375	.250	.500	

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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	4	2	0	6	0	0	2	0	2	0	2	0	0	2	0	0	1	0	1	0	11	1
07:15 AM	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	3	
07:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	
Total	0	6	2	0	8	0	0	2	0	2	1	2	1	0	4	1	0	1	0	2	0	16	1
08:00 AM	0	0	0	0	0	1	0	0	0	1	0	3	0	0	3	0	0	1	0	1	0	5	
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	
08:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	3	
08:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	
Total	0	3	0	0	3	1	0	0	0	1	0	4	0	0	4	1	1	2	0	4	0	12	1
Grand Total	0	9	2	0	11	1	0	2	0	3	1	6	1	0	8	2	1	3	0	6	0	28	2
Apprch %	0	81.8	18.2			33.3	0	66.7			12.5	75	12.5			33.3	16.7	50					
Total %	0	32.1	7.1		39.3	3.6	0	7.1		10.7	3.6	21.4	3.6		28.6	7.1	3.6	10.7		21.4	0	100	

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	
07:45 AM	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	
08:00 AM	0	0	0	0	**1**	0	0	**1**	0	**3**	0	**3**	0	0	**1**	**1**	
08:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	**1**	0	0	1	
Total Volume	0	2	0	2	1	0	0	1	0	3	1	4	1	0	1	2	
% App. Total	0	100	0		100	0	0		0	75	25		50	0	50		
PHF	.000	.500	.000	.500	.250	.000	.000	.250	.000	.250	.250	.333	.250	.000	.250	.500	.4

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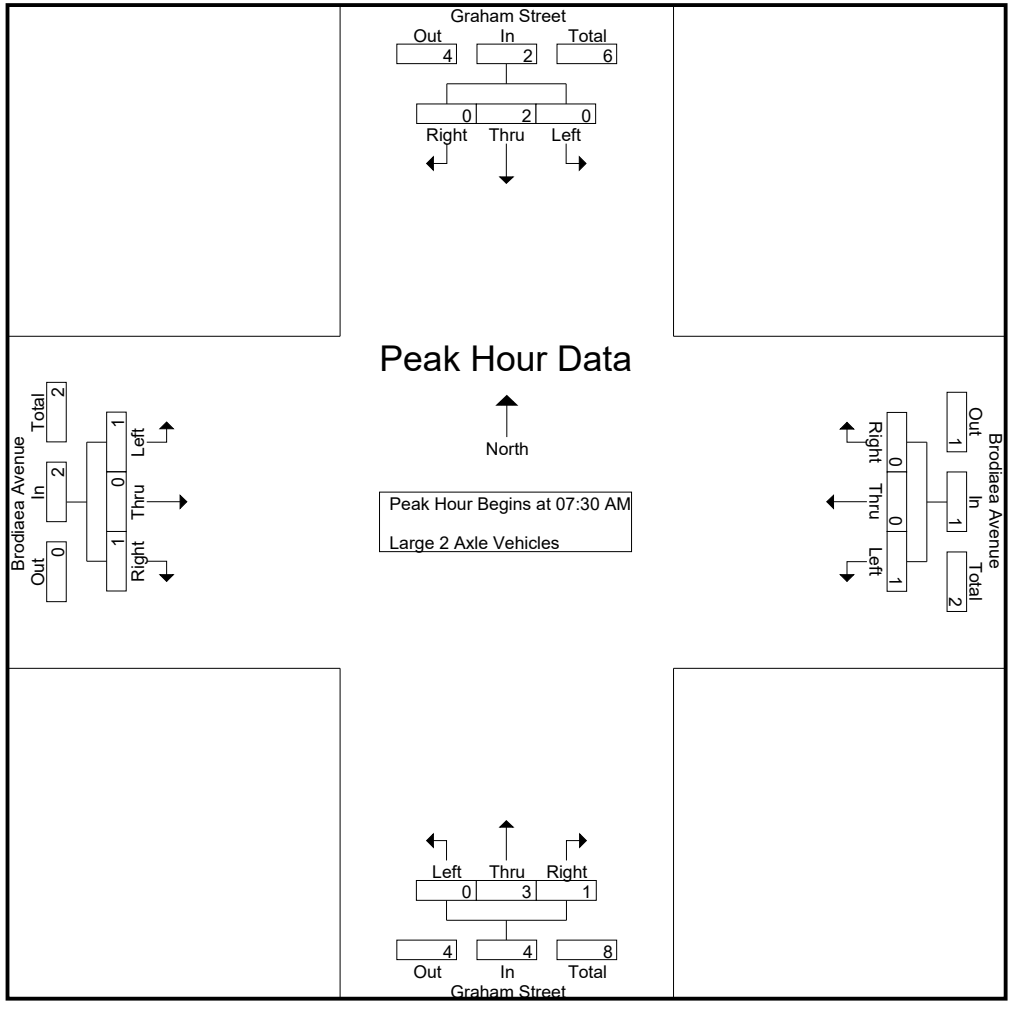
City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:30 AM				07:30 AM				07:30 AM				07:30 AM				
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	
+15 mins.	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	
+30 mins.	0	0	0	0	**1**	0	0	**1**	0	**3**	0	**3**	0	0	**1**	**1**	
+45 mins.	0	1	0	1	0	0	0	0	0	0	0	0	**1**	0	0	1	
Total Volume	0	2	0	2	1	0	0	1	0	3	1	4	1	0	1	2	
% App. Total	0	100	0		100	0	0		0	75	25		50	0	50		
PHF	.000	.500	.000	.500	.250	.000	.000	.250	.000	.250	.250	.333	.250	.000	.250	.500	

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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 3 Axle Vehicles

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	2	
07:15 AM	1	1	0	0	2	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	5	
07:30 AM	1	0	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	3	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	2	1	0	0	3	0	1	4	0	5	0	1	0	0	1	1	0	0	0	1	0	10	1
08:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	3	
Grand Total	2	2	0	0	4	0	2	4	0	6	0	2	0	0	2	1	0	0	0	1	0	13	1
Apprch %	50	50	0			0	33.3	66.7			0	100	0			100	0	0					
Total %	15.4	15.4	0		30.8	0	15.4	30.8		46.2	0	15.4	0		15.4	7.7	0	0		7.7	0	100	

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**1**	0	0	**1**	0	0	**1**	**1**	0	**1**	0	**1**	0	0	0	0	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
08:00 AM	0	0	0	0	0	**1**	0	1	0	0	0	0	0	0	0	0	
08:15 AM	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	1	1	0	2	0	1	1	2	0	1	0	1	0	0	0	0	
% App. Total	50	50	0		0	50	50		0	100	0		0	0	0		
PHF	.250	.250	.000	.500	.000	.250	.250	.500	.000	.250	.000	.250	.000	.000	.000	.000	.4

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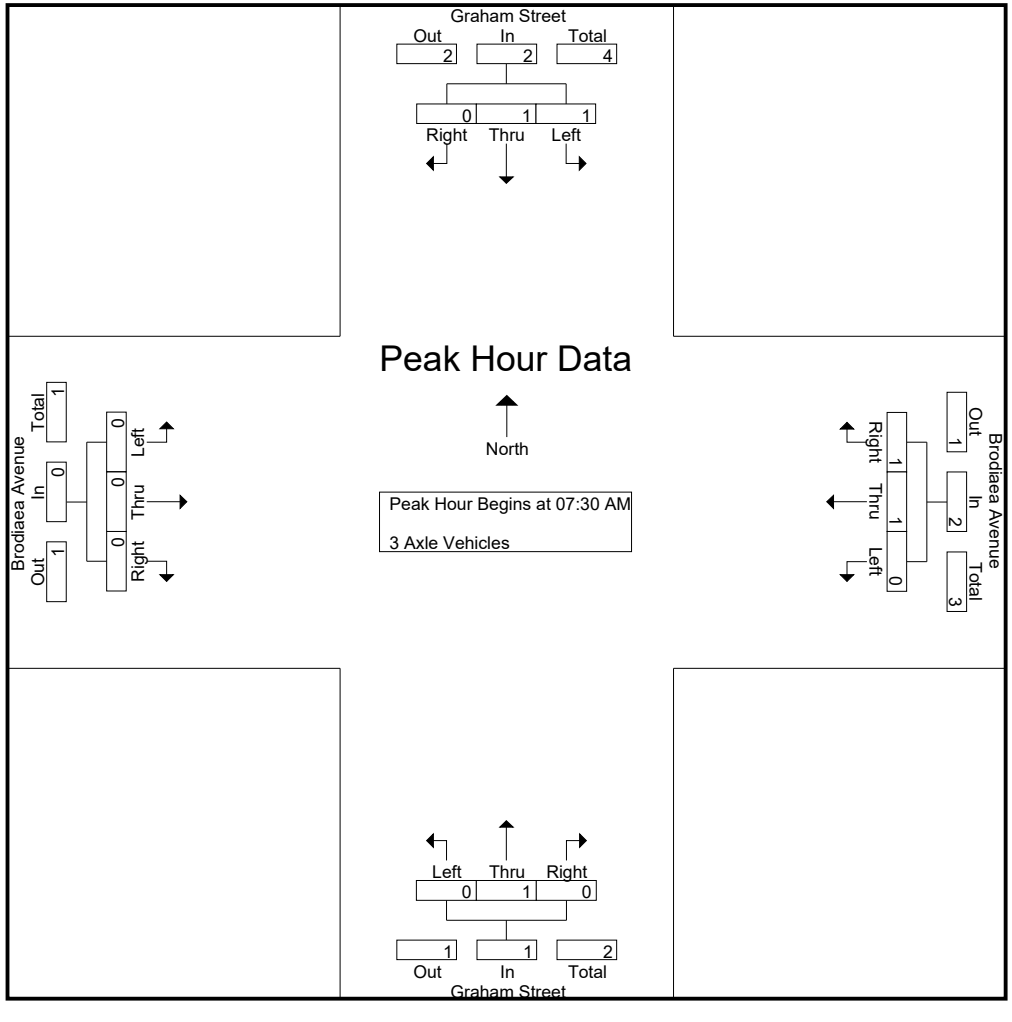
City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:30 AM				07:30 AM				07:30 AM				07:30 AM				
+0 mins.	**1**	0	0	**1**	0	0	**1**	**1**	0	**1**	0	**1**	0	0	0	0	
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+30 mins.	0	0	0	0	0	**1**	0	1	0	0	0	0	0	0	0	0	
+45 mins.	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	1	1	0	2	0	1	1	2	0	1	0	1	0	0	0	0	
% App. Total	50	50	0		0	50	50		0	100	0		0	0	0		
PHF	.250	.250	.000	.500	.000	.250	.250	.500	.000	.250	.000	.250	.000	.000	.000	.000	

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File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 4+ Axle Trucks

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
07:00 AM	1	0	0	0	1	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	3	
07:15 AM	1	0	0	0	1	0	0	2	1	2	0	0	0	0	0	0	0	0	0	0	1	3	
07:30 AM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	1	0	0	1	0	3	
07:45 AM	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Total	5	0	0	0	5	0	0	5	1	5	0	0	1	0	1	0	1	0	0	1	1	12	1
08:00 AM	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	2	
08:15 AM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	
08:30 AM	0	0	0	0	0	1	0	1	0	2	0	0	1	1	1	0	0	0	0	0	1	3	
08:45 AM	0	0	0	0	0	0	1	2	0	3	1	0	0	0	1	0	0	0	0	0	0	4	
Total	0	0	0	0	0	2	1	5	0	8	1	0	2	1	3	0	0	0	0	0	1	11	1
Grand Total	5	0	0	0	5	2	1	10	1	13	1	0	3	1	4	0	1	0	0	1	2	23	2
Apprch %	100	0	0			15.4	7.7	76.9			25	0	75			0	100	0					
Total %	21.7	0	0		21.7	8.7	4.3	43.5		56.5	4.3	0	13		17.4	0	4.3	0		4.3	8	92	

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	**1**	0	**1**	
07:45 AM	**3**	0	0	**3**	0	0	0	0	0	0	0	0	0	0	0	0	
08:00 AM	0	0	0	0	**1**	0	0	1	0	0	**1**	**1**	0	0	0	0	
08:15 AM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	
Total Volume	3	0	0	3	1	0	4	5	0	0	1	1	0	1	0	1	
% App. Total	100	0	0		20	0	80		0	0	100		0	100	0		
PHF	.250	.000	.000	.250	.250	.000	.500	.625	.000	.000	.250	.250	.000	.250	.000	.250	.8

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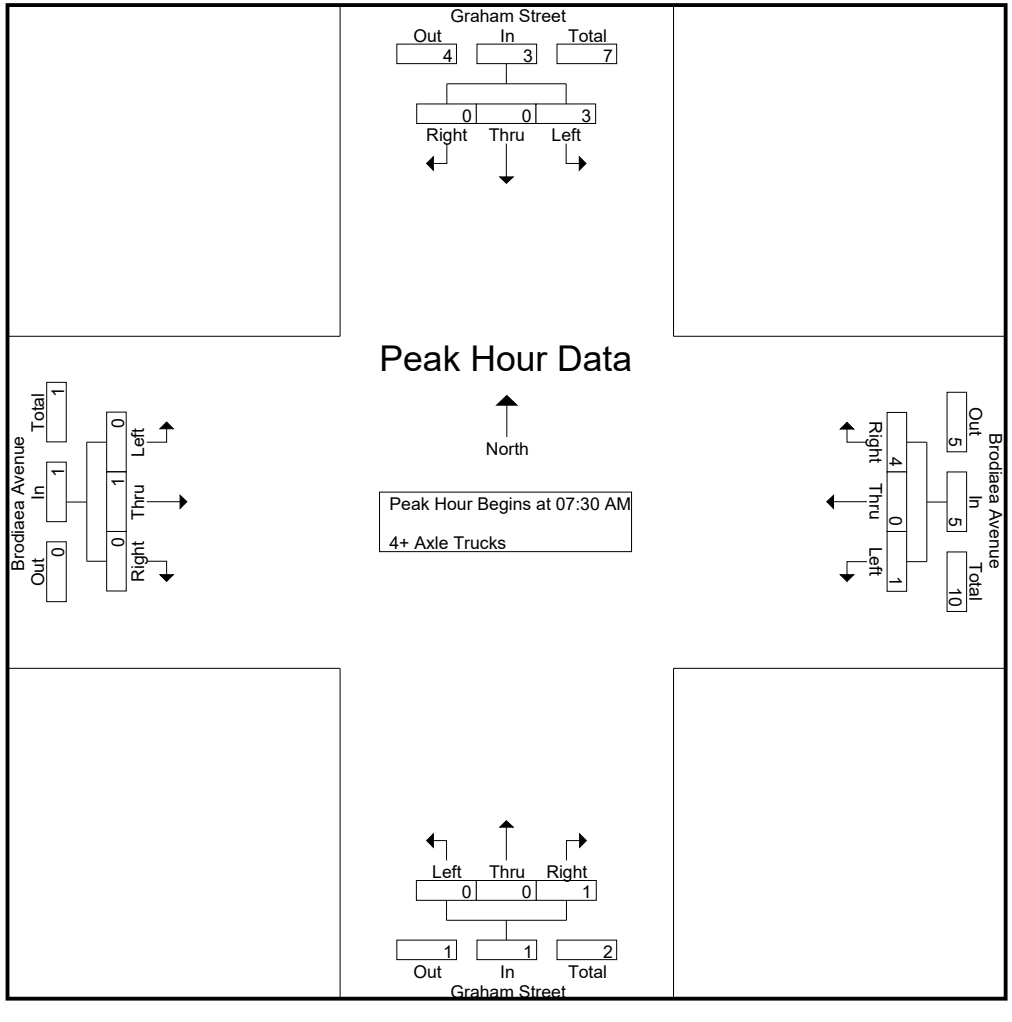
City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:30 AM				07:30 AM				07:30 AM				07:30 AM				
+0 mins.	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	**1**	0	**1**	
+15 mins.	**3**	0	0	**3**	0	0	0	0	0	0	0	0	0	0	0	0	
+30 mins.	0	0	0	0	**1**	0	0	1	0	0	**1**	**1**	0	0	0	0	
+45 mins.	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	
Total Volume	3	0	0	3	1	0	4	5	0	0	1	1	0	1	0	1	
% App. Total	100	0	0		20	0	80		0	0	100		0	100	0		
PHF	.250	.000	.000	.250	.250	.000	.500	.625	.000	.000	.250	.250	.000	.250	.000	.250	

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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	14	66	0	0	80	3	13	19	8	35	2	60	6	0	68	1	0	0	0	1	8	184	19
04:15 PM	21	72	2	0	95	1	14	13	6	28	0	63	3	1	66	1	3	1	1	5	8	194	20
04:30 PM	24	63	1	0	88	5	7	10	4	22	0	67	4	1	71	1	4	2	2	7	7	188	19
04:45 PM	13	63	0	0	76	7	11	18	10	36	1	75	4	1	80	0	2	0	0	2	11	194	20
Total	72	264	3	0	339	16	45	60	28	121	3	265	17	3	285	3	9	3	3	15	34	760	79
05:00 PM	21	61	1	0	83	11	5	6	5	22	1	63	6	0	70	2	4	2	1	8	6	183	18
05:15 PM	17	73	0	0	90	7	8	6	4	21	0	51	3	0	54	0	6	1	1	7	5	172	17
05:30 PM	13	75	2	0	90	7	14	9	1	30	0	53	2	0	55	0	2	0	0	2	1	177	17
05:45 PM	14	76	1	0	91	9	11	8	6	28	1	50	1	0	52	2	3	2	1	7	7	178	18
Total	65	285	4	0	354	34	38	29	16	101	2	217	12	0	231	4	15	5	3	24	19	710	72
Grand Total	137	549	7	0	693	50	83	89	44	222	5	482	29	3	516	7	24	8	6	39	53	1470	152
Apprch %	19.8	79.2	1			22.5	37.4	40.1			1	93.4	5.6			17.9	61.5	20.5					
Total %	9.3	37.3	0.5		47.1	3.4	5.6	6.1		15.1	0.3	32.8	2		35.1	0.5	1.6	0.5		2.7	3.5	96.5	
Passenger Vehicles	127	544	7		678	43	81	82		248	5	479	23		509	7	22	8		43	0	0	147
% Passenger Vehicles	92.7	99.1	100	0	97.8	86	97.6	92.1	95.5	93.2	100	99.4	79.3	66.7	98.1	100	91.7	100	100	95.6	0	0	9
Large 2 Axle Vehicles	7	5	0		12	1	0	4		7	0	3	3		6	0	0	0		0	0	0	2
% Large 2 Axle Vehicles	5.1	0.9	0	0	1.7	2	0	4.5	4.5	2.6	0	0.6	10.3	0	1.2	0	0	0	0	0	0	0	1
3 Axle Vehicles	1	0	0		1	1	1	0		2	0	0	0		0	0	0	0		0	0	0	
% 3 Axle Vehicles	0.7	0	0	0	0.1	2	1.2	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	2	0	0		2	5	1	3		9	0	0	3		4	0	2	0		2	0	0	1
% 4+ Axle Trucks	1.5	0	0	0	0.3	10	1.2	3.4	0	3.4	0	0	10.3	33.3	0.8	0	8.3	0	0	4.4	0	0	1

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	14	66	0	80	3	13	**19**	35	**2**	60	**6**	68	**1**	0	0	1	1
04:15 PM	21	**72**	**2**	**95**	1	**14**	13	28	0	63	3	66	1	3	1	5	**1**
04:30 PM	**24**	63	1	88	5	7	10	22	0	67	4	71	1	**4**	**2**	**7**	1
04:45 PM	13	63	0	76	**7**	11	18	**36**	1	**75**	4	**80**	0	2	0	2	1
Total Volume	72	264	3	339	16	45	60	121	3	265	17	285	3	9	3	15	7
% App. Total	21.2	77.9	0.9		13.2	37.2	49.6		1.1	93	6		20	60	20		
PHF	.750	.917	.375	.892	.571	.804	.789	.840	.375	.883	.708	.891	.750	.563	.375	.536	.9

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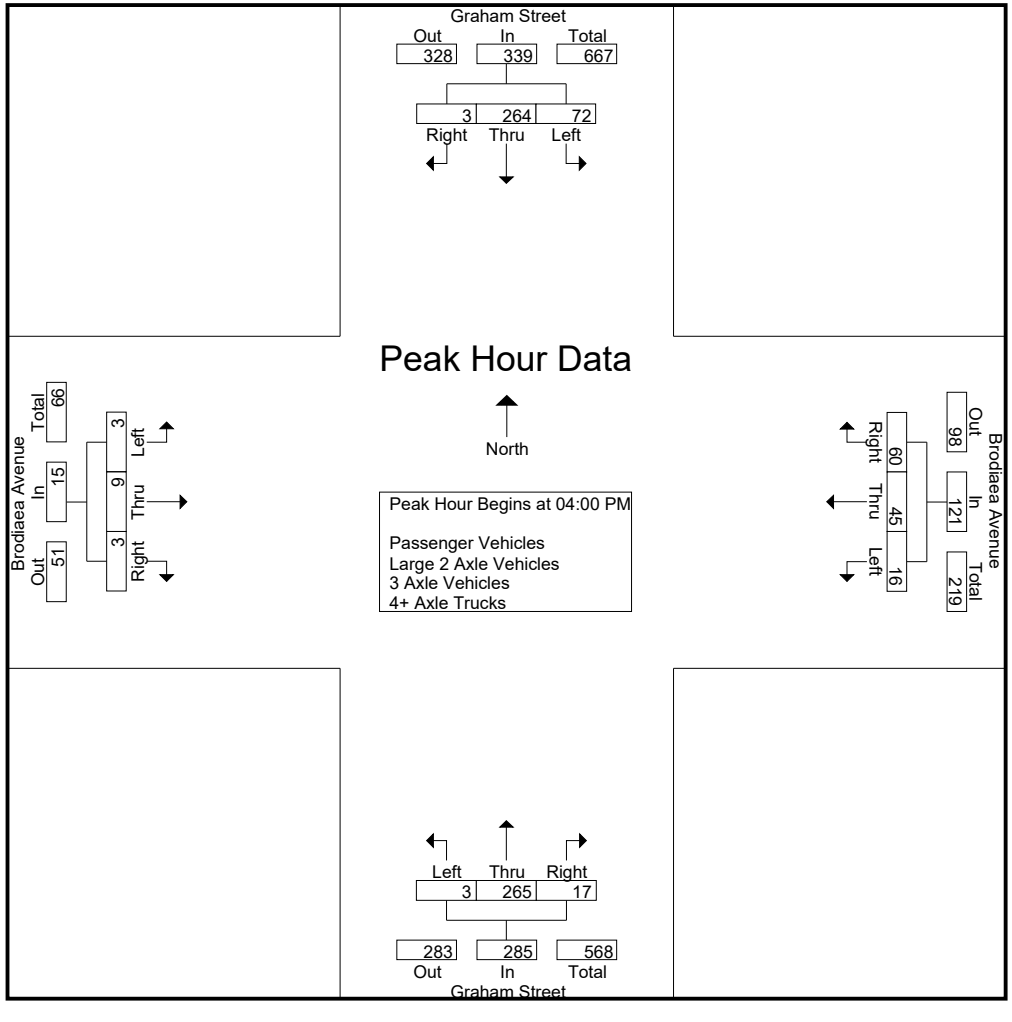
City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
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File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	05:00 PM				04:00 PM				04:15 PM				04:30 PM				
+0 mins.	**21**	61	1	83	3	13	**19**	35	0	63	3	66	1	4	**2**	7	
+15 mins.	17	73	0	90	1	**14**	13	28	0	67	4	71	0	2	0	2	
+30 mins.	13	75	**2**	90	5	7	10	22	**1**	**75**	4	**80**	**2**	4	2	**8**	
+45 mins.	14	**76**	1	**91**	**7**	11	18	**36**	1	63	**6**	70	0	**6**	1	7	
Total Volume	65	285	4	354	16	45	60	121	2	268	17	287	3	16	5	24	
% App. Total	18.4	80.5	1.1		13.2	37.2	49.6		0.7	93.4	5.9		12.5	66.7	20.8		
PHF	.774	.938	.500	.973	.571	.804	.789	.840	.500	.893	.708	.897	.375	.667	.625	.750	

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File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	14	66	0	0	80	1	13	18	8	32	2	60	5	0	67	1	0	0	0	1	8	180	18
04:15 PM	20	71	2	0	93	1	13	11	5	25	0	63	1	1	64	1	2	1	1	4	7	186	19
04:30 PM	22	62	1	0	85	5	7	8	4	20	0	67	3	0	70	1	4	2	2	7	6	182	18
04:45 PM	13	61	0	0	74	6	11	17	10	34	1	75	4	1	80	0	2	0	0	2	11	190	20
Total	69	260	3	0	332	13	44	54	27	111	3	265	13	2	281	3	8	3	3	14	32	738	77
05:00 PM	17	61	1	0	79	8	5	6	5	19	1	61	4	0	66	2	4	2	1	8	6	172	17
05:15 PM	16	72	0	0	88	7	8	5	3	20	0	50	3	0	53	0	5	1	1	6	4	167	17
05:30 PM	12	75	2	0	89	6	13	9	1	28	0	53	2	0	55	0	2	0	0	2	1	174	17
05:45 PM	13	76	1	0	90	9	11	8	6	28	1	50	1	0	52	2	3	2	1	7	7	177	18
Total	58	284	4	0	346	30	37	28	15	95	2	214	10	0	226	4	14	5	3	23	18	690	70
Grand Total	127	544	7	0	678	43	81	82	42	206	5	479	23	2	507	7	22	8	6	37	50	1428	147
Apprch %	18.7	80.2	1			20.9	39.3	39.8			1	94.5	4.5			18.9	59.5	21.6					
Total %	8.9	38.1	0.5		47.5	3	5.7	5.7		14.4	0.4	33.5	1.6		35.5	0.5	1.5	0.6		2.6	3.4	96.6	

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	14	66	0	80	1	**13**	**18**	32	**2**	60	**5**	67	**1**	0	0	1	1
04:15 PM	20	**71**	**2**	**93**	1	13	11	25	0	63	1	64	1	2	1	4	1
04:30 PM	**22**	62	1	85	5	7	8	20	0	67	3	70	1	**4**	**2**	**7**	1
04:45 PM	13	61	0	74	**6**	11	17	**34**	1	**75**	4	**80**	0	2	0	2	**1**
Total Volume	69	260	3	332	13	44	54	111	3	265	13	281	3	8	3	14	7
% App. Total	20.8	78.3	0.9		11.7	39.6	48.6		1.1	94.3	4.6		21.4	57.1	21.4		
PHF	.784	.915	.375	.892	.542	.846	.750	.816	.375	.883	.650	.878	.750	.500	.375	.500	.9

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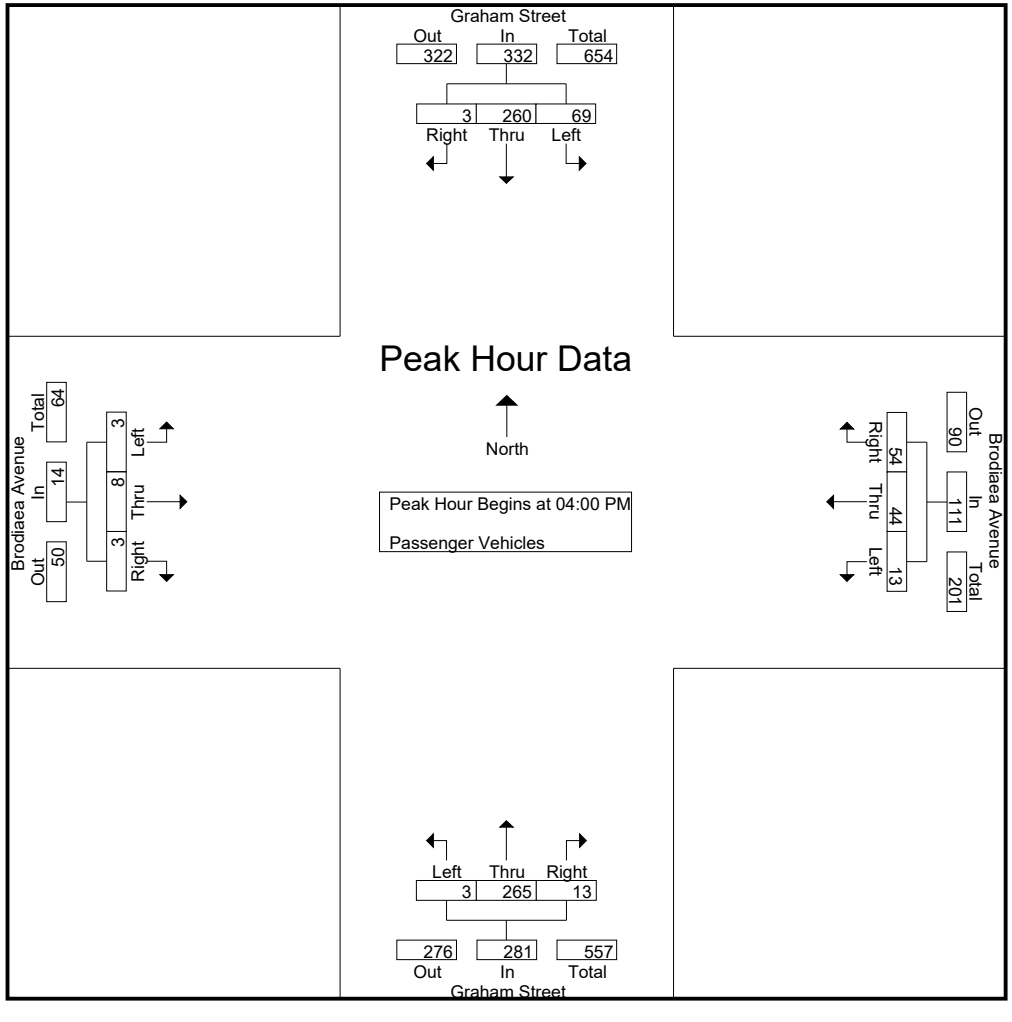
City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Graham Street
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File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	14	66	0	80	1	**13**	**18**	32	**2**	60	**5**	67	**1**	0	0	1	
+15 mins.	20	**71**	**2**	**93**	1	13	11	25	0	63	1	64	1	2	1	4	
+30 mins.	**22**	62	1	85	5	7	8	20	0	67	3	70	1	**4**	**2**	**7**	
+45 mins.	13	61	0	74	**6**	11	17	**34**	1	**75**	4	**80**	0	2	0	2	
Total Volume	69	260	3	332	13	44	54	111	3	265	13	281	3	8	3	14	
% App. Total	20.8	78.3	0.9		11.7	39.6	48.6		1.1	94.3	4.6		21.4	57.1	21.4		
PHF	.784	.915	.375	.892	.542	.846	.750	.816	.375	.883	.650	.878	.750	.500	.375	.500	

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City of Moreno Valley
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Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	
04:15 PM	1	1	0	0	2	0	0	2	1	2	0	0	1	0	1	0	0	0	0	0	1	5	
04:30 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
04:45 PM	0	2	0	0	2	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	4	
Total	2	4	0	0	6	1	0	3	1	4	0	0	2	0	2	0	0	0	0	0	1	12	1
05:00 PM	3	0	0	0	3	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	6	
05:15 PM	0	1	0	0	1	0	0	1	1	1	0	1	0	0	1	0	0	0	0	0	1	3	
05:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
05:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Total	5	1	0	0	6	0	0	1	1	1	0	3	1	0	4	0	0	0	0	0	1	11	1
Grand Total	7	5	0	0	12	1	0	4	2	5	0	3	3	0	6	0	0	0	0	0	2	23	2
Apprch %	58.3	41.7	0			20	0	80			0	50	50			0	0	0					
Total %	30.4	21.7	0		52.2	4.3	0	17.4		21.7	0	13	13		26.1	0	0	0		0	8	92	

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	
04:15 PM	**1**	1	0	**2**	0	0	**2**	**2**	0	0	1	1	0	0	0	0	
04:30 PM	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
04:45 PM	0	**2**	0	2	**1**	0	1	2	0	0	0	0	0	0	0	0	
Total Volume	2	4	0	6	1	0	3	4	0	0	2	2	0	0	0	0	
% App. Total	33.3	66.7	0		25	0	75		0	0	100		0	0	0		
PHF	.500	.500	.000	.750	.250	.000	.375	.500	.000	.000	.500	.500	.000	.000	.000	.000	.6

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File Name : 08_MRV_Graham_Brodiea
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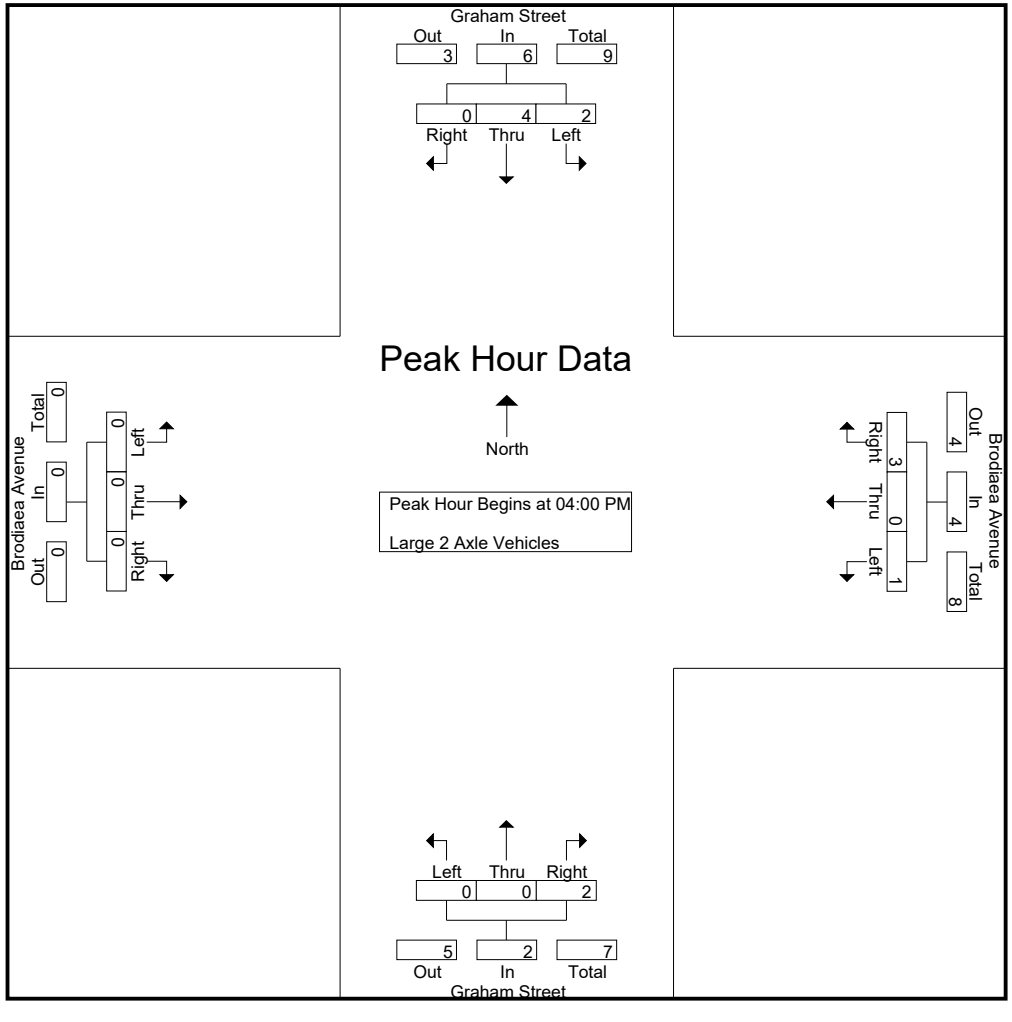

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Site Code : 05118259
Start Date : 4/3/2018
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	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	
+15 mins.	**1**	1	0	**2**	0	0	**2**	**2**	0	0	1	1	0	0	0	0	
+30 mins.	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
+45 mins.	0	**2**	0	2	**1**	0	1	2	0	0	0	0	0	0	0	0	
Total Volume	2	4	0	6	1	0	3	4	0	0	2	2	0	0	0	0	
% App. Total	33.3	66.7	0		25	0	75		0	0	100		0	0	0		
PHF	.500	.500	.000	.750	.250	.000	.375	.500	.000	.000	.500	.500	.000	.000	.000	.000	

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File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 3 Axle Vehicles

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	
05:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Grand Total	1	0	0	0	1	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	
Apprch %	100	0	0			50	50	0			0	0	0			0	0	0					
Total %	33.3	0	0		33.3	33.3	33.3	0		66.7	0	0	0		0	0	0	0		0	0	100	

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	
04:15 PM	0	0	0	0	0	**1**	0	1	0	0	0	0	0	0	0	0	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	
% App. Total	0	0	0		50	50	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.5

Counts Unlimited
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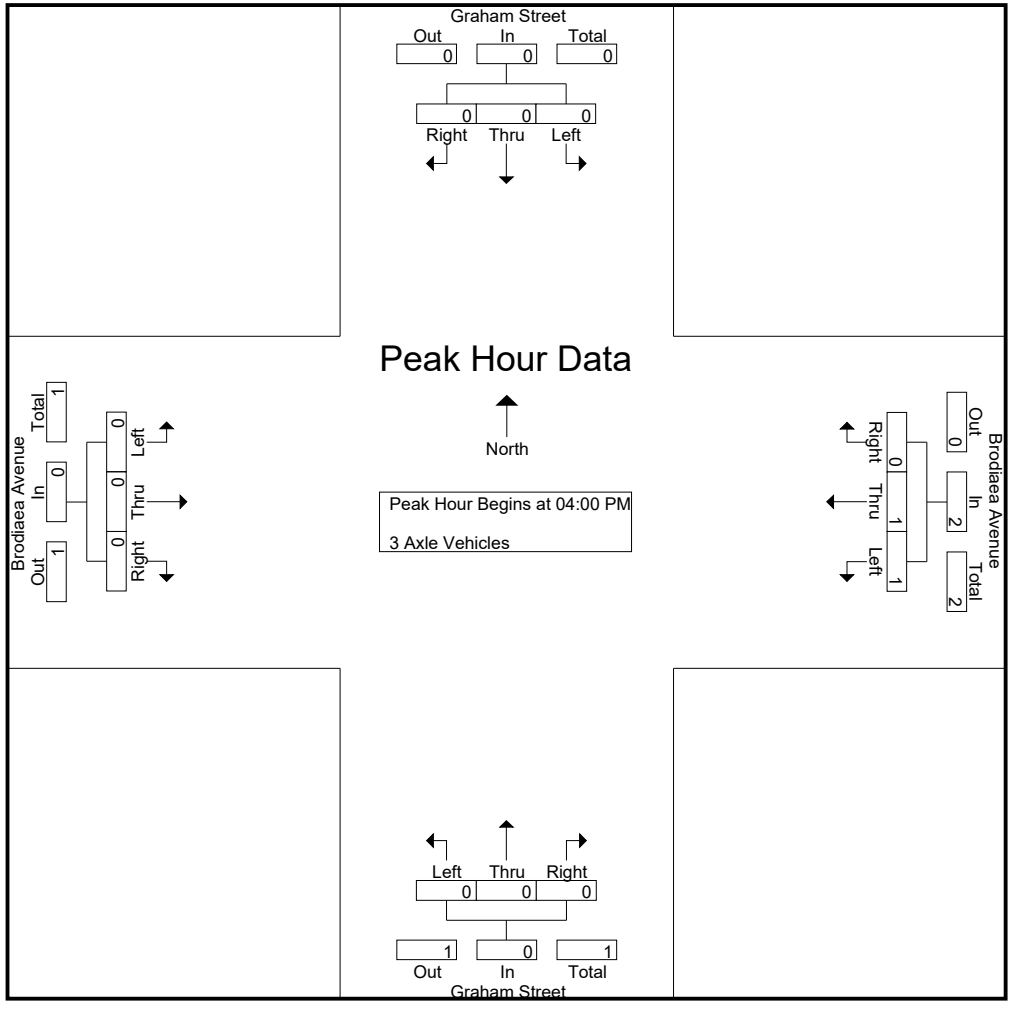
(951) 268-6268

City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
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Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 3

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	
+15 mins.	0	0	0	0	0	**1**	0	1	0	0	0	0	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	
% App. Total	0	0	0		50	50	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	

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City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 1

Groups Printed- 4+ Axle Trucks

	Graham Street Southbound					Brodiaea Avenue Westbound					Graham Street Northbound					Brodiaea Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Tot
04:00 PM	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	2	
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	2	
04:30 PM	1	0	0	0	1	0	0	2	0	2	0	0	1	1	1	0	0	0	0	0	1	4	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	1	0	0	0	1	1	0	3	0	4	0	0	2	1	2	0	1	0	0	1	1	8	
05:00 PM	0	0	0	0	0	3	0	0	0	3	0	0	1	0	1	0	0	0	0	0	0	4	
05:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	
05:30 PM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	1	0	0	0	1	4	1	0	0	5	0	0	1	0	1	0	1	0	0	1	0	8	
Grand Total	2	0	0	0	2	5	1	3	0	9	0	0	3	1	3	0	2	0	0	2	1	16	1
Apprch %	100	0	0			55.6	11.1	33.3			0	0	100			0	100	0					
Total %	12.5	0	0		12.5	31.2	6.2	18.8		56.2	0	0	18.8		18.8	0	12.5	0		12.5	5.9	94.1	

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	**1**	0	1	**2**	0	0	0	0	0	0	0	0	
04:15 PM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	**1**	0	**1**	
04:30 PM	**1**	0	0	**1**	0	0	**2**	2	0	0	1	1	0	0	0	0	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	1	0	0	1	1	0	3	4	0	0	2	2	0	1	0	1	
% App. Total	100	0	0		25	0	75		0	0	100		0	100	0		
PHF	.250	.000	.000	.250	.250	.000	.375	.500	.000	.000	.500	.500	.000	.250	.000	.250	.5

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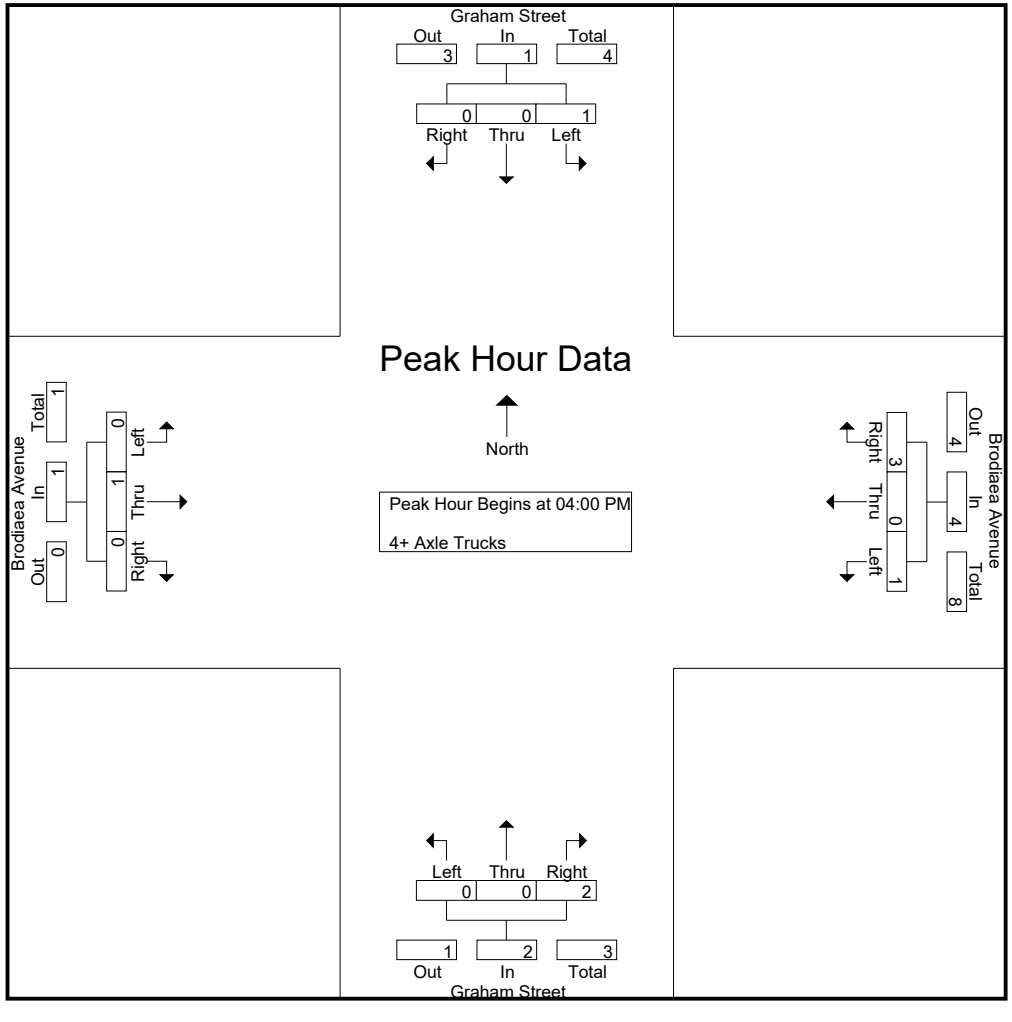
City of Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue
Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
Start Date : 4/3/2018
Page No : 2



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City of Moreno Valley
N/S: Graham Street
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Weather: Clear

File Name : 08_MRV_Graham_Brodiea
Site Code : 05118259
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Page No : 3

	Graham Street Southbound				Brodiaea Avenue Westbound				Graham Street Northbound				Brodiaea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. To
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	0	0	0	**1**	0	1	**2**	0	0	0	0	0	0	0	0	
+15 mins.	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	**1**	0	**1**	
+30 mins.	**1**	0	0	**1**	0	0	**2**	2	0	0	1	1	0	0	0	0	
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	1	0	0	1	1	0	3	4	0	0	2	2	0	1	0	1	
% App. Total	100	0	0		25	0	75		0	0	100		0	100	0		
PHF	.250	.000	.000	.250	.250	.000	.375	.500	.000	.000	.500	.500	.000	.250	.000	.250	

Location: Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue

Date: 4/3/2018
Date: Tuesday

PEDESTRIANS

	North Leg Graham Street	East Leg Brodiaea Avenue	South Leg Graham Street	West Leg Brodiaea Avenue	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	1	0	1	2
8:00 AM	1	2	0	0	3
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	1	3	0	1	5

	North Leg Graham Street	East Leg Brodiaea Avenue	South Leg Graham Street	West Leg Brodiaea Avenue	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	1	1	0	2
4:15 PM	0	1	0	0	1
4:30 PM	0	0	0	1	1
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	3	3
5:45 PM	0	0	0	1	1
TOTAL VOLUMES:	0	2	1	5	8

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Location: Moreno Valley
N/S: Graham Street
E/W: Brodiaea Avenue

Date: 4/3/2018
Date: Tuesday

BICYCLES

	Southbound Graham Street			Westbound Brodiaea Avenue			Northbound Graham Street			Eastbound Brodiaea Avenue			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	1	0	0	0	0	0	0	0	0	0	0	0	1

	Southbound Graham Street			Westbound Brodiaea Avenue			Northbound Graham Street			Eastbound Brodiaea Avenue			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

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email: counts@countsunlimited.com

City of Moreno Valley
Brodiaea Avenue
E/ Frederick Street
24 Hour Directional Classification Count

MRV002
Site Code: 051-18259

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/03/18	0	1	0	0	0	0	0	**1**	0	0	0	0	0	2
01:00	0	1	0	0	0	0	0	1	0	0	0	0	0	2
02:00	0	0	1	0	0	0	0	1	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	1	0	0	0	0	0	2
04:00	0	2	0	0	0	0	0	1	0	0	0	0	0	3
05:00	0	0	2	**2**	0	0	0	0	0	0	0	0	0	4
06:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
07:00	1	1	1	0	0	0	0	0	**1**	0	0	0	0	4
08:00	**2**	3	1	0	1	0	0	0	0	0	0	0	0	7
09:00	0	4	2	0	1	0	0	0	0	0	0	0	0	7
10:00	0	5	2	0	1	0	0	0	0	0	0	0	0	8
11:00	2	**11**	**5**	0	**3**	**1**	0	0	0	0	0	0	0	**22**
12 PM	0	4	3	0	0	0	0	0	0	0	0	0	0	7
13:00	0	11	3	0	**4**	0	0	0	0	0	0	0	0	**18**
14:00	0	8	2	0	0	**1**	0	0	0	0	0	0	0	11
15:00	0	5	**6**	0	3	0	0	0	0	0	0	0	0	14
16:00	**1**	10	1	0	1	1	0	0	0	0	0	0	0	14
17:00	1	**14**	2	0	0	1	0	0	0	0	0	0	0	18
18:00	1	3	2	0	0	1	0	0	0	0	0	0	0	7
19:00	0	3	2	0	1	0	0	0	0	0	0	0	0	6
20:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
21:00	1	3	0	0	0	0	0	0	0	0	0	0	0	4
22:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	9	104	37	2	15	5	0	5	1	0	0	0	0	178
Percent	5.1%	58.4%	20.8%	1.1%	8.4%	2.8%	0.0%	2.8%	0.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	11:00	05:00	11:00	11:00		00:00	07:00					11:00
Vol.	2	11	5	2	3	1		1	1					22
PM Peak	16:00	17:00	15:00		13:00	14:00								13:00
Vol.	1	14	6		4	1								18
Grand Total	9	104	37	2	15	5	0	5	1	0	0	0	0	178
Percent	5.1%	58.4%	20.8%	1.1%	8.4%	2.8%	0.0%	2.8%	0.6%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

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City of Moreno Valley
Brodiaea Avenue
E/ Frederick Street
24 Hour Directional Classification Count

MRV002
Site Code: 051-18259

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/03/18	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	**1**	2	0	0	0	**1**	0	0	0	0	0	0	0	4
02:00	0	7	0	0	0	1	0	0	0	0	0	0	0	8
03:00	0	4	0	0	0	1	0	0	0	0	0	0	0	5
04:00	0	15	4	0	0	0	0	0	0	0	0	0	0	19
05:00	1	19	4	0	2	0	0	0	0	0	0	0	0	26
06:00	1	33	7	**1**	**4**	0	0	0	**1**	0	0	0	0	47
07:00	0	**43**	**14**	0	4	1	0	0	0	0	0	0	0	**62**
08:00	0	38	8	0	2	1	0	**1**	0	0	0	0	0	50
09:00	1	29	8	0	2	1	0	0	0	0	0	0	0	41
10:00	0	33	11	0	1	1	0	0	0	0	0	0	0	46
11:00	0	33	9	0	2	1	0	0	0	0	0	0	0	45
12 PM	2	34	10	0	1	**1**	0	0	**1**	0	0	0	0	49
13:00	0	29	7	1	**2**	0	0	0	0	0	0	0	0	39
14:00	**6**	32	6	0	2	0	0	**1**	0	0	0	0	0	47
15:00	1	**46**	**11**	**2**	2	0	0	0	0	0	0	0	0	**62**
16:00	1	42	7	1	0	0	0	0	0	0	0	0	0	51
17:00	1	40	4	0	1	0	0	0	0	0	0	0	0	46
18:00	0	27	3	0	0	0	0	0	0	0	0	0	0	30
19:00	0	22	4	0	0	0	0	0	0	0	0	0	0	26
20:00	1	20	3	0	0	1	0	0	0	0	0	0	0	25
21:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
22:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
23:00	1	2	1	0	0	1	0	0	0	0	0	0	0	5
Total	17	563	122	5	25	11	0	2	2	0	0	0	0	747
Percent	2.3%	75.4%	16.3%	0.7%	3.3%	1.5%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	01:00	07:00	07:00	06:00	06:00	01:00		08:00	06:00					07:00
Vol.	1	43	14	1	4	1		1	1					62
PM Peak	14:00	15:00	15:00	15:00	13:00	12:00		14:00	12:00					15:00
Vol.	6	46	11	2	2	1		1	1					62
Grand Total	17	563	122	5	25	11	0	2	2	0	0	0	0	747
Percent	2.3%	75.4%	16.3%	0.7%	3.3%	1.5%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	

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City of Moreno Valley
Brodiaea Avenue
E/ Frederick Street
24 Hour Directional Classification Count

MRV002
Site Code: 051-18259

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/03/18	0	2	0	0	0	0	0	**1**	0	0	0	0	0	3
01:00	1	3	0	0	0	1	0	1	0	0	0	0	0	6
02:00	0	7	1	0	0	1	0	1	0	0	0	0	0	10
03:00	0	5	0	0	0	1	0	1	0	0	0	0	0	7
04:00	0	17	4	0	0	0	0	1	0	0	0	0	0	22
05:00	1	19	6	**2**	2	0	0	0	0	0	0	0	0	30
06:00	1	37	9	1	4	0	0	0	**1**	0	0	0	0	53
07:00	1	**44**	**15**	0	4	1	0	0	1	0	0	0	0	66
08:00	**2**	41	9	0	3	1	0	1	0	0	0	0	0	57
09:00	1	33	10	0	3	1	0	0	0	0	0	0	0	48
10:00	0	38	13	0	2	1	0	0	0	0	0	0	0	54
11:00	2	44	14	0	**5**	**2**	0	0	0	0	0	0	0	**67**
12 PM	2	38	13	0	1	**1**	0	0	**1**	0	0	0	0	56
13:00	0	40	10	1	**6**	0	0	0	0	0	0	0	0	57
14:00	**6**	40	8	0	2	1	0	**1**	0	0	0	0	0	58
15:00	1	51	**17**	**2**	5	0	0	0	0	0	0	0	0	**76**
16:00	2	52	8	1	1	1	0	0	0	0	0	0	0	65
17:00	2	**54**	6	0	1	1	0	0	0	0	0	0	0	64
18:00	1	30	5	0	0	1	0	0	0	0	0	0	0	37
19:00	0	25	6	0	1	0	0	0	0	0	0	0	0	32
20:00	1	25	3	0	0	1	0	0	0	0	0	0	0	30
21:00	1	10	0	0	0	0	0	0	0	0	0	0	0	11
22:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
23:00	1	5	1	0	0	1	0	0	0	0	0	0	0	8
Total	26	667	159	7	40	16	0	7	3	0	0	0	0	925
Percent	2.8%	72.1%	17.2%	0.8%	4.3%	1.7%	0.0%	0.8%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	05:00	11:00	11:00		00:00	06:00					11:00
Vol.	2	44	15	2	5	2		1	1					67
PM Peak	14:00	17:00	15:00	15:00	13:00	12:00		14:00	12:00					15:00
Vol.	6	54	17	2	6	1		1	1					76
Grand Total	26	667	159	7	40	16	0	7	3	0	0	0	0	925
Percent	2.8%	72.1%	17.2%	0.8%	4.3%	1.7%	0.0%	0.8%	0.3%	0.0%	0.0%	0.0%	0.0%	

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City of Moreno Valley
Frederick Drive
N/ Brodiaea Avenue
24 Hour Directional Classification Count

MRV001
Site Code: 051-18259

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/03/18	0	21	2	0	0	0	0	0	0	0	0	0	0	23
01:00	2	11	1	0	0	0	0	0	0	0	0	0	0	14
02:00	1	14	2	0	0	2	0	0	0	0	0	0	0	19
03:00	1	17	2	0	0	0	0	0	0	0	0	0	0	20
04:00	2	33	9	0	1	1	0	0	0	0	0	0	0	46
05:00	3	65	15	1	7	1	0	0	0	0	0	0	0	92
06:00	9	104	26	1	10	**7**	0	0	3	0	0	0	0	160
07:00	7	**211**	**57**	**5**	**16**	0	0	0	**6**	0	0	0	0	**302**
08:00	7	211	55	3	14	3	0	**2**	1	0	0	0	0	296
09:00	**10**	152	45	1	13	4	0	0	0	0	0	0	0	225
10:00	4	169	44	4	9	4	0	1	0	0	0	0	0	235
11:00	6	193	48	2	11	6	0	0	2	0	0	0	0	268
12 PM	**11**	186	52	0	5	1	0	**2**	**2**	0	0	0	0	259
13:00	6	203	47	**3**	12	1	0	0	0	0	0	0	0	272
14:00	6	229	54	0	**13**	**3**	0	1	0	0	0	0	0	306
15:00	7	235	**71**	2	8	1	0	0	0	0	0	0	0	324
16:00	6	**245**	60	1	11	3	0	1	0	0	0	0	0	**327**
17:00	6	203	49	0	4	3	0	0	0	0	0	0	0	265
18:00	4	132	38	1	8	0	0	1	0	0	0	0	0	184
19:00	2	150	26	1	4	1	0	0	1	0	0	0	0	185
20:00	7	97	18	1	0	2	0	0	0	0	0	0	0	125
21:00	3	65	11	1	1	0	0	0	0	0	0	0	0	81
22:00	0	51	7	0	1	0	0	0	0	0	0	0	0	59
23:00	0	31	5	0	2	1	0	0	0	0	0	0	0	39
Total	110	3028	744	27	150	44	0	8	15	0	0	0	0	4126
Percent	2.7%	73.4%	18.0%	0.7%	3.6%	1.1%	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	07:00	07:00	07:00	06:00		08:00	07:00					07:00
Vol.	10	211	57	5	16	7		2	6					302
PM Peak	12:00	16:00	15:00	13:00	14:00	14:00		12:00	12:00					16:00
Vol.	11	245	71	3	13	3		2	2					327
Grand Total	110	3028	744	27	150	44	0	8	15	0	0	0	0	4126
Percent	2.7%	73.4%	18.0%	0.7%	3.6%	1.1%	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	

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24 Hour Directional Classification Count

MRV001
Site Code: 051-18259

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/03/18	0	31	8	0	0	0	0	0	0	0	0	0	0	39
01:00	1	17	2	0	0	0	0	0	0	0	0	0	0	20
02:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
03:00	0	25	3	0	0	0	0	0	0	0	0	0	0	28
04:00	0	39	12	0	2	0	0	0	0	0	0	0	0	53
05:00	1	99	27	0	2	1	0	0	1	0	0	0	0	131
06:00	4	109	25	**2**	6	2	0	1	2	0	0	0	0	151
07:00	**6**	**192**	36	1	6	1	2	3	1	**1**	0	0	0	**249**
08:00	1	134	35	1	**18**	1	4	2	2	0	0	0	0	198
09:00	1	132	33	1	11	0	**8**	3	**3**	0	0	0	0	192
10:00	0	131	36	2	4	0	4	4	1	0	0	0	0	182
11:00	1	185	**39**	2	9	**4**	1	**5**	1	0	0	0	0	247
12 PM	4	236	51	1	5	2	1	2	0	0	0	0	0	302
13:00	1	250	71	2	12	2	**2**	3	**2**	1	0	0	0	346
14:00	**7**	224	58	0	8	2	2	**6**	0	0	0	0	0	307
15:00	6	285	60	1	**20**	2	0	2	1	0	0	**1**	0	378
16:00	5	299	**74**	**4**	16	0	1	5	1	**2**	0	0	**1**	408
17:00	6	**382**	63	1	8	0	0	1	1	0	0	1	0	**463**
18:00	0	277	39	2	9	1	0	0	0	0	0	0	1	329
19:00	1	171	36	1	11	**3**	0	1	1	0	0	0	0	225
20:00	1	187	33	1	2	0	0	0	0	0	0	0	0	224
21:00	0	124	18	1	0	0	1	1	0	0	0	0	0	145
22:00	0	97	14	0	1	0	0	0	0	0	0	0	0	112
23:00	1	54	11	0	1	0	0	0	0	0	0	0	0	67
Total	47	3686	786	23	151	21	26	39	17	4	0	2	2	4804
Percent	1.0%	76.7%	16.4%	0.5%	3.1%	0.4%	0.5%	0.8%	0.4%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	11:00	06:00	08:00	11:00	09:00	11:00	09:00	07:00				07:00
Vol.	6	192	39	2	18	4	8	5	3	1				249
PM Peak	14:00	17:00	16:00	16:00	15:00	19:00	13:00	14:00	13:00	16:00		15:00	16:00	17:00
Vol.	7	382	74	4	20	3	2	6	2	2		1	1	463
Grand Total	47	3686	786	23	151	21	26	39	17	4	0	2	2	4804
Percent	1.0%	76.7%	16.4%	0.5%	3.1%	0.4%	0.5%	0.8%	0.4%	0.1%	0.0%	0.0%	0.0%	

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MRV001
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Northbound, Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/03/18	0	52	10	0	0	0	0	0	0	0	0	0	0	62
01:00	3	28	3	0	0	0	0	0	0	0	0	0	0	34
02:00	1	20	4	0	0	2	0	0	0	0	0	0	0	27
03:00	1	42	5	0	0	0	0	0	0	0	0	0	0	48
04:00	2	72	21	0	3	1	0	0	0	0	0	0	0	99
05:00	4	164	42	1	9	2	0	0	1	0	0	0	0	223
06:00	**13**	213	51	3	16	9	0	1	5	0	0	0	0	311
07:00	13	**403**	**93**	**6**	22	1	2	3	**7**	**1**	0	0	0	**551**
08:00	8	345	90	4	**32**	4	4	4	3	0	0	0	0	494
09:00	11	284	78	2	24	4	**8**	3	3	0	0	0	0	417
10:00	4	300	80	6	13	4	4	**5**	1	0	0	0	0	417
11:00	7	378	87	4	20	**10**	1	5	3	0	0	0	0	515
12 PM	**15**	422	103	1	10	3	1	4	**2**	0	0	0	0	561
13:00	7	453	118	**5**	24	3	**2**	3	2	1	0	0	0	618
14:00	13	453	112	0	21	**5**	2	**7**	0	0	0	0	0	613
15:00	13	520	131	3	**28**	3	0	2	1	0	0	**1**	0	702
16:00	11	544	**134**	5	27	3	1	6	1	**2**	0	0	**1**	**735**
17:00	12	**585**	112	1	12	3	0	1	1	0	0	1	0	728
18:00	4	409	77	3	17	1	0	1	0	0	0	0	1	513
19:00	3	321	62	2	15	4	0	1	2	0	0	0	0	410
20:00	8	284	51	2	2	2	0	0	0	0	0	0	0	349
21:00	3	189	29	2	1	0	1	1	0	0	0	0	0	226
22:00	0	148	21	0	2	0	0	0	0	0	0	0	0	171
23:00	1	85	16	0	3	1	0	0	0	0	0	0	0	106
Total	157	6714	1530	50	301	65	26	47	32	4	0	2	2	8930
Percent	1.8%	75.2%	17.1%	0.6%	3.4%	0.7%	0.3%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	07:00	08:00	11:00	09:00	10:00	07:00	07:00				07:00
Vol.	13	403	93	6	32	10	8	5	7	1				551
PM Peak	12:00	17:00	16:00	13:00	15:00	14:00	13:00	14:00	12:00	16:00		15:00	16:00	16:00
Vol.	15	585	134	5	28	5	2	7	2	2		1	1	735
Grand Total	157	6714	1530	50	301	65	26	47	32	4	0	2	2	8930
Percent	1.8%	75.2%	17.1%	0.6%	3.4%	0.7%	0.3%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	

APPENDIX 3.2:

EXISTING (2018) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	33	22	50	61	40	31
Future Vol, veh/h	33	22	50	61	40	31
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	38	25	57	70	46	36

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	185	58	0	0	127	0
Stage 1	57	-	-	-	-	-
Stage 2	128	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	809	1014	-	-	1472	-
Stage 1	971	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	784	1013	-	-	1472	-
Mov Cap-2 Maneuver	804	-	-	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	903	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	4.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	804	1013	1472	-
HCM Lane V/C Ratio	-	-	0.047	0.025	0.031	-
HCM Control Delay (s)	-	-	9.7	8.6	7.5	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0.1	-

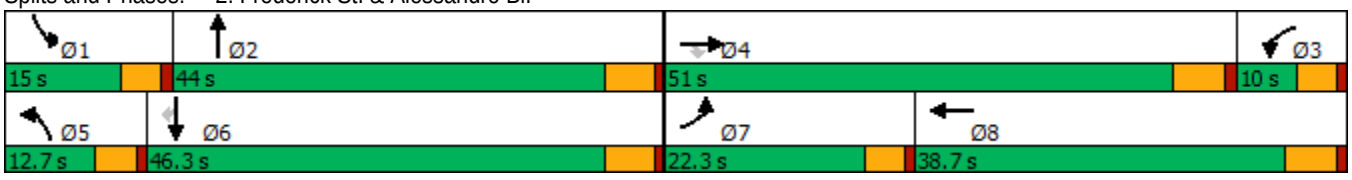
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
04/19/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	110	436	35	75	1315	85	218	99	248	186
Future Volume (vph)	110	436	35	75	1315	85	218	99	248	186
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	22.3	51.0	51.0	10.0	38.7	12.7	44.0	15.0	46.3	46.3
Total Split (%)	18.6%	42.5%	42.5%	8.3%	32.3%	10.6%	36.7%	12.5%	38.6%	38.6%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	11.9	45.2	45.2	5.4	38.7	7.1	40.1	7.9	40.9	40.9
Actuated g/C Ratio	0.10	0.38	0.38	0.05	0.33	0.06	0.34	0.07	0.34	0.34
v/c Ratio	0.64	0.33	0.05	0.95	0.88	0.43	0.20	0.44	0.21	0.29
Control Delay	66.9	27.1	0.1	145.3	45.9	60.5	28.1	59.3	28.3	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	27.1	0.1	145.3	45.9	60.5	28.1	59.3	28.3	5.0
LOS	E	C	A	F	D	E	C	E	C	A
Approach Delay		33.1			50.8		36.8		25.9	
Approach LOS		C			D		D		C	

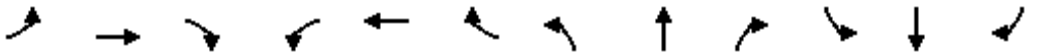
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 41.2	Intersection LOS: D
Intersection Capacity Utilization 86.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
04/19/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	436	35	75	1315	105	85	218	17	99	248	186
Future Volume (veh/h)	110	436	35	75	1315	105	85	218	17	99	248	186
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	115	454	15	78	1370	85	89	227	10	103	258	136
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	142	1385	610	83	1802	112	141	1206	53	157	1253	551
Arrive On Green	0.08	0.38	0.38	0.05	0.36	0.36	0.04	0.34	0.34	0.04	0.35	0.35
Sat Flow, veh/h	1810	3610	1590	1810	4987	309	3510	3520	154	3510	3610	1587
Grp Volume(v), veh/h	115	454	15	78	950	505	89	116	121	103	258	136
Grp Sat Flow(s),veh/h/ln	1810	1805	1590	1810	1729	1838	1755	1805	1870	1755	1805	1587
Q Serve(g_s), s	7.4	10.4	0.5	5.1	28.5	28.5	2.9	5.3	5.4	3.4	5.9	7.2
Cycle Q Clear(g_c), s	7.4	10.4	0.5	5.1	28.5	28.5	2.9	5.3	5.4	3.4	5.9	7.2
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	142	1385	610	83	1249	664	141	618	640	157	1253	551
V/C Ratio(X)	0.81	0.33	0.02	0.94	0.76	0.76	0.63	0.19	0.19	0.66	0.21	0.25
Avail Cap(c_a), veh/h	272	1385	610	83	1249	664	241	618	640	310	1253	551
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.4	25.6	14.2	56.1	33.1	33.1	55.7	27.2	27.2	55.4	27.0	27.5
Incr Delay (d2), s/veh	4.2	0.6	0.1	78.1	4.4	8.0	1.7	0.7	0.7	1.7	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	4.4	0.3	4.1	12.1	13.5	1.3	2.4	2.5	1.5	2.6	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.6	26.2	14.2	134.1	37.5	41.1	57.4	27.9	27.9	57.1	27.4	28.5
LnGrp LOS	E	C	B	F	D	D	E	C	C	E	C	C
Approach Vol, veh/h		584			1533			326			497	
Approach Delay, s/veh		32.1			43.6			36.0			33.9	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	45.8	11.2	51.0	9.3	46.3	13.8	48.4
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	5.4	* 45	8.1	40.9	17.7	32.9
Max Q Clear Time (g_c+I1), s	5.4	7.4	7.1	12.4	4.9	9.2	9.4	30.5
Green Ext Time (p_c), s	0.1	1.8	0.0	4.3	0.0	2.0	0.1	1.8

Intersection Summary	
HCM 6th Ctrl Delay	38.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

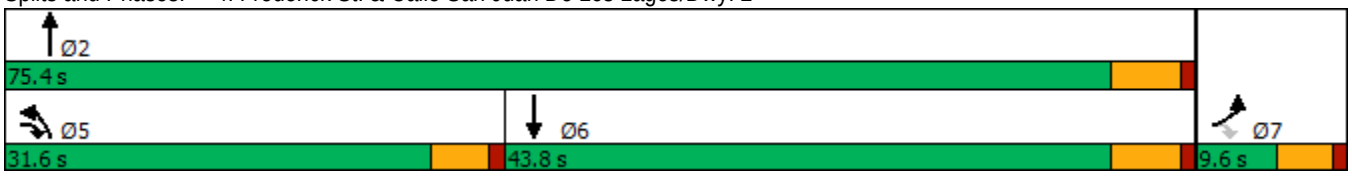
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
04/17/2018

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	24	12	45	306	256
Future Volume (vph)	24	12	45	306	256
Turn Type	Prot	pm+ov	Prot	NA	NA
Protected Phases	7	5	5	2	6
Permitted Phases		7			
Detector Phase	7	5	5	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	9.6	9.6	15.4	28.4
Total Split (s)	9.6	31.6	31.6	75.4	43.8
Total Split (%)	11.3%	37.2%	37.2%	88.7%	51.5%
Yellow Time (s)	3.6	3.6	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.4	5.4
Lead/Lag		Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes		Yes
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	5.0	8.8	6.9	76.6	67.9
Actuated g/C Ratio	0.06	0.11	0.08	0.93	0.82
v/c Ratio	0.24	0.07	0.33	0.10	0.13
Control Delay	42.6	4.5	40.8	0.9	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	4.5	40.8	0.9	2.9
LOS	D	A	D	A	A
Approach Delay				6.0	2.9
Approach LOS				A	A

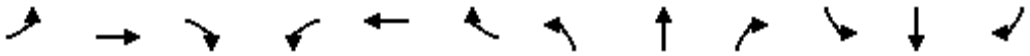
Intersection Summary			
Cycle Length: 85			
Actuated Cycle Length: 82.4			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 5.7		Intersection LOS: A	
Intersection Capacity Utilization 39.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
04/17/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	0	12	0	0	0	45	306	0	0	256	77
Future Volume (veh/h)	24	0	12	0	0	0	45	306	0	0	256	77
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	0	1900				1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	26	0	6				49	333	0	0	278	79
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	57	0	116				74	3059	0	0	2093	583
Arrive On Green	0.03	0.00	0.03				0.04	0.85	0.00	0.00	0.75	0.75
Sat Flow, veh/h	1810	0	1610				1810	3705	0	0	2883	777
Grp Volume(v), veh/h	26	0	6				49	333	0	0	178	179
Grp Sat Flow(s),veh/h/ln	1810	0	1610				1810	1805	0	0	1805	1760
Q Serve(g_s), s	1.2	0.0	0.3				2.2	1.3	0.0	0.0	2.3	2.3
Cycle Q Clear(g_c), s	1.2	0.0	0.3				2.2	1.3	0.0	0.0	2.3	2.3
Prop In Lane	1.00		1.00				1.00		0.00	0.00		0.44
Lane Grp Cap(c), veh/h	57	0	116				74	3059	0	0	1355	1321
V/C Ratio(X)	0.46	0.00	0.05				0.66	0.11	0.00	0.00	0.13	0.14
Avail Cap(c_a), veh/h	110	0	163				591	3059	0	0	1355	1321
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	0.0	35.7				39.1	1.1	0.0	0.0	2.8	2.9
Incr Delay (d2), s/veh	5.6	0.0	0.2				3.7	0.1	0.0	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0				1.0	0.1	0.0	0.0	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	0.0	35.9				42.8	1.1	0.0	0.0	3.0	3.1
LnGrp LOS	D	A	D				D	A	A	A	A	A
Approach Vol, veh/h		32						382			357	
Approach Delay, s/veh		43.2						6.5			3.1	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		75.4		7.2	8.0	67.4						
Change Period (Y+Rc), s		5.4		4.6	4.6	5.4						
Max Green Setting (Gmax), s		70.0		5.0	27.0	38.4						
Max Q Clear Time (g_c+I1), s		3.3		3.2	4.2	4.3						
Green Ext Time (p_c), s		2.2		0.0	0.0	2.1						

Intersection Summary												
HCM 6th Ctrl Delay			6.4									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	5	0	0	67	0	284	8	0	255	13
Future Vol, veh/h	0	0	5	0	0	67	0	284	8	0	255	13
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	5	0	0	74	0	312	9	0	280	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	147	-	-	163	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	880	0	0	859	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	880	-	-	857	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

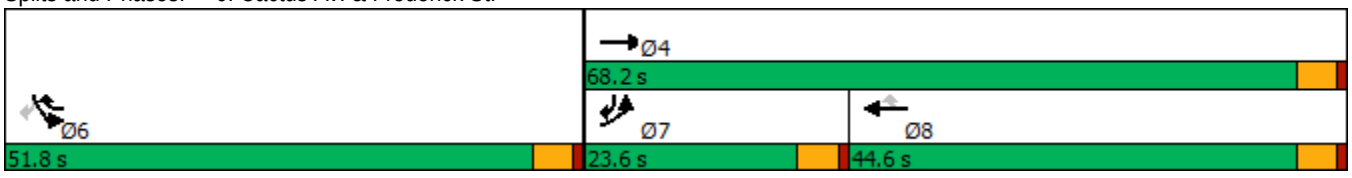
Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	9.6	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	880	857	-	-
HCM Lane V/C Ratio	-	-	0.006	0.086	-	-
HCM Control Delay (s)	-	-	9.1	9.6	-	-
HCM Lane LOS	-	-	A	A	-	-
HCM 95th %tile Q(veh)	-	-	0	0.3	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	164	972	1681	147	131	83
Future Volume (vph)	164	972	1681	147	131	83
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	23.6	68.2	44.6	51.8	51.8	23.6
Total Split (%)	19.7%	56.8%	37.2%	43.2%	43.2%	19.7%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	19.2	64.2	40.4	58.9	13.9	37.7
Actuated g/C Ratio	0.22	0.73	0.46	0.67	0.16	0.43
v/c Ratio	0.44	0.27	0.75	0.14	0.25	0.13
Control Delay	35.4	5.0	23.0	1.0	32.2	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	5.0	23.0	1.0	32.2	14.7
LOS	D	A	C	A	C	B
Approach Delay		9.4	21.3		25.4	
Approach LOS		A	C		C	

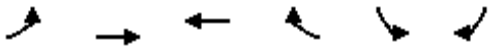
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 87.4	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 61.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
04/17/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	164	972	1681	147	131	83
Future Volume (veh/h)	164	972	1681	147	131	83
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	174	1034	1788	150	139	48
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	415	3984	2506	972	424	564
Arrive On Green	0.23	0.77	0.48	0.48	0.12	0.12
Sat Flow, veh/h	1810	5358	5358	1610	3510	1610
Grp Volume(v), veh/h	174	1034	1788	150	139	48
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1610	1755	1610
Q Serve(g_s), s	6.8	4.8	22.5	3.4	3.0	1.7
Cycle Q Clear(g_c), s	6.8	4.8	22.5	3.4	3.0	1.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	415	3984	2506	972	424	564
V/C Ratio(X)	0.42	0.26	0.71	0.15	0.33	0.09
Avail Cap(c_a), veh/h	415	3984	2506	972	2001	1287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	2.8	16.9	7.2	33.3	18.0
Incr Delay (d2), s/veh	3.1	0.2	1.1	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.7	7.6	1.4	1.2	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.3	2.9	18.0	7.3	33.5	18.0
LnGrp LOS	C	A	B	A	C	B
Approach Vol, veh/h		1208	1938		187	
Approach Delay, s/veh		6.9	17.1		29.5	
Approach LOS		A	B		C	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	68.2	14.6	23.6	44.6
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	63.6	47.2	19.0	40.0
Max Q Clear Time (g_c+I1), s	6.8	5.0	8.8	24.5
Green Ext Time (p_c), s	12.3	0.3	0.1	12.4

Intersection Summary	
HCM 6th Ctrl Delay	14.1
HCM 6th LOS	B

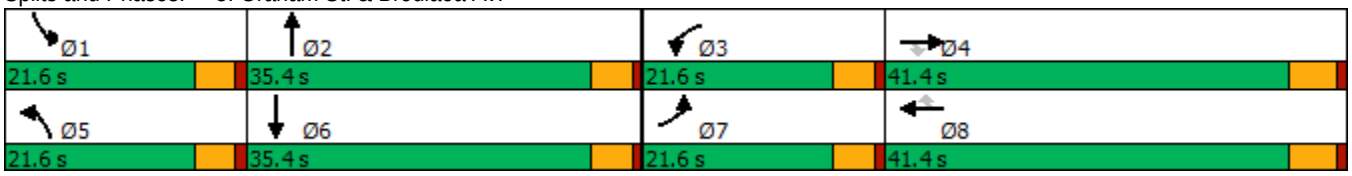
Timings
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
04/17/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	2	6	3	20	52	75	3	194	42	241
Future Volume (vph)	2	6	3	20	52	75	3	194	42	241
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.7	12.9	12.9	6.1	13.1	13.1	5.8	18.3	6.7	21.0
Actuated g/C Ratio	0.14	0.31	0.31	0.14	0.31	0.31	0.14	0.43	0.16	0.50
v/c Ratio	0.01	0.01	0.01	0.10	0.11	0.17	0.02	0.17	0.18	0.17
Control Delay	26.0	15.5	0.0	24.1	14.3	5.1	25.7	13.8	22.8	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	15.5	0.0	24.1	14.3	5.1	25.7	13.8	22.8	11.0
LOS	C	B	A	C	B	A	C	B	C	B
Approach Delay		13.5			10.9			14.0		12.7
Approach LOS		B			B			B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 42.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.18	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 34.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
04/17/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	6	3	20	52	75	3	194	18	42	241	5
Future Volume (veh/h)	2	6	3	20	52	75	3	194	18	42	241	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2	8	3	25	65	59	4	242	20	52	301	6
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	5	370	314	55	422	358	10	843	69	99	1081	21
Arrive On Green	0.00	0.19	0.19	0.03	0.22	0.22	0.01	0.25	0.25	0.05	0.30	0.30
Sat Flow, veh/h	1810	1900	1610	1810	1900	1608	1810	3376	277	1810	3618	72
Grp Volume(v), veh/h	2	8	3	25	65	59	4	128	134	52	150	157
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1608	1810	1805	1848	1810	1805	1885
Q Serve(g_s), s	0.0	0.1	0.1	0.6	1.1	1.2	0.1	2.4	2.4	1.1	2.6	2.6
Cycle Q Clear(g_c), s	0.0	0.1	0.1	0.6	1.1	1.2	0.1	2.4	2.4	1.1	2.6	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		0.04
Lane Grp Cap(c), veh/h	5	370	314	55	422	358	10	450	461	99	539	563
V/C Ratio(X)	0.40	0.02	0.01	0.46	0.15	0.17	0.41	0.29	0.29	0.53	0.28	0.28
Avail Cap(c_a), veh/h	751	1669	1414	751	1669	1412	751	1352	1384	751	1352	1412
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	13.3	13.3	19.5	12.8	12.9	20.3	12.4	12.4	18.9	11.0	11.0
Incr Delay (d2), s/veh	18.3	0.0	0.0	2.2	0.2	0.2	9.7	0.3	0.3	1.6	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.2	0.4	0.4	0.1	0.8	0.9	0.5	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	13.4	13.3	21.7	13.0	13.1	30.0	12.8	12.8	20.5	11.3	11.3
LnGrp LOS	D	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		13			149			266			359	
Approach Delay, s/veh		17.3			14.5			13.0			12.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	14.9	5.8	13.4	4.8	16.9	4.7	14.5
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	3.1	4.4	2.6	2.1	2.1	4.6	2.0	3.2
Green Ext Time (p_c), s	0.0	1.5	0.0	0.0	0.0	1.8	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	42	78	28	27	45
Future Vol, veh/h	42	42	78	28	27	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	47	47	88	31	30	51

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	199	88	0	0	119	0
Stage 1	88	-	-	-	-	-
Stage 2	111	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	794	976	-	-	1482	-
Stage 1	940	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	778	976	-	-	1482	-
Mov Cap-2 Maneuver	817	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	2.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	817	976	1482	-
HCM Lane V/C Ratio	-	-	0.058	0.048	0.02	-
HCM Control Delay (s)	-	-	9.7	8.9	7.5	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	0.1	-

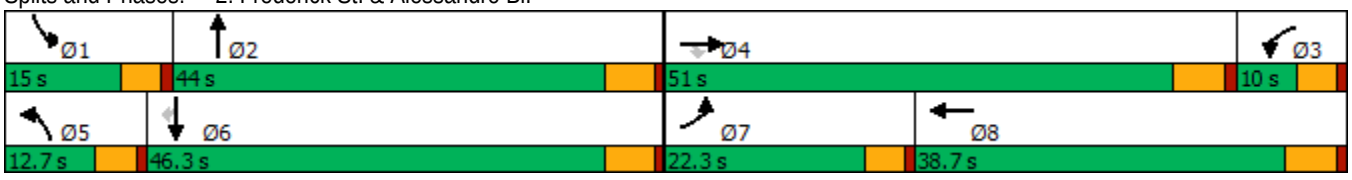
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
04/19/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	196	1224	136	59	804	97	267	262	267	118
Future Volume (vph)	196	1224	136	59	804	97	267	262	267	118
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	22.3	51.0	51.0	10.0	38.7	12.7	44.0	15.0	46.3	46.3
Total Split (%)	18.6%	42.5%	42.5%	8.3%	32.3%	10.6%	36.7%	12.5%	38.6%	38.6%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	16.1	46.0	46.0	5.4	33.3	7.3	38.6	10.4	41.8	41.8
Actuated g/C Ratio	0.14	0.39	0.39	0.05	0.28	0.06	0.32	0.09	0.35	0.35
v/c Ratio	0.84	0.92	0.21	0.76	0.71	0.48	0.31	0.90	0.22	0.19
Control Delay	78.9	46.9	7.6	105.1	40.4	61.7	28.6	85.7	28.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.9	46.9	7.6	105.1	40.4	61.7	28.6	85.7	28.2	2.4
LOS	E	D	A	F	D	E	C	F	C	A
Approach Delay		47.5			44.2		36.0		46.8	
Approach LOS		D			D		D		D	

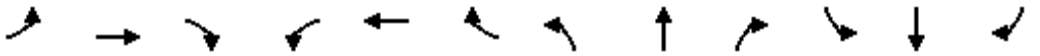
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.8	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 45.1	Intersection LOS: D
Intersection Capacity Utilization 93.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
04/19/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	196	1224	136	59	804	162	97	267	70	262	267	118
Future Volume (veh/h)	196	1224	136	59	804	162	97	267	70	262	267	118
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	206	1288	118	62	846	100	102	281	54	276	281	75
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	233	1347	600	80	1400	165	154	962	182	301	1302	578
Arrive On Green	0.13	0.37	0.37	0.04	0.30	0.30	0.04	0.32	0.32	0.09	0.36	0.36
Sat Flow, veh/h	1810	3610	1608	1810	4692	551	3510	3019	571	3510	3610	1602
Grp Volume(v), veh/h	206	1288	118	62	622	324	102	166	169	276	281	75
Grp Sat Flow(s),veh/h/ln	1810	1805	1608	1810	1729	1785	1755	1805	1785	1755	1805	1602
Q Serve(g_s), s	13.6	42.1	4.8	4.1	18.7	18.8	3.5	8.4	8.6	9.5	6.5	3.8
Cycle Q Clear(g_c), s	13.6	42.1	4.8	4.1	18.7	18.8	3.5	8.4	8.6	9.5	6.5	3.8
Prop In Lane	1.00		1.00	1.00		0.31	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	233	1347	600	80	1032	533	154	575	569	301	1302	578
V/C Ratio(X)	0.88	0.96	0.20	0.78	0.60	0.61	0.66	0.29	0.30	0.92	0.22	0.13
Avail Cap(c_a), veh/h	264	1347	600	81	1032	533	235	575	569	301	1302	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	37.0	16.2	57.3	36.4	36.4	57.0	31.0	31.1	54.9	26.9	26.0
Incr Delay (d2), s/veh	23.9	16.1	0.7	33.6	2.6	5.1	1.8	1.3	1.3	30.5	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	20.6	2.3	2.6	8.0	8.7	1.6	3.8	3.9	5.4	2.8	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.8	53.1	16.9	90.9	39.0	41.5	58.8	32.2	32.4	85.4	27.2	26.5
LnGrp LOS	E	D	B	F	D	D	E	C	C	F	C	C
Approach Vol, veh/h		1612			1008			437			632	
Approach Delay, s/veh		53.4			43.0			38.5			52.5	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	44.0	11.2	51.0	9.9	49.1	20.2	41.9
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	5.4	* 45	8.1	40.9	17.7	32.9
Max Q Clear Time (g_c+I1), s	11.5	10.6	6.1	44.1	5.5	8.5	15.6	20.8
Green Ext Time (p_c), s	0.0	2.7	0.0	0.9	0.0	2.0	0.1	4.5

Intersection Summary	
HCM 6th Ctrl Delay	48.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

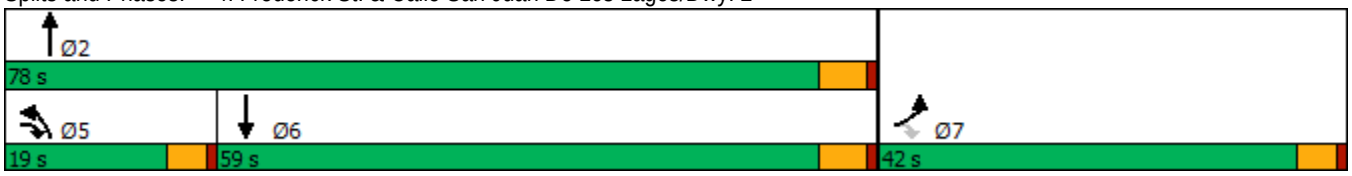
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
04/19/2018

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	136	25	22	304	432
Future Volume (vph)	136	25	22	304	432
Turn Type	Prot	pm+ov	Prot	NA	NA
Protected Phases	7	5	5	2	6
Permitted Phases		7			
Detector Phase	7	5	5	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	9.6	9.6	15.4	28.4
Total Split (s)	42.0	19.0	19.0	78.0	59.0
Total Split (%)	35.0%	15.8%	15.8%	65.0%	49.2%
Yellow Time (s)	3.6	3.6	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.4	5.4
Lead/Lag		Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes		Yes
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	13.3	23.9	6.0	72.7	66.1
Actuated g/C Ratio	0.14	0.25	0.06	0.76	0.69
v/c Ratio	0.61	0.07	0.23	0.13	0.22
Control Delay	49.6	9.8	48.5	3.6	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	9.8	48.5	3.6	6.8
LOS	D	A	D	A	A
Approach Delay				6.6	6.8
Approach LOS				A	A

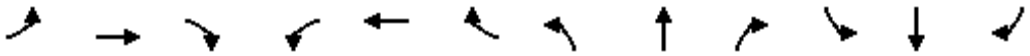
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 96	
Natural Cycle: 50	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 34.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
04/19/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	0	25	0	0	0	22	304	0	0	432	55
Future Volume (veh/h)	136	0	25	0	0	0	22	304	0	0	432	55
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	0	1900				1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	153	0	22				25	342	0	0	485	55
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	195	0	215				46	2831	0	0	2316	262
Arrive On Green	0.11	0.00	0.11				0.03	0.78	0.00	0.00	0.71	0.71
Sat Flow, veh/h	1810	0	1610				1810	3705	0	0	3362	369
Grp Volume(v), veh/h	153	0	22				25	342	0	0	267	273
Grp Sat Flow(s),veh/h/ln	1810	0	1610				1810	1805	0	0	1805	1831
Q Serve(g_s), s	7.6	0.0	1.1				1.3	2.1	0.0	0.0	4.7	4.7
Cycle Q Clear(g_c), s	7.6	0.0	1.1				1.3	2.1	0.0	0.0	4.7	4.7
Prop In Lane	1.00		1.00				1.00		0.00	0.00		0.20
Lane Grp Cap(c), veh/h	195	0	215				46	2831	0	0	1280	1298
V/C Ratio(X)	0.78	0.00	0.10				0.54	0.12	0.00	0.00	0.21	0.21
Avail Cap(c_a), veh/h	731	0	692				281	2831	0	0	1280	1298
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	40.3	0.0	35.2				44.6	2.4	0.0	0.0	4.6	4.6
Incr Delay (d2), s/veh	6.8	0.0	0.2				3.6	0.1	0.0	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	1.1				0.6	0.5	0.0	0.0	1.4	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.0	0.0	35.4				48.2	2.5	0.0	0.0	5.0	5.0
LnGrp LOS	D	A	D				D	A	A	A	A	A
Approach Vol, veh/h		175						367			540	
Approach Delay, s/veh		45.6						5.6			5.0	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		78.0		14.6	7.0	71.0						
Change Period (Y+Rc), s		5.4		4.6	4.6	5.4						
Max Green Setting (Gmax), s		72.6		37.4	14.4	53.6						
Max Q Clear Time (g_c+I1), s		4.1		9.6	3.3	6.7						
Green Ext Time (p_c), s		2.3		0.5	0.0	3.3						

Intersection Summary												
HCM 6th Ctrl Delay			11.7									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	28	0	0	48	0	277	18	0	447	10
Future Vol, veh/h	0	0	28	0	0	48	0	277	18	0	447	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	31	0	0	53	0	304	20	0	491	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	253	-	-	162	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	753	0	0	861	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	752	-	-	861	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

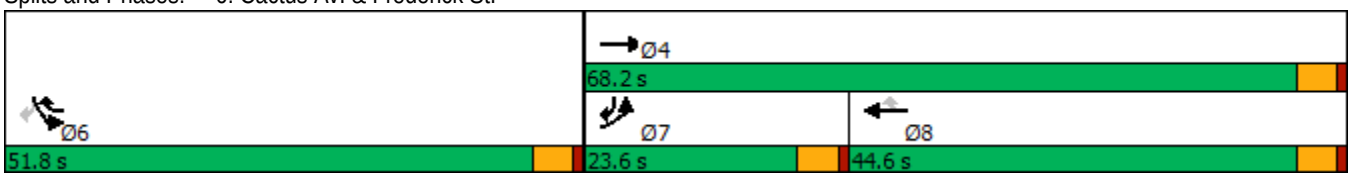
Approach	EB	WB	NB	SB
HCM Control Delay, s	10	9.5	0	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	752	861	-	-
HCM Lane V/C Ratio	-	-	0.041	0.061	-	-
HCM Control Delay (s)	-	-	10	9.5	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.1	0.2	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	77	1976	969	141	408	139
Future Volume (vph)	77	1976	969	141	408	139
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	23.6	68.2	44.6	51.8	51.8	23.6
Total Split (%)	19.7%	56.8%	37.2%	43.2%	43.2%	19.7%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	19.1	64.0	40.3	57.4	17.1	40.9
Actuated g/C Ratio	0.21	0.71	0.45	0.63	0.19	0.45
v/c Ratio	0.21	0.55	0.43	0.14	0.63	0.19
Control Delay	33.5	8.1	18.9	1.0	37.7	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	8.1	18.9	1.0	37.7	13.1
LOS	C	A	B	A	D	B
Approach Delay		9.1	16.7		31.5	
Approach LOS		A	B		C	

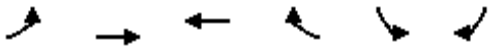
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 90.4	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 57.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
04/18/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	77	1976	969	141	408	139
Future Volume (veh/h)	77	1976	969	141	408	139
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	79	2037	999	101	421	46
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	402	3856	2425	977	523	598
Arrive On Green	0.22	0.74	0.47	0.47	0.15	0.15
Sat Flow, veh/h	1810	5358	5358	1577	3510	1610
Grp Volume(v), veh/h	79	2037	999	101	421	46
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1577	1755	1610
Q Serve(g_s), s	3.0	14.2	10.9	2.2	9.9	1.6
Cycle Q Clear(g_c), s	3.0	14.2	10.9	2.2	9.9	1.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	402	3856	2425	977	523	598
V/C Ratio(X)	0.20	0.53	0.41	0.10	0.80	0.08
Avail Cap(c_a), veh/h	402	3856	2425	977	1937	1246
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	4.6	15.0	6.7	35.2	17.4
Incr Delay (d2), s/veh	1.1	0.5	0.2	0.1	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.8	3.7	1.0	4.1	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.2	5.2	15.2	6.8	36.3	17.4
LnGrp LOS	C	A	B	A	D	B
Approach Vol, veh/h		2116	1100		467	
Approach Delay, s/veh		6.0	14.4		34.5	
Approach LOS		A	B		C	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	68.2	17.4	23.6	44.6
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	63.6	47.2	19.0	40.0
Max Q Clear Time (g_c+I1), s	16.2	11.9	5.0	12.9
Green Ext Time (p_c), s	31.7	0.8	0.1	10.4

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

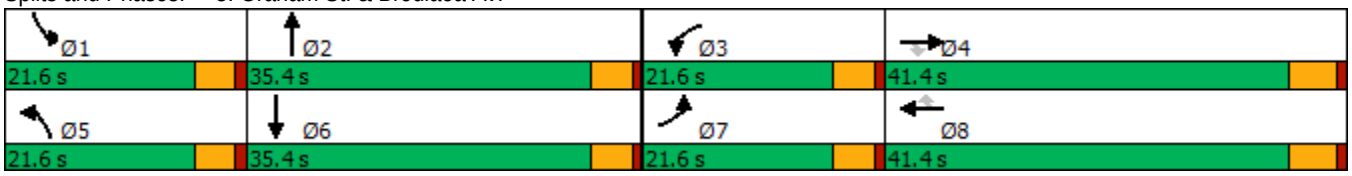
Timings
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
04/18/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	3	11	3	20	46	68	3	265	75	266
Future Volume (vph)	3	11	3	20	46	68	3	265	75	266
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.7	12.8	12.8	6.0	13.0	13.0	5.7	19.3	7.4	25.0
Actuated g/C Ratio	0.13	0.28	0.28	0.13	0.29	0.29	0.13	0.43	0.16	0.55
v/c Ratio	0.01	0.02	0.01	0.09	0.09	0.14	0.01	0.21	0.28	0.15
Control Delay	27.3	16.9	0.0	26.1	16.1	3.7	27.3	15.4	24.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	16.9	0.0	26.1	16.1	3.7	27.3	15.4	24.3	10.2
LOS	C	B	A	C	B	A	C	B	C	B
Approach Delay		15.8			11.3			15.5		13.3
Approach LOS		B			B			B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 45.4	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.28	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 34.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
04/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	11	3	20	46	68	3	265	22	75	266	3
Future Volume (veh/h)	3	11	3	20	46	68	3	265	22	75	266	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	3	12	0	22	50	44	3	288	21	82	289	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	335	284	49	378	321	7	851	62	134	1169	12
Arrive On Green	0.00	0.18	0.00	0.03	0.20	0.20	0.00	0.25	0.25	0.07	0.32	0.32
Sat Flow, veh/h	1810	1900	1610	1810	1900	1610	1810	3412	247	1810	3660	38
Grp Volume(v), veh/h	3	12	0	22	50	44	3	152	157	82	142	150
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1610	1810	1805	1854	1810	1805	1893
Q Serve(g_s), s	0.1	0.2	0.0	0.5	0.9	0.9	0.1	2.8	2.8	1.8	2.4	2.4
Cycle Q Clear(g_c), s	0.1	0.2	0.0	0.5	0.9	0.9	0.1	2.8	2.8	1.8	2.4	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.02
Lane Grp Cap(c), veh/h	7	335	284	49	378	321	7	450	462	134	577	605
V/C Ratio(X)	0.40	0.04	0.00	0.45	0.13	0.14	0.40	0.34	0.34	0.61	0.25	0.25
Avail Cap(c_a), veh/h	754	1677	1421	754	1677	1421	754	1359	1396	754	1359	1425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	13.9	0.0	19.5	13.4	13.4	20.3	12.5	12.6	18.3	10.3	10.3
Incr Delay (d2), s/veh	12.6	0.0	0.0	2.4	0.2	0.2	12.6	0.4	0.4	1.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.2	0.3	0.3	0.1	1.0	1.0	0.7	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	14.0	0.0	21.9	13.6	13.6	32.9	13.0	13.0	20.0	10.5	10.5
LnGrp LOS	C	B	A	C	B	B	C	B	B	B	B	B
Approach Vol, veh/h		15			116			312			374	
Approach Delay, s/veh		17.8			15.2			13.2			12.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	14.9	5.7	12.6	4.8	17.7	4.8	13.5
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	3.8	4.8	2.5	2.2	2.1	4.4	2.1	2.9
Green Ext Time (p_c), s	0.1	1.8	0.0	0.0	0.0	1.7	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX 3.3:

EXISTING (2018) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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California MUTCD 2014 Edition
(FHWA's MUTCD 2009, as amended for use in California)

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

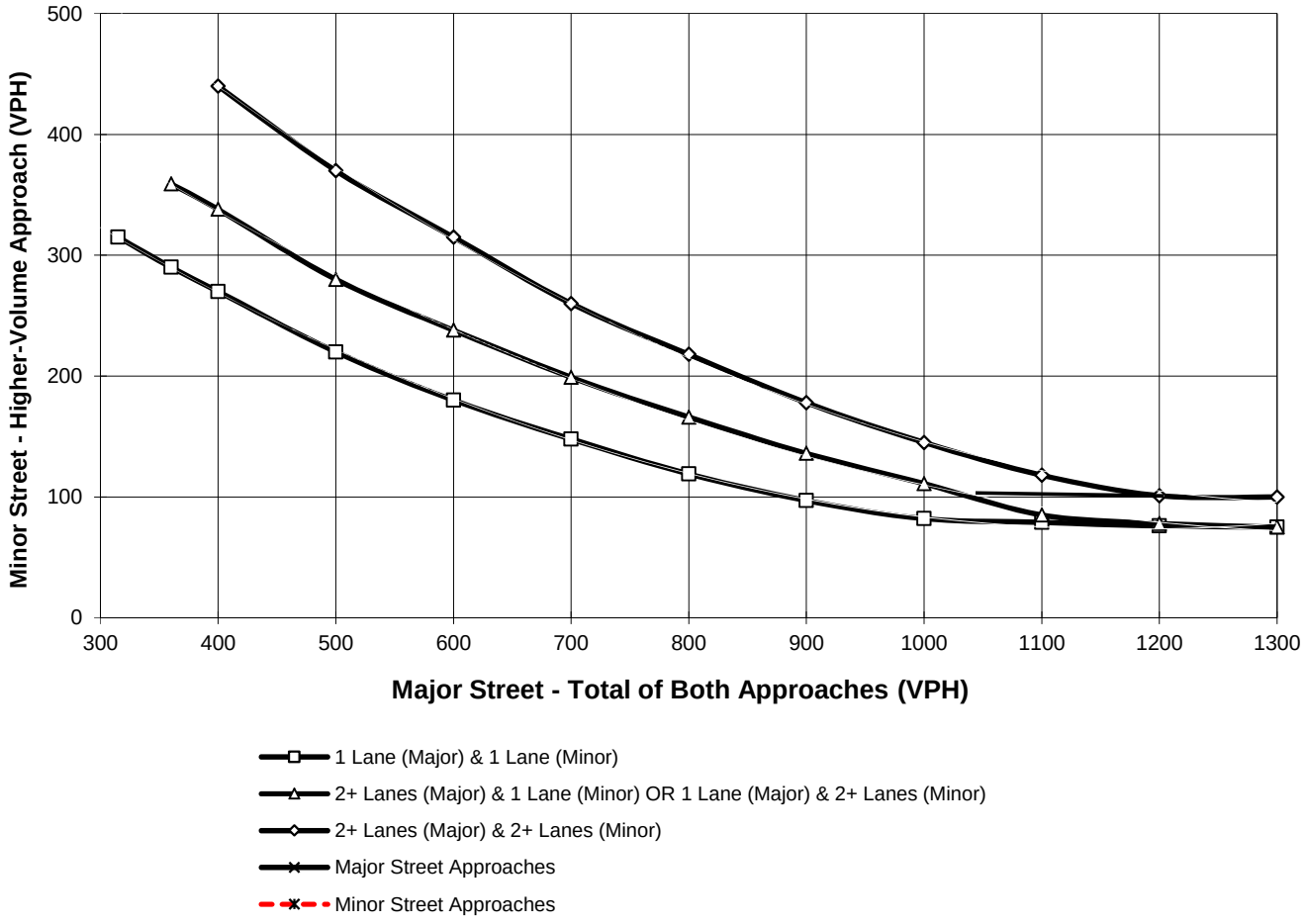
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2018) Conditions - Weekday PM Peak Hour**

Major Street Name = **Veterans Way** Total of Both Approaches (VPH) = **177**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Calle San Juan de Los Lagos** High Volume Approach (VPH) = **84**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 3.4:

EXISTING (2018) CONDITIONS QUEUING ANALYSIS WORKSHEETS

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Queuing and Blocking Report
Existing (2018) - AM Peak Hour

Centerpointe (JN: 11410)
09/07/2018

Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	NB	SB
Directions Served	L	R	R	L
Maximum Queue (ft)	35	24	4	28
Average Queue (ft)	15	9	0	3
95th Queue (ft)	37	26	3	16
Link Distance (ft)		1530	1143	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			115
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	154	189	185	26	215	354	359	347	67	74	100	121
Average Queue (ft)	77	112	85	9	104	250	252	237	21	38	41	55
95th Queue (ft)	139	172	160	23	213	339	338	326	52	69	82	97
Link Distance (ft)		1582	1582	1582		2574	2574	2574			571	571
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)		0			5	36					0	
Queuing Penalty (veh)		0			23	27					0	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	102	140	136	137	145
Average Queue (ft)	22	72	64	63	56
95th Queue (ft)	73	123	119	120	107
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)	0	8	4	3	2
Queuing Penalty (veh)	0	10	4	5	2

Intersection: 3: Frederick St. & Dwy. 1

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	59	28	76	39	53	54	80
Average Queue (ft)	19	7	30	5	9	11	21
95th Queue (ft)	45	27	63	25	35	38	63
Link Distance (ft)		1530		235	235	275	275
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	120		150				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB	NB	NB	SB
Directions Served	R	R	T	TR	T
Maximum Queue (ft)	31	49	6	6	6
Average Queue (ft)	4	26	0	0	0
95th Queue (ft)	22	46	4	4	4
Link Distance (ft)	167	480	1156	1156	235
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	172	126	118	58	294	284	276	57	82	100	80
Average Queue (ft)	85	56	40	17	178	175	142	23	28	45	24
95th Queue (ft)	145	110	91	48	258	255	242	52	66	83	59
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1156	1156
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)							0			0	
Queuing Penalty (veh)							0			0	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	17	31	27	48	70	48	25	83	47	63	82	45
Average Queue (ft)	1	3	3	17	23	25	2	33	11	24	29	10
95th Queue (ft)	10	16	16	43	52	45	12	62	32	53	64	31
Link Distance (ft)		2009	2009		828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210			150			160			150		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 71

Queuing and Blocking Report
Existing (2018) - PM Peak Hour

Centerpointe (JN: 11410)
09/07/2018

Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	44	29	28
Average Queue (ft)	19	15	2
95th Queue (ft)	41	31	14
Link Distance (ft)		1530	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		115
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	330	517	500	66	214	258	259	259	74	87	147	168
Average Queue (ft)	221	329	321	25	64	170	171	150	22	42	70	85
95th Queue (ft)	373	474	452	52	138	226	229	231	56	76	126	149
Link Distance (ft)		1582	1582	1582		2574	2574	2574			571	571
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)	1	20			1	21					1	
Queuing Penalty (veh)	6	40			4	12					1	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	160	219	340	235	82
Average Queue (ft)	121	160	124	75	35
95th Queue (ft)	202	230	279	176	65
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)	16	56	5	3	0
Queuing Penalty (veh)	21	74	12	4	0

Intersection: 3: Frederick St. & Dwy. 1

Movement							
Directions Served							
Maximum Queue (ft)							
Average Queue (ft)							
95th Queue (ft)							
Link Distance (ft)							
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	149	54	62	73	65	140	127
Average Queue (ft)	78	15	22	18	19	39	35
95th Queue (ft)	128	43	53	53	52	102	94
Link Distance (ft)		1530		235	235	275	275
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	120		150				
Storage Blk Time (%)	3	0					
Queuing Penalty (veh)	1	0					

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB
Directions Served	R	R
Maximum Queue (ft)	36	53
Average Queue (ft)	19	22
95th Queue (ft)	44	45
Link Distance (ft)	167	480
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	114	229	221	196	195	202	193	54	176	200	95
Average Queue (ft)	44	107	95	59	127	118	71	23	92	111	29
95th Queue (ft)	90	187	174	136	176	174	151	49	149	172	67
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1156	1156
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)									1	2	
Queuing Penalty (veh)									1	5	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	30	35	27	52	61	56	25	100	59	71	82	46
Average Queue (ft)	3	8	2	14	23	26	2	45	18	34	34	13
95th Queue (ft)	17	30	13	42	52	45	13	82	47	61	66	36
Link Distance (ft)		2009	2009		828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210			150			160			150		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 181

APPENDIX 4.1:

POST PROCESSING WORKSHEETS

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Project: Centerpointe TIA
Scenario: General Plan Buildout (Post 2040)

Job #: 11410
Analyst: CP
Date: 43209

LOCATION: Frederick St. & Alessandro Bl.
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA EXISTING COUNT	AM FUTURE VOLUME	AM DIFF-ERENCE	AM % CHANGE	PM PEAK HOUR INPUT DATA EXISTING COUNT	PM FUTURE VOLUME	PM DIFF-ERENCE	PM % CHANGE
NORTH BOUND	Left	85	49	-36	-42%	97	70	-27	-28%
	Through	218	252	34	16%	267	264	-3	-1%
	Right	17	18	1	6%	70	95	25	36%
	NB Total	320	319	-1	0%	434	429	-5	-1%
SOUTH BOUND	Left	99	209	110	111%	262	635	373	142%
	Through	248	241	-7	-3%	267	335	68	25%
	Right	186	211	25	13%	118	153	35	30%
	SB Total	533	661	128	24%	647	1,123	476	74%
EAST BOUND	Left	110	192	82	75%	196	250	54	28%
	Through	436	711	275	63%	1,224	2,140	916	75%
	Right	35	26	-9	-26%	136	123	-13	-10%
	EB Total	581	929	348	60%	1,556	2,513	957	62%
WEST BOUND	Left	75	96	21	28%	59	88	29	49%
	Through	1,315	1,970	655	50%	804	1,237	433	54%
	Right	105	313	208	198%	162	340	178	110%
	WB Total	1,495	2,379	884	59%	1,025	1,665	640	62%
TOTAL ENTERING VOLUME		2,929	4,288	1359	46%	3,662	5,730	2068	56%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES AM	VOLUMES PM	PERCENT OF ADT AM	PERCENT OF ADT PM	ADT
North Leg	Inbound	661	1,123			
North Leg	Outbound	757	854			
North Leg	**TOTAL**	**1,418**	**1,977**	**7%**	**9%**	**21,000**
South Leg	Inbound	319	429			
South Leg	Outbound	363	546			
South Leg	**TOTAL**	**682**	**975**	**10%**	**14%**	**7,000**
East Leg	Inbound	2,379	1,665			
East Leg	Outbound	938	2,870			
East Leg	**TOTAL**	**3,317**	**4,535**	**7%**	**9%**	**49,000**
West Leg	Inbound	929	2,513			
West Leg	Outbound	2,230	1,460			
West Leg	**TOTAL**	**3,159**	**3,973**	**7%**	**9%**	**43,000**
OVERALL TOTAL		***8,576***	***11,460***	***7%***	***10%***	***120,000***

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Project: Centerpointe TIA
Scenario: General Plan Buildout (Post 2040)

Job #: 11410
Analyst: CP
Date: 43209

LOCATION: Frederick St. & Cactus Av.
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA: EXISTING COUNT	AM: FUTURE VOLUME	AM: DIFF-ERENCE	AM: % CHANGE	PM PEAK HOUR INPUT DATA: EXISTING COUNT	PM: FUTURE VOLUME	PM: DIFF-ERENCE	PM: % CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
SOUTH BOUND	Left	131	82	-49	-37%	408	355	-53	-13%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	83	127	44	53%	139	250	111	80%
	SB Total	214	209	-5	-2%	547	605	58	11%
EAST BOUND	Left	164	215	51	31%	77	115	38	49%
	Through	972	1,128	156	16%	1,976	3,075	1,099	56%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	EB Total	1,136	1,343	207	18%	2,053	3,190	1,137	55%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	1,681	2,623	942	56%	969	1,570	601	62%
	Right	147	105	-42	-29%	141	105	-36	-26%
	WB Total	1,828	2,728	900	49%	1,110	1,675	565	51%
TOTAL ENTERING VOLUME		3,178	4,280	1102	35%	3,710	5,470	1760	47%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES: AM	VOLUMES: PM	PERCENT OF ADT: AM	PERCENT OF ADT: PM	ADT
North Leg	Inbound	209	605			
North Leg	Outbound	320	220			
North Leg	**TOTAL**	**529**	**825**	**18%**	**28%**	**3,000**
South Leg	Inbound	0	0			
South Leg	Outbound	0	0			
South Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
East Leg	Inbound	2,728	1,675			
East Leg	Outbound	1,210	3,430			
East Leg	**TOTAL**	**3,938**	**5,105**	**11%**	**14%**	**37,000**
West Leg	Inbound	1,343	3,190			
West Leg	Outbound	2,750	1,820			
West Leg	**TOTAL**	**4,093**	**5,010**	**11%**	**14%**	**36,000**
OVERALL TOTAL		***8,560***	***10,940***	**11%**	***14%***	***76,000***

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APPENDIX 5.1:

E+P CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	23	50	65	44	31
Future Vol, veh/h	34	23	50	65	44	31
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	39	26	57	75	51	36

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	195	58	0	0	132	0
Stage 1	57	-	-	-	-	-
Stage 2	138	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	798	1014	-	-	1466	-
Stage 1	971	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	770	1013	-	-	1466	-
Mov Cap-2 Maneuver	792	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	894	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	4.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	792	1013	1466	-
HCM Lane V/C Ratio	-	-	0.049	0.026	0.034	-
HCM Control Delay (s)	-	-	9.8	8.6	7.5	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.1	-

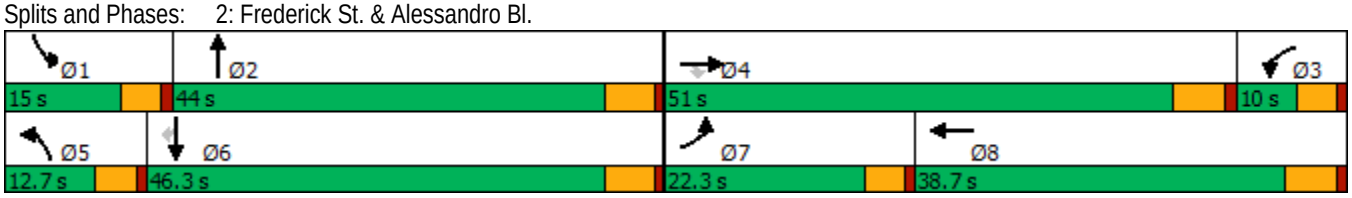
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	110	436	39	79	1315	88	219	99	252	186
Future Volume (vph)	110	436	39	79	1315	88	219	99	252	186
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	22.3	51.0	51.0	10.0	38.7	12.7	44.0	15.0	46.3	46.3
Total Split (%)	18.6%	42.5%	42.5%	8.3%	32.3%	10.6%	36.7%	12.5%	38.6%	38.6%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	11.9	45.2	45.2	5.4	38.7	7.1	40.1	7.9	40.9	40.9
Actuated g/C Ratio	0.10	0.38	0.38	0.05	0.33	0.06	0.34	0.07	0.34	0.34
v/c Ratio	0.64	0.33	0.06	1.00	0.89	0.44	0.20	0.45	0.21	0.29
Control Delay	66.9	27.2	0.2	158.2	46.0	60.8	28.0	59.4	28.4	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	27.2	0.2	158.2	46.0	60.8	28.0	59.4	28.4	5.0
LOS	E	C	A	F	D	E	C	E	C	A
Approach Delay		32.8			51.9		36.9		26.0	
Approach LOS		C			D		D		C	

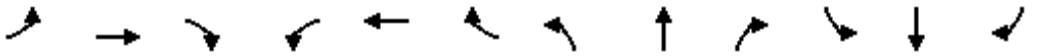
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 41.7	Intersection LOS: D
Intersection Capacity Utilization 86.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	436	39	79	1315	105	88	219	18	99	252	186
Future Volume (veh/h)	110	436	39	79	1315	105	88	219	18	99	252	186
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	115	454	20	82	1370	85	92	228	11	103	262	136
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	142	1384	609	83	1800	112	144	1202	58	157	1252	550
Arrive On Green	0.08	0.38	0.38	0.05	0.36	0.36	0.04	0.34	0.34	0.04	0.35	0.35
Sat Flow, veh/h	1810	3610	1590	1810	4987	309	3510	3504	168	3510	3610	1587
Grp Volume(v), veh/h	115	454	20	82	950	505	92	117	122	103	262	136
Grp Sat Flow(s),veh/h/ln	1810	1805	1590	1810	1729	1838	1755	1805	1867	1755	1805	1587
Q Serve(g_s), s	7.4	10.5	0.7	5.3	28.5	28.5	3.0	5.4	5.4	3.4	6.0	7.2
Cycle Q Clear(g_c), s	7.4	10.5	0.7	5.3	28.5	28.5	3.0	5.4	5.4	3.4	6.0	7.2
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	142	1384	609	83	1248	664	144	619	640	157	1252	550
V/C Ratio(X)	0.81	0.33	0.03	0.99	0.76	0.76	0.64	0.19	0.19	0.66	0.21	0.25
Avail Cap(c_a), veh/h	272	1384	609	83	1248	664	241	619	640	310	1252	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	25.7	14.2	56.2	33.2	33.2	55.7	27.2	27.2	55.4	27.1	27.5
Incr Delay (d2), s/veh	4.2	0.6	0.1	95.1	4.4	8.0	1.8	0.7	0.7	1.7	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	4.4	0.4	4.6	12.1	13.6	1.4	2.4	2.5	1.5	2.6	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.7	26.3	14.3	151.3	37.6	41.2	57.5	27.9	27.9	57.2	27.5	28.6
LnGrp LOS	E	C	B	F	D	D	E	C	C	E	C	C
Approach Vol, veh/h		589			1537			331			501	
Approach Delay, s/veh		32.0			44.9			36.1			33.9	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	45.9	11.2	51.0	9.4	46.3	13.8	48.4
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	5.4	* 45	8.1	40.9	17.7	32.9
Max Q Clear Time (g_c+I1), s	5.4	7.4	7.3	12.5	5.0	9.2	9.4	30.5
Green Ext Time (p_c), s	0.1	1.9	0.0	4.3	0.0	2.1	0.1	1.8

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	333	0	0	343
Future Vol, veh/h	0	2	333	0	0	343
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	2	362	0	0	373

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	181	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	837	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	837	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	837	-
HCM Lane V/C Ratio	-	-	0.003	-
HCM Control Delay (s)	-	-	9.3	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-

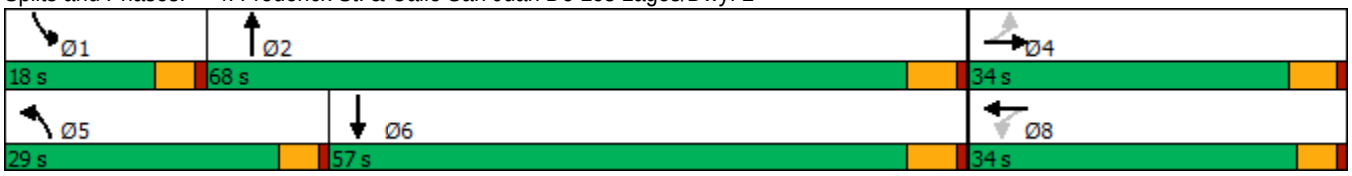
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	24	7	2	2	45	307	9	258
Future Volume (vph)	24	7	2	2	45	307	9	258
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	23.4	23.4	22.6	22.6	9.6	15.4	9.6	28.4
Total Split (s)	34.0	34.0	34.0	34.0	29.0	68.0	18.0	57.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	24.2%	56.7%	15.0%	47.5%
Yellow Time (s)	4.4	4.4	3.6	3.6	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4		4.6	4.6	5.4	4.6	5.4
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	11.5	11.5		11.9	6.9	69.4	5.3	64.1
Actuated g/C Ratio	0.14	0.14		0.14	0.08	0.82	0.06	0.76
v/c Ratio	0.13	0.09		0.03	0.33	0.12	0.09	0.14
Control Delay	35.8	22.8		29.3	45.0	3.8	43.4	5.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	22.8		29.3	45.0	3.8	43.4	5.7
LOS	D	C		C	D	A	D	A
Approach Delay		30.0		29.3		9.0		6.7
Approach LOS		C		C		A		A

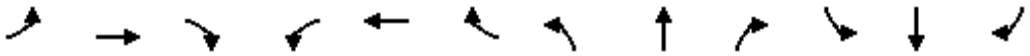
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 84.3	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 45.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	7	12	2	2	2	45	307	11	9	258	77
Future Volume (veh/h)	24	7	12	2	2	2	45	307	11	9	258	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	26	8	6	2	2	2	49	334	12	10	280	79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	205	84	63	81	68	47	72	2577	92	22	1948	539
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.04	0.73	0.73	0.01	0.70	0.70
Sat Flow, veh/h	1435	1003	752	309	818	563	1810	3552	127	1810	2792	773
Grp Volume(v), veh/h	26	0	14	6	0	0	49	169	177	10	179	180
Grp Sat Flow(s),veh/h/ln	1435	0	1755	1689	0	0	1810	1805	1874	1810	1805	1760
Q Serve(g_s), s	1.1	0.0	0.6	0.0	0.0	0.0	2.3	2.5	2.5	0.5	2.9	3.0
Cycle Q Clear(g_c), s	1.4	0.0	0.6	0.3	0.0	0.0	2.3	2.5	2.5	0.5	2.9	3.0
Prop In Lane	1.00		0.43	0.33		0.33	1.00		0.07	1.00		0.44
Lane Grp Cap(c), veh/h	205	0	147	197	0	0	72	1310	1360	22	1260	1228
V/C Ratio(X)	0.13	0.00	0.10	0.03	0.00	0.00	0.68	0.13	0.13	0.45	0.14	0.15
Avail Cap(c_a), veh/h	560	0	582	612	0	0	512	1310	1360	281	1260	1228
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	0.0	36.5	36.3	0.0	0.0	40.9	3.6	3.6	42.3	4.4	4.4
Incr Delay (d2), s/veh	0.3	0.0	0.3	0.1	0.0	0.0	4.1	0.2	0.2	5.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.3	0.1	0.0	0.0	1.1	0.7	0.7	0.2	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	0.0	36.8	36.4	0.0	0.0	44.9	3.8	3.8	47.4	4.6	4.6
LnGrp LOS	D	A	D	D	A	A	D	A	A	D	A	A
Approach Vol, veh/h		40			6			395			369	
Approach Delay, s/veh		37.0			36.4			8.9			5.8	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	68.0		12.6	8.1	65.6		12.6				
Change Period (Y+Rc), s	4.6	5.4		5.4	4.6	5.4		* 5.4				
Max Green Setting (Gmax), s	13.4	62.6		28.6	24.4	51.6		* 29				
Max Q Clear Time (g_c+I1), s	2.5	4.5		3.4	4.3	5.0		2.3				
Green Ext Time (p_c), s	0.0	2.0		0.1	0.0	2.1		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	9.1
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↱			↱		↑↑↳			↑↑↳	
Traffic Vol, veh/h	0	0	5	0	0	68	0	295	8	2	257	13
Future Vol, veh/h	0	0	5	0	0	68	0	295	8	2	257	13
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	5	0	0	75	0	324	9	2	282	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	148	-	-	169	-	0	0	334	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	878	0	0	852	0	-	-	1237	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	878	-	-	850	-	-	-	1236	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

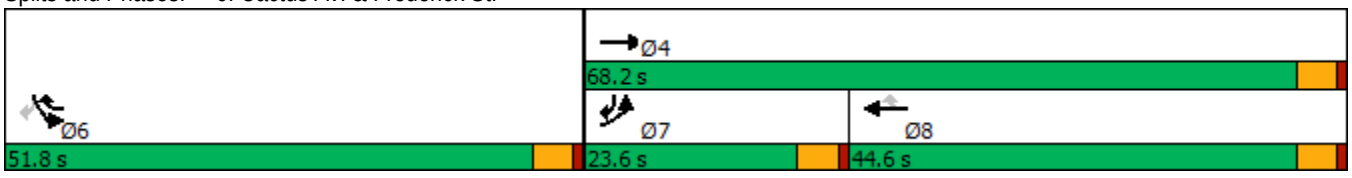
Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	9.6	0	0.1
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	878	850	1236	-	-
HCM Lane V/C Ratio	-	-	0.006	0.088	0.002	-	-
HCM Control Delay (s)	-	-	9.1	9.6	7.9	-	-
HCM Lane LOS	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	-	-	0	0.3	0	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	171	972	1681	151	132	85
Future Volume (vph)	171	972	1681	151	132	85
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	23.6	68.2	44.6	51.8	51.8	23.6
Total Split (%)	19.7%	56.8%	37.2%	43.2%	43.2%	19.7%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	19.2	64.2	40.4	58.9	13.9	37.7
Actuated g/C Ratio	0.22	0.73	0.46	0.67	0.16	0.43
v/c Ratio	0.46	0.27	0.75	0.14	0.25	0.13
Control Delay	35.8	5.0	23.0	1.0	32.2	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	5.0	23.0	1.0	32.2	14.7
LOS	D	A	C	A	C	B
Approach Delay		9.6	21.2		25.4	
Approach LOS		A	C		C	

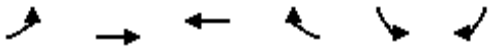
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 87.4	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 61.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	171	972	1681	151	132	85
Future Volume (veh/h)	171	972	1681	151	132	85
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	182	1034	1788	155	140	50
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	415	3984	2506	972	424	564
Arrive On Green	0.23	0.77	0.48	0.48	0.12	0.12
Sat Flow, veh/h	1810	5358	5358	1610	3510	1610
Grp Volume(v), veh/h	182	1034	1788	155	140	50
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1610	1755	1610
Q Serve(g_s), s	7.1	4.8	22.5	3.5	3.0	1.7
Cycle Q Clear(g_c), s	7.1	4.8	22.5	3.5	3.0	1.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	415	3984	2506	972	424	564
V/C Ratio(X)	0.44	0.26	0.71	0.16	0.33	0.09
Avail Cap(c_a), veh/h	415	3984	2506	972	2001	1287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	2.8	16.9	7.2	33.3	18.0
Incr Delay (d2), s/veh	3.3	0.2	1.1	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.7	7.6	1.4	1.2	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.7	2.9	18.0	7.3	33.5	18.1
LnGrp LOS	C	A	B	A	C	B
Approach Vol, veh/h		1216	1943		190	
Approach Delay, s/veh		7.1	17.1		29.4	
Approach LOS		A	B		C	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	68.2	14.6	23.6	44.6
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	63.6	47.2	19.0	40.0
Max Q Clear Time (g_c+I1), s	6.8	5.0	9.1	24.5
Green Ext Time (p_c), s	12.3	0.3	0.2	12.5

Intersection Summary	
HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	67	12	3	1
Future Vol, veh/h	2	8	67	12	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	9	73	13	3	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	86	0	-	0	93	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	13	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1523	-	-	-	912	986
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	1015	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1523	-	-	-	911	986
Mov Cap-2 Maneuver	-	-	-	-	856	-
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	1015	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1523	-	-	-	885
HCM Lane V/C Ratio	0.001	-	-	-	0.005
HCM Control Delay (s)	7.4	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

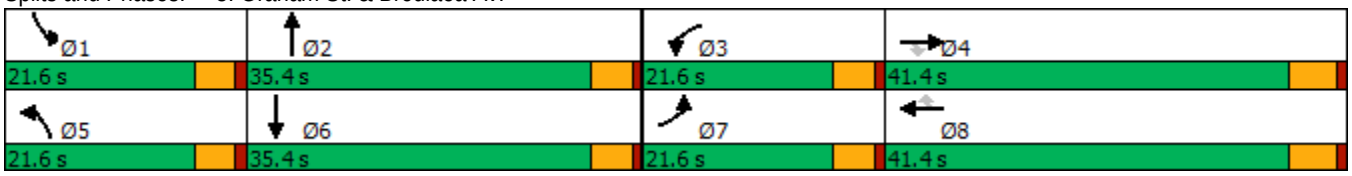
Timings
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	2	7	5	20	57	75	10	194	42	241
Future Volume (vph)	2	7	5	20	57	75	10	194	42	241
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.8	12.9	12.9	6.1	13.1	13.1	5.9	18.1	6.7	20.7
Actuated g/C Ratio	0.14	0.31	0.31	0.15	0.31	0.31	0.14	0.43	0.16	0.49
v/c Ratio	0.01	0.02	0.01	0.10	0.12	0.17	0.05	0.17	0.18	0.17
Control Delay	26.0	15.4	0.0	24.1	14.3	5.0	24.7	13.9	22.8	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	15.4	0.0	24.1	14.3	5.0	24.7	13.9	22.8	11.2
LOS	C	B	A	C	B	A	C	B	C	B
Approach Delay		12.0			11.0			14.4		12.9
Approach LOS		B			B			B		B

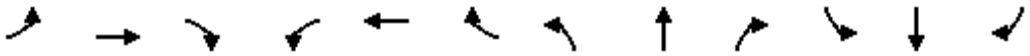
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 41.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.18	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 34.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	7	5	20	57	75	10	194	18	42	241	5
Future Volume (veh/h)	2	7	5	20	57	75	10	194	18	42	241	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2	9	5	25	71	59	12	242	20	52	301	6
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	5	378	321	55	430	364	28	838	69	98	1038	21
Arrive On Green	0.00	0.20	0.20	0.03	0.23	0.23	0.02	0.25	0.25	0.05	0.29	0.29
Sat Flow, veh/h	1810	1900	1610	1810	1900	1608	1810	3376	277	1810	3618	72
Grp Volume(v), veh/h	2	9	5	25	71	59	12	128	134	52	150	157
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1608	1810	1805	1848	1810	1805	1885
Q Serve(g_s), s	0.0	0.2	0.1	0.6	1.2	1.2	0.3	2.4	2.4	1.2	2.7	2.7
Cycle Q Clear(g_c), s	0.0	0.2	0.1	0.6	1.2	1.2	0.3	2.4	2.4	1.2	2.7	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		0.04
Lane Grp Cap(c), veh/h	5	378	321	55	430	364	28	448	459	98	518	541
V/C Ratio(X)	0.40	0.02	0.02	0.46	0.16	0.16	0.43	0.29	0.29	0.53	0.29	0.29
Avail Cap(c_a), veh/h	746	1659	1406	746	1659	1404	746	1344	1376	746	1344	1404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	13.3	13.3	19.7	12.8	12.8	20.1	12.5	12.6	19.0	11.4	11.4
Incr Delay (d2), s/veh	18.3	0.0	0.0	2.2	0.2	0.2	3.7	0.3	0.3	1.6	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.2	0.4	0.4	0.1	0.8	0.9	0.5	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	13.3	13.3	21.9	13.0	13.0	23.9	12.9	12.9	20.6	11.7	11.7
LnGrp LOS	D	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		16			155			274			359	
Approach Delay, s/veh		16.5			14.4			13.4			13.0	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	14.9	5.8	13.6	5.2	16.5	4.7	14.7
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	3.2	4.4	2.6	2.2	2.3	4.7	2.0	3.2
Green Ext Time (p_c), s	0.0	1.5	0.0	0.0	0.0	1.8	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	46	78	29	28	45
Future Vol, veh/h	46	46	78	29	28	45
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	53	53	90	33	32	52

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	206	91	0	0	123	0
Stage 1	90	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	787	972	-	-	1477	-
Stage 1	939	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	770	971	-	-	1477	-
Mov Cap-2 Maneuver	811	-	-	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	914	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	2.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	811	971	1477	-
HCM Lane V/C Ratio	-	-	0.065	0.054	0.022	-
HCM Control Delay (s)	-	-	9.7	8.9	7.5	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	0.1	-

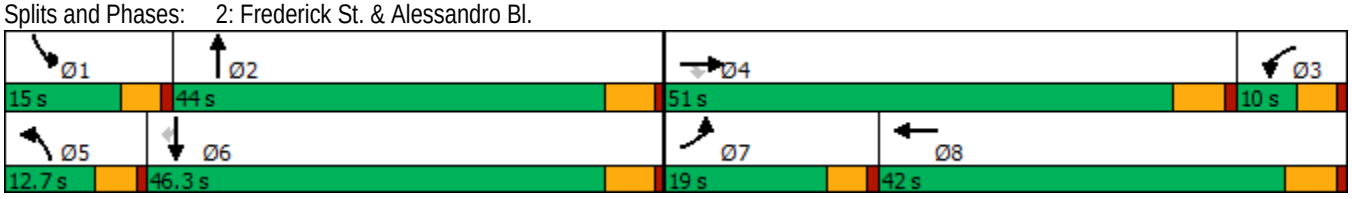
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	196	1224	137	60	804	112	273	262	268	118
Future Volume (vph)	196	1224	137	60	804	112	273	262	268	118
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	19.0	51.0	51.0	10.0	42.0	12.7	44.0	15.0	46.3	46.3
Total Split (%)	15.8%	42.5%	42.5%	8.3%	35.0%	10.6%	36.7%	12.5%	38.6%	38.6%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	14.4	45.2	45.2	5.4	36.2	7.5	38.6	10.4	41.5	41.5
Actuated g/C Ratio	0.12	0.38	0.38	0.04	0.30	0.06	0.32	0.09	0.35	0.35
v/c Ratio	0.94	0.94	0.21	0.78	0.65	0.54	0.32	0.90	0.22	0.19
Control Delay	101.2	50.0	7.6	108.7	37.4	63.7	29.0	86.2	28.6	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.2	50.0	7.6	108.7	37.4	63.7	29.0	86.2	28.6	2.3
LOS	F	D	A	F	D	E	C	F	C	A
Approach Delay		52.7			41.6		37.5		47.1	
Approach LOS		D			D		D		D	

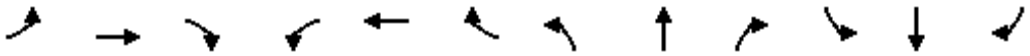
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 46.7	Intersection LOS: D
Intersection Capacity Utilization 93.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	196	1224	137	60	804	162	112	273	74	262	268	118
Future Volume (veh/h)	196	1224	137	60	804	162	112	273	74	262	268	118
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	204	1275	122	62	838	145	117	284	69	273	279	65
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	215	1347	593	80	1369	235	171	918	219	301	1285	565
Arrive On Green	0.12	0.37	0.37	0.04	0.31	0.31	0.05	0.32	0.32	0.09	0.36	0.36
Sat Flow, veh/h	1810	3610	1590	1810	4442	763	3510	2882	687	3510	3610	1587
Grp Volume(v), veh/h	204	1275	122	62	651	332	117	176	177	273	279	65
Grp Sat Flow(s),veh/h/ln	1810	1805	1590	1810	1729	1747	1755	1805	1764	1755	1805	1587
Q Serve(g_s), s	13.6	41.5	5.0	4.1	19.4	19.6	4.0	8.9	9.2	9.3	6.5	3.3
Cycle Q Clear(g_c), s	13.6	41.5	5.0	4.1	19.4	19.6	4.0	8.9	9.2	9.3	6.5	3.3
Prop In Lane	1.00		1.00	1.00		0.44	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	215	1347	593	80	1066	539	171	575	562	301	1285	565
V/C Ratio(X)	0.95	0.95	0.21	0.78	0.61	0.62	0.69	0.31	0.32	0.91	0.22	0.12
Avail Cap(c_a), veh/h	215	1347	593	81	1066	539	235	575	562	301	1285	565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	36.8	15.9	57.3	35.7	35.8	56.7	31.2	31.3	54.9	27.2	26.2
Incr Delay (d2), s/veh	46.4	14.7	0.8	33.6	2.6	5.2	1.8	1.4	1.5	28.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	20.0	2.4	2.6	8.3	8.8	1.8	4.0	4.1	5.2	2.8	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.4	51.5	16.7	90.9	38.3	41.0	58.5	32.5	32.7	83.3	27.6	26.6
LnGrp LOS	F	D	B	F	D	D	E	C	C	F	C	C
Approach Vol, veh/h		1601			1045			470			617	
Approach Delay, s/veh		55.0			42.3			39.1			52.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	44.0	11.2	51.0	10.5	48.5	19.0	43.2
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	5.4	* 45	8.1	40.9	14.4	36.2
Max Q Clear Time (g_c+I1), s	11.3	11.2	6.1	43.5	6.0	8.5	15.6	21.6
Green Ext Time (p_c), s	0.0	2.9	0.0	1.4	0.0	1.9	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	49.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	12	453	0	0	490
Future Vol, veh/h	0	12	453	0	0	490
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	13	492	0	0	533

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	246	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	760	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	760	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	760	-
HCM Lane V/C Ratio	-	-	0.017	-
HCM Control Delay (s)	-	-	9.8	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-

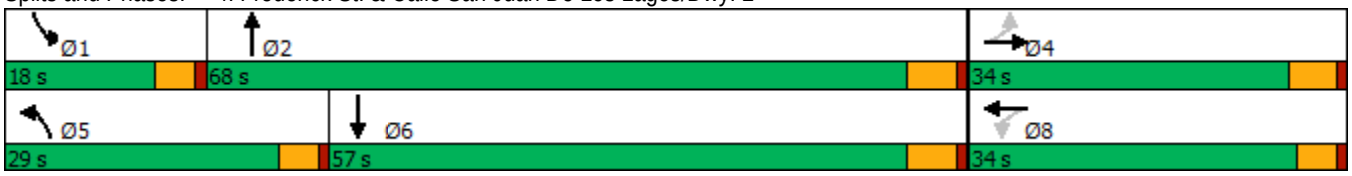
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	136	2	11	7	22	308	3	433
Future Volume (vph)	136	2	11	7	22	308	3	433
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	23.4	23.4	22.6	22.6	9.6	15.4	9.6	28.4
Total Split (s)	34.0	34.0	34.0	34.0	29.0	68.0	18.0	57.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	24.2%	56.7%	15.0%	47.5%
Yellow Time (s)	4.4	4.4	3.6	3.6	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4		4.6	4.6	5.4	4.6	5.4
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	14.9	14.9		15.7	5.9	63.1	5.1	60.4
Actuated g/C Ratio	0.16	0.16		0.17	0.07	0.70	0.06	0.67
v/c Ratio	0.64	0.10		0.10	0.20	0.13	0.03	0.22
Control Delay	49.0	14.0		24.5	46.7	5.7	45.3	7.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	14.0		24.5	46.7	5.7	45.3	7.4
LOS	D	B		C	D	A	D	A
Approach Delay		43.3		24.5		8.5		7.6
Approach LOS		D		C		A		A

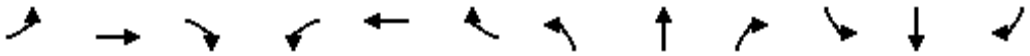
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 90.5	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 42.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	2	25	11	7	9	22	308	3	3	433	55
Future Volume (veh/h)	136	2	25	11	7	9	22	308	3	3	433	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	148	2	20	12	8	10	24	335	3	3	471	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	266	19	187	117	78	69	45	2556	23	7	2203	256
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.03	0.70	0.70	0.00	0.68	0.68
Sat Flow, veh/h	1417	147	1471	475	613	544	1810	3665	33	1810	3258	379
Grp Volume(v), veh/h	148	0	22	30	0	0	24	165	173	3	260	266
Grp Sat Flow(s),veh/h/ln	1417	0	1619	1632	0	0	1810	1805	1893	1810	1805	1831
Q Serve(g_s), s	7.4	0.0	1.1	0.0	0.0	0.0	1.2	2.7	2.7	0.1	4.9	4.9
Cycle Q Clear(g_c), s	8.7	0.0	1.1	1.3	0.0	0.0	1.2	2.7	2.7	0.1	4.9	4.9
Prop In Lane	1.00		0.91	0.40		0.33	1.00		0.02	1.00		0.21
Lane Grp Cap(c), veh/h	266	0	206	264	0	0	45	1259	1320	7	1221	1238
V/C Ratio(X)	0.56	0.00	0.11	0.11	0.00	0.00	0.53	0.13	0.13	0.41	0.21	0.21
Avail Cap(c_a), veh/h	537	0	516	580	0	0	492	1259	1320	270	1221	1238
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.9	0.0	34.7	34.8	0.0	0.0	43.2	4.5	4.5	44.6	5.5	5.5
Incr Delay (d2), s/veh	1.8	0.0	0.2	0.2	0.0	0.0	3.5	0.2	0.2	13.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.4	0.6	0.0	0.0	0.6	0.8	0.9	0.1	1.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.7	0.0	34.9	35.0	0.0	0.0	46.8	4.7	4.7	57.9	5.9	5.9
LnGrp LOS	D	A	C	C	A	A	D	A	A	E	A	A
Approach Vol, veh/h		170			30			362			529	
Approach Delay, s/veh		39.1			35.0			7.5			6.2	
Approach LOS		D			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	68.0		16.8	6.9	66.1		16.8				
Change Period (Y+Rc), s	4.6	5.4		5.4	4.6	5.4		* 5.4				
Max Green Setting (Gmax), s	13.4	62.6		28.6	24.4	51.6		* 29				
Max Q Clear Time (g_c+I1), s	2.1	4.7		10.7	3.2	6.9		3.3				
Green Ext Time (p_c), s	0.0	1.9		0.4	0.0	3.2		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		12.5	
HCM 6th LOS		B	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	28	0	0	52	0	280	18	1	458	10
Future Vol, veh/h	0	0	28	0	0	52	0	280	18	1	458	10
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	31	0	0	57	0	308	20	1	503	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	257	-	-	166	-	0	0	329	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	748	0	0	856	0	-	-	1242	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	748	-	-	854	-	-	-	1241	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

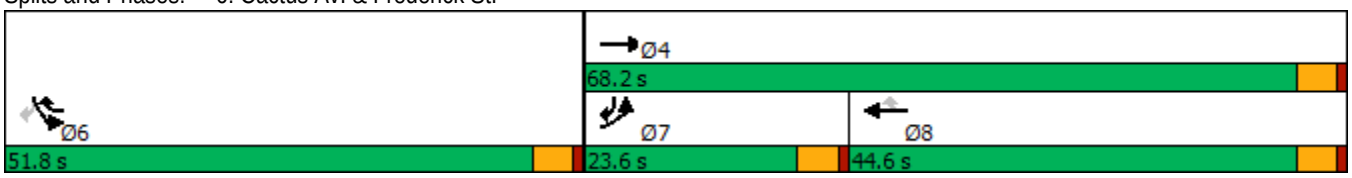
Approach	EB	WB	NB	SB
HCM Control Delay, s	10	9.5	0	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	748	854	1241	-	-
HCM Lane V/C Ratio	-	-	0.041	0.067	0.001	-	-
HCM Control Delay (s)	-	-	10	9.5	7.9	-	-
HCM Lane LOS	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	-	-	0.1	0.2	0	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	79	1976	969	142	412	146
Future Volume (vph)	79	1976	969	142	412	146
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	23.6	68.2	44.6	51.8	51.8	23.6
Total Split (%)	19.7%	56.8%	37.2%	43.2%	43.2%	19.7%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	19.1	64.0	40.3	62.4	17.5	41.3
Actuated g/C Ratio	0.21	0.70	0.44	0.69	0.19	0.45
v/c Ratio	0.22	0.57	0.45	0.13	0.65	0.21
Control Delay	33.8	8.5	19.3	1.0	38.0	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	8.5	19.3	1.0	38.0	13.6
LOS	C	A	B	A	D	B
Approach Delay		9.4	17.0		31.6	
Approach LOS		A	B		C	

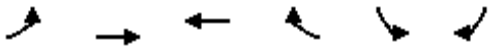
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 90.8	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 57.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	1976	969	142	412	146
Future Volume (veh/h)	79	1976	969	142	412	146
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	84	2102	1031	145	438	115
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	399	3829	2408	997	544	605
Arrive On Green	0.22	0.74	0.46	0.46	0.16	0.16
Sat Flow, veh/h	1810	5358	5358	1610	3510	1610
Grp Volume(v), veh/h	84	2102	1031	145	438	115
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1610	1755	1610
Q Serve(g_s), s	3.3	15.4	11.5	3.2	10.4	4.1
Cycle Q Clear(g_c), s	3.3	15.4	11.5	3.2	10.4	4.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	399	3829	2408	997	544	605
V/C Ratio(X)	0.21	0.55	0.43	0.15	0.80	0.19
Avail Cap(c_a), veh/h	399	3829	2408	997	1923	1237
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	5.0	15.4	6.9	35.1	18.1
Incr Delay (d2), s/veh	1.2	0.6	0.2	0.1	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.1	3.9	1.5	4.3	4.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.6	5.5	15.6	7.0	36.2	18.1
LnGrp LOS	C	A	B	A	D	B
Approach Vol, veh/h		2186	1176		553	
Approach Delay, s/veh		6.4	14.5		32.5	
Approach LOS		A	B		C	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	68.2	18.0	23.6	44.6
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	63.6	47.2	19.0	40.0
Max Q Clear Time (g_c+I1), s	17.4	12.4	5.3	13.5
Green Ext Time (p_c), s	32.3	1.0	0.1	10.9

Intersection Summary	
HCM 6th Ctrl Delay	12.5
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	18	48	3	16	4
Future Vol, veh/h	1	18	48	3	16	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	20	52	3	17	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	55	0	-	0	76	54
Stage 1	-	-	-	-	54	-
Stage 2	-	-	-	-	22	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1563	-	-	-	932	1019
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	1006	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1563	-	-	-	931	1019
Mov Cap-2 Maneuver	-	-	-	-	874	-
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	1006	-

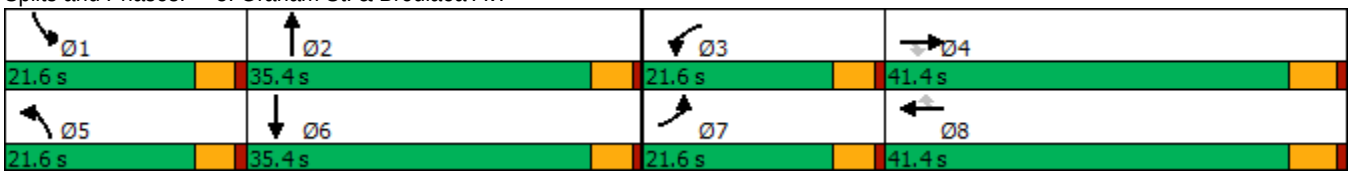
Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1563	-	-	-	900
HCM Lane V/C Ratio	0.001	-	-	-	0.024
HCM Control Delay (s)	7.3	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	3	17	14	20	47	68	5	265	75	266
Future Volume (vph)	3	17	14	20	47	68	5	265	75	266
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.6	12.7	12.7	6.1	12.9	12.9	5.6	19.2	7.9	27.9
Actuated g/C Ratio	0.12	0.27	0.27	0.13	0.27	0.27	0.12	0.40	0.16	0.58
v/c Ratio	0.02	0.04	0.04	0.11	0.12	0.17	0.03	0.25	0.32	0.16
Control Delay	28.0	17.6	0.1	26.8	17.1	4.9	27.8	16.6	25.2	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	17.6	0.1	26.8	17.1	4.9	27.8	16.6	25.2	10.0
LOS	C	B	A	C	B	A	C	B	C	A
Approach Delay		11.3			12.4			16.8		13.3
Approach LOS		B			B			B		B

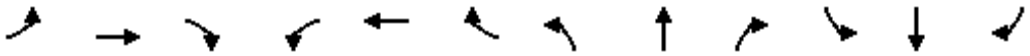
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 47.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.32	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 34.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	17	14	20	47	68	5	265	22	75	266	3
Future Volume (veh/h)	3	17	14	20	47	68	5	265	22	75	266	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	4	21	17	25	59	50	6	331	26	94	332	4
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	375	318	54	422	357	15	815	64	143	1136	14
Arrive On Green	0.01	0.20	0.20	0.03	0.22	0.22	0.01	0.24	0.24	0.08	0.31	0.31
Sat Flow, veh/h	1810	1900	1610	1810	1900	1608	1810	3391	265	1810	3652	44
Grp Volume(v), veh/h	4	21	17	25	59	50	6	175	182	94	164	172
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1608	1810	1805	1850	1810	1805	1891
Q Serve(g_s), s	0.1	0.4	0.4	0.6	1.1	1.1	0.1	3.5	3.5	2.1	2.9	2.9
Cycle Q Clear(g_c), s	0.1	0.4	0.4	0.6	1.1	1.1	0.1	3.5	3.5	2.1	2.9	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		0.02
Lane Grp Cap(c), veh/h	10	375	318	54	422	357	15	434	445	143	562	588
V/C Ratio(X)	0.41	0.06	0.05	0.46	0.14	0.14	0.41	0.40	0.41	0.66	0.29	0.29
Avail Cap(c_a), veh/h	722	1606	1361	722	1606	1359	722	1301	1334	722	1301	1363
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	13.9	13.9	20.3	13.3	13.3	21.0	13.6	13.6	19.1	11.1	11.1
Incr Delay (d2), s/veh	9.8	0.1	0.1	2.2	0.1	0.2	6.8	0.6	0.6	1.9	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.1	0.2	0.4	0.3	0.1	1.3	1.3	0.9	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	13.9	13.9	22.6	13.4	13.5	27.8	14.2	14.2	21.0	11.4	11.4
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		42			134			363			430	
Approach Delay, s/veh		15.5			15.2			14.4			13.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	14.9	5.9	13.8	4.9	18.0	4.8	14.9
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	4.1	5.5	2.6	2.4	2.1	4.9	2.1	3.1
Green Ext Time (p_c), s	0.1	2.1	0.0	0.1	0.0	2.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX 5.2:

E+P CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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California MUTCD 2014 Edition
(FHWA's MUTCD 2009, as amended for use in California)

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

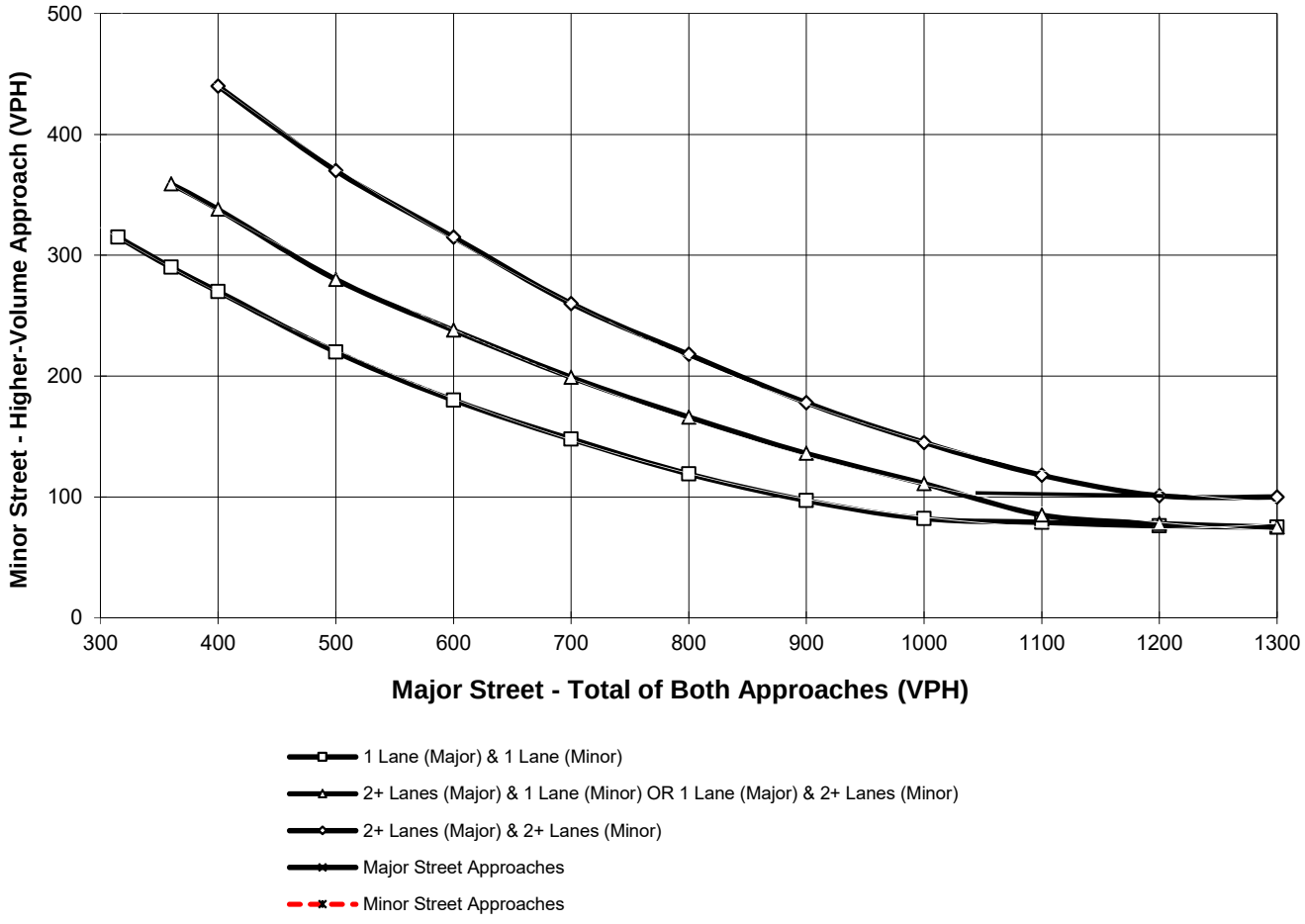
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Conditions - Weekday PM Peak Hour**

Major Street Name = **Veterans Way** Total of Both Approaches (VPH) = **180**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Calle San Juan de Los Lagos** High Volume Approach (VPH) = **92**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P	
				CALC	CHS	DATE	05/15/18
Jurisdiction:	City of Moreno Valley			CHK	CHS	DATE	05/15/18
Major Street:	Brodiaea Av.			Critical Approach Speed (Major)		40	mph
Minor Street:	Driveway 3			Critical Approach Speed (Minor)		25	mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **951** vpd Minor Street Future ADT = **91** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **RURAL (R)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **951**	1 **91**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **951**	1 **91**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A: 4% B: 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 5.3:

E+P CONDITIONS QUEUING ANALYSIS WORKSHEETS

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Queuing and Blocking Report
E+P - AM Peak Hour

Centerpointe (JN: 11410)
05/15/2018

Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	40	32	29
Average Queue (ft)	16	10	3
95th Queue (ft)	37	27	18
Link Distance (ft)		1530	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		115
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	156	164	178	34	215	394	385	374	78	86	119	134
Average Queue (ft)	81	89	97	11	115	259	259	244	25	42	43	61
95th Queue (ft)	145	149	164	27	232	356	353	339	59	75	92	110
Link Distance (ft)		3252	3252	3252		2574	2574	2574			571	571
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)					13	38					0	
Queuing Penalty (veh)					55	30					0	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	84	130	146	127	112
Average Queue (ft)	15	69	67	63	53
95th Queue (ft)	50	116	122	114	93
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)		7	4	3	1
Queuing Penalty (veh)		9	3	5	1

Intersection: 3: Frederick St. & Dwy. 1

Movement	WB
Directions Served	R
Maximum Queue (ft)	24
Average Queue (ft)	2
95th Queue (ft)	13
Link Distance (ft)	345
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	54	51	44	90	83	70	45	103	131
Average Queue (ft)	20	12	6	33	16	25	11	23	33
95th Queue (ft)	48	37	26	70	54	63	36	74	95
Link Distance (ft)		1530	288		230	230		276	276
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	120			150			100		
Storage Blk Time (%)								0	
Queuing Penalty (veh)								0	

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB	NB	SB	SB
Directions Served	R	R	TR	LT	TR
Maximum Queue (ft)	31	57	12	29	17
Average Queue (ft)	5	28	0	1	1
95th Queue (ft)	23	45	6	13	9
Link Distance (ft)	167	481	1150	230	230
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	177	125	134	85	274	270	245	58	82	101	72
Average Queue (ft)	84	51	41	15	179	176	144	26	27	45	24
95th Queue (ft)	150	103	91	51	250	247	224	52	65	86	58
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)							0			0	
Queuing Penalty (veh)							0			0	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	12	31
Average Queue (ft)	0	3
95th Queue (ft)	6	19
Link Distance (ft)		326
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	12	39	28	47	61	58	25	99	54	66	82	54
Average Queue (ft)	2	3	3	15	27	28	7	37	14	25	36	13
95th Queue (ft)	13	19	16	40	56	48	25	74	42	48	69	38
Link Distance (ft)		2009			828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210		100	150			160			150		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 104

Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	34	36	24
Average Queue (ft)	21	17	2
95th Queue (ft)	37	32	14
Link Distance (ft)		1530	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		115
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	330	473	460	109	156	240	247	229	86	102	126	157
Average Queue (ft)	189	297	312	27	56	166	166	147	32	50	76	94
95th Queue (ft)	321	435	440	74	119	221	227	227	73	91	119	146
Link Distance (ft)		3695	3695	3695		2574	2574	2574			571	571
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)	3	15			1	21					1	
Queuing Penalty (veh)	18	29			1	12					1	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	160	213	292	203	76
Average Queue (ft)	115	152	110	69	34
95th Queue (ft)	193	214	221	149	61
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)	13	57	6	2	0
Queuing Penalty (veh)	17	76	15	2	0

Intersection: 3: Frederick St. & Dwy. 1

Movement	WB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	10
95th Queue (ft)	33
Link Distance (ft)	345
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	159	105	65	56	61	65	34	197	172
Average Queue (ft)	82	21	20	20	22	27	3	63	48
95th Queue (ft)	134	66	51	47	55	60	18	142	117
Link Distance (ft)		1530	288		230	230		276	276
Upstream Blk Time (%)								0	0
Queuing Penalty (veh)								0	0
Storage Bay Dist (ft)	120			150			100		
Storage Blk Time (%)	4							3	
Queuing Penalty (veh)	1							0	

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB	NB	SB
Directions Served	R	R	TR	LT
Maximum Queue (ft)	36	45	6	16
Average Queue (ft)	21	23	0	1
95th Queue (ft)	45	43	4	9
Link Distance (ft)	167	481	1150	230
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	108	226	218	194	197	191	158	54	186	232	77
Average Queue (ft)	46	109	100	64	130	117	69	24	96	117	30
95th Queue (ft)	91	192	179	147	179	173	141	51	162	192	61
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)									1	3	
Queuing Penalty (veh)									2	7	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	14
95th Queue (ft)	39
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	30	44	33	52	56	53	25	112	62	98	82	46
Average Queue (ft)	2	9	9	15	22	26	4	48	18	37	35	13
95th Queue (ft)	15	33	30	43	52	48	19	89	47	71	68	37
Link Distance (ft)		2009			828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210		100	150			160			150		
Storage Blk Time (%)										0		
Queuing Penalty (veh)										0		

Network Summary

Network wide Queuing Penalty: 181

APPENDIX 6.1:

OPENING YEAR CUMULATIVE (2023) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	36	24	125	67	44	46
Future Vol, veh/h	36	24	125	67	44	46
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	41	28	144	77	51	53

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	299	145	0	0	221	0
Stage 1	144	-	-	-	-	-
Stage 2	155	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	697	908	-	-	1360	-
Stage 1	888	-	-	-	-	-
Stage 2	878	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	671	907	-	-	1360	-
Mov Cap-2 Maneuver	743	-	-	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	878	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	3.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	743	907	1360	-
HCM Lane V/C Ratio	-	-	0.056	0.03	0.037	-
HCM Control Delay (s)	-	-	10.1	9.1	7.7	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.1	-

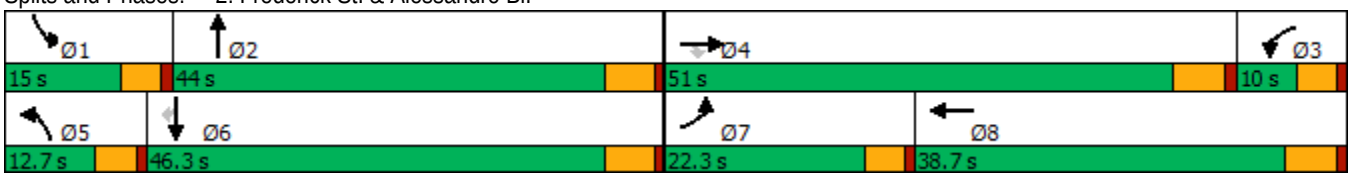
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	125	485	77	102	1475	135	263	110	293	228
Future Volume (vph)	125	485	77	102	1475	135	263	110	293	228
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	22.3	51.0	51.0	10.0	38.7	12.7	44.0	15.0	46.3	46.3
Total Split (%)	18.6%	42.5%	42.5%	8.3%	32.3%	10.6%	36.7%	12.5%	38.6%	38.6%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	12.8	45.2	45.2	5.4	37.8	7.8	40.4	8.2	40.9	40.9
Actuated g/C Ratio	0.11	0.38	0.38	0.05	0.32	0.07	0.34	0.07	0.34	0.34
v/c Ratio	0.67	0.37	0.12	1.31	1.02	0.62	0.26	0.48	0.25	0.34
Control Delay	67.9	28.0	2.0	246.4	68.4	67.0	28.5	60.1	29.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	28.0	2.0	246.4	68.4	67.0	28.5	60.1	29.1	4.9
LOS	E	C	A	F	E	E	C	E	C	A
Approach Delay		32.3			79.1		40.4		25.7	
Approach LOS		C			E		D		C	

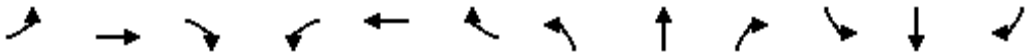
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.7	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 55.1	Intersection LOS: E
Intersection Capacity Utilization 90.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	485	77	102	1475	116	135	263	38	110	293	228
Future Volume (veh/h)	125	485	77	102	1475	116	135	263	38	110	293	228
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	130	505	59	106	1536	97	141	274	32	115	305	180
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	157	1362	600	82	1721	109	196	1136	131	170	1232	542
Arrive On Green	0.09	0.38	0.38	0.05	0.35	0.35	0.06	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	1810	3610	1590	1810	4981	314	3510	3255	376	3510	3610	1587
Grp Volume(v), veh/h	130	505	59	106	1066	567	141	151	155	115	305	180
Grp Sat Flow(s),veh/h/ln	1810	1805	1590	1810	1729	1837	1755	1805	1826	1755	1805	1587
Q Serve(g_s), s	8.5	12.1	2.2	5.4	35.0	35.0	4.7	7.1	7.3	3.9	7.3	10.1
Cycle Q Clear(g_c), s	8.5	12.1	2.2	5.4	35.0	35.0	4.7	7.1	7.3	3.9	7.3	10.1
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	157	1362	600	82	1195	635	196	630	637	170	1232	542
V/C Ratio(X)	0.83	0.37	0.10	1.30	0.89	0.89	0.72	0.24	0.24	0.68	0.25	0.33
Avail Cap(c_a), veh/h	267	1362	600	82	1195	635	237	630	637	305	1232	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.8	27.0	14.3	57.2	37.1	37.1	55.6	27.7	27.7	56.1	28.4	29.3
Incr Delay (d2), s/veh	4.2	0.8	0.3	199.5	10.3	17.4	5.7	0.9	0.9	1.8	0.5	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	5.2	1.1	6.9	15.8	18.0	2.2	3.2	3.3	1.7	3.2	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	27.8	14.7	256.7	47.4	54.5	61.3	28.6	28.7	57.8	28.9	30.9
LnGrp LOS	E	C	B	F	D	D	E	C	C	E	C	C
Approach Vol, veh/h		694			1739			447			600	
Approach Delay, s/veh		32.3			62.5			38.9			35.0	
Approach LOS		C			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	47.2	11.2	51.0	11.3	46.3	15.0	47.2
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	5.4	* 45	8.1	40.9	17.7	32.9
Max Q Clear Time (g_c+I1), s	5.9	9.3	7.4	14.1	6.7	12.1	10.5	37.0
Green Ext Time (p_c), s	0.1	2.4	0.0	5.0	0.0	2.5	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	48.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

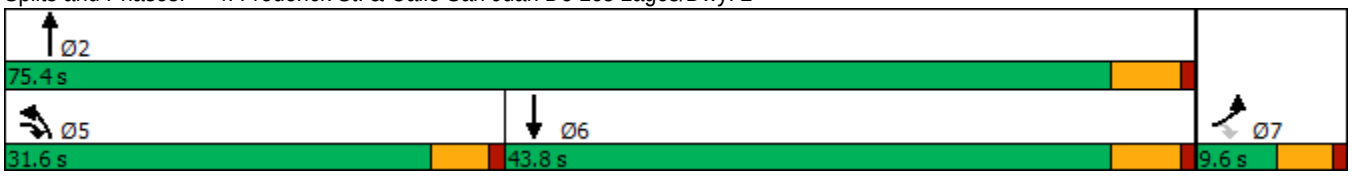
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	26	19	85	422	359
Future Volume (vph)	26	19	85	422	359
Turn Type	Prot	pm+ov	Prot	NA	NA
Protected Phases	7	5	5	2	6
Permitted Phases		7			
Detector Phase	7	5	5	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	9.6	9.6	15.4	28.4
Total Split (s)	9.6	31.6	31.6	75.4	43.8
Total Split (%)	11.3%	37.2%	37.2%	88.7%	51.5%
Yellow Time (s)	3.6	3.6	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.4	5.4
Lead/Lag		Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes		Yes
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	5.0	10.5	8.6	76.4	62.6
Actuated g/C Ratio	0.06	0.13	0.10	0.93	0.76
v/c Ratio	0.25	0.09	0.49	0.14	0.18
Control Delay	43.1	7.5	42.6	0.9	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	7.5	42.6	0.9	4.1
LOS	D	A	D	A	A
Approach Delay				7.9	4.1
Approach LOS				A	A

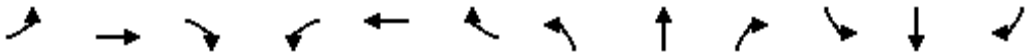
Intersection Summary			
Cycle Length: 85			
Actuated Cycle Length: 82.2			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 40.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	19	0	0	0	85	422	0	0	359	84
Future Volume (veh/h)	26	0	19	0	0	0	85	422	0	0	359	84
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	0	1900				1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	28	0	14				92	459	0	0	390	86
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	68	0	167				120	3041	0	0	2123	464
Arrive On Green	0.04	0.00	0.04				0.07	0.84	0.00	0.00	0.72	0.72
Sat Flow, veh/h	1810	0	1610				1810	3705	0	0	3041	643
Grp Volume(v), veh/h	28	0	14				92	459	0	0	237	239
Grp Sat Flow(s),veh/h/ln	1810	0	1610				1810	1805	0	0	1805	1784
Q Serve(g_s), s	1.3	0.0	0.7				4.2	1.9	0.0	0.0	3.5	3.6
Cycle Q Clear(g_c), s	1.3	0.0	0.7				4.2	1.9	0.0	0.0	3.5	3.6
Prop In Lane	1.00		1.00				1.00		0.00	0.00		0.36
Lane Grp Cap(c), veh/h	68	0	167				120	3041	0	0	1301	1286
V/C Ratio(X)	0.41	0.00	0.08				0.77	0.15	0.00	0.00	0.18	0.19
Avail Cap(c_a), veh/h	109	0	203				588	3041	0	0	1301	1286
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	39.1	0.0	33.7				38.2	1.2	0.0	0.0	3.7	3.7
Incr Delay (d2), s/veh	4.0	0.0	0.2				3.8	0.1	0.0	0.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0				1.9	0.1	0.0	0.0	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	0.0	33.9				42.0	1.3	0.0	0.0	4.0	4.1
LnGrp LOS	D	A	C				D	A	A	A	A	A
Approach Vol, veh/h		42						551			476	
Approach Delay, s/veh		40.0						8.1			4.0	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		75.4		7.7	10.1	65.3						
Change Period (Y+Rc), s		5.4		4.6	4.6	5.4						
Max Green Setting (Gmax), s		70.0		5.0	27.0	38.4						
Max Q Clear Time (g_c+I1), s		3.9		3.3	6.2	5.6						
Green Ext Time (p_c), s		3.2		0.0	0.1	2.8						

Intersection Summary												
HCM 6th Ctrl Delay			7.5									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	6	0	0	75	0	432	8	0	364	14
Future Vol, veh/h	0	0	6	0	0	75	0	432	8	0	364	14
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	7	0	0	82	0	475	9	0	400	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	208	-	-	244	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	804	0	0	763	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	804	-	-	762	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	10.3	0	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	804	762	-	-
HCM Lane V/C Ratio	-	-	0.008	0.108	-	-
HCM Control Delay (s)	-	-	9.5	10.3	-	-
HCM Lane LOS	-	-	A	B	-	-
HCM 95th %tile Q(veh)	-	-	0	0.4	-	-

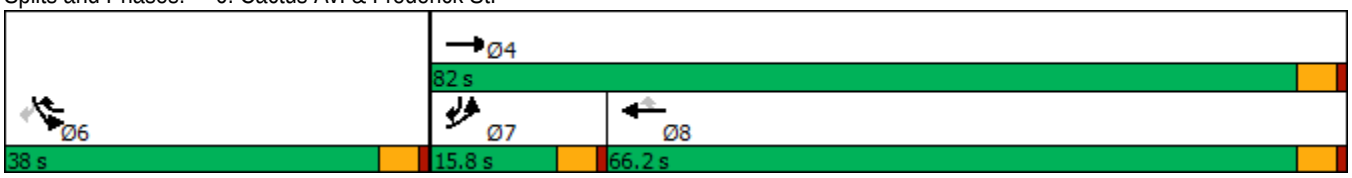
Timings
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	209	1695	2880	252	209	111
Future Volume (vph)	209	1695	2880	252	209	111
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	15.8	82.0	66.2	38.0	38.0	15.8
Total Split (%)	13.2%	68.3%	55.2%	31.7%	31.7%	13.2%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	11.3	77.9	62.0	81.1	14.4	30.3
Actuated g/C Ratio	0.11	0.77	0.61	0.80	0.14	0.30
v/c Ratio	1.11	0.45	0.97	0.21	0.45	0.24
Control Delay	139.4	5.6	30.2	2.4	42.0	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.4	5.6	30.2	2.4	42.0	27.6
LOS	F	A	C	A	D	C
Approach Delay		20.3	28.0		37.0	
Approach LOS		C	C		D	

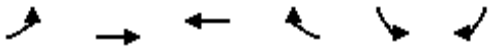
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.6	
Natural Cycle: 120	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 25.8	Intersection LOS: C
Intersection Capacity Utilization 87.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	209	1695	2880	252	209	111
Future Volume (veh/h)	209	1695	2880	252	209	111
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	222	1803	3064	262	222	78
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	210	4156	3308	1193	363	353
Arrive On Green	0.12	0.80	0.64	0.64	0.10	0.10
Sat Flow, veh/h	1810	5358	5358	1610	3510	1610
Grp Volume(v), veh/h	222	1803	3064	262	222	78
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1610	1755	1610
Q Serve(g_s), s	11.2	10.2	50.5	4.9	5.8	3.8
Cycle Q Clear(g_c), s	11.2	10.2	50.5	4.9	5.8	3.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	210	4156	3308	1193	363	353
V/C Ratio(X)	1.06	0.43	0.93	0.22	0.61	0.22
Avail Cap(c_a), veh/h	210	4156	3308	1193	1214	743
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	2.9	15.5	3.9	41.4	30.9
Incr Delay (d2), s/veh	78.3	0.3	5.3	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.3	1.5	16.4	1.9	2.5	3.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	121.0	3.3	20.8	4.0	42.1	31.0
LnGrp LOS	F	A	C	A	D	C
Approach Vol, veh/h		2025	3326		300	
Approach Delay, s/veh		16.2	19.5		39.2	
Approach LOS		B	B		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	82.0	14.6	15.8	66.2
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	77.4	33.4	11.2	61.6
Max Q Clear Time (g_c+I1), s	12.2	7.8	13.2	52.5
Green Ext Time (p_c), s	31.5	0.5	0.0	9.0

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

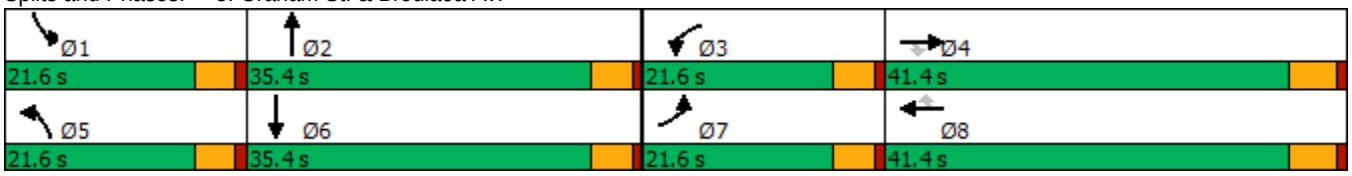
Timings
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	2	7	3	22	58	83	3	339	46	393
Future Volume (vph)	2	7	3	22	58	83	3	339	46	393
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.7	12.8	12.8	7.1	13.1	13.1	5.7	19.5	6.9	24.6
Actuated g/C Ratio	0.13	0.28	0.28	0.16	0.29	0.29	0.13	0.43	0.15	0.54
v/c Ratio	0.01	0.02	0.01	0.10	0.13	0.19	0.02	0.29	0.21	0.26
Control Delay	27.5	17.3	0.0	24.5	16.3	5.6	27.3	15.4	24.8	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	17.3	0.0	24.5	16.3	5.6	27.3	15.4	24.8	10.8
LOS	C	B	A	C	B	A	C	B	C	B
Approach Delay		14.9			12.0			15.5		12.2
Approach LOS		B			B			B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 45.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.29	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 36.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	7	3	22	58	83	3	339	19	46	393	6
Future Volume (veh/h)	2	7	3	22	58	83	3	339	19	46	393	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2	9	3	28	72	69	4	424	22	58	491	8
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	5	383	325	60	441	373	10	854	44	106	1083	18
Arrive On Green	0.00	0.20	0.20	0.03	0.23	0.23	0.01	0.24	0.24	0.06	0.30	0.30
Sat Flow, veh/h	1810	1900	1610	1810	1900	1608	1810	3491	181	1810	3634	59
Grp Volume(v), veh/h	2	9	3	28	72	69	4	219	227	58	244	255
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1608	1810	1805	1866	1810	1805	1888
Q Serve(g_s), s	0.0	0.2	0.1	0.6	1.3	1.4	0.1	4.4	4.4	1.3	4.6	4.6
Cycle Q Clear(g_c), s	0.0	0.2	0.1	0.6	1.3	1.4	0.1	4.4	4.4	1.3	4.6	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		0.03
Lane Grp Cap(c), veh/h	5	383	325	60	441	373	10	442	457	106	538	563
V/C Ratio(X)	0.40	0.02	0.01	0.47	0.16	0.18	0.41	0.49	0.50	0.55	0.45	0.45
Avail Cap(c_a), veh/h	736	1636	1387	736	1636	1385	736	1325	1370	736	1325	1386
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.8	13.4	13.3	19.8	12.8	12.9	20.7	13.6	13.6	19.1	11.9	11.9
Incr Delay (d2), s/veh	18.3	0.0	0.0	2.1	0.2	0.2	9.7	0.9	0.8	1.6	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.3	0.4	0.4	0.1	1.6	1.6	0.5	1.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	13.4	13.4	21.9	13.0	13.1	30.5	14.4	14.4	20.8	12.5	12.5
LnGrp LOS	D	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		14			169			450			557	
Approach Delay, s/veh		17.1			14.5			14.6			13.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	14.9	6.0	13.8	4.8	17.2	4.7	15.1
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	3.3	6.4	2.6	2.2	2.1	6.6	2.0	3.4
Green Ext Time (p_c), s	0.0	2.7	0.0	0.0	0.0	3.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	46	99	31	30	120
Future Vol, veh/h	46	46	99	31	30	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	52	52	111	35	34	135

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	314	111	0	0	146	0
Stage 1	111	-	-	-	-	-
Stage 2	203	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	683	948	-	-	1448	-
Stage 1	919	-	-	-	-	-
Stage 2	836	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	667	948	-	-	1448	-
Mov Cap-2 Maneuver	738	-	-	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	836	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	1.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	738	948	1448	-
HCM Lane V/C Ratio	-	-	0.07	0.055	0.023	-
HCM Control Delay (s)	-	-	10.2	9	7.5	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	0.1	-

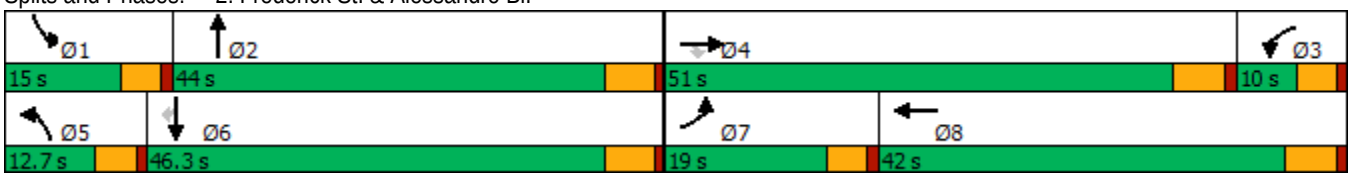
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	240	1375	237	108	892	151	317	290	337	134
Future Volume (vph)	240	1375	237	108	892	151	317	290	337	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	19.0	51.0	51.0	10.0	42.0	12.7	44.0	15.0	46.3	46.3
Total Split (%)	15.8%	42.5%	42.5%	8.3%	35.0%	10.6%	36.7%	12.5%	38.6%	38.6%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	14.4	45.2	45.2	5.4	36.2	7.9	38.6	10.4	41.1	41.1
Actuated g/C Ratio	0.12	0.38	0.38	0.04	0.30	0.07	0.32	0.09	0.34	0.34
v/c Ratio	1.17	1.06	0.35	1.41	0.73	0.69	0.38	1.01	0.29	0.22
Control Delay	161.3	80.2	10.0	282.9	39.6	71.1	29.9	108.0	29.6	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	161.3	80.2	10.0	282.9	39.6	71.1	29.9	108.0	29.6	3.6
LOS	F	F	A	F	D	E	C	F	C	A
Approach Delay		81.7			61.9		40.9		54.9	
Approach LOS		F			E		D		D	

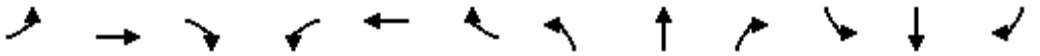
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.41	
Intersection Signal Delay: 66.4	Intersection LOS: E
Intersection Capacity Utilization 100.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	1375	237	108	892	179	151	317	98	290	337	134
Future Volume (veh/h)	240	1375	237	108	892	179	151	317	98	290	337	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	253	1447	224	114	939	117	159	334	83	305	355	92
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	215	1346	600	81	1438	179	214	912	223	301	1240	550
Arrive On Green	0.12	0.37	0.37	0.04	0.31	0.31	0.06	0.32	0.32	0.09	0.34	0.34
Sat Flow, veh/h	1810	3610	1608	1810	4659	578	3510	2864	701	3510	3610	1602
Grp Volume(v), veh/h	253	1447	224	114	696	360	159	209	208	305	355	92
Grp Sat Flow(s),veh/h/ln	1810	1805	1608	1810	1729	1780	1755	1805	1759	1755	1805	1602
Q Serve(g_s), s	14.4	45.2	9.4	5.4	21.1	21.2	5.4	10.8	11.1	10.4	8.7	4.8
Cycle Q Clear(g_c), s	14.4	45.2	9.4	5.4	21.1	21.2	5.4	10.8	11.1	10.4	8.7	4.8
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	215	1346	600	81	1067	549	214	575	560	301	1240	550
V/C Ratio(X)	1.18	1.07	0.37	1.41	0.65	0.66	0.74	0.36	0.37	1.01	0.29	0.17
Avail Cap(c_a), veh/h	215	1346	600	81	1067	549	235	575	560	301	1240	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.4	38.0	16.2	57.9	36.3	36.3	56.0	31.8	31.9	55.4	29.0	27.7
Incr Delay (d2), s/veh	117.3	47.3	1.8	244.4	3.1	6.0	9.2	1.8	1.9	55.1	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.4	27.7	3.6	7.9	9.0	9.8	2.6	4.9	4.9	6.8	3.8	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	170.7	85.3	18.0	302.3	39.4	42.3	65.2	33.6	33.8	110.5	29.6	28.4
LnGrp LOS	F	F	B	F	D	D	E	C	C	F	C	C
Approach Vol, veh/h		1924			1170			576			752	
Approach Delay, s/veh		88.7			65.9			42.4			62.2	
Approach LOS		F			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	44.0	11.2	51.0	12.0	47.0	19.0	43.2
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	5.4	* 45	8.1	40.9	14.4	36.2
Max Q Clear Time (g_c+I1), s	12.4	13.1	7.4	47.2	7.4	10.7	16.4	23.2
Green Ext Time (p_c), s	0.0	3.4	0.0	0.0	0.0	2.5	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	72.1
HCM 6th LOS	E

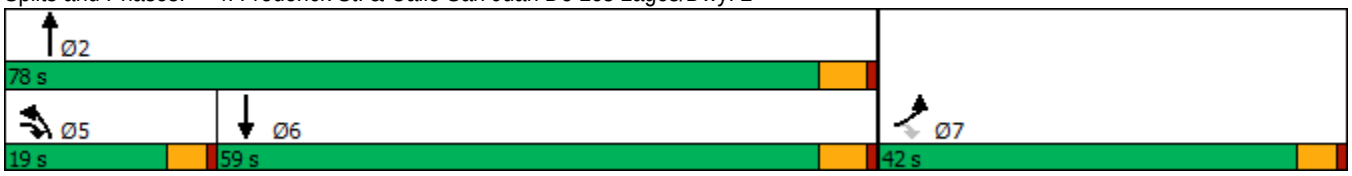
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	150	63	31	423	650
Future Volume (vph)	150	63	31	423	650
Turn Type	Prot	pm+ov	Prot	NA	NA
Protected Phases	7	5	5	2	6
Permitted Phases		7			
Detector Phase	7	5	5	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	9.6	9.6	15.4	28.4
Total Split (s)	42.0	19.0	19.0	78.0	59.0
Total Split (%)	35.0%	15.8%	15.8%	65.0%	49.2%
Yellow Time (s)	3.6	3.6	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.4	5.4
Lead/Lag		Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes		Yes
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	14.3	25.4	6.5	72.7	63.7
Actuated g/C Ratio	0.15	0.26	0.07	0.75	0.66
v/c Ratio	0.64	0.15	0.29	0.18	0.34
Control Delay	50.1	7.1	50.1	4.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	7.1	50.1	4.0	8.9
LOS	D	A	D	A	A
Approach Delay				7.2	8.9
Approach LOS				A	A

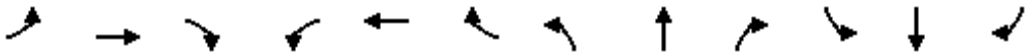
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 97	
Natural Cycle: 50	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	0	63	0	0	0	31	423	0	0	650	61
Future Volume (veh/h)	150	0	63	0	0	0	31	423	0	0	650	61
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	0	1900				1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	169	0	65				35	475	0	0	730	62
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	215	0	243				58	2796	0	0	2334	198
Arrive On Green	0.12	0.00	0.12				0.03	0.77	0.00	0.00	0.69	0.69
Sat Flow, veh/h	1810	0	1610				1810	3705	0	0	3461	286
Grp Volume(v), veh/h	169	0	65				35	475	0	0	391	401
Grp Sat Flow(s),veh/h/ln	1810	0	1610				1810	1805	0	0	1805	1846
Q Serve(g_s), s	8.5	0.0	3.3				1.8	3.2	0.0	0.0	8.0	8.0
Cycle Q Clear(g_c), s	8.5	0.0	3.3				1.8	3.2	0.0	0.0	8.0	8.0
Prop In Lane	1.00		1.00				1.00		0.00	0.00		0.15
Lane Grp Cap(c), veh/h	215	0	243				58	2796	0	0	1252	1281
V/C Ratio(X)	0.79	0.00	0.27				0.61	0.17	0.00	0.00	0.31	0.31
Avail Cap(c_a), veh/h	722	0	694				278	2796	0	0	1252	1281
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	0.0	35.2				44.8	2.7	0.0	0.0	5.6	5.6
Incr Delay (d2), s/veh	6.2	0.0	0.6				3.8	0.1	0.0	0.0	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	0.0				0.8	0.7	0.0	0.0	2.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	0.0	35.8				48.6	2.9	0.0	0.0	6.3	6.3
LnGrp LOS	D	A	D				D	A	A	A	A	A
Approach Vol, veh/h		234						510			792	
Approach Delay, s/veh		43.5						6.0			6.3	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		78.0		15.7	7.6	70.4						
Change Period (Y+Rc), s		5.4		4.6	4.6	5.4						
Max Green Setting (Gmax), s		72.6		37.4	14.4	53.6						
Max Q Clear Time (g_c+I1), s		5.2		10.5	3.8	10.0						
Green Ext Time (p_c), s		3.3		0.7	0.0	5.3						

Intersection Summary												
HCM 6th Ctrl Delay			11.8									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	0	0	54	0	400	20	0	702	11
Future Vol, veh/h	0	0	31	0	0	54	0	400	20	0	702	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	34	0	0	59	0	440	22	0	771	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	394	-	-	231	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	611	0	0	777	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	610	-	-	777	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	10	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	610	777	-	-
HCM Lane V/C Ratio	-	-	0.056	0.076	-	-
HCM Control Delay (s)	-	-	11.3	10	-	-
HCM Lane LOS	-	-	B	B	-	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	-	-

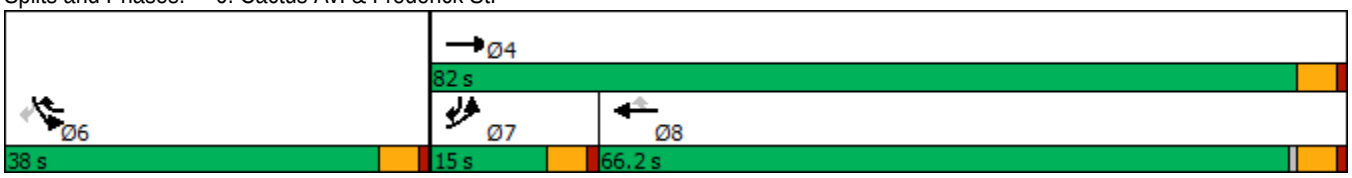
Timings
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	103	3090	2011	231	618	193
Future Volume (vph)	103	3090	2011	231	618	193
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	15.0	82.0	66.2	38.0	38.0	15.0
Total Split (%)	12.5%	68.3%	55.2%	31.7%	31.7%	12.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	10.4	77.6	62.5	87.1	24.6	39.6
Actuated g/C Ratio	0.09	0.70	0.56	0.78	0.22	0.36
v/c Ratio	0.63	0.88	0.71	0.18	0.82	0.34
Control Delay	67.2	18.2	20.2	0.6	50.9	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	18.2	20.2	0.6	50.9	27.3
LOS	E	B	C	A	D	C
Approach Delay		19.8	18.2		45.3	
Approach LOS		B	B		D	

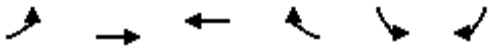
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.4	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 85.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	3090	2011	231	618	193
Future Volume (veh/h)	103	3090	2011	231	618	193
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	106	3186	2073	194	637	102
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	173	3682	2969	1234	722	485
Arrive On Green	0.10	0.71	0.57	0.57	0.21	0.21
Sat Flow, veh/h	1810	5358	5358	1577	3510	1610
Grp Volume(v), veh/h	106	3186	2073	194	637	102
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1577	1755	1610
Q Serve(g_s), s	6.1	50.4	31.0	3.4	19.2	5.2
Cycle Q Clear(g_c), s	6.1	50.4	31.0	3.4	19.2	5.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	173	3682	2969	1234	722	485
V/C Ratio(X)	0.61	0.87	0.70	0.16	0.88	0.21
Avail Cap(c_a), veh/h	173	3682	2969	1234	1075	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	11.9	16.6	3.1	42.0	28.4
Incr Delay (d2), s/veh	15.3	3.0	0.8	0.1	4.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	14.8	10.8	2.1	8.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	62.6	14.9	17.4	3.1	46.3	28.5
LnGrp LOS	E	B	B	A	D	C
Approach Vol, veh/h		3292	2267		739	
Approach Delay, s/veh		16.4	16.2		43.9	
Approach LOS		B	B		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	82.0	27.0	15.0	67.0
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	77.4	33.4	10.4	61.6
Max Q Clear Time (g_c+I1), s	52.4	21.2	8.1	33.0
Green Ext Time (p_c), s	24.5	1.2	0.0	23.1

Intersection Summary	
HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

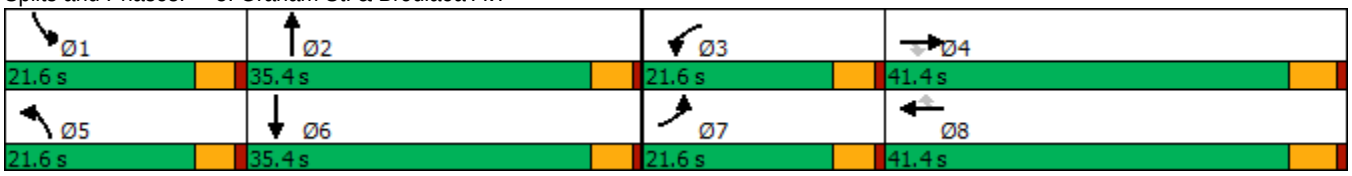
Timings
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	3	12	3	22	52	75	3	504	83	532
Future Volume (vph)	3	12	3	22	52	75	3	504	83	532
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.7	13.0	13.0	6.2	15.1	15.1	5.7	23.2	8.1	31.8
Actuated g/C Ratio	0.11	0.24	0.24	0.12	0.28	0.28	0.11	0.43	0.15	0.59
v/c Ratio	0.02	0.03	0.01	0.11	0.11	0.16	0.02	0.37	0.33	0.27
Control Delay	32.7	22.0	0.0	31.5	18.5	4.7	32.7	18.0	29.6	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	22.0	0.0	31.5	18.5	4.7	32.7	18.0	29.6	10.7
LOS	C	C	A	C	B	A	C	B	C	B
Approach Delay		20.2			13.5			18.1		13.2
Approach LOS		C			B			B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 53.6	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 40.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	12	3	22	52	75	3	504	24	83	532	3
Future Volume (veh/h)	3	12	3	22	52	75	3	504	24	83	532	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	3	13	0	24	57	52	3	548	23	90	578	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	346	293	52	393	333	7	940	39	138	1247	6
Arrive On Green	0.00	0.18	0.00	0.03	0.21	0.21	0.00	0.27	0.27	0.08	0.34	0.34
Sat Flow, veh/h	1810	1900	1610	1810	1900	1610	1810	3530	148	1810	3682	19
Grp Volume(v), veh/h	3	13	0	24	57	52	3	280	291	90	283	298
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1610	1810	1805	1873	1810	1805	1897
Q Serve(g_s), s	0.1	0.2	0.0	0.6	1.1	1.1	0.1	5.8	5.8	2.1	5.3	5.3
Cycle Q Clear(g_c), s	0.1	0.2	0.0	0.6	1.1	1.1	0.1	5.8	5.8	2.1	5.3	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	7	346	293	52	393	333	7	481	499	138	611	642
V/C Ratio(X)	0.41	0.04	0.00	0.46	0.15	0.16	0.41	0.58	0.58	0.65	0.46	0.46
Avail Cap(c_a), veh/h	711	1582	1341	711	1582	1341	711	1282	1330	711	1282	1347
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	14.6	0.0	20.7	14.0	14.1	21.5	13.8	13.8	19.4	11.2	11.2
Incr Delay (d2), s/veh	12.7	0.0	0.0	2.3	0.2	0.2	12.7	1.1	1.1	1.9	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.0	0.2	0.4	0.4	0.1	2.1	2.2	0.9	1.8	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	14.6	0.0	23.0	14.2	14.3	34.2	14.9	14.9	21.3	11.8	11.7
LnGrp LOS	C	B	A	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		16			133			574			671	
Approach Delay, s/veh		18.3			15.8			15.0			13.0	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	16.2	5.9	13.3	4.8	19.3	4.8	14.3
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	4.1	7.8	2.6	2.2	2.1	7.3	2.1	3.1
Green Ext Time (p_c), s	0.1	3.5	0.0	0.0	0.0	3.6	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX 6.2:

OPENING YEAR CUMULATIVE (2023) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	37	25	125	71	48	46
Future Vol, veh/h	37	25	125	71	48	46
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	43	29	144	82	55	53

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	307	145	0	0	226	0
Stage 1	144	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	689	908	-	-	1354	-
Stage 1	888	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	661	907	-	-	1354	-
Mov Cap-2 Maneuver	735	-	-	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	735	907	1354	-
HCM Lane V/C Ratio	-	-	0.058	0.032	0.041	-
HCM Control Delay (s)	-	-	10.2	9.1	7.8	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.1	-

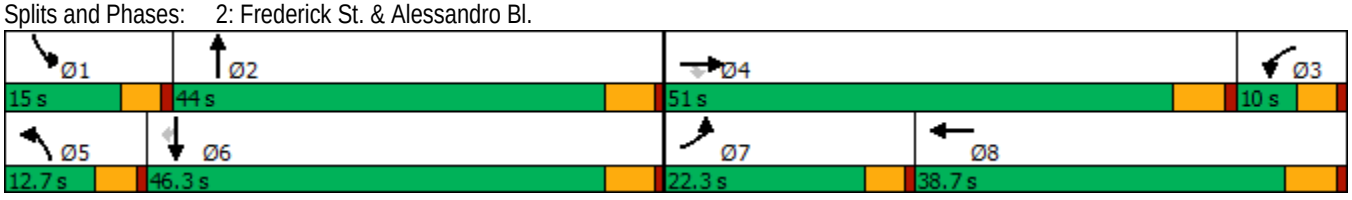
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	125	485	81	106	1475	138	264	110	297	228
Future Volume (vph)	125	485	81	106	1475	138	264	110	297	228
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	22.3	51.0	51.0	10.0	38.7	12.7	44.0	15.0	46.3	46.3
Total Split (%)	18.6%	42.5%	42.5%	8.3%	32.3%	10.6%	36.7%	12.5%	38.6%	38.6%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	12.8	45.2	45.2	5.4	37.8	7.8	40.4	8.2	40.9	40.9
Actuated g/C Ratio	0.11	0.38	0.38	0.05	0.32	0.07	0.34	0.07	0.34	0.34
v/c Ratio	0.67	0.37	0.12	1.36	1.02	0.63	0.26	0.48	0.25	0.34
Control Delay	67.9	28.0	2.2	263.7	68.4	67.7	28.4	60.1	29.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	28.0	2.2	263.7	68.4	67.7	28.4	60.1	29.1	4.9
LOS	E	C	A	F	E	E	C	E	C	A
Approach Delay		32.2			80.6		40.7		25.8	
Approach LOS		C			F		D		C	

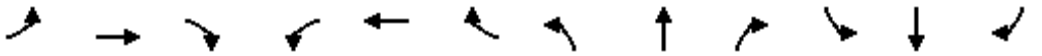
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.7	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.36	
Intersection Signal Delay: 55.8	Intersection LOS: E
Intersection Capacity Utilization 90.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	485	81	106	1475	116	138	264	39	110	297	228
Future Volume (veh/h)	125	485	81	106	1475	116	138	264	39	110	297	228
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	130	505	63	110	1536	97	144	275	33	115	309	180
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	157	1361	599	81	1719	109	199	1134	135	170	1231	541
Arrive On Green	0.09	0.38	0.38	0.05	0.35	0.35	0.06	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	1810	3610	1590	1810	4981	314	3510	3244	385	3510	3610	1587
Grp Volume(v), veh/h	130	505	63	110	1066	567	144	152	156	115	309	180
Grp Sat Flow(s),veh/h/ln	1810	1805	1590	1810	1729	1837	1755	1805	1824	1755	1805	1587
Q Serve(g_s), s	8.5	12.2	2.4	5.4	35.0	35.0	4.8	7.2	7.3	3.9	7.4	10.1
Cycle Q Clear(g_c), s	8.5	12.2	2.4	5.4	35.0	35.0	4.8	7.2	7.3	3.9	7.4	10.1
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	157	1361	599	81	1193	634	199	631	638	170	1231	541
V/C Ratio(X)	0.83	0.37	0.11	1.35	0.89	0.89	0.72	0.24	0.25	0.68	0.25	0.33
Avail Cap(c_a), veh/h	267	1361	599	81	1193	634	237	631	638	304	1231	541
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	27.1	14.4	57.3	37.2	37.2	55.6	27.7	27.7	56.1	28.5	29.4
Incr Delay (d2), s/veh	4.2	0.8	0.4	218.8	10.4	17.5	6.2	0.9	0.9	1.8	0.5	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	5.2	1.2	7.4	15.8	18.0	2.3	3.2	3.3	1.7	3.2	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	27.8	14.7	276.0	47.6	54.7	61.8	28.6	28.7	57.9	29.0	31.0
LnGrp LOS	E	C	B	F	D	D	E	C	C	E	C	C
Approach Vol, veh/h		698			1743			452			604	
Approach Delay, s/veh		32.3			64.3			39.2			35.1	
Approach LOS		C			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	47.3	11.2	51.0	11.4	46.3	15.0	47.2
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	5.4	* 45	8.1	40.9	17.7	32.9
Max Q Clear Time (g_c+I1), s	5.9	9.3	7.4	14.2	6.8	12.1	10.5	37.0
Green Ext Time (p_c), s	0.1	2.5	0.0	5.0	0.0	2.5	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	49.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	451	0	0	455
Future Vol, veh/h	0	2	451	0	0	455
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	2	490	0	0	495

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	245	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	762	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	762	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	762	-
HCM Lane V/C Ratio	-	-	0.003	-
HCM Control Delay (s)	-	-	9.7	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-

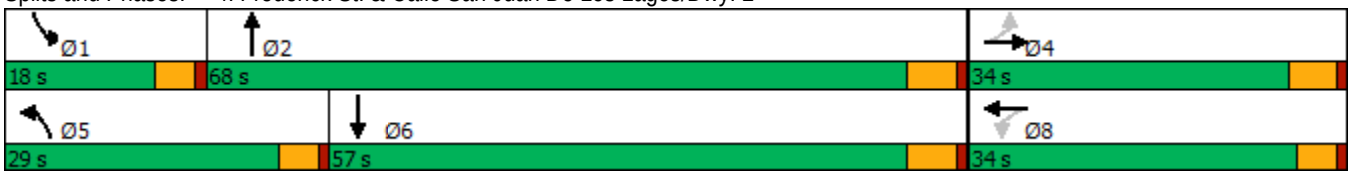
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	26	7	2	2	85	423	9	361
Future Volume (vph)	26	7	2	2	85	423	9	361
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	23.4	23.4	22.6	22.6	9.6	15.4	9.6	28.4
Total Split (s)	34.0	34.0	34.0	34.0	29.0	68.0	18.0	57.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	24.2%	56.7%	15.0%	47.5%
Yellow Time (s)	4.4	4.4	3.6	3.6	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4		4.6	4.6	5.4	4.6	5.4
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	11.5	11.5		11.9	8.9	70.6	5.4	59.5
Actuated g/C Ratio	0.13	0.13		0.14	0.10	0.83	0.06	0.70
v/c Ratio	0.15	0.12		0.03	0.49	0.16	0.09	0.20
Control Delay	36.6	19.9		29.7	46.6	3.9	44.0	7.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	19.9		29.7	46.6	3.9	44.0	7.3
LOS	D	B		C	D	A	D	A
Approach Delay		28.1		29.7		10.9		8.0
Approach LOS		C		C		B		A

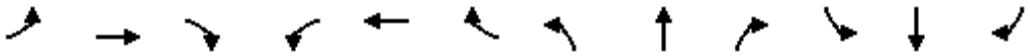
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 85.4	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 10.6	Intersection LOS: B
Intersection Capacity Utilization 45.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	7	19	2	2	2	85	423	11	9	361	84
Future Volume (veh/h)	26	7	19	2	2	2	85	423	11	9	361	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	28	8	14	2	2	2	92	460	12	10	392	86
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	215	56	98	84	73	51	119	2585	67	22	1963	427
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.07	0.72	0.72	0.01	0.67	0.67
Sat Flow, veh/h	1435	616	1077	320	802	561	1810	3592	94	1810	2949	641
Grp Volume(v), veh/h	28	0	22	6	0	0	92	231	241	10	238	240
Grp Sat Flow(s),veh/h/ln	1435	0	1693	1683	0	0	1810	1805	1881	1810	1805	1784
Q Serve(g_s), s	1.2	0.0	1.0	0.0	0.0	0.0	4.4	3.6	3.6	0.5	4.4	4.5
Cycle Q Clear(g_c), s	1.5	0.0	1.0	0.3	0.0	0.0	4.4	3.6	3.6	0.5	4.4	4.5
Prop In Lane	1.00		0.64	0.33		0.33	1.00		0.05	1.00		0.36
Lane Grp Cap(c), veh/h	215	0	154	209	0	0	119	1299	1353	22	1202	1188
V/C Ratio(X)	0.13	0.00	0.14	0.03	0.00	0.00	0.77	0.18	0.18	0.45	0.20	0.20
Avail Cap(c_a), veh/h	556	0	556	606	0	0	508	1299	1353	279	1202	1188
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.6	0.0	36.4	36.1	0.0	0.0	40.0	3.9	3.9	42.7	5.6	5.6
Incr Delay (d2), s/veh	0.3	0.0	0.4	0.1	0.0	0.0	3.9	0.3	0.3	5.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.4	0.1	0.0	0.0	2.0	1.0	1.1	0.2	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.9	0.0	36.8	36.1	0.0	0.0	43.9	4.2	4.2	47.8	6.0	6.0
LnGrp LOS	D	A	D	D	A	A	D	A	A	D	A	A
Approach Vol, veh/h		50			6			564			488	
Approach Delay, s/veh		36.8			36.1			10.7			6.8	
Approach LOS		D			D			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	68.0		13.3	10.3	63.3		13.3				
Change Period (Y+Rc), s	4.6	5.4		5.4	4.6	5.4		* 5.4				
Max Green Setting (Gmax), s	13.4	62.6		28.6	24.4	51.6		* 29				
Max Q Clear Time (g_c+I1), s	2.5	5.6		3.5	6.4	6.5		2.3				
Green Ext Time (p_c), s	0.0	2.8		0.1	0.1	2.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		10.3	
HCM 6th LOS		B	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	6	0	0	76	0	443	8	2	366	14
Future Vol, veh/h	0	0	6	0	0	76	0	443	8	2	366	14
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	7	0	0	84	0	487	9	2	402	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	209	-	-	250	-	0	0	497	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	803	0	0	756	0	-	-	1077	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	803	-	-	755	-	-	-	1076	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	10.4	0	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	803	755	1076	-	-
HCM Lane V/C Ratio	-	-	0.008	0.111	0.002	-	-
HCM Control Delay (s)	-	-	9.5	10.4	8.4	-	-
HCM Lane LOS	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0	0.4	0	-	-

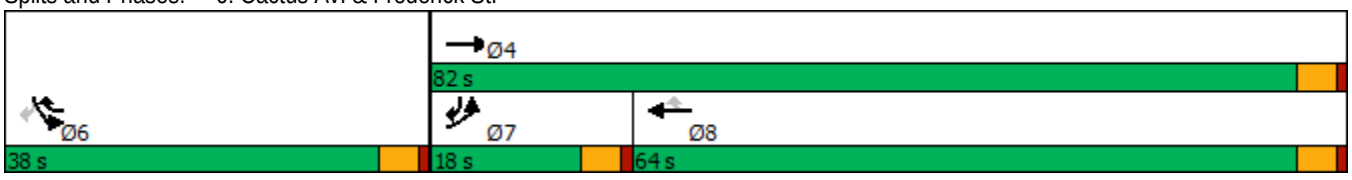
Timings
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	216	1695	2880	256	210	113
Future Volume (vph)	216	1695	2880	256	210	113
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	18.0	82.0	64.0	38.0	38.0	18.0
Total Split (%)	15.0%	68.3%	53.3%	31.7%	31.7%	15.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	13.5	78.0	59.8	78.9	14.5	32.6
Actuated g/C Ratio	0.13	0.77	0.59	0.78	0.14	0.32
v/c Ratio	0.96	0.45	1.00	0.21	0.45	0.23
Control Delay	94.9	5.6	39.3	2.5	42.0	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.9	5.6	39.3	2.5	42.0	25.9
LOS	F	A	D	A	D	C
Approach Delay		15.7	36.3		36.4	
Approach LOS		B	D		D	

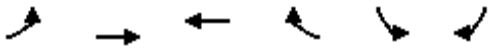
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.7	
Natural Cycle: 120	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 29.0	Intersection LOS: C
Intersection Capacity Utilization 87.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	216	1695	2880	256	210	113
Future Volume (veh/h)	216	1695	2880	256	210	113
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	230	1803	3064	266	223	80
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	251	4156	3190	1157	363	390
Arrive On Green	0.14	0.80	0.61	0.61	0.10	0.10
Sat Flow, veh/h	1810	5358	5358	1610	3510	1610
Grp Volume(v), veh/h	230	1803	3064	266	223	80
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1610	1755	1610
Q Serve(g_s), s	12.1	10.2	53.7	5.4	5.9	3.8
Cycle Q Clear(g_c), s	12.1	10.2	53.7	5.4	5.9	3.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	251	4156	3190	1157	363	390
V/C Ratio(X)	0.92	0.43	0.96	0.23	0.61	0.21
Avail Cap(c_a), veh/h	251	4156	3190	1157	1214	780
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	2.9	17.5	4.6	41.5	29.2
Incr Delay (d2), s/veh	38.7	0.3	8.7	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	1.5	18.9	2.1	2.5	3.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	79.8	3.3	26.2	4.7	42.1	29.3
LnGrp LOS	E	A	C	A	D	C
Approach Vol, veh/h		2033	3330		303	
Approach Delay, s/veh		11.9	24.5		38.7	
Approach LOS		B	C		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	82.0	14.6	18.0	64.0
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	77.4	33.4	13.4	59.4
Max Q Clear Time (g_c+I1), s	12.2	7.9	14.1	55.7
Green Ext Time (p_c), s	31.5	0.5	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	75	12	3	1
Future Vol, veh/h	2	8	75	12	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	9	82	13	3	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	95	0	-	0	102	89
Stage 1	-	-	-	-	89	-
Stage 2	-	-	-	-	13	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1512	-	-	-	901	975
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	1015	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1512	-	-	-	900	975
Mov Cap-2 Maneuver	-	-	-	-	848	-
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	1015	-

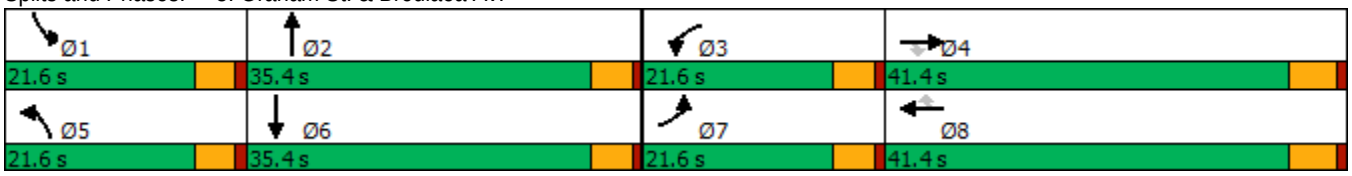
Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1512	-	-	-	877
HCM Lane V/C Ratio	0.001	-	-	-	0.005
HCM Control Delay (s)	7.4	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	2	8	5	22	63	83	10	339	46	393
Future Volume (vph)	2	8	5	22	63	83	10	339	46	393
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.8	13.1	13.1	6.2	15.1	15.1	5.9	19.8	7.0	24.6
Actuated g/C Ratio	0.12	0.28	0.28	0.13	0.32	0.32	0.12	0.42	0.15	0.52
v/c Ratio	0.01	0.02	0.01	0.12	0.13	0.18	0.06	0.30	0.22	0.27
Control Delay	29.5	19.0	0.0	28.0	15.4	5.2	28.6	16.8	26.7	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	19.0	0.0	28.0	15.4	5.2	28.6	16.8	26.7	12.2
LOS	C	B	A	C	B	A	C	B	C	B
Approach Delay		14.7			12.0			17.2		13.7
Approach LOS		B			B			B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 47.4	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 36.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	8	5	22	63	83	10	339	19	46	393	6
Future Volume (veh/h)	2	8	5	22	63	83	10	339	19	46	393	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2	10	5	28	79	69	12	424	22	58	491	8
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	5	390	331	60	448	379	28	850	44	106	1041	17
Arrive On Green	0.00	0.21	0.21	0.03	0.24	0.24	0.02	0.24	0.24	0.06	0.29	0.29
Sat Flow, veh/h	1810	1900	1610	1810	1900	1608	1810	3491	181	1810	3634	59
Grp Volume(v), veh/h	2	10	5	28	79	69	12	219	227	58	244	255
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1608	1810	1805	1866	1810	1805	1888
Q Serve(g_s), s	0.0	0.2	0.1	0.6	1.4	1.4	0.3	4.4	4.4	1.3	4.7	4.7
Cycle Q Clear(g_c), s	0.0	0.2	0.1	0.6	1.4	1.4	0.3	4.4	4.4	1.3	4.7	4.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		0.03
Lane Grp Cap(c), veh/h	5	390	331	60	448	379	28	440	455	106	517	541
V/C Ratio(X)	0.40	0.03	0.02	0.47	0.18	0.18	0.43	0.50	0.50	0.55	0.47	0.47
Avail Cap(c_a), veh/h	732	1628	1380	732	1628	1378	732	1319	1364	732	1319	1379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	13.3	13.3	19.9	12.8	12.8	20.5	13.7	13.7	19.2	12.4	12.4
Incr Delay (d2), s/veh	18.3	0.0	0.0	2.1	0.2	0.2	3.8	0.9	0.9	1.6	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.3	0.5	0.4	0.1	1.6	1.6	0.5	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3	13.4	13.3	22.0	13.0	13.0	24.3	14.5	14.5	20.9	13.0	13.0
LnGrp LOS	D	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		17			176			458			557	
Approach Delay, s/veh		16.4			14.4			14.8			13.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	14.9	6.0	14.0	5.3	16.7	4.7	15.3
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	3.3	6.4	2.6	2.2	2.3	6.7	2.0	3.4
Green Ext Time (p_c), s	0.0	2.7	0.0	0.0	0.0	3.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	14.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	50	99	32	31	120
Future Vol, veh/h	50	50	99	32	31	120
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	57	57	114	37	36	138

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	324	115	0	0	151	0
Stage 1	114	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	674	943	-	-	1442	-
Stage 1	916	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	657	942	-	-	1442	-
Mov Cap-2 Maneuver	731	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	830	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	1.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	731	942	1442	-
HCM Lane V/C Ratio	-	-	0.079	0.061	0.025	-
HCM Control Delay (s)	-	-	10.3	9.1	7.6	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.2	0.1	-

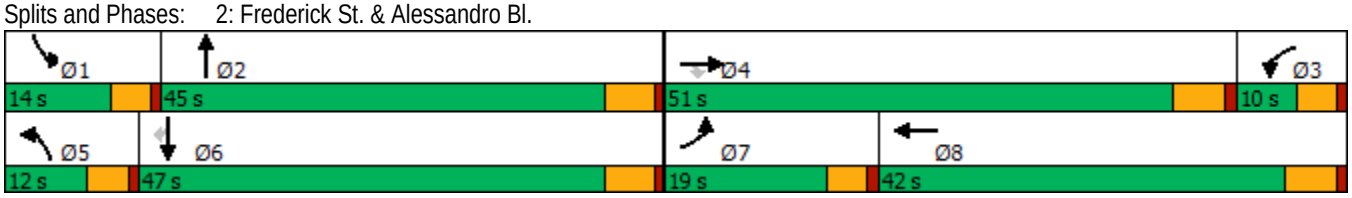
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	240	1375	238	109	892	166	323	290	338	134
Future Volume (vph)	240	1375	238	109	892	166	323	290	338	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	19.0	51.0	51.0	10.0	42.0	12.0	45.0	14.0	47.0	47.0
Total Split (%)	15.8%	42.5%	42.5%	8.3%	35.0%	10.0%	37.5%	11.7%	39.2%	39.2%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	14.4	45.2	45.2	5.4	36.2	7.4	39.6	9.4	41.6	41.6
Actuated g/C Ratio	0.12	0.38	0.38	0.04	0.30	0.06	0.33	0.08	0.35	0.35
v/c Ratio	1.16	1.05	0.35	1.41	0.72	0.80	0.38	1.10	0.28	0.21
Control Delay	156.8	76.6	9.8	282.9	39.3	82.4	29.2	135.2	29.1	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	156.8	76.6	9.8	282.9	39.3	82.4	29.2	135.2	29.1	3.5
LOS	F	E	A	F	D	F	C	F	C	A
Approach Delay		78.4			61.9		44.1		65.0	
Approach LOS		E			E		D		E	

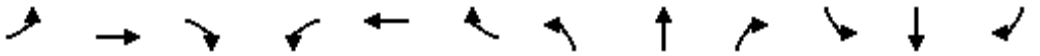
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.41	
Intersection Signal Delay: 67.0	Intersection LOS: E
Intersection Capacity Utilization 100.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	1375	238	109	892	179	166	323	102	290	338	134
Future Volume (veh/h)	240	1375	238	109	892	179	166	323	102	290	338	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	250	1432	227	114	929	162	173	336	98	302	352	82
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	215	1346	593	81	1368	238	214	901	258	272	1239	545
Arrive On Green	0.12	0.37	0.37	0.04	0.31	0.31	0.06	0.33	0.33	0.08	0.34	0.34
Sat Flow, veh/h	1810	3610	1590	1810	4434	770	3510	2758	791	3510	3610	1587
Grp Volume(v), veh/h	250	1432	227	114	724	367	173	218	216	302	352	82
Grp Sat Flow(s),veh/h/ln	1810	1805	1590	1810	1729	1746	1755	1805	1744	1755	1805	1587
Q Serve(g_s), s	14.4	45.2	9.7	5.4	22.2	22.3	5.9	11.2	11.5	9.4	8.6	4.3
Cycle Q Clear(g_c), s	14.4	45.2	9.7	5.4	22.2	22.3	5.9	11.2	11.5	9.4	8.6	4.3
Prop In Lane	1.00		1.00	1.00		0.44	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	215	1346	593	81	1067	539	214	590	570	272	1239	545
V/C Ratio(X)	1.16	1.06	0.38	1.41	0.68	0.68	0.81	0.37	0.38	1.11	0.28	0.15
Avail Cap(c_a), veh/h	215	1346	593	81	1067	539	214	590	570	272	1239	545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.4	38.0	16.3	57.9	36.6	36.7	56.2	31.2	31.4	55.9	29.0	27.6
Incr Delay (d2), s/veh	112.3	43.4	1.9	244.4	3.5	6.8	18.7	1.8	1.9	87.1	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.1	26.9	3.6	7.9	9.5	10.2	3.1	5.1	5.1	7.4	3.8	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	165.7	81.4	18.2	302.3	40.1	43.5	74.9	33.0	33.3	143.0	29.5	28.1
LnGrp LOS	F	F	B	F	D	D	E	C	C	F	C	C
Approach Vol, veh/h		1909			1205			607			736	
Approach Delay, s/veh		84.9			66.0			45.0			75.9	
Approach LOS		F			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	45.0	11.2	51.0	12.0	47.0	19.0	43.2
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	9.4	39.6	5.4	* 45	7.4	41.6	14.4	36.2
Max Q Clear Time (g_c+I1), s	11.4	13.5	7.4	47.2	7.9	10.6	16.4	24.3
Green Ext Time (p_c), s	0.0	3.6	0.0	0.0	0.0	2.5	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	72.9
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	12	586	0	0	714
Future Vol, veh/h	0	12	586	0	0	714
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	13	637	0	0	776

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	319	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	683	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	683	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

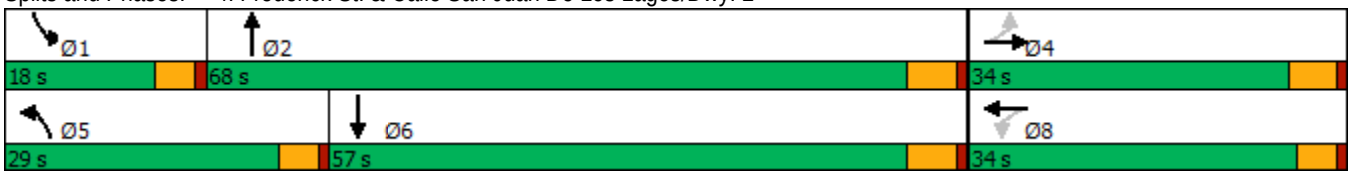
Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	683	-
HCM Lane V/C Ratio	-	-	0.019	-
HCM Control Delay (s)	-	-	10.4	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	150	2	11	7	31	427	3	651
Future Volume (vph)	150	2	11	7	31	427	3	651
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	23.4	23.4	22.6	22.6	9.6	15.4	9.6	28.4
Total Split (s)	34.0	34.0	34.0	34.0	29.0	68.0	18.0	57.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	24.2%	56.7%	15.0%	47.5%
Yellow Time (s)	4.4	4.4	3.6	3.6	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4		4.6	4.6	5.4	4.6	5.4
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	15.8	15.8		16.6	6.4	63.2	5.1	58.1
Actuated g/C Ratio	0.17	0.17		0.18	0.07	0.69	0.06	0.63
v/c Ratio	0.67	0.21		0.10	0.27	0.19	0.03	0.34
Control Delay	50.1	10.5		24.2	48.2	6.3	46.0	9.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	10.5		24.2	48.2	6.3	46.0	9.9
LOS	D	B		C	D	A	D	A
Approach Delay		38.2		24.2		9.2		10.0
Approach LOS		D		C		A		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 91.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 49.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	2	63	11	7	9	31	427	3	3	651	61
Future Volume (veh/h)	150	2	63	11	7	9	31	427	3	3	651	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	163	2	61	12	8	10	34	464	3	3	708	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	284	7	208	117	79	70	57	2543	16	7	2233	192
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.03	0.69	0.69	0.00	0.66	0.66
Sat Flow, veh/h	1417	51	1553	458	587	522	1810	3676	24	1810	3363	290
Grp Volume(v), veh/h	163	0	63	30	0	0	34	228	239	3	380	389
Grp Sat Flow(s),veh/h/ln	1417	0	1604	1567	0	0	1810	1805	1895	1810	1805	1848
Q Serve(g_s), s	6.0	0.0	3.2	0.0	0.0	0.0	1.7	4.0	4.0	0.1	8.1	8.1
Cycle Q Clear(g_c), s	9.2	0.0	3.2	3.2	0.0	0.0	1.7	4.0	4.0	0.1	8.1	8.1
Prop In Lane	1.00		0.97	0.40		0.33	1.00		0.01	1.00		0.16
Lane Grp Cap(c), veh/h	284	0	215	266	0	0	57	1248	1311	7	1198	1227
V/C Ratio(X)	0.57	0.00	0.29	0.11	0.00	0.00	0.59	0.18	0.18	0.41	0.32	0.32
Avail Cap(c_a), veh/h	541	0	507	562	0	0	488	1248	1311	268	1198	1227
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	0.0	35.3	34.5	0.0	0.0	43.2	4.9	4.9	45.0	6.5	6.5
Incr Delay (d2), s/veh	1.8	0.0	0.7	0.2	0.0	0.0	3.6	0.3	0.3	13.3	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	1.3	0.6	0.0	0.0	0.8	1.3	1.3	0.1	2.7	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.5	0.0	36.1	34.7	0.0	0.0	46.8	5.2	5.2	58.3	7.2	7.2
LnGrp LOS	D	A	D	C	A	A	D	A	A	E	A	A
Approach Vol, veh/h		226			30			501			772	
Approach Delay, s/veh		38.5			34.7			8.1			7.4	
Approach LOS		D			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	68.0		17.5	7.5	65.5		17.5				
Change Period (Y+Rc), s	4.6	5.4		5.4	4.6	5.4		* 5.4				
Max Green Setting (Gmax), s	13.4	62.6		28.6	24.4	51.6		* 29				
Max Q Clear Time (g_c+I1), s	2.1	6.0		11.2	3.7	10.1		5.2				
Green Ext Time (p_c), s	0.0	2.8		0.7	0.0	5.1		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		12.7	
HCM 6th LOS		B	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	0	0	58	0	403	20	1	713	11
Future Vol, veh/h	0	0	31	0	0	58	0	403	20	1	713	11
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	34	0	0	64	0	443	22	1	784	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	398	-	-	235	-	0	0	466	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	607	0	0	773	0	-	-	1106	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	607	-	-	772	-	-	-	1105	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	10.1	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	607	772	1105	-	-
HCM Lane V/C Ratio	-	-	0.056	0.083	0.001	-	-
HCM Control Delay (s)	-	-	11.3	10.1	8.3	-	-
HCM Lane LOS	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.2	0.3	0	-	-

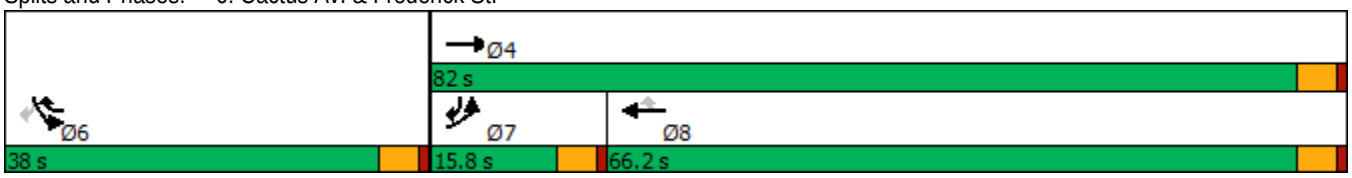
Timings
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	105	3090	2011	232	622	200
Future Volume (vph)	105	3090	2011	232	622	200
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	15.8	82.0	66.2	38.0	38.0	15.8
Total Split (%)	13.2%	68.3%	55.2%	31.7%	31.7%	13.2%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	11.2	77.6	61.7	91.8	25.4	41.2
Actuated g/C Ratio	0.10	0.69	0.55	0.82	0.23	0.37
v/c Ratio	0.62	0.92	0.75	0.18	0.84	0.36
Control Delay	65.5	20.8	22.1	0.6	51.4	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	20.8	22.1	0.6	51.4	27.1
LOS	E	C	C	A	D	C
Approach Delay		22.3	19.9		45.5	
Approach LOS		C	B		D	

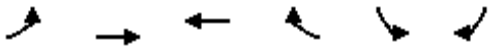
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.2	
Natural Cycle: 110	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 85.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	105	3090	2011	232	622	200
Future Volume (veh/h)	105	3090	2011	232	622	200
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	112	3287	2139	241	662	173
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	184	3647	2902	1245	749	507
Arrive On Green	0.10	0.70	0.56	0.56	0.21	0.21
Sat Flow, veh/h	1810	5358	5358	1610	3510	1610
Grp Volume(v), veh/h	112	3287	2139	241	662	173
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1610	1755	1610
Q Serve(g_s), s	6.5	56.6	34.0	4.4	20.1	9.1
Cycle Q Clear(g_c), s	6.5	56.6	34.0	4.4	20.1	9.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	184	3647	2902	1245	749	507
V/C Ratio(X)	0.61	0.90	0.74	0.19	0.88	0.34
Avail Cap(c_a), veh/h	184	3647	2902	1245	1065	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.3	13.3	18.2	3.3	42.0	28.9
Incr Delay (d2), s/veh	14.1	4.1	1.1	0.1	5.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	17.2	12.0	2.8	9.0	8.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	61.4	17.4	19.3	3.4	47.0	29.1
LnGrp LOS	E	B	B	A	D	C
Approach Vol, veh/h		3399	2380		835	
Approach Delay, s/veh		18.8	17.7		43.3	
Approach LOS		B	B		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	82.0	28.1	15.8	66.2
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	77.4	33.4	11.2	61.6
Max Q Clear Time (g_c+I1), s	58.6	22.1	8.5	36.0
Green Ext Time (p_c), s	18.6	1.4	0.0	21.6

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	20	54	3	16	4
Future Vol, veh/h	1	20	54	3	16	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	22	59	3	17	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	62	0	-	0	85	61
Stage 1	-	-	-	-	61	-
Stage 2	-	-	-	-	24	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1554	-	-	-	921	1010
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	1004	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1554	-	-	-	920	1010
Mov Cap-2 Maneuver	-	-	-	-	867	-
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	1004	-

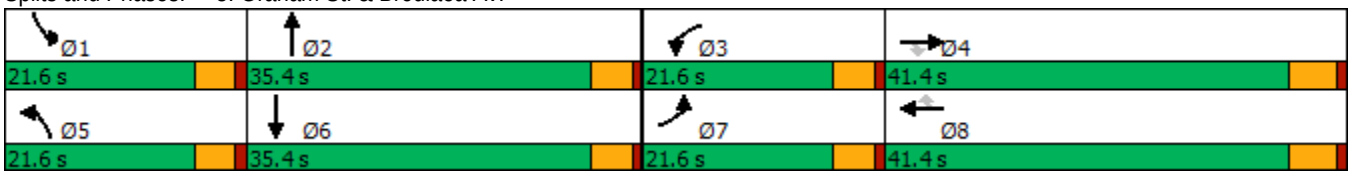
Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1554	-	-	-	892
HCM Lane V/C Ratio	0.001	-	-	-	0.024
HCM Control Delay (s)	7.3	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	3	18	14	22	53	75	5	504	83	532
Future Volume (vph)	3	18	14	22	53	75	5	504	83	532
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.8	13.0	13.0	6.4	15.2	15.2	5.8	26.3	9.1	35.6
Actuated g/C Ratio	0.10	0.23	0.23	0.11	0.26	0.26	0.10	0.46	0.16	0.62
v/c Ratio	0.02	0.05	0.04	0.14	0.13	0.19	0.03	0.40	0.37	0.30
Control Delay	35.3	24.7	0.1	33.8	21.0	6.2	35.2	18.1	31.6	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	24.7	0.1	33.8	21.0	6.2	35.2	18.1	31.6	10.5
LOS	D	C	A	C	C	A	D	B	C	B
Approach Delay		15.8			15.5			18.3		13.3
Approach LOS		B			B			B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 57.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 15.6	Intersection LOS: B
Intersection Capacity Utilization 40.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	18	14	22	53	75	5	504	24	83	532	3
Future Volume (veh/h)	3	18	14	22	53	75	5	504	24	83	532	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	4	22	17	28	66	59	6	630	28	104	665	4
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	362	307	59	414	350	15	1014	45	143	1321	8
Arrive On Green	0.01	0.19	0.19	0.03	0.22	0.22	0.01	0.29	0.29	0.08	0.36	0.36
Sat Flow, veh/h	1810	1900	1610	1810	1900	1608	1810	3520	156	1810	3678	22
Grp Volume(v), veh/h	4	22	17	28	66	59	6	323	335	104	326	343
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1608	1810	1805	1871	1810	1805	1895
Q Serve(g_s), s	0.1	0.4	0.4	0.7	1.3	1.4	0.2	7.3	7.3	2.6	6.7	6.7
Cycle Q Clear(g_c), s	0.1	0.4	0.4	0.7	1.3	1.4	0.2	7.3	7.3	2.6	6.7	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	10	362	307	59	414	350	15	520	539	143	648	681
V/C Ratio(X)	0.41	0.06	0.06	0.48	0.16	0.17	0.41	0.62	0.62	0.73	0.50	0.50
Avail Cap(c_a), veh/h	653	1452	1230	653	1452	1229	653	1176	1219	653	1176	1235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	15.6	15.6	22.4	14.9	15.0	23.3	14.5	14.5	21.2	11.8	11.8
Incr Delay (d2), s/veh	9.8	0.1	0.1	2.2	0.2	0.2	6.8	1.2	1.2	2.7	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.1	0.3	0.5	0.4	0.1	2.7	2.8	1.1	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.2	15.7	15.7	24.6	15.1	15.2	30.1	15.7	15.7	23.9	12.4	12.4
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		43			153			664			773	
Approach Delay, s/veh		17.3			16.9			15.9			13.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	18.3	6.1	14.4	5.0	21.6	4.9	15.7
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	4.6	9.3	2.7	2.4	2.2	8.7	2.1	3.4
Green Ext Time (p_c), s	0.1	4.1	0.0	0.1	0.0	4.2	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	15.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX 6.3:

OPENING YEAR CUMULATIVE (2023) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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California MUTCD 2014 Edition
(FHWA's MUTCD 2009, as amended for use in California)

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

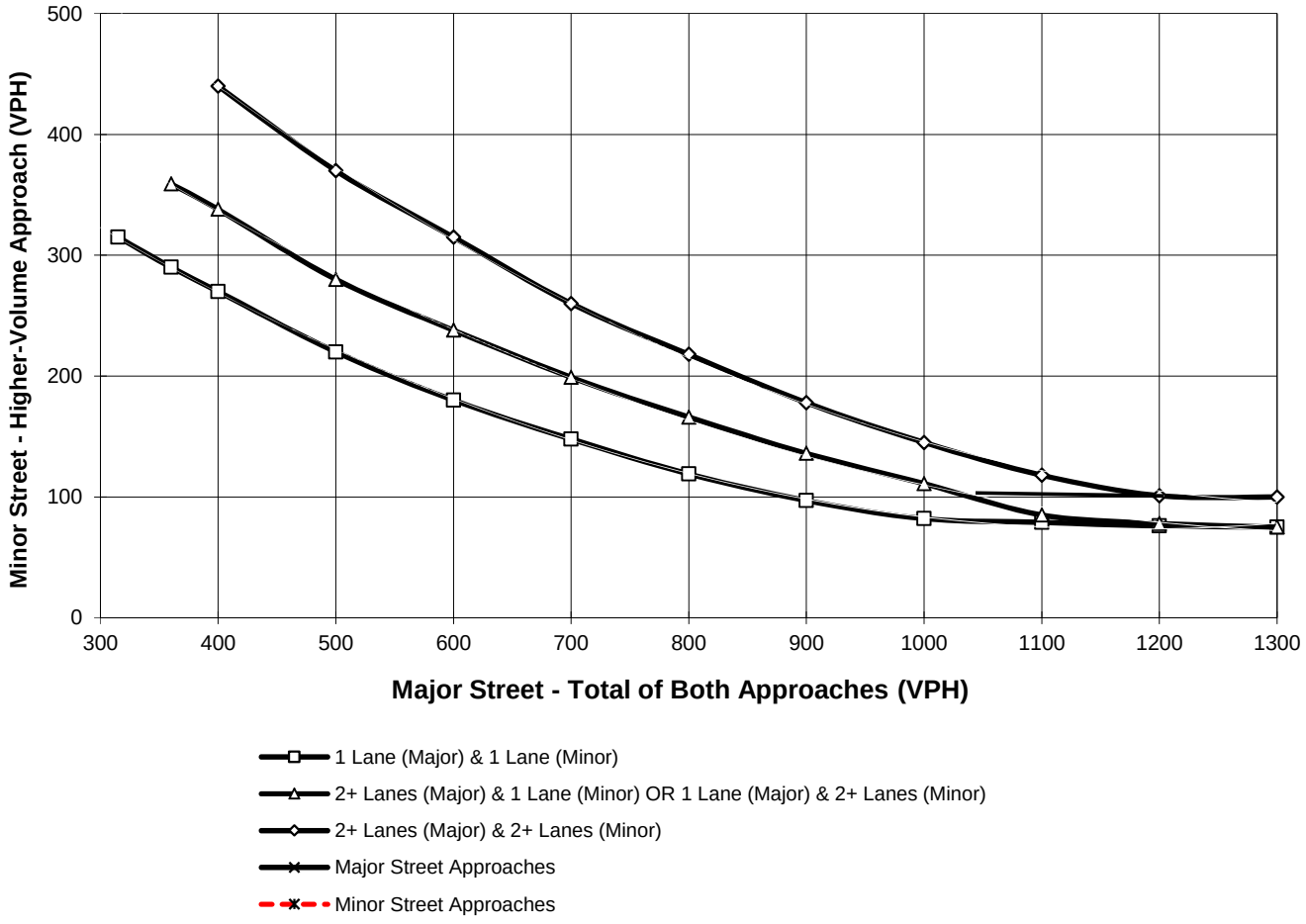
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Opening Year (2023) Without Project Conditions - Weekday PM Peak Hour**

Major Street Name = **Veterans Way** Total of Both Approaches (VPH) = **279**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Calle San Juan de Los Lagos** High Volume Approach (VPH) = **92**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 6.4:

OPENING YEAR CUMULATIVE (2023) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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California MUTCD 2014 Edition
(FHWA's MUTCD 2009, as amended for use in California)

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

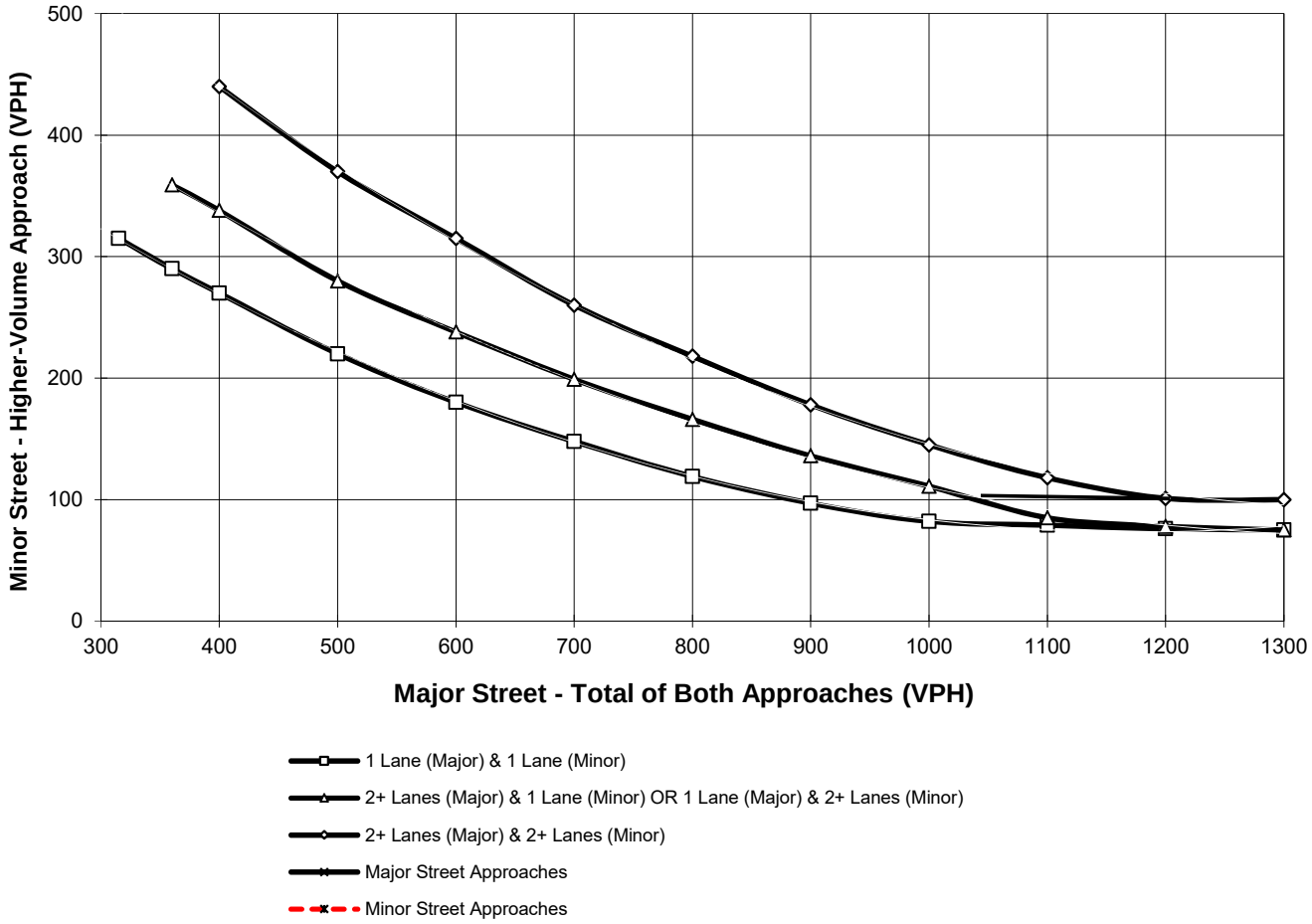
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Opening Year (2023) With Project Conditions - Weekday PM Peak Hour**

Major Street Name = **Veterans Way** Total of Both Approaches (VPH) = **282**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Calle San Juan de Los Lagos** High Volume Approach (VPH) = **100**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		OYC (2023) WP
				CALC	CHS	DATE	05/15/18
Jurisdiction:	City of Moreno Valley			CHK	CHS	DATE	05/15/18
Major Street:	Brodiaea Av.				Critical Approach Speed (Major)		40 mph
Minor Street:	Driveway 3				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,054** vpd Minor Street Future ADT = **91** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,054**	1 **91**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,054**	1 **91**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A: 4% B: 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 6.5:

OPENING YEAR CUMULATIVE (2023) WITH PROJECT CONDITIONS QUEUING ANALYSIS WORKSHEETS

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Queuing and Blocking Report
Opening Year (2023) With Project - AM Peak Hour

Centerpointe (JN: 11410)
05/15/2018

Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	52	24	28
Average Queue (ft)	19	11	4
95th Queue (ft)	44	28	19
Link Distance (ft)		1530	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		115
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	190	190	197	44	215	1402	1391	1364	99	99	130	146
Average Queue (ft)	100	97	104	18	214	1080	1070	1028	42	52	59	78
95th Queue (ft)	167	154	163	40	216	1900	1877	1807	86	92	110	128
Link Distance (ft)		3252	3252	3252		2574	2574	2574			571	571
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)					100	49			0		0	
Queuing Penalty (veh)					489	52			0		1	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	120	138	150	168	174
Average Queue (ft)	21	67	79	74	78
95th Queue (ft)	70	120	131	137	153
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)	0	7	7	4	6
Queuing Penalty (veh)	0	10	7	10	10

Intersection: 3: Frederick St. & Dwy. 1

Movement	WB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	2
95th Queue (ft)	15
Link Distance (ft)	345
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	60	56	39	113	98	101	45	137	164
Average Queue (ft)	21	15	7	59	27	32	10	43	47
95th Queue (ft)	55	42	29	106	74	82	34	100	108
Link Distance (ft)		1530	288		230	230		276	276
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	120			150			100		
Storage Blk Time (%)				0				1	
Queuing Penalty (veh)				0				0	

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB	NB	SB
Directions Served	R	R	TR	LT
Maximum Queue (ft)	31	55	6	11
Average Queue (ft)	7	29	0	0
95th Queue (ft)	28	46	6	7
Link Distance (ft)	167	481	1150	230
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	304	277	196	170	538	559	548	340	104	125	128
Average Queue (ft)	156	80	65	41	320	322	307	116	50	65	45
95th Queue (ft)	266	184	136	104	501	511	500	335	91	106	99
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)	1	0					11			0	
Queuing Penalty (veh)	6	0					29			0	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	23
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	24	31	28	48	70	58	33	112	90	55	98	68
Average Queue (ft)	2	4	2	16	27	27	8	52	23	24	48	23
95th Queue (ft)	15	22	15	42	55	52	28	92	60	48	84	54
Link Distance (ft)		2009			828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210		100	150			160			150		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 613

Queuing and Blocking Report
Opening Year (2023) With Project - PM Peak Hour

Centerpointe (JN: 11410)
05/15/2018

Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	61	28	28
Average Queue (ft)	21	16	3
95th Queue (ft)	44	31	16
Link Distance (ft)		1530	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		115
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	330	1940	1910	1529	215	828	816	443	131	144	171	186
Average Queue (ft)	314	1628	1623	409	207	609	591	214	64	79	92	113
95th Queue (ft)	395	2273	2261	1296	253	1052	1023	341	127	131	152	167
Link Distance (ft)		3695	3695	3695		2574	2574	2574			571	571
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)	53	50			95	10			1	2	1	
Queuing Penalty (veh)	365	121			284	11			1	3	2	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	160	219	427	318	91
Average Queue (ft)	142	188	234	165	38
95th Queue (ft)	191	244	514	410	69
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)	42	73	7	9	0
Queuing Penalty (veh)	71	123	21	11	0

Intersection: 3: Frederick St. & Dwy. 1

Movement	WB
Directions Served	R
Maximum Queue (ft)	35
Average Queue (ft)	7
95th Queue (ft)	28
Link Distance (ft)	345
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	164	123	66	72	100	101	54	214	203
Average Queue (ft)	90	30	21	25	34	37	3	87	70
95th Queue (ft)	143	82	53	58	77	82	27	171	152
Link Distance (ft)		1530	288		230	230		276	276
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	120			150			100		
Storage Blk Time (%)	5							4	
Queuing Penalty (veh)	3							0	

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB	SB	SB
Directions Served	R	R	LT	TR
Maximum Queue (ft)	53	61	21	9
Average Queue (ft)	22	25	1	0
95th Queue (ft)	48	47	11	7
Link Distance (ft)	167	481	230	230
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	320	401	395	364	315	315	288	75	200	362	184
Average Queue (ft)	92	247	244	216	225	219	196	26	160	205	70
95th Queue (ft)	193	375	372	348	303	301	286	62	224	328	145
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)		3					1		15	23	
Queuing Penalty (veh)		3					2		45	71	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	16
95th Queue (ft)	41
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	29	56	39	48	66	67	30	148	144	85	125	95
Average Queue (ft)	3	11	7	16	26	26	4	78	48	39	57	34
95th Queue (ft)	16	38	27	43	55	55	20	127	102	75	100	75
Link Distance (ft)		2009			828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210		100	150			160			150		
Storage Blk Time (%)								0			0	
Queuing Penalty (veh)								0			0	

Network Summary

Network wide Queuing Penalty: 1138

APPENDIX 7.1:

GENERAL PLAN BUILDOUT (POST-2040) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	51	33	137	94	62	48
Future Vol, veh/h	51	33	137	94	62	48
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	55	36	149	102	67	52

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	335	150	0	0	251	0
Stage 1	149	-	-	-	-	-
Stage 2	186	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	664	902	-	-	1326	-
Stage 1	884	-	-	-	-	-
Stage 2	851	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	630	901	-	-	1326	-
Mov Cap-2 Maneuver	709	-	-	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	851	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	4.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	709	901	1326	-
HCM Lane V/C Ratio	-	-	0.078	0.04	0.051	-
HCM Control Delay (s)	-	-	10.5	9.2	7.9	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.1	0.2	-

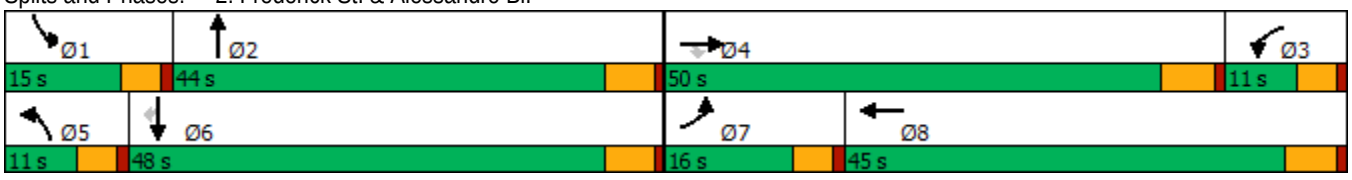
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	211	781	85	116	1970	149	337	230	383	288
Future Volume (vph)	211	781	85	116	1970	149	337	230	383	288
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	16.0	50.0	50.0	11.0	45.0	11.0	44.0	15.0	48.0	48.0
Total Split (%)	13.3%	41.7%	41.7%	9.2%	37.5%	9.2%	36.7%	12.5%	40.0%	40.0%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	11.4	44.2	44.2	6.4	39.2	6.4	38.8	10.2	42.6	42.6
Actuated g/C Ratio	0.10	0.37	0.37	0.05	0.33	0.05	0.32	0.08	0.36	0.36
v/c Ratio	1.29	0.61	0.13	1.26	1.42	0.83	0.34	0.81	0.31	0.41
Control Delay	209.0	33.3	2.6	222.9	225.4	90.0	31.0	74.9	28.9	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	209.0	33.3	2.6	222.9	225.4	90.0	31.0	74.9	28.9	8.0
LOS	F	C	A	F	F	F	C	E	C	A
Approach Delay		65.3			225.2		47.6		34.0	
Approach LOS		E			F		D		C	

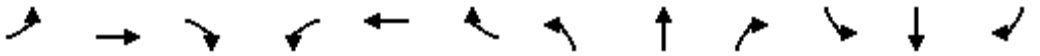
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.42	
Intersection Signal Delay: 135.9	Intersection LOS: F
Intersection Capacity Utilization 111.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	781	85	116	1970	313	149	337	42	230	383	288
Future Volume (veh/h)	211	781	85	116	1970	313	149	337	42	230	383	288
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	220	814	43	121	2052	162	155	351	21	240	399	150
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	170	1317	580	96	1633	128	185	1108	66	294	1269	558
Arrive On Green	0.09	0.36	0.36	0.05	0.33	0.33	0.05	0.32	0.32	0.08	0.35	0.35
Sat Flow, veh/h	1810	3610	1590	1810	4898	384	3510	3458	206	3510	3610	1587
Grp Volume(v), veh/h	220	814	43	121	1444	770	155	182	190	240	399	150
Grp Sat Flow(s),veh/h/ln	1810	1805	1590	1810	1729	1823	1755	1805	1859	1755	1805	1587
Q Serve(g_s), s	11.4	22.4	1.7	6.4	40.4	40.4	5.3	9.3	9.3	8.1	9.8	8.2
Cycle Q Clear(g_c), s	11.4	22.4	1.7	6.4	40.4	40.4	5.3	9.3	9.3	8.1	9.8	8.2
Prop In Lane	1.00		1.00	1.00		0.21	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	170	1317	580	96	1153	608	185	578	596	294	1269	558
V/C Ratio(X)	1.29	0.62	0.07	1.27	1.25	1.27	0.84	0.32	0.32	0.82	0.31	0.27
Avail Cap(c_a), veh/h	170	1317	580	96	1153	608	185	578	596	301	1269	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	31.6	15.4	57.4	40.4	40.4	56.9	31.1	31.2	54.6	28.7	28.1
Incr Delay (d2), s/veh	168.2	2.2	0.2	179.6	121.1	132.7	25.7	1.4	1.4	14.4	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	9.8	0.8	7.6	35.7	39.6	3.0	4.2	4.3	4.1	4.3	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	223.1	33.8	15.6	237.0	161.5	173.1	82.6	32.6	32.6	69.0	29.3	29.3
LnGrp LOS	F	C	B	F	F	F	F	C	C	E	C	C
Approach Vol, veh/h		1077			2335			527			789	
Approach Delay, s/veh		71.7			169.2			47.3			41.4	
Approach LOS		E			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	44.2	12.2	50.0	11.0	48.0	16.0	46.2
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	6.4	* 44	6.4	42.6	11.4	39.2
Max Q Clear Time (g_c+I1), s	10.1	11.3	8.4	24.4	7.3	11.8	13.4	42.4
Green Ext Time (p_c), s	0.0	3.0	0.0	7.2	0.0	3.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	112.1
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

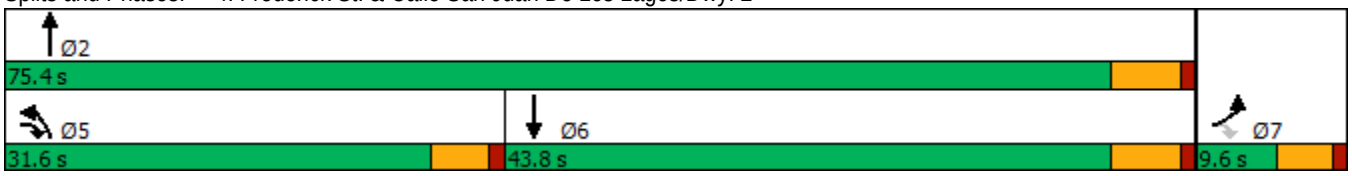
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/01/2018

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	36	21	93	485	392
Future Volume (vph)	36	21	93	485	392
Turn Type	Prot	pm+ov	Prot	NA	NA
Protected Phases	7	5	5	2	6
Permitted Phases		7			
Detector Phase	7	5	5	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	9.6	9.6	15.4	28.4
Total Split (s)	9.6	31.6	31.6	75.4	43.8
Total Split (%)	11.3%	37.2%	37.2%	88.7%	51.5%
Yellow Time (s)	3.6	3.6	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.4	5.4
Lead/Lag		Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes		Yes
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	5.0	12.1	9.2	75.3	62.2
Actuated g/C Ratio	0.06	0.14	0.11	0.89	0.74
v/c Ratio	0.36	0.09	0.52	0.16	0.22
Control Delay	48.0	7.9	43.9	1.2	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	7.9	43.9	1.2	4.9
LOS	D	A	D	A	A
Approach Delay				8.1	4.9
Approach LOS				A	A

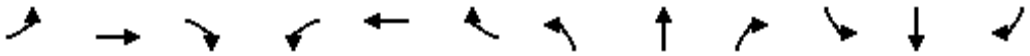
Intersection Summary			
Cycle Length: 85			
Actuated Cycle Length: 84.2			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 7.9		Intersection LOS: A	
Intersection Capacity Utilization 40.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	21	0	0	0	93	485	0	0	392	118
Future Volume (veh/h)	36	0	21	0	0	0	93	485	0	0	392	118
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	0	1900				1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	39	0	16				101	527	0	0	426	123
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	78	0	186				131	3023	0	0	1966	562
Arrive On Green	0.04	0.00	0.04				0.07	0.84	0.00	0.00	0.71	0.71
Sat Flow, veh/h	1810	0	1610				1810	3705	0	0	2865	792
Grp Volume(v), veh/h	39	0	16				101	527	0	0	276	273
Grp Sat Flow(s),veh/h/ln	1810	0	1610				1810	1805	0	0	1805	1757
Q Serve(g_s), s	1.8	0.0	0.7				4.6	2.3	0.0	0.0	4.4	4.5
Cycle Q Clear(g_c), s	1.8	0.0	0.7				4.6	2.3	0.0	0.0	4.4	4.5
Prop In Lane	1.00		1.00				1.00		0.00	0.00		0.45
Lane Grp Cap(c), veh/h	78	0	186				131	3023	0	0	1281	1247
V/C Ratio(X)	0.50	0.00	0.09				0.77	0.17	0.00	0.00	0.22	0.22
Avail Cap(c_a), veh/h	108	0	213				584	3023	0	0	1281	1247
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	39.1	0.0	33.0				38.1	1.3	0.0	0.0	4.2	4.2
Incr Delay (d2), s/veh	4.9	0.0	0.2				3.6	0.1	0.0	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0				2.1	0.2	0.0	0.0	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.0	0.0	33.2				41.7	1.4	0.0	0.0	4.5	4.6
LnGrp LOS	D	A	C				D	A	A	A	A	A
Approach Vol, veh/h		55						628			549	
Approach Delay, s/veh		40.9						7.9			4.6	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		75.4		8.2	10.6	64.8						
Change Period (Y+Rc), s		5.4		4.6	4.6	5.4						
Max Green Setting (Gmax), s		70.0		5.0	27.0	38.4						
Max Q Clear Time (g_c+I1), s		4.3		3.8	6.6	6.5						
Green Ext Time (p_c), s		3.7		0.0	0.1	3.3						

Intersection Summary												
HCM 6th Ctrl Delay			7.9									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	8	0	0	104	0	475	12	0	393	20
Future Vol, veh/h	0	0	8	0	0	104	0	475	12	0	393	20
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	9	0	0	113	0	516	13	0	427	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	225	-	-	267	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	784	0	0	737	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	784	-	-	736	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	10.8	0	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	784	736	-	-
HCM Lane V/C Ratio	-	-	0.011	0.154	-	-
HCM Control Delay (s)	-	-	9.6	10.8	-	-
HCM Lane LOS	-	-	A	B	-	-
HCM 95th %tile Q(veh)	-	-	0	0.5	-	-

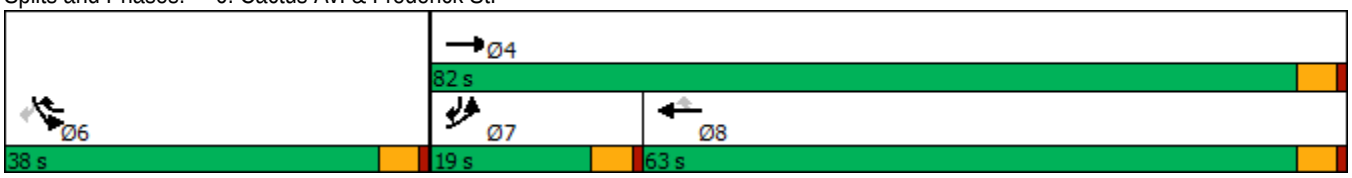
Timings
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	253	1865	3168	277	229	140
Future Volume (vph)	253	1865	3168	277	229	140
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	19.0	82.0	63.0	38.0	38.0	19.0
Total Split (%)	15.8%	68.3%	52.5%	31.7%	31.7%	15.8%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	14.5	77.9	58.8	78.1	14.7	33.9
Actuated g/C Ratio	0.14	0.76	0.58	0.77	0.14	0.33
v/c Ratio	1.05	0.50	1.13	0.24	0.48	0.28
Control Delay	113.3	6.1	84.8	3.1	42.5	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	113.3	6.1	84.8	3.1	42.5	25.9
LOS	F	A	F	A	D	C
Approach Delay		18.9	78.2		36.2	
Approach LOS		B	E		D	

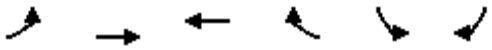
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.9	
Natural Cycle: 120	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 54.4	Intersection LOS: D
Intersection Capacity Utilization 95.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	253	1865	3168	277	229	140
Future Volume (veh/h)	253	1865	3168	277	229	140
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	269	1984	3370	289	244	109
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	270	4156	3136	1140	363	407
Arrive On Green	0.15	0.80	0.60	0.60	0.10	0.10
Sat Flow, veh/h	1810	5358	5358	1610	3510	1610
Grp Volume(v), veh/h	269	1984	3370	289	244	109
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1610	1755	1610
Q Serve(g_s), s	14.4	11.9	58.4	6.2	6.5	5.2
Cycle Q Clear(g_c), s	14.4	11.9	58.4	6.2	6.5	5.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	270	4156	3136	1140	363	407
V/C Ratio(X)	1.00	0.48	1.07	0.25	0.67	0.27
Avail Cap(c_a), veh/h	270	4156	3136	1140	1214	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	3.1	19.1	5.0	41.7	28.9
Incr Delay (d2), s/veh	54.1	0.4	40.5	0.2	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	1.8	29.8	2.4	2.8	5.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	95.2	3.5	59.6	5.2	42.5	29.1
LnGrp LOS	F	A	F	A	D	C
Approach Vol, veh/h		2253	3659		353	
Approach Delay, s/veh		14.4	55.3		38.4	
Approach LOS		B	E		D	

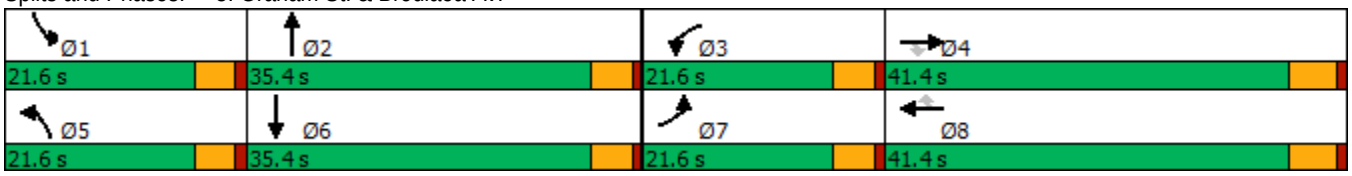
Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	82.0	14.6	19.0	63.0
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	77.4	33.4	14.4	58.4
Max Q Clear Time (g_c+I1), s	13.9	8.5	16.4	60.4
Green Ext Time (p_c), s	36.4	0.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	39.6
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	2	9	4	30	80	116	5	373	65	432
Future Volume (vph)	2	9	4	30	80	116	5	373	65	432
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.6	12.8	12.8	6.2	15.1	15.1	5.6	16.7	7.3	22.2
Actuated g/C Ratio	0.11	0.25	0.25	0.12	0.30	0.30	0.11	0.33	0.14	0.44
v/c Ratio	0.01	0.02	0.01	0.15	0.16	0.23	0.03	0.37	0.28	0.31
Control Delay	30.5	19.4	0.0	28.3	15.7	5.1	29.8	17.8	27.2	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	19.4	0.0	28.3	15.7	5.1	29.8	17.8	27.2	12.5
LOS	C	B	A	C	B	A	C	B	C	B
Approach Delay		16.0			12.0			18.0		14.4
Approach LOS		B			B			B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 51	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 37.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/01/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	9	4	30	80	116	5	373	27	65	432	8
Future Volume (veh/h)	2	9	4	30	80	116	5	373	27	65	432	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2	10	3	33	87	96	5	405	27	71	470	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	5	403	341	68	469	397	12	814	54	120	1074	21
Arrive On Green	0.00	0.21	0.21	0.04	0.25	0.25	0.01	0.24	0.24	0.07	0.30	0.30
Sat Flow, veh/h	1810	1900	1610	1810	1900	1608	1810	3434	228	1810	3621	69
Grp Volume(v), veh/h	2	10	3	33	87	96	5	212	220	71	234	245
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1608	1810	1805	1857	1810	1805	1886
Q Serve(g_s), s	0.0	0.2	0.1	0.8	1.6	2.1	0.1	4.4	4.4	1.6	4.5	4.5
Cycle Q Clear(g_c), s	0.0	0.2	0.1	0.8	1.6	2.1	0.1	4.4	4.4	1.6	4.5	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		0.04
Lane Grp Cap(c), veh/h	5	403	341	68	469	397	12	428	440	120	536	559
V/C Ratio(X)	0.40	0.02	0.01	0.48	0.19	0.24	0.41	0.50	0.50	0.59	0.44	0.44
Avail Cap(c_a), veh/h	712	1583	1342	712	1583	1340	712	1283	1320	712	1283	1340
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	13.5	13.4	20.4	12.8	13.0	21.4	14.2	14.3	19.6	12.3	12.3
Incr Delay (d2), s/veh	18.4	0.0	0.0	1.9	0.2	0.3	8.0	0.9	0.9	1.7	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.3	0.5	0.6	0.1	1.6	1.7	0.7	1.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	13.5	13.4	22.3	13.0	13.3	29.4	15.1	15.1	21.3	12.8	12.8
LnGrp LOS	D	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		15			216			437			550	
Approach Delay, s/veh		17.0			14.6			15.3			13.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	14.9	6.2	14.6	4.9	17.5	4.7	16.1
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	3.6	6.4	2.8	2.2	2.1	6.5	2.0	4.1
Green Ext Time (p_c), s	0.1	2.6	0.0	0.0	0.0	2.9	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	14.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	65	64	120	43	42	132
Future Vol, veh/h	65	64	120	43	42	132
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	71	70	130	47	46	143

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	365	130	0	0	177	0
Stage 1	130	-	-	-	-	-
Stage 2	235	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	639	925	-	-	1411	-
Stage 1	901	-	-	-	-	-
Stage 2	809	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	618	925	-	-	1411	-
Mov Cap-2 Maneuver	700	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	809	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	1.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	700	925	1411	-
HCM Lane V/C Ratio	-	-	0.101	0.075	0.032	-
HCM Control Delay (s)	-	-	10.7	9.2	7.6	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.2	0.1	-

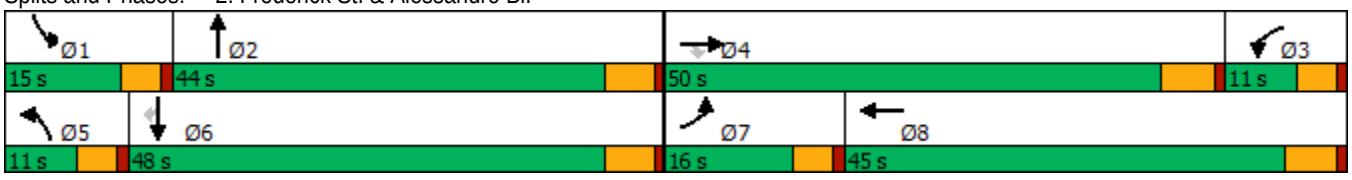
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	303	2140	260	119	1359	166	412	498	612	182
Future Volume (vph)	303	2140	260	119	1359	166	412	498	612	182
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	16.0	50.0	50.0	11.0	45.0	11.0	44.0	15.0	48.0	48.0
Total Split (%)	13.3%	41.7%	41.7%	9.2%	37.5%	9.2%	36.7%	12.5%	40.0%	40.0%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	11.4	44.2	44.2	6.4	39.2	6.4	38.6	10.4	42.6	42.6
Actuated g/C Ratio	0.10	0.37	0.37	0.05	0.33	0.05	0.32	0.09	0.36	0.36
v/c Ratio	1.87	1.70	0.41	1.30	1.09	0.94	0.48	1.73	0.50	0.29
Control Delay	441.5	343.8	17.3	237.2	88.7	108.9	32.5	374.7	32.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	441.5	343.8	17.3	237.2	88.7	108.9	32.5	374.7	32.1	7.4
LOS	F	F	B	F	F	F	C	F	C	A
Approach Delay		323.3			98.3		51.0		160.6	
Approach LOS		F			F		D		F	

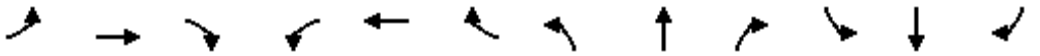
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.87	
Intersection Signal Delay: 198.8	Intersection LOS: F
Intersection Capacity Utilization 127.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	2140	260	119	1359	374	166	412	107	498	612	182
Future Volume (veh/h)	303	2140	260	119	1359	374	166	412	107	498	612	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	319	2253	137	125	1431	197	175	434	55	524	644	96
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	170	1317	586	96	1532	211	185	1025	129	301	1269	563
Arrive On Green	0.09	0.36	0.36	0.05	0.33	0.33	0.05	0.32	0.32	0.09	0.35	0.35
Sat Flow, veh/h	1810	3610	1608	1810	4595	632	3510	3218	405	3510	3610	1602
Grp Volume(v), veh/h	319	2253	137	125	1077	551	175	242	247	524	644	96
Grp Sat Flow(s),veh/h/ln	1810	1805	1608	1810	1729	1769	1755	1805	1819	1755	1805	1602
Q Serve(g_s), s	11.4	44.2	5.6	6.4	36.5	36.6	6.0	12.8	13.0	10.4	17.1	5.0
Cycle Q Clear(g_c), s	11.4	44.2	5.6	6.4	36.5	36.6	6.0	12.8	13.0	10.4	17.1	5.0
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	170	1317	586	96	1153	590	185	575	579	301	1269	563
V/C Ratio(X)	1.87	1.71	0.23	1.31	0.93	0.93	0.94	0.42	0.43	1.74	0.51	0.17
Avail Cap(c_a), veh/h	170	1317	586	96	1153	590	185	575	579	301	1269	563
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	38.5	16.3	57.4	39.1	39.1	57.2	32.5	32.6	55.4	31.0	27.1
Incr Delay (d2), s/veh	414.9	323.4	0.9	195.4	14.8	24.1	49.5	2.3	2.3	346.3	1.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.7	77.6	2.8	8.0	17.1	19.0	3.9	5.8	6.0	19.0	7.5	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	469.8	361.9	17.3	252.8	53.9	63.2	106.8	34.8	34.9	401.7	32.5	27.8
LnGrp LOS	F	F	B	F	D	E	F	C	C	F	C	C
Approach Vol, veh/h		2709			1753			664			1264	
Approach Delay, s/veh		357.1			71.0			53.8			185.2	
Approach LOS		F			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	44.0	12.2	50.0	11.0	48.0	16.0	46.2
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	6.4	* 44	6.4	42.6	11.4	39.2
Max Q Clear Time (g_c+I1), s	12.4	15.0	8.4	46.2	8.0	19.1	13.4	38.6
Green Ext Time (p_c), s	0.0	3.9	0.0	0.0	0.0	4.5	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	213.1
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

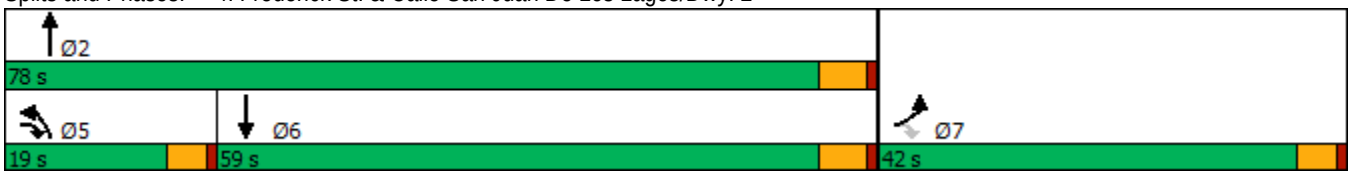
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/01/2018

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	210	69	33	469	818
Future Volume (vph)	210	69	33	469	818
Turn Type	Prot	pm+ov	Prot	NA	NA
Protected Phases	7	5	5	2	6
Permitted Phases		7			
Detector Phase	7	5	5	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	9.6	9.6	15.4	28.4
Total Split (s)	42.0	19.0	19.0	78.0	59.0
Total Split (%)	35.0%	15.8%	15.8%	65.0%	49.2%
Yellow Time (s)	3.6	3.6	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.4	5.4
Lead/Lag		Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes		Yes
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	17.8	29.0	6.6	72.8	63.6
Actuated g/C Ratio	0.18	0.29	0.07	0.72	0.63
v/c Ratio	0.71	0.14	0.31	0.20	0.44
Control Delay	51.7	6.8	52.6	5.1	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	6.8	52.6	5.1	11.4
LOS	D	A	D	A	B
Approach Delay				8.3	11.4
Approach LOS				A	B

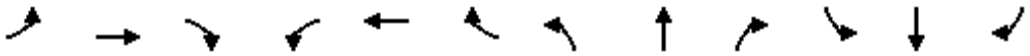
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.6	
Natural Cycle: 55	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 46.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	210	0	69	0	0	0	33	469	0	0	818	85
Future Volume (veh/h)	210	0	69	0	0	0	33	469	0	0	818	85
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	0	1900				1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	228	0	70				36	510	0	0	889	85
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	274	0	295				58	2693	0	0	2218	212
Arrive On Green	0.15	0.00	0.15				0.03	0.75	0.00	0.00	0.67	0.67
Sat Flow, veh/h	1810	0	1610				1810	3705	0	0	3422	318
Grp Volume(v), veh/h	228	0	70				36	510	0	0	482	492
Grp Sat Flow(s),veh/h/ln	1810	0	1610				1810	1805	0	0	1805	1840
Q Serve(g_s), s	11.9	0.0	3.6				1.9	4.1	0.0	0.0	11.8	11.8
Cycle Q Clear(g_c), s	11.9	0.0	3.6				1.9	4.1	0.0	0.0	11.8	11.8
Prop In Lane	1.00		1.00				1.00		0.00	0.00		0.17
Lane Grp Cap(c), veh/h	274	0	295				58	2693	0	0	1203	1227
V/C Ratio(X)	0.83	0.00	0.24				0.62	0.19	0.00	0.00	0.40	0.40
Avail Cap(c_a), veh/h	695	0	670				268	2693	0	0	1203	1227
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	0.0	33.9				46.5	3.7	0.0	0.0	7.4	7.4
Incr Delay (d2), s/veh	6.5	0.0	0.4				4.0	0.2	0.0	0.0	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	0.0				0.9	1.1	0.0	0.0	4.1	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.6	0.0	34.3				50.6	3.8	0.0	0.0	8.4	8.4
LnGrp LOS	D	A	C				D	A	A	A	A	A
Approach Vol, veh/h		298						546			974	
Approach Delay, s/veh		43.7						6.9			8.4	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		78.0		19.3	7.7	70.3						
Change Period (Y+Rc), s		5.4		4.6	4.6	5.4						
Max Green Setting (Gmax), s		72.6		37.4	14.4	53.6						
Max Q Clear Time (g_c+I1), s		6.1		13.9	3.9	13.8						
Green Ext Time (p_c), s		3.6		0.8	0.0	7.0						

Intersection Summary												
HCM 6th Ctrl Delay			13.7									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	43	0	0	74	0	428	28	0	772	15
Future Vol, veh/h	0	0	43	0	0	74	0	428	28	0	772	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	47	0	0	80	0	465	30	0	839	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	430	-	-	248	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	579	0	0	758	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	578	-	-	758	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.8	10.3	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	578	758	-	-
HCM Lane V/C Ratio	-	-	0.081	0.106	-	-
HCM Control Delay (s)	-	-	11.8	10.3	-	-
HCM Lane LOS	-	-	B	B	-	-
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-	-

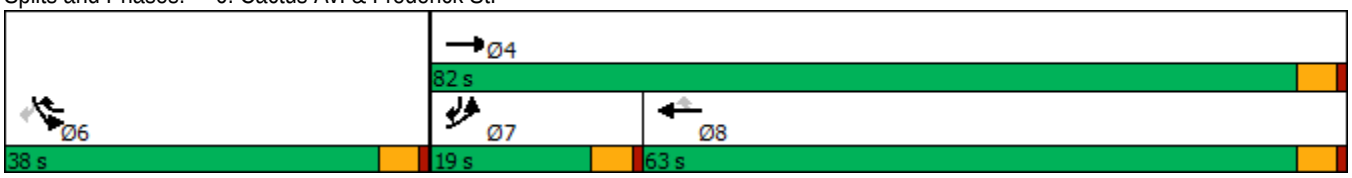
Timings
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/02/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	126	3379	2212	254	631	275
Future Volume (vph)	126	3379	2212	254	631	275
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	19.0	82.0	63.0	38.0	38.0	19.0
Total Split (%)	15.8%	68.3%	52.5%	31.7%	31.7%	15.8%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	14.4	77.6	58.5	83.5	25.0	44.1
Actuated g/C Ratio	0.13	0.69	0.52	0.75	0.22	0.39
v/c Ratio	0.56	0.97	0.84	0.21	0.83	0.45
Control Delay	57.0	26.5	27.0	0.7	51.2	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	26.5	27.0	0.7	51.2	27.1
LOS	E	C	C	A	D	C
Approach Delay		27.6	24.3		43.9	
Approach LOS		C	C		D	

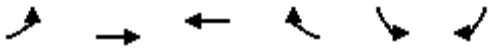
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.8	
Natural Cycle: 120	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 28.6	Intersection LOS: C
Intersection Capacity Utilization 91.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	126	3379	2212	254	631	275
Future Volume (veh/h)	126	3379	2212	254	631	275
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	130	3484	2280	218	651	187
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	238	3660	2761	1179	739	550
Arrive On Green	0.13	0.71	0.53	0.53	0.21	0.21
Sat Flow, veh/h	1810	5358	5358	1577	3510	1610
Grp Volume(v), veh/h	130	3484	2280	218	651	187
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1577	1755	1610
Q Serve(g_s), s	7.4	66.1	40.2	4.5	19.7	9.5
Cycle Q Clear(g_c), s	7.4	66.1	40.2	4.5	19.7	9.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	238	3660	2761	1179	739	550
V/C Ratio(X)	0.55	0.95	0.83	0.18	0.88	0.34
Avail Cap(c_a), veh/h	238	3660	2761	1179	1069	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.6	14.5	21.4	4.2	42.0	26.9
Incr Delay (d2), s/veh	8.8	7.3	2.3	0.1	4.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	20.9	14.8	2.7	8.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.4	21.8	23.7	4.3	46.6	27.0
LnGrp LOS	D	C	C	A	D	C
Approach Vol, veh/h		3614	2498		838	
Approach Delay, s/veh		22.9	22.0		42.2	
Approach LOS		C	C		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	82.0	27.7	19.0	63.0
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	77.4	33.4	14.4	58.4
Max Q Clear Time (g_c+I1), s	68.1	21.7	9.4	42.2
Green Ext Time (p_c), s	9.3	1.4	0.1	14.7

Intersection Summary	
HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C

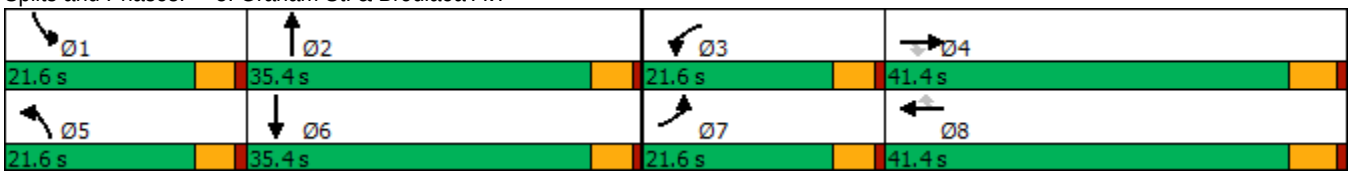
Timings
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/01/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	17	5	30	71	104	5	554	116	585
Future Volume (vph)	5	17	5	30	71	104	5	554	116	585
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.9	13.2	13.2	6.6	15.5	15.5	5.9	25.7	9.8	35.5
Actuated g/C Ratio	0.10	0.23	0.23	0.11	0.27	0.27	0.10	0.45	0.17	0.62
v/c Ratio	0.03	0.04	0.01	0.16	0.15	0.22	0.03	0.40	0.41	0.29
Control Delay	35.8	25.1	0.0	33.9	21.3	6.5	35.8	18.7	31.6	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	25.1	0.0	33.9	21.3	6.5	35.8	18.7	31.6	10.3
LOS	D	C	A	C	C	A	D	B	C	B
Approach Delay		22.5			15.7			18.9		13.8
Approach LOS		C			B			B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 57.4	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 43.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/01/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	17	5	30	71	104	5	554	34	116	585	5
Future Volume (veh/h)	5	17	5	30	71	104	5	554	34	116	585	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	5	18	2	33	77	83	5	602	34	126	636	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	12	366	309	67	423	359	12	965	54	165	1330	10
Arrive On Green	0.01	0.19	0.19	0.04	0.22	0.22	0.01	0.28	0.28	0.09	0.36	0.36
Sat Flow, veh/h	1810	1900	1608	1810	1900	1610	1810	3473	196	1810	3671	29
Grp Volume(v), veh/h	5	18	2	33	77	83	5	313	323	126	313	328
Grp Sat Flow(s),veh/h/ln	1810	1900	1608	1810	1900	1610	1810	1805	1864	1810	1805	1895
Q Serve(g_s), s	0.1	0.4	0.0	0.9	1.6	2.0	0.1	7.3	7.3	3.3	6.4	6.4
Cycle Q Clear(g_c), s	0.1	0.4	0.0	0.9	1.6	2.0	0.1	7.3	7.3	3.3	6.4	6.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		0.02
Lane Grp Cap(c), veh/h	12	366	309	67	423	359	12	502	518	165	654	687
V/C Ratio(X)	0.41	0.05	0.01	0.49	0.18	0.23	0.41	0.62	0.62	0.76	0.48	0.48
Avail Cap(c_a), veh/h	640	1423	1204	640	1423	1206	640	1153	1190	640	1153	1210
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	15.8	15.7	22.7	15.1	15.3	23.8	15.2	15.2	21.3	11.8	11.8
Incr Delay (d2), s/veh	8.1	0.1	0.0	2.1	0.2	0.3	8.1	1.3	1.2	2.8	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.0	0.4	0.6	0.6	0.1	2.7	2.8	1.4	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	15.9	15.7	24.8	15.3	15.6	31.8	16.4	16.4	24.1	12.4	12.3
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		25			193			641			767	
Approach Delay, s/veh		19.1			17.1			16.5			14.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	18.1	6.4	14.6	4.9	22.1	4.9	16.1
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	5.3	9.3	2.9	2.4	2.1	8.4	2.1	4.0
Green Ext Time (p_c), s	0.1	3.9	0.0	0.1	0.0	4.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	15.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX 7.2:

GENERAL PLAN BUILDOUT (POST-2040) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	52	34	137	98	66	48
Future Vol, veh/h	52	34	137	98	66	48
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	57	37	149	107	72	52

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	345	150	0	0	256	0
Stage 1	149	-	-	-	-	-
Stage 2	196	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	656	902	-	-	1321	-
Stage 1	884	-	-	-	-	-
Stage 2	842	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	620	901	-	-	1321	-
Mov Cap-2 Maneuver	699	-	-	-	-	-
Stage 1	835	-	-	-	-	-
Stage 2	842	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	4.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	699	901	1321	-
HCM Lane V/C Ratio	-	-	0.081	0.041	0.054	-
HCM Control Delay (s)	-	-	10.6	9.2	7.9	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.1	0.2	-

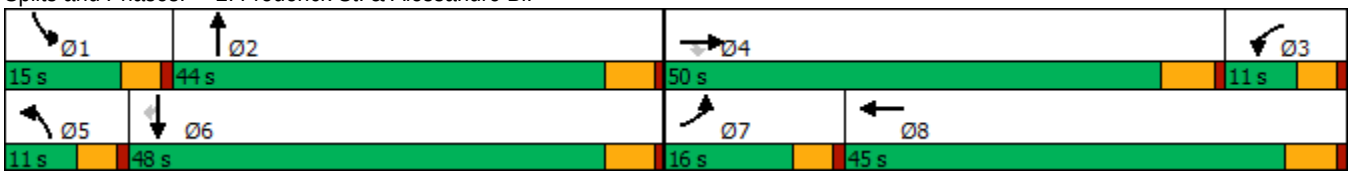
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	211	781	89	120	1970	152	338	230	387	288
Future Volume (vph)	211	781	89	120	1970	152	338	230	387	288
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.6	42.4	9.6	43.4	43.4
Total Split (s)	16.0	50.0	50.0	11.0	45.0	11.0	44.0	15.0	48.0	48.0
Total Split (%)	13.3%	41.7%	41.7%	9.2%	37.5%	9.2%	36.7%	12.5%	40.0%	40.0%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	11.4	44.2	44.2	6.4	39.2	6.4	38.8	10.2	42.6	42.6
Actuated g/C Ratio	0.10	0.37	0.37	0.05	0.33	0.05	0.32	0.08	0.36	0.36
v/c Ratio	1.29	0.61	0.14	1.30	1.42	0.85	0.34	0.81	0.31	0.41
Control Delay	209.0	33.3	3.1	237.2	225.4	92.4	31.0	74.9	29.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	209.0	33.3	3.1	237.2	225.4	92.4	31.0	74.9	29.0	8.1
LOS	F	C	A	F	F	F	C	E	C	A
Approach Delay		65.1			226.0		48.5		34.0	
Approach LOS		E			F		D		C	

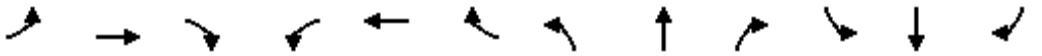
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.42	
Intersection Signal Delay: 136.1	Intersection LOS: F
Intersection Capacity Utilization 111.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	781	89	120	1970	313	152	338	43	230	387	288
Future Volume (veh/h)	211	781	89	120	1970	313	152	338	43	230	387	288
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	220	814	47	125	2052	162	158	352	22	240	403	150
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	170	1317	580	96	1633	128	185	1105	69	294	1269	558
Arrive On Green	0.09	0.36	0.36	0.05	0.33	0.33	0.05	0.32	0.32	0.08	0.35	0.35
Sat Flow, veh/h	1810	3610	1590	1810	4898	384	3510	3448	215	3510	3610	1587
Grp Volume(v), veh/h	220	814	47	125	1444	770	158	184	190	240	403	150
Grp Sat Flow(s),veh/h/ln	1810	1805	1590	1810	1729	1823	1755	1805	1858	1755	1805	1587
Q Serve(g_s), s	11.4	22.4	1.8	6.4	40.4	40.4	5.4	9.3	9.4	8.1	9.9	8.2
Cycle Q Clear(g_c), s	11.4	22.4	1.8	6.4	40.4	40.4	5.4	9.3	9.4	8.1	9.9	8.2
Prop In Lane	1.00		1.00	1.00		0.21	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	170	1317	580	96	1153	608	185	578	595	294	1269	558
V/C Ratio(X)	1.29	0.62	0.08	1.31	1.25	1.27	0.85	0.32	0.32	0.82	0.32	0.27
Avail Cap(c_a), veh/h	170	1317	580	96	1153	608	185	578	595	301	1269	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	31.6	15.4	57.4	40.4	40.4	56.9	31.1	31.2	54.6	28.7	28.1
Incr Delay (d2), s/veh	168.2	2.2	0.3	195.4	121.1	132.7	28.6	1.4	1.4	14.4	0.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	9.8	0.9	8.0	35.7	39.6	3.1	4.2	4.4	4.1	4.3	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	223.1	33.8	15.7	252.8	161.5	173.1	85.5	32.6	32.6	69.0	29.3	29.3
LnGrp LOS	F	C	B	F	F	F	F	C	C	E	C	C
Approach Vol, veh/h		1081			2339			532			793	
Approach Delay, s/veh		71.5			170.2			48.3			41.4	
Approach LOS		E			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	44.2	12.2	50.0	11.0	48.0	16.0	46.2
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	6.4	* 44	6.4	42.6	11.4	39.2
Max Q Clear Time (g_c+I1), s	10.1	11.4	8.4	24.4	7.4	11.9	13.4	42.4
Green Ext Time (p_c), s	0.0	3.0	0.0	7.2	0.0	3.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	112.5
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	524	0	0	521
Future Vol, veh/h	0	2	524	0	0	521
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	2	570	0	0	566

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	285	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	718	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	718	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	718	-
HCM Lane V/C Ratio	-	-	0.003	-
HCM Control Delay (s)	-	-	10	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0	-

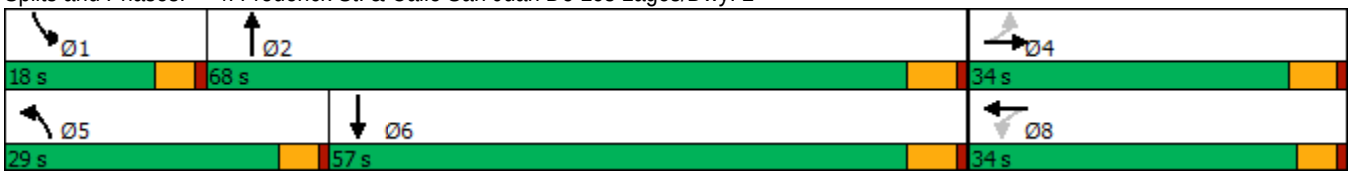
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	7	2	2	93	486	9	394
Future Volume (vph)	36	7	2	2	93	486	9	394
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	23.4	23.4	22.6	22.6	9.6	15.4	9.6	28.4
Total Split (s)	34.0	34.0	34.0	34.0	29.0	68.0	18.0	57.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	24.2%	56.7%	15.0%	47.5%
Yellow Time (s)	4.4	4.4	3.6	3.6	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4		4.6	4.6	5.4	4.6	5.4
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	11.5	11.5		12.1	10.3	69.7	6.1	59.3
Actuated g/C Ratio	0.13	0.13		0.14	0.11	0.78	0.07	0.66
v/c Ratio	0.21	0.13		0.03	0.49	0.19	0.08	0.24
Control Delay	39.0	19.5		30.2	46.0	4.6	43.4	8.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	19.5		30.2	46.0	4.6	43.4	8.6
LOS	D	B		C	D	A	D	A
Approach Delay		30.4		30.2		11.1		9.3
Approach LOS		C		C		B		A

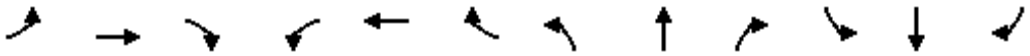
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 89.6	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 46.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	7	21	2	2	2	93	486	11	9	394	118
Future Volume (veh/h)	36	7	21	2	2	2	93	486	11	9	394	118
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	39	8	16	2	2	2	101	528	12	10	428	123
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	224	55	110	87	77	55	132	2574	58	22	1811	516
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.07	0.71	0.71	0.01	0.65	0.65
Sat Flow, veh/h	1435	561	1123	331	789	560	1810	3606	82	1810	2773	789
Grp Volume(v), veh/h	39	0	24	6	0	0	101	264	276	10	277	274
Grp Sat Flow(s),veh/h/ln	1435	0	1684	1679	0	0	1810	1805	1883	1810	1805	1757
Q Serve(g_s), s	1.9	0.0	1.1	0.0	0.0	0.0	4.8	4.3	4.3	0.5	5.5	5.6
Cycle Q Clear(g_c), s	2.1	0.0	1.1	0.3	0.0	0.0	4.8	4.3	4.3	0.5	5.5	5.6
Prop In Lane	1.00		0.67	0.33		0.33	1.00		0.04	1.00		0.45
Lane Grp Cap(c), veh/h	224	0	165	220	0	0	132	1288	1344	22	1179	1148
V/C Ratio(X)	0.17	0.00	0.15	0.03	0.00	0.00	0.76	0.20	0.21	0.45	0.24	0.24
Avail Cap(c_a), veh/h	551	0	549	601	0	0	503	1288	1344	276	1179	1148
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.6	0.0	36.2	35.8	0.0	0.0	39.9	4.2	4.2	43.0	6.2	6.3
Incr Delay (d2), s/veh	0.4	0.0	0.4	0.0	0.0	0.0	8.8	0.4	0.3	13.4	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	0.1	0.0	0.0	2.4	1.3	1.3	0.3	1.8	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	0.0	36.6	35.8	0.0	0.0	48.7	4.6	4.6	56.5	6.7	6.7
LnGrp LOS	D	A	D	D	A	A	D	A	A	E	A	A
Approach Vol, veh/h		63			6			641			561	
Approach Delay, s/veh		36.8			35.8			11.5			7.6	
Approach LOS		D			D			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	68.0		14.0	11.0	62.7		14.0				
Change Period (Y+Rc), s	4.6	5.4		5.4	4.6	5.4		* 5.4				
Max Green Setting (Gmax), s	13.4	62.6		28.6	24.4	51.6		* 29				
Max Q Clear Time (g_c+I1), s	2.5	6.3		4.1	6.8	7.6		2.3				
Green Ext Time (p_c), s	0.0	3.3		0.2	0.2	3.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		11.2	
HCM 6th LOS		B	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	8	0	0	105	0	486	12	2	395	20
Future Vol, veh/h	0	0	8	0	0	105	0	486	12	2	395	20
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	9	0	0	114	0	528	13	2	429	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	226	-	-	273	-	0	0	542	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	783	0	0	731	0	-	-	1037	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	783	-	-	730	-	-	-	1036	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	10.8	0	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	783	730	1036	-	-
HCM Lane V/C Ratio	-	-	0.011	0.156	0.002	-	-
HCM Control Delay (s)	-	-	9.6	10.8	8.5	-	-
HCM Lane LOS	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0	0.6	0	-	-

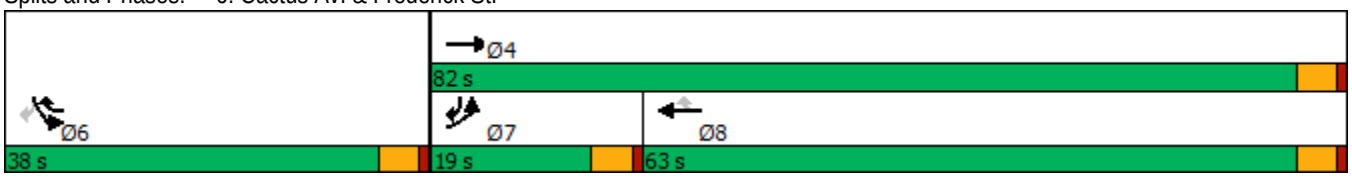
Timings
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	260	1865	3168	281	230	142
Future Volume (vph)	260	1865	3168	281	230	142
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	19.0	82.0	63.0	38.0	38.0	19.0
Total Split (%)	15.8%	68.3%	52.5%	31.7%	31.7%	15.8%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	14.5	77.9	58.8	78.1	14.7	33.9
Actuated g/C Ratio	0.14	0.76	0.58	0.77	0.14	0.33
v/c Ratio	1.08	0.50	1.13	0.24	0.48	0.28
Control Delay	122.1	6.1	84.9	3.2	42.5	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.1	6.1	84.9	3.2	42.5	25.9
LOS	F	A	F	A	D	C
Approach Delay		20.3	78.2		36.2	
Approach LOS		C	E		D	

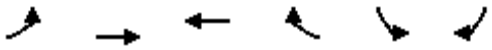
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.9	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 54.9	Intersection LOS: D
Intersection Capacity Utilization 95.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	260	1865	3168	281	230	142
Future Volume (veh/h)	260	1865	3168	281	230	142
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	277	1984	3370	293	245	111
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	270	4156	3136	1140	363	407
Arrive On Green	0.15	0.80	0.60	0.60	0.10	0.10
Sat Flow, veh/h	1810	5358	5358	1610	3510	1610
Grp Volume(v), veh/h	277	1984	3370	293	245	111
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1610	1755	1610
Q Serve(g_s), s	14.4	11.9	58.4	6.3	6.5	5.3
Cycle Q Clear(g_c), s	14.4	11.9	58.4	6.3	6.5	5.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	270	4156	3136	1140	363	407
V/C Ratio(X)	1.03	0.48	1.07	0.26	0.67	0.27
Avail Cap(c_a), veh/h	270	4156	3136	1140	1214	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	3.1	19.1	5.0	41.7	29.0
Incr Delay (d2), s/veh	61.9	0.4	40.5	0.2	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	1.8	29.8	2.5	2.8	5.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	103.0	3.5	59.6	5.2	42.5	29.1
LnGrp LOS	F	A	F	A	D	C
Approach Vol, veh/h		2261	3663		356	
Approach Delay, s/veh		15.7	55.2		38.4	
Approach LOS		B	E		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	82.0	14.6	19.0	63.0
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	77.4	33.4	14.4	58.4
Max Q Clear Time (g_c+I1), s	13.9	8.5	16.4	60.4
Green Ext Time (p_c), s	36.4	0.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	40.0
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	12	104	12	3	1
Future Vol, veh/h	2	12	104	12	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	13	113	13	3	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	126	0	-	0	137	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	17	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1473	-	-	-	861	937
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	1011	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1473	-	-	-	860	937
Mov Cap-2 Maneuver	-	-	-	-	819	-
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	1011	-

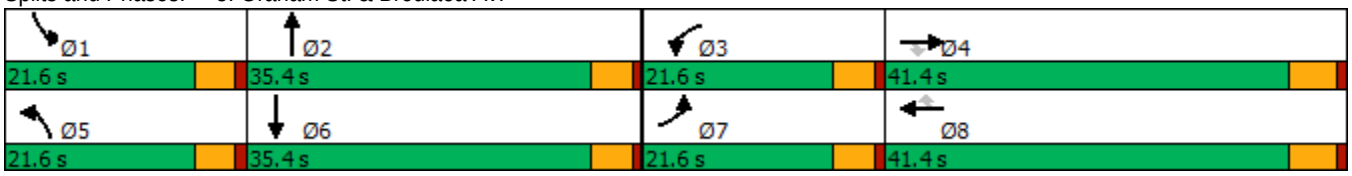
Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1473	-	-	-	846
HCM Lane V/C Ratio	0.001	-	-	-	0.005
HCM Control Delay (s)	7.4	-	-	-	9.3
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	2	10	6	30	85	116	12	373	65	432
Future Volume (vph)	2	10	6	30	85	116	12	373	65	432
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.6	12.8	12.8	6.2	15.1	15.1	5.8	16.5	7.3	21.9
Actuated g/C Ratio	0.11	0.25	0.25	0.12	0.30	0.30	0.11	0.32	0.14	0.43
v/c Ratio	0.01	0.02	0.01	0.15	0.16	0.23	0.06	0.37	0.28	0.31
Control Delay	30.5	19.4	0.0	28.3	15.7	5.1	29.2	17.8	27.1	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	19.4	0.0	28.3	15.7	5.1	29.2	17.8	27.1	12.7
LOS	C	B	A	C	B	A	C	B	C	B
Approach Delay		13.7			12.1			18.2		14.6
Approach LOS		B			B			B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 50.8	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 37.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	10	6	30	85	116	12	373	27	65	432	8
Future Volume (veh/h)	2	10	6	30	85	116	12	373	27	65	432	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2	11	6	33	92	96	13	405	27	71	470	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	5	406	344	68	473	400	30	812	54	120	1036	20
Arrive On Green	0.00	0.21	0.21	0.04	0.25	0.25	0.02	0.24	0.24	0.07	0.29	0.29
Sat Flow, veh/h	1810	1900	1610	1810	1900	1608	1810	3434	228	1810	3621	69
Grp Volume(v), veh/h	2	11	6	33	92	96	13	212	220	71	234	245
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1608	1810	1805	1857	1810	1805	1886
Q Serve(g_s), s	0.0	0.2	0.1	0.8	1.7	2.1	0.3	4.4	4.4	1.7	4.6	4.6
Cycle Q Clear(g_c), s	0.0	0.2	0.1	0.8	1.7	2.1	0.3	4.4	4.4	1.7	4.6	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		0.04
Lane Grp Cap(c), veh/h	5	406	344	68	473	400	30	427	439	120	516	539
V/C Ratio(X)	0.40	0.03	0.02	0.48	0.19	0.24	0.43	0.50	0.50	0.59	0.45	0.45
Avail Cap(c_a), veh/h	710	1579	1338	710	1579	1337	710	1280	1317	710	1280	1337
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	13.5	13.4	20.4	12.8	13.0	21.1	14.3	14.3	19.6	12.7	12.7
Incr Delay (d2), s/veh	18.4	0.0	0.0	1.9	0.2	0.3	3.6	0.9	0.9	1.7	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.3	0.6	0.6	0.1	1.6	1.7	0.7	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	13.5	13.5	22.4	13.0	13.3	24.6	15.2	15.2	21.4	13.3	13.3
LnGrp LOS	D	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		19			221			445			550	
Approach Delay, s/veh		16.3			14.5			15.5			14.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	14.9	6.2	14.7	5.3	17.1	4.7	16.2
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	3.7	6.4	2.8	2.2	2.3	6.6	2.0	4.1
Green Ext Time (p_c), s	0.1	2.6	0.0	0.0	0.0	2.9	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	69	68	120	44	43	132
Future Vol, veh/h	69	68	120	44	43	132
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	0	115	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	75	74	130	48	47	143

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	367	131	0	0	178	0
Stage 1	130	-	-	-	-	-
Stage 2	237	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	637	924	-	-	1410	-
Stage 1	901	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	616	923	-	-	1410	-
Mov Cap-2 Maneuver	698	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	698	923	1410	-
HCM Lane V/C Ratio	-	-	0.107	0.08	0.033	-
HCM Control Delay (s)	-	-	10.8	9.2	7.6	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.3	0.1	-

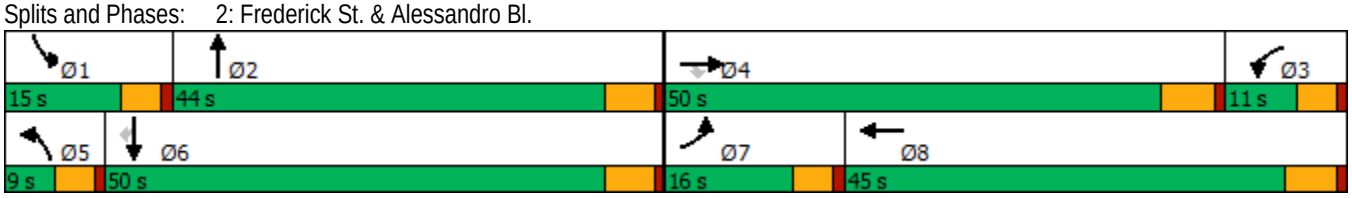
Timings
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	303	2140	261	120	1359	181	418	498	613	182
Future Volume (vph)	303	2140	261	120	1359	181	418	498	613	182
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	4.4	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.8	33.8	9.6	36.8	9.0	42.4	9.6	43.4	43.4
Total Split (s)	16.0	50.0	50.0	11.0	45.0	9.0	44.0	15.0	50.0	50.0
Total Split (%)	13.3%	41.7%	41.7%	9.2%	37.5%	7.5%	36.7%	12.5%	41.7%	41.7%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	4.4	3.6	4.4	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	5.4	4.6	5.4	5.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	Max	None	Max	Max
Act Effct Green (s)	11.4	44.2	44.2	6.4	39.2	4.4	38.6	10.4	44.6	44.6
Actuated g/C Ratio	0.10	0.37	0.37	0.05	0.33	0.04	0.32	0.09	0.37	0.37
v/c Ratio	1.85	1.68	0.40	1.30	1.08	1.48	0.48	1.71	0.48	0.27
Control Delay	434.1	336.0	13.1	237.2	84.7	291.2	32.6	367.7	30.3	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	434.1	336.0	13.1	237.2	84.7	291.2	32.6	367.7	30.3	6.9
LOS	F	F	B	F	F	F	C	F	C	A
Approach Delay		315.8			94.5		98.6		156.9	
Approach LOS		F			F		F		F	

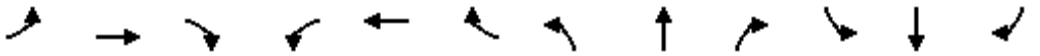
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.85	
Intersection Signal Delay: 198.5	Intersection LOS: F
Intersection Capacity Utilization 127.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Frederick St. & Alessandro Bl.



HCM 6th Signalized Intersection Summary
2: Frederick St. & Alessandro Bl.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	2140	261	120	1359	374	181	418	111	498	613	182
Future Volume (veh/h)	303	2140	261	120	1359	374	181	418	111	498	613	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	316	2229	137	125	1416	195	189	435	59	519	639	95
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	170	1317	586	96	1532	211	127	1016	137	301	1328	590
Arrive On Green	0.09	0.36	0.36	0.05	0.33	0.33	0.04	0.32	0.32	0.09	0.37	0.37
Sat Flow, veh/h	1810	3610	1608	1810	4595	632	3510	3189	430	3510	3610	1602
Grp Volume(v), veh/h	316	2229	137	125	1065	546	189	245	249	519	639	95
Grp Sat Flow(s),veh/h/ln	1810	1805	1608	1810	1729	1769	1755	1805	1814	1755	1805	1602
Q Serve(g_s), s	11.4	44.2	5.8	6.4	36.0	36.0	4.4	13.0	13.1	10.4	16.5	4.8
Cycle Q Clear(g_c), s	11.4	44.2	5.8	6.4	36.0	36.0	4.4	13.0	13.1	10.4	16.5	4.8
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	170	1317	586	96	1153	590	127	575	578	301	1328	590
V/C Ratio(X)	1.86	1.69	0.23	1.31	0.92	0.93	1.48	0.43	0.43	1.72	0.48	0.16
Avail Cap(c_a), veh/h	170	1317	586	96	1153	590	127	575	578	301	1328	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	38.5	17.4	57.4	38.9	38.9	58.4	32.6	32.6	55.4	29.4	25.7
Incr Delay (d2), s/veh	407.2	315.2	0.9	195.4	13.6	22.6	254.4	2.3	2.3	339.0	1.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.3	76.1	2.8	8.0	16.7	18.6	6.4	5.9	6.0	18.7	7.2	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	462.1	353.7	18.4	252.8	52.6	61.5	312.8	34.9	35.0	394.4	30.7	26.3
LnGrp LOS	F	F	B	F	D	E	F	C	C	F	C	C
Approach Vol, veh/h		2682			1736			683			1253	
Approach Delay, s/veh		349.3			69.8			111.8			181.0	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	44.0	12.2	50.0	9.0	50.0	16.0	46.2
Change Period (Y+Rc), s	4.6	5.4	5.8	* 5.8	4.6	5.4	4.6	5.8
Max Green Setting (Gmax), s	10.4	38.6	6.4	* 44	4.4	44.6	11.4	39.2
Max Q Clear Time (g_c+I1), s	12.4	15.1	8.4	46.2	6.4	18.5	13.4	38.0
Green Ext Time (p_c), s	0.0	4.0	0.0	0.0	0.0	4.6	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	214.2
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	12	692	0	0	906
Future Vol, veh/h	0	12	692	0	0	906
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	13	752	0	0	985

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	376	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	627	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	627	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	627	-
HCM Lane V/C Ratio	-	-	0.021	-
HCM Control Delay (s)	-	-	10.9	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

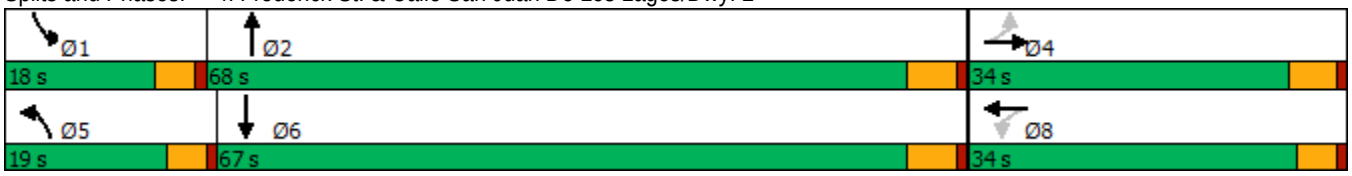
Timings
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	210	2	11	7	33	473	3	819
Future Volume (vph)	210	2	11	7	33	473	3	819
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	23.4	23.4	22.6	22.6	9.6	15.4	9.6	28.4
Total Split (s)	34.0	34.0	34.0	34.0	19.0	68.0	18.0	67.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	15.8%	56.7%	15.0%	55.8%
Yellow Time (s)	4.4	4.4	3.6	3.6	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4		4.6	4.6	5.4	4.6	5.4
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	20.8	20.8		21.7	6.7	67.9	5.1	62.9
Actuated g/C Ratio	0.20	0.20		0.21	0.07	0.67	0.05	0.62
v/c Ratio	0.79	0.20		0.08	0.30	0.21	0.03	0.45
Control Delay	59.0	9.7		24.9	55.3	7.8	52.3	12.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	9.7		24.9	55.3	7.8	52.3	12.7
LOS	E	A		C	E	A	D	B
Approach Delay		46.6		24.9		10.9		12.8
Approach LOS		D		C		B		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.5	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 54.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2



HCM 6th Signalized Intersection Summary
4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Centerpointe (JN: 11410)
05/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	210	2	69	11	7	9	33	473	3	3	819	85
Future Volume (veh/h)	210	2	69	11	7	9	33	473	3	3	819	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	228	2	68	12	8	10	36	514	3	3	890	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	337	8	273	137	93	89	58	2437	14	7	2107	206
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.03	0.66	0.66	0.00	0.63	0.63
Sat Flow, veh/h	1417	46	1561	487	533	510	1810	3679	21	1810	3322	325
Grp Volume(v), veh/h	228	0	70	30	0	0	36	252	265	3	484	493
Grp Sat Flow(s),veh/h/ln	1417	0	1606	1530	0	0	1810	1805	1896	1810	1805	1841
Q Serve(g_s), s	10.5	0.0	3.6	0.0	0.0	0.0	1.9	5.3	5.3	0.2	13.0	13.0
Cycle Q Clear(g_c), s	14.2	0.0	3.6	3.7	0.0	0.0	1.9	5.3	5.3	0.2	13.0	13.0
Prop In Lane	1.00		0.97	0.40		0.33	1.00		0.01	1.00		0.18
Lane Grp Cap(c), veh/h	337	0	281	320	0	0	58	1196	1256	7	1145	1168
V/C Ratio(X)	0.68	0.00	0.25	0.09	0.00	0.00	0.62	0.21	0.21	0.41	0.42	0.42
Avail Cap(c_a), veh/h	506	0	473	518	0	0	268	1196	1256	250	1145	1168
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	0.0	34.5	33.6	0.0	0.0	46.4	6.4	6.4	48.2	8.9	8.9
Incr Delay (d2), s/veh	2.4	0.0	0.5	0.1	0.0	0.0	4.0	0.4	0.4	13.4	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	1.4	0.6	0.0	0.0	0.9	1.8	1.9	0.1	4.7	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.9	0.0	35.0	33.7	0.0	0.0	50.4	6.8	6.8	61.7	10.0	10.0
LnGrp LOS	D	A	D	C	A	A	D	A	A	E	B	A
Approach Vol, veh/h		298			30			553			980	
Approach Delay, s/veh		39.5			33.7			9.7			10.2	
Approach LOS		D			C			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	69.7		22.4	7.7	67.0		22.4				
Change Period (Y+Rc), s	4.6	5.4		5.4	4.6	5.4		* 5.4				
Max Green Setting (Gmax), s	13.4	62.6		28.6	14.4	61.6		* 29				
Max Q Clear Time (g_c+I1), s	2.2	7.3		16.2	3.9	15.0		5.7				
Green Ext Time (p_c), s	0.0	3.1		0.8	0.0	7.1		0.1				

Intersection Summary		
HCM 6th Ctrl Delay		15.1
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	43	0	0	78	0	431	28	1	783	15
Future Vol, veh/h	0	0	43	0	0	78	0	431	28	1	783	15
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	47	0	0	85	0	468	30	1	851	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	434	-	-	251	-	0	0	499	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	576	0	0	755	0	-	-	1075	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	576	-	-	754	-	-	-	1074	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.8	10.4	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	576	754	1074	-	-
HCM Lane V/C Ratio	-	-	0.081	0.112	0.001	-	-
HCM Control Delay (s)	-	-	11.8	10.4	8.4	-	-
HCM Lane LOS	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.3	0.4	0	-	-

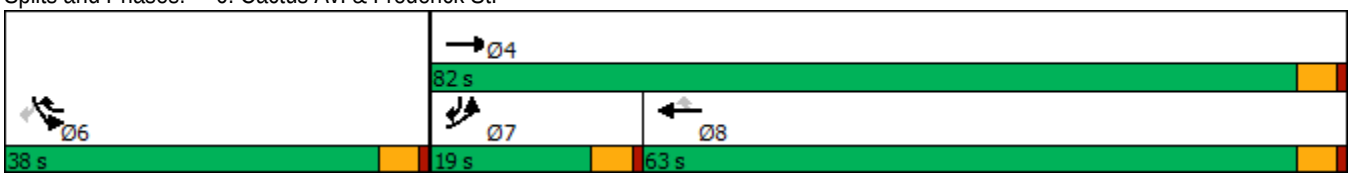
Timings
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	128	3379	2212	255	635	282
Future Volume (vph)	128	3379	2212	255	635	282
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases				8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	14.6	30.6	37.6	37.6	9.6
Total Split (s)	19.0	82.0	63.0	38.0	38.0	19.0
Total Split (%)	15.8%	68.3%	52.5%	31.7%	31.7%	15.8%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	Max	Max	None	Min	Min	Max
Act Effct Green (s)	14.4	77.6	58.5	89.0	25.8	44.9
Actuated g/C Ratio	0.13	0.69	0.52	0.79	0.23	0.40
v/c Ratio	0.59	1.01	0.87	0.20	0.84	0.47
Control Delay	58.8	35.2	29.1	0.8	51.8	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	35.2	29.1	0.8	51.8	27.4
LOS	E	D	C	A	D	C
Approach Delay		36.1	26.2		44.3	
Approach LOS		D	C		D	

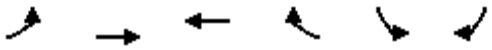
Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 112.6			
Natural Cycle: 120			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 33.6		Intersection LOS: C	
Intersection Capacity Utilization 91.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 6: Cactus Av. & Frederick St.



HCM 6th Signalized Intersection Summary
6: Cactus Av. & Frederick St.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	128	3379	2212	255	635	282
Future Volume (veh/h)	128	3379	2212	255	635	282
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	136	3595	2353	265	676	260
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	235	3624	2734	1200	766	561
Arrive On Green	0.13	0.70	0.53	0.53	0.22	0.22
Sat Flow, veh/h	1810	5358	5358	1610	3510	1610
Grp Volume(v), veh/h	136	3595	2353	265	676	260
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1610	1755	1610
Q Serve(g_s), s	7.8	75.4	43.5	5.6	20.7	13.9
Cycle Q Clear(g_c), s	7.8	75.4	43.5	5.6	20.7	13.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	235	3624	2734	1200	766	561
V/C Ratio(X)	0.58	0.99	0.86	0.22	0.88	0.46
Avail Cap(c_a), veh/h	235	3624	2734	1200	1058	695
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	16.4	22.7	4.3	41.9	28.1
Incr Delay (d2), s/veh	10.0	13.2	3.1	0.1	5.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	25.9	16.3	3.5	9.2	13.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	55.3	29.6	25.8	4.4	47.3	28.3
LnGrp LOS	E	C	C	A	D	C
Approach Vol, veh/h		3731	2618		936	
Approach Delay, s/veh		30.5	23.6		42.0	
Approach LOS		C	C		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	82.0	28.8	19.0	63.0
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	77.4	33.4	14.4	58.4
Max Q Clear Time (g_c+I1), s	77.4	22.7	9.8	45.5
Green Ext Time (p_c), s	0.0	1.5	0.1	12.1

Intersection Summary	
HCM 6th Ctrl Delay	29.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	28	74	3	16	4
Future Vol, veh/h	1	28	74	3	16	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	30	80	3	17	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	83	0	-	0	114	82
Stage 1	-	-	-	-	82	-
Stage 2	-	-	-	-	32	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1527	-	-	-	887	983
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1527	-	-	-	886	983
Mov Cap-2 Maneuver	-	-	-	-	844	-
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	996	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1527	-	-	-	869
HCM Lane V/C Ratio	0.001	-	-	-	0.025
HCM Control Delay (s)	7.4	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

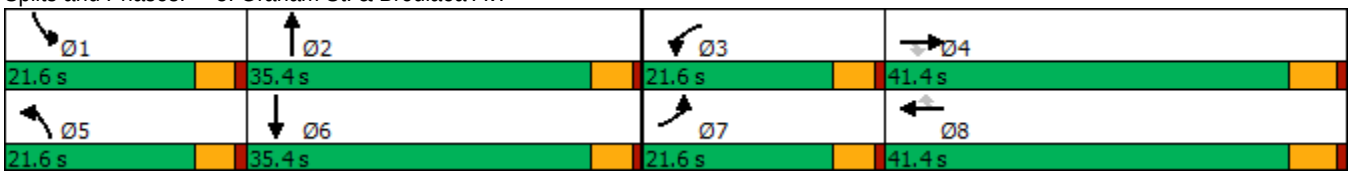
Timings
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/15/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	23	16	30	72	104	7	554	116	585
Future Volume (vph)	5	23	16	30	72	104	7	554	116	585
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	28.4	28.4	9.6	29.4	29.4	9.6	24.7	9.6	25.7
Total Split (s)	21.6	41.4	41.4	21.6	41.4	41.4	21.6	35.4	21.6	35.4
Total Split (%)	18.0%	34.5%	34.5%	18.0%	34.5%	34.5%	18.0%	29.5%	18.0%	29.5%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	4.4	3.6	3.7	3.6	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	5.4	4.6	4.7	4.6	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.9	13.3	13.3	6.7	15.5	15.5	6.0	26.2	10.0	36.2
Actuated g/C Ratio	0.10	0.23	0.23	0.12	0.27	0.27	0.10	0.45	0.17	0.62
v/c Ratio	0.03	0.06	0.04	0.16	0.15	0.22	0.04	0.39	0.41	0.29
Control Delay	36.0	25.3	0.2	34.2	21.7	6.6	35.6	18.7	31.7	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	25.3	0.2	34.2	21.7	6.6	35.6	18.7	31.7	10.3
LOS	D	C	A	C	C	A	D	B	C	B
Approach Delay		17.4			15.9			18.9		13.8
Approach LOS		B			B			B		B

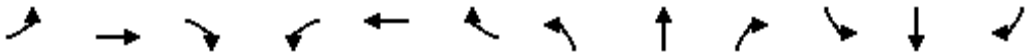
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 58	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 43.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Graham St. & Brodiaea Av.



HCM 6th Signalized Intersection Summary
8: Graham St. & Brodiaea Av.

Centerpointe (JN: 11410)
05/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	23	16	30	72	104	7	554	34	116	585	5
Future Volume (veh/h)	5	23	16	30	72	104	7	554	34	116	585	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	5	25	16	33	78	83	8	602	35	126	636	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	12	371	315	67	429	363	19	964	56	165	1317	10
Arrive On Green	0.01	0.20	0.20	0.04	0.23	0.23	0.01	0.28	0.28	0.09	0.36	0.36
Sat Flow, veh/h	1810	1900	1610	1810	1900	1608	1810	3466	201	1810	3670	29
Grp Volume(v), veh/h	5	25	16	33	78	83	8	313	324	126	313	328
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1810	1900	1608	1810	1805	1862	1810	1805	1894
Q Serve(g_s), s	0.1	0.5	0.4	0.9	1.6	2.0	0.2	7.3	7.4	3.3	6.5	6.5
Cycle Q Clear(g_c), s	0.1	0.5	0.4	0.9	1.6	2.0	0.2	7.3	7.4	3.3	6.5	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		0.02
Lane Grp Cap(c), veh/h	12	371	315	67	429	363	19	502	518	165	648	680
V/C Ratio(X)	0.41	0.07	0.05	0.49	0.18	0.23	0.42	0.62	0.63	0.76	0.48	0.48
Avail Cap(c_a), veh/h	635	1411	1196	635	1411	1194	635	1143	1180	635	1143	1200
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	15.9	15.8	22.9	15.1	15.3	23.8	15.3	15.3	21.5	12.1	12.1
Incr Delay (d2), s/veh	8.1	0.1	0.1	2.1	0.2	0.3	5.4	1.3	1.2	2.8	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.1	0.4	0.6	0.6	0.1	2.8	2.9	1.4	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	16.0	15.9	25.0	15.4	15.6	29.2	16.6	16.5	24.3	12.6	12.6
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		46			194			645			767	
Approach Delay, s/veh		17.7			17.1			16.7			14.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	18.2	6.4	14.9	5.1	22.1	4.9	16.3
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.4	4.6	* 4.7	4.6	5.4
Max Green Setting (Gmax), s	17.0	* 31	17.0	36.0	17.0	* 31	17.0	36.0
Max Q Clear Time (g_c+I1), s	5.3	9.4	2.9	2.5	2.2	8.5	2.1	4.0
Green Ext Time (p_c), s	0.1	3.9	0.0	0.1	0.0	4.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX 7.3:

GENERAL PLAN BUILDOUT (POST-2040) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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California MUTCD 2014 Edition
(FHWA's MUTCD 2009, as amended for use in California)

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

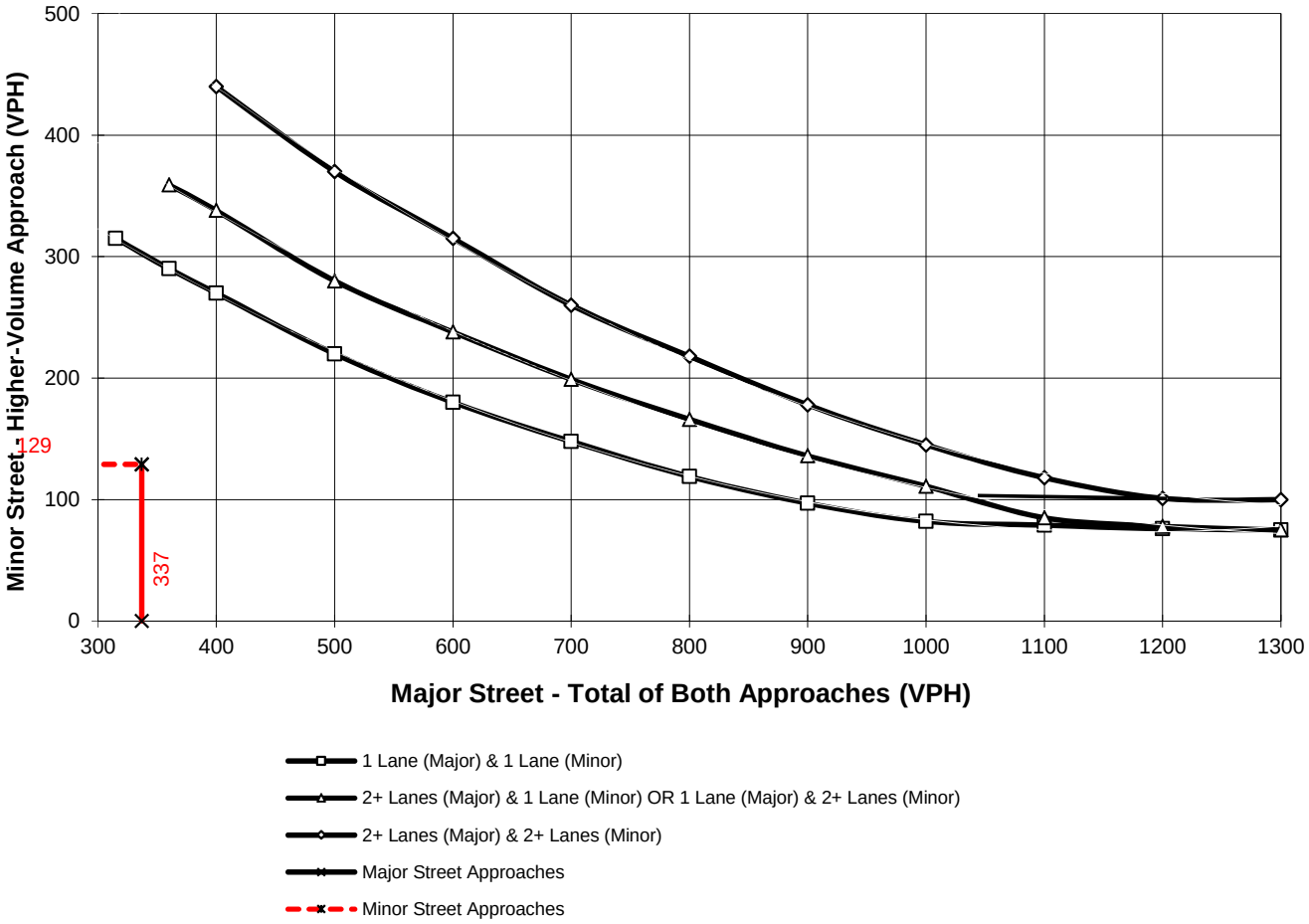
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **General Plan Buildout (Post 2040) Without Project Conditions - Weekday PM Peak Ho**

Major Street Name = **Veterans Way** Total of Both Approaches (VPH) = **337**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Calle San Juan de Los Lagos** High Volume Approach (VPH) = **129**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 7.4:

GENERAL PLAN BUILDOUT (POST-2040) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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California MUTCD 2014 Edition
(FHWA's MUTCD 2009, as amended for use in California)

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

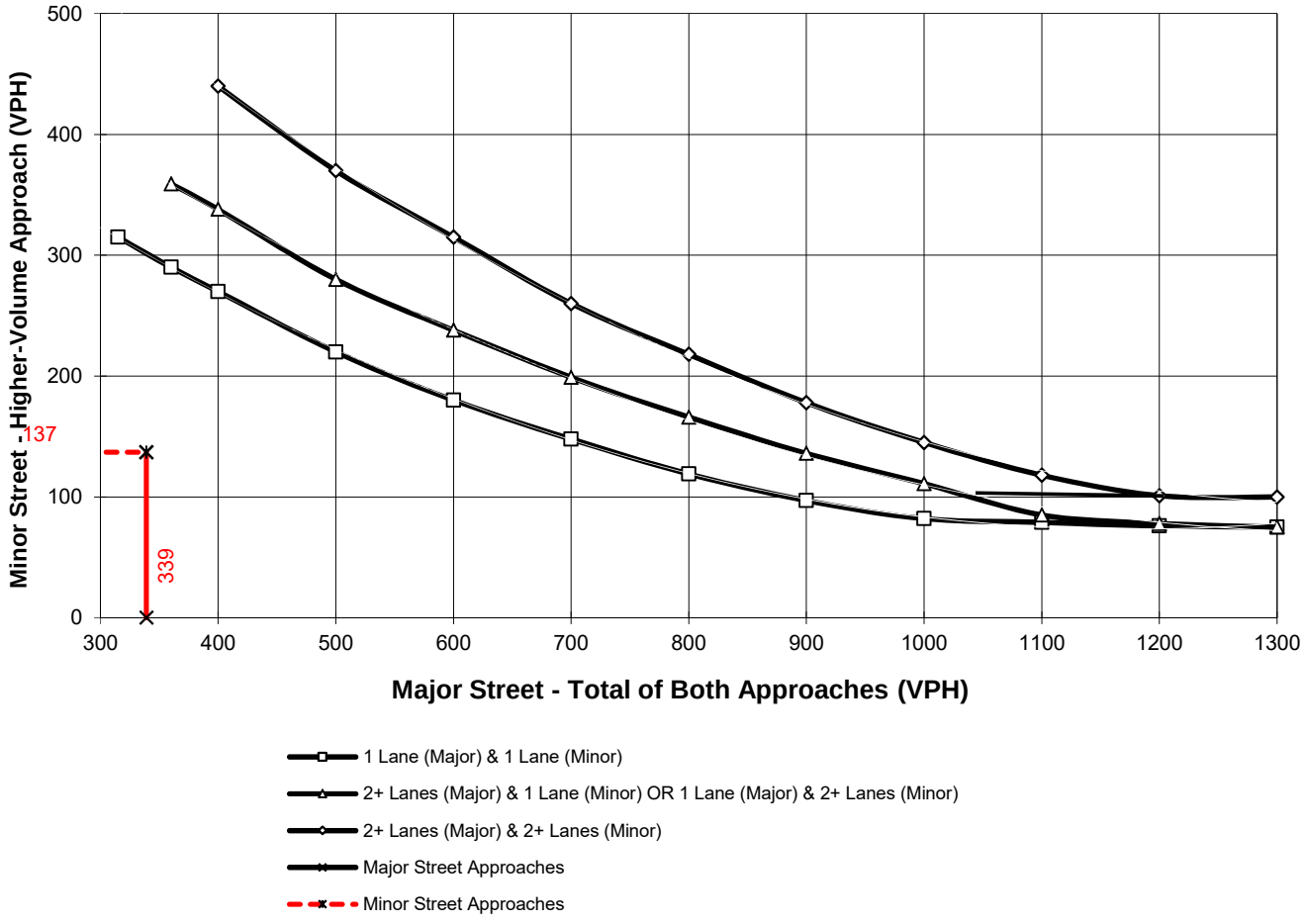
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **General Plan Buildout (Post 2040) With Project Conditions - Weekday PM Peak Hour**

Major Street Name = **Veterans Way** Total of Both Approaches (VPH) = **339**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Calle San Juan de Los Lagos** High Volume Approach (VPH) = **137**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		Post 2040 WP
				CALC CHS	DATE	05/15/18
Jurisdiction: City of Moreno Valley				CHK CHS	DATE	05/15/18
Major Street: Brodiaea Av.				Critical Approach Speed (Major)		40 mph
Minor Street: Driveway 3				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,573** vpd Minor Street Future ADT = **91** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **RURAL (R)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,573**	1 **91**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,573**	1 **91**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A 4% B 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 7.5:

GENERAL PLAN BUILDOUT (POST-2040) WITH PROJECT CONDITIONS QUEUING ANALYSIS WORKSHEETS

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Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	R	L
Maximum Queue (ft)	49	28	4	9	35
Average Queue (ft)	22	14	0	0	12
95th Queue (ft)	43	31	3	4	35
Link Distance (ft)		1530	1143	1143	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				115
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	330	1066	1043	57	215	2589	2589	2589	119	124	144	168
Average Queue (ft)	322	764	728	19	134	2589	2589	2589	52	73	83	98
95th Queue (ft)	373	1222	1207	41	259	2589	2589	2589	99	112	136	148
Link Distance (ft)		3252	3252	3252		2574	2574	2574			571	571
Upstream Blk Time (%)						89	96	97				
Queuing Penalty (veh)						0	0	0				
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)	90	0			12	66			0	0	1	
Queuing Penalty (veh)	350	1			77	80			0	0	2	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	160	197	192	186	167
Average Queue (ft)	92	135	116	111	85
95th Queue (ft)	180	194	179	169	142
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)	5	39	9	12	5
Queuing Penalty (veh)	9	76	20	36	10

Intersection: 3: Frederick St. & Dwy. 1

Movement	WB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	2
95th Queue (ft)	16
Link Distance (ft)	345
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	72	52	31	128	112	108	34	142	188
Average Queue (ft)	28	19	6	58	27	35	7	47	61
95th Queue (ft)	61	47	25	104	78	83	28	114	134
Link Distance (ft)		1530	288		230	230		276	276
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	120			150			100		
Storage Blk Time (%)				0	0			2	
Queuing Penalty (veh)				0	0			0	

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB	SB
Directions Served	R	R	LT
Maximum Queue (ft)	31	90	16
Average Queue (ft)	6	37	1
95th Queue (ft)	26	66	9
Link Distance (ft)	167	481	230
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	374	632	602	300	2544	2544	2544	340	126	139	161
Average Queue (ft)	266	209	156	68	2532	2535	2527	299	62	72	64
95th Queue (ft)	407	534	436	181	2664	2638	2696	470	111	124	135
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)					56	60	83				
Queuing Penalty (veh)					0	0	0				
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)	23	0					42		0	0	
Queuing Penalty (veh)	140	0					117		0	0	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	6	31
Average Queue (ft)	0	4
95th Queue (ft)	4	20
Link Distance (ft)		326
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	18	31	29	56	94	72	41	114	77	80	125	84
Average Queue (ft)	1	7	4	19	37	31	10	60	28	31	55	28
95th Queue (ft)	10	27	20	47	77	52	32	101	62	63	96	64
Link Distance (ft)		2009			828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210		100	150			160			150		
Storage Blk Time (%)											0	
Queuing Penalty (veh)											0	

Network Summary

Network wide Queuing Penalty: 918

Queuing and Blocking Report
General Plan Buildout (Post-2040) With Project - PM Peak Hour

Centerpointe (JN: 11410)
05/15/2018

Intersection: 1: Veterans Wy. & Calle San Juan De Los Lagos

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	51	38	28
Average Queue (ft)	22	17	4
95th Queue (ft)	42	34	20
Link Distance (ft)		1530	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		115
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	TR	L	L	T	TR
Maximum Queue (ft)	330	3710	3710	3710	215	1084	1066	1109	180	224	484	462
Average Queue (ft)	286	3710	3710	3710	195	666	663	664	148	181	298	220
95th Queue (ft)	416	3710	3710	3710	264	1222	1205	1184	224	279	586	446
Link Distance (ft)		3695	3695	3695		2574	2574	2574			571	571
Upstream Blk Time (%)		99	98	94							7	0
Queuing Penalty (veh)		0	0	0							26	0
Storage Bay Dist (ft)	250				130				135	135		
Storage Blk Time (%)	25	57			67	56			49	68	4	
Queuing Penalty (veh)	265	173			301	67			102	141	8	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	160	220	1199	1199	166
Average Queue (ft)	158	219	1199	1198	51
95th Queue (ft)	164	220	1199	1205	124
Link Distance (ft)			1184	1184	
Upstream Blk Time (%)			95	48	
Queuing Penalty (veh)			0	0	
Storage Bay Dist (ft)	100	100			100
Storage Blk Time (%)	85	90	12	18	0
Queuing Penalty (veh)	261	276	58	32	1

Intersection: 3: Frederick St. & Dwy. 1

Movement	WB	NB	NB
Directions Served	R	T	TR
Maximum Queue (ft)	39	78	55
Average Queue (ft)	12	16	7
95th Queue (ft)	37	100	74
Link Distance (ft)	345	276	276
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		1	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Frederick St. & Calle San Juan De Los Lagos/Dwy. 2

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	172	210	66	72	124	107	30	227	233
Average Queue (ft)	116	44	20	28	45	46	3	81	75
95th Queue (ft)	171	126	53	63	95	97	17	183	181
Link Distance (ft)		1530	288		230	230		276	276
Upstream Blk Time (%)								0	0
Queuing Penalty (veh)								0	0
Storage Bay Dist (ft)	120			150			100		
Storage Blk Time (%)	14	0			0			5	
Queuing Penalty (veh)	10	0			0			0	

Intersection: 5: Frederick St. & Private Driveway/Brodiaea Av.

Movement	EB	WB	NB	SB
Directions Served	R	R	T	LT
Maximum Queue (ft)	50	55	11	6
Average Queue (ft)	23	28	0	0
95th Queue (ft)	48	49	8	4
Link Distance (ft)	167	481	1150	230
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	335	518	489	494	425	424	416	338	199	269	171
Average Queue (ft)	123	270	269	248	253	251	229	56	125	153	79
95th Queue (ft)	271	458	453	434	367	366	354	191	203	243	155
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)		5					4		7	13	
Queuing Penalty (veh)		6					10		21	42	

Intersection: 7: Brodiaea Av. & Dwy. 3

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	15
95th Queue (ft)	40
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Graham St. & Brodiaea Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	30	44	39	60	85	73	25	162	160	110	124	112
Average Queue (ft)	4	16	11	22	30	30	6	89	60	49	64	42
95th Queue (ft)	19	43	34	52	65	57	24	144	123	88	108	89
Link Distance (ft)		2009			828	828		1200	1200		1170	1170
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210		100	150			160			150		
Storage Blk Time (%)								0		0	0	
Queuing Penalty (veh)								0		0	0	

Network Summary

Network wide Queuing Penalty: 1801

APPENDIX 7.6:

GENERAL PLAN BUILDOUT (POST-2040) WITH PROJECT CONDITIONS WITH IMPROVEMENTS QUEUING ANALYSIS WORKSHEETS

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Queuing and Blocking Report
General Plan Buildout (Post-2040) With Project - AM Peak Hour 09/06/2018

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	L	T	T	TR	L	L
Maximum Queue (ft)	325	654	582	400	109	27	178	2589	2589	2589	138	142
Average Queue (ft)	279	397	362	94	21	3	20	2589	2589	2589	62	80
95th Queue (ft)	392	973	927	260	57	18	99	2589	2589	2589	120	130
Link Distance (ft)		3252	3252	3252				2574	2574	2574		
Upstream Blk Time (%)								86	98	99		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (ft)	250				100	130	130				135	135
Storage Blk Time (%)	55	0		4				65			1	1
Queuing Penalty (veh)	144	0		4				6			1	2

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	TR	L	L	T	T	R
Maximum Queue (ft)	150	159	160	220	1193	1193	215
Average Queue (ft)	75	90	157	219	1101	1082	112
95th Queue (ft)	131	148	164	220	1399	1416	217
Link Distance (ft)	887	887			1178	1178	
Upstream Blk Time (%)					70	37	
Queuing Penalty (veh)					0	0	
Storage Bay Dist (ft)			100	100			100
Storage Blk Time (%)	1		93	99	8	19	13
Queuing Penalty (veh)	1		179	191	19	55	25

Queuing and Blocking Report
General Plan Buildout (Post-2040) With Project - AM Peak Hour

Centerpointe (JN: 11410)
09/06/2018

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	360	511	414	297	2544	2544	2545	340	142	145	148
Average Queue (ft)	255	208	152	85	2479	2480	2470	288	56	67	61
95th Queue (ft)	408	540	445	266	2792	2779	2801	477	117	125	128
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)					47	49	71				
Queuing Penalty (veh)					0	0	0				
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)	19	0					41		0	0	
Queuing Penalty (veh)	116	0					114		0	1	

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	L	T	T	TR	L	L
Maximum Queue (ft)	330	3710	3710	3710	150	53	214	920	926	941	176	206
Average Queue (ft)	328	3683	3676	3659	114	13	35	596	605	610	125	148
95th Queue (ft)	342	3892	3903	3934	200	40	145	980	987	1004	212	249
Link Distance (ft)		3695	3695	3695				2574	2574	2574		
Upstream Blk Time (%)		82	75	77								
Queuing Penalty (veh)		0	0	0								
Storage Bay Dist (ft)	250				100	130	130				135	135
Storage Blk Time (%)	83	40		56	0			64			31	44
Queuing Penalty (veh)	591	121		147	2			15			64	92

Intersection: 2: Frederick St. & Alessandro Bl.

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	TR	L	L	T	T	R
Maximum Queue (ft)	364	339	160	220	1193	1193	132
Average Queue (ft)	183	164	157	219	1193	1180	34
95th Queue (ft)	389	330	164	219	1196	1346	91
Link Distance (ft)	887	887			1178	1178	
Upstream Blk Time (%)					98	53	
Queuing Penalty (veh)					0	0	
Storage Bay Dist (ft)			100	100			100
Storage Blk Time (%)	5		93	99	5	11	0
Queuing Penalty (veh)	9		284	303	26	20	1

Intersection: 6: Cactus Av. & Frederick St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (ft)	263	401	396	378	380	373	368	197	192	245	192
Average Queue (ft)	95	216	215	189	234	234	209	39	105	126	71
95th Queue (ft)	177	364	360	337	338	345	326	136	171	195	148
Link Distance (ft)		1599	1599	1599	2529	2529	2529			1150	1150
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300							265	140		
Storage Blk Time (%)		2					2		3	5	
Queuing Penalty (veh)		3					6		9	16	

Zone Summary

Zone wide Queuing Penalty: 1710

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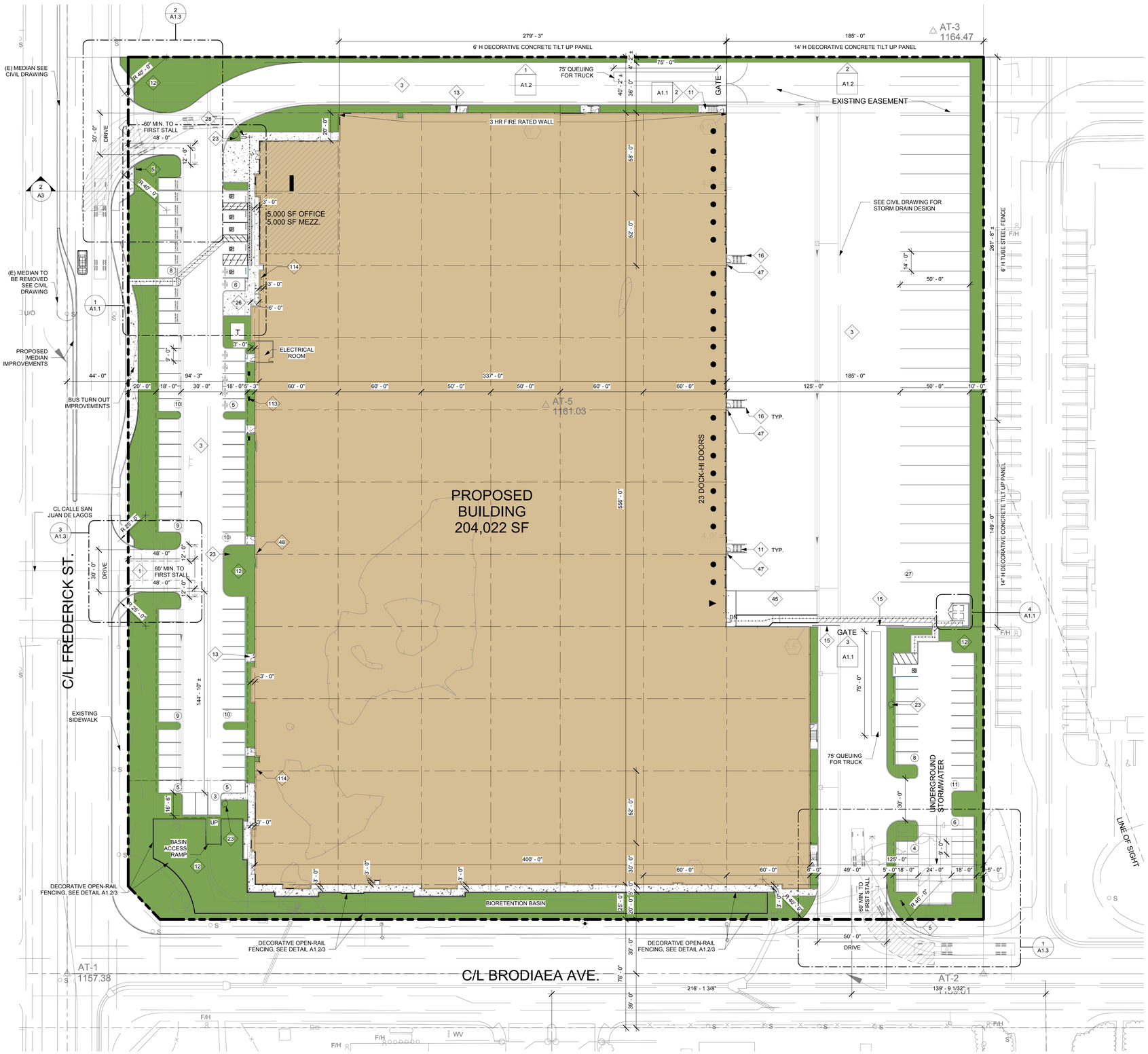


1 PROPOSED SITE PLAN
1" = 30'-0"

DEVELOPER/OWNER

NEWCASTLE PARTNERS, INC.
4740 GREEN RIVER ROAD, #118
CORONA, CA 92880

CONTACT: JACKSON SMITH
PHONE: 951.582.9800
EMAIL: JACKSON@NEWCASTLEPARTNERS.COM

APPLICANT'S REPRESENTATIVE/ARCHITECT

HERDMAN ARCHITECTURE & DESIGN, INC.
16201 SCIENTIFIC WAY
IRVINE, CA 92618
CONTACT: BRIDGET HERDMAN
PHONE: 714.389.2800
EMAIL: BRIDGET@HERDMAN-AD.COM

ACCESSOR PARCEL NUMBER

297170029

SCOPE OF WORK

NEW SPECULATIVE CONCRETE TILT-UP BUILDING FOR WAREHOUSE & OFFICE USE. INCLUDES SITE IMPROVEMENTS AS SHOWN.

PROJECT INFORMATION

CONSTRUCTION TYPE: III-B
NUMBER OF FLOORS: 1
OCCUPANCY: B, S-1, F-1
FIRE SPRINKLERS: YES (ESFR)

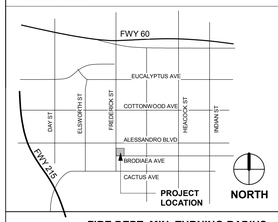
PROJECT INFORMATION - Scheme 3		06.13.2018
ZONING	O - OFFICE (CHANGE TO LI - LIGHT INDUSTRIAL)	
	CLEAR HEIGHT 32 ', 6" INSIDE OF FIRST COLUMN LINE	
GROSS SITE AREA	8.78 AC	382,428 SF
TOTAL BUILDING AREA		204,022 SF
FOOTPRINT		199,022 SF
	WAREHOUSE	194,022
	OFFICE	5,000
MEZZANINE		
	OFFICE	5,000
NET COVERAGE		53.3%
LANDSCAPE PROVIDED		11.2% 42,759 SF
PARKING REQUIRED		
	WAREHOUSE	
1/1000 FIRST 20K		20
1/2000 20K-40K		10
1/4000 OVER 40K		39
	OFFICE @ 1/250	40
TOTAL REQUIRED		109 STANDARD STALLS
	CLEAN AIR VEHICLES PARKING	11
	EV CHARGING SPACE	7
PARKING PROVIDED		109
	STANDARD	86
	ADA	5
	CLEAN AIR VEHICLES PARKING	11
	EV CHARGING S"ACE	7
	TRAILERS	27

* CLEAN AIR VEHICLE PARKING SPACES PROVIDED BASED ON THE TABLE 5.106.5.2. OF 2016 GREEN BUILDING CODE.

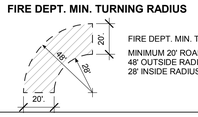
SITE LEGEND

- LANDSCAPE AREA
- CONCRETE PAVING
- STANDARD PARKING STALL
- TYP. HANDICAP PARKING STALL W/ 8' LOADING ZONE
- PROVIDE 12" HIGH WHITE HELVETIC LETTERING AT CARPOOL/ VANPOOL/ AND LOW-E/ FUEL EFFICIENT SPACE ONLY (NOTED EV ON SITE PLAN)
- PROVIDE 12" HIGH WHITE HELVETIC LETTERING AT CARPOOL/ VANPOOL/ AND LOW-E/ FUEL EFFICIENT CHARGING SPACE ONLY (NOTED EVC ON SITE PLAN)
- ADA PATH OF TRAVEL
- PROPERTY LINE
- DOCK HIGH DOOR
- DRIVE THRU. DOOR
- FIRE HYDRANT
- STREET LIGHT

VICINITY MAP



FIRE DEPT. MIN. TURNING RADIUS



FIRE DEPT. MIN. TURNING RADIUS
MINIMUM 20' ROADWAY
48' OUTSIDE RADIUS
28' INSIDE RADIUS

FIRE TRUCK RADIUS | SCALE: N.T.S.

SHEET INDEX

KEYNOTES

1 NEW DRIVE CUT, PER CITY OR COUNTY STANDARDS. REFER TO LANDSCAPE DRAWINGS FOR ENHANCED PAVING DESIGN IF APPLICABLE. REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFO.
3 CONCRETE PAVING, REFER TO CIVIL DRAWINGS FOR SECTION AND DRAINAGE. G.C. TO COORDINATE WITH SOILS REPORT. REFER TO STRUCTURAL DRAWINGS FOR CONCRETE DESIGN AT TRUCK APRONS IF APPLICABLE.
5 ADA SITE ENTRY SIGN PER CODE, TYP.
11 EXTERIOR CONCRETE STAIR W/CONCRETE WALLS. WALLS & RAILINGS PAINTED PEREXTERIOR COLOR SCHEDULE. REFER TO CIVIL AND STRUCTURAL DRAWINGS
12 LANDSCAPE AREA - SEE LANDSCAPE PLANS FOR ADDITIONAL INFORMATION
13 CONCRETE LANDING PAD & STEP(S) AS SHOWN @ EXTERIOR MAN DOORS, TYP. REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION
15 SLIDING METAL GATE, ELECTRONICALLY OR MANUALY OPERATED. PROVIDE CONDUIT TO GUARD SHACK AND OFFICE AREA FOR GATE CONTROL @ INTERCOM. PROVIDE KNOX PAD PER FIRE DEPT. STD.
16 PROTECTIVE METAL BOLLARDS, CONCRETE FILLED, PAINTED, TYP.
19 CONCRETE SCREEN WALL.
23 NEW FIRE HYDRANT, SEE FIRE PROTECTION DRAWINGS.
26 EMPLOYEE OUTDOOR BREAK AREA.
28 SECURE BICYCLE RACK.BY ANOVA FURNISHINGS, CIRBLEBRSZIG- CIRCLE STAINLESS STEEL BIKE RACK, INGROUND MOUNT PER MUNICIPAL CODE 9.11.060 . STAINLESS STEEL FINISH.SEE A1.2/5 FOR DETAIL.
33 CONCRETE TRASH ENCLOSURE PER CITY REQUIREMENTS.
45 CONCRETE TRUCK RAMP WITH 42" HIGH CONC. TILT UP GUARD WALLS PAINTED TO MATCH BUILDING, SEE ELEVATIONS.
47 EXTERIOR METAL DOWNSPOUT AND OVERFLOW SCUPPERS PAINTED TO MATCH BUILDING. REFER TO PLUMBING PLANS FOR MINIMUM SCUPPER OPENINGS ALLOWABLE PER CODE.
48 INTERIOR ROOF DRAIN AND INTERIOR OVERFLOW DRAIN.
113 EV CHARGERS - CONDUIT FOR FUTURE ONLY
114 INTERIOR ROOF DRAIN WITH DECORATIVE EXTERIOR SCUPPER

SITE PLAN GENERAL NOTES

1. SITE PLAN SHALL MEET ALL ENGINEERING & NPDES REQUIREMENTS.
2. GENERAL CONTRACTOR TO REVIEW SOILS REPORT PREPARED BY SOUTHERN CALIFORNIA GEOTECHNICAL DATED _____ AND ANY SUBSEQUENT AMENDMENTS. G.C. TO CONFIRM COMPLIANCE.
3. REFER TO CIVIL DRAWINGS FOR ADDITIONAL UTILITY INFORMATION INCLUDING POINTS OF CONNECTION TO OFFSITE UTILITIES AND BUILDING POINTS OF CONNECTION.
4. GENERAL CONTRACTOR TO COORDINATE ALL POINTS OF CONNECTION BETWEEN OFFSITES, CIVIL, M,E,P, & FP DRAWINGS.
5. GRADES SURROUNDING BUILDING TO PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDING.
6. REFER TO CIVIL DRAWINGS FOR FINISH GRADE ELEVATIONS AND PERCENTAGE SLOPES.
7. GENERAL CONTRACTOR TO CONFIRM AND COMPLY WITH ALL BUILDING, FIRE, AND ENGINEERING DEPARTMENT REGULATIONS DURING CONSTRUCTION INCLUDING ANY TEMPORARY FACILITIES REQUIRED.
8. ALL PAVED AND LANDSCAPED AREAS TO BE BOUND BY 6" MIN. CONCRETE CURB TYPICAL UNLESS SPECIFICALLY NOTED OTHERWISE.
9. ALL ADA PATHS OF TRAVEL NOTED ON PLANS TO MEET THE FOLLOWING MINIMUM REQUIREMENTS: NO ABRUPT CHANGES IN ELEVATION ALLOWABLE ALONG THE PATH OF TRAVEL. THE SLOPE AND CROSS-SLOPE SHALL NOT EXCEED 5% AND 2% RESPECTIVELY UNLESS AN ADA COMPLIANT RAMP OR CURB RAMP IS DESIGNED BY THE CIVIL ENGINEER. IF A WALK CROSSES OR ADJOINS A VEHICLE WAY, AND THE WALKING SURFACES ARE NOT SEPARATED BY CURBS, RAILING OR OTHER ELEMENTS BETWEEN THE PEDESTRIAN AREAS AND VEHICULAR AREAS, THE BOUNDARY BETWEEN THE AREAS SHALL BE DEFINED BY A 4' DEEP DETECTABLE WARNING WHICH IS 36" WIDE COMPLYING WITH CBC SECTION 11B-705.1.2.5
10. ALL SPECIFICATIONS ON DRAWINGS ARE MINIMUM REQUIREMENTS ONLY. GENERAL CONTRACTOR TO NOTIFY ARCHITECT IN WRITING OF ANY CONFLICTS IN DRAWINGS AND SPECIFICATIONS VIA "RFI".
11. GENERAL CONTRACTOR TO REFER TO ARCHITECTURAL DETAIL SHEETS FOR TYPICAL MINIMUM SITE IMPROVEMENT STANDARDS.
12. CONCRETE MOW STRIP PER ARCHITECTURAL DETAILS TO BE PROVIDED AT ALL GLAZING/STOREFRONT LOCATIONS WHERE ADJACENT TO LANDSCAPING.
13. CONCRETE SPLASH BLOCK PER ARCHITECTURAL DETAILS TO BE PROVIDED AT ALL ROOF DRAINDOWN SPOUT TERMINATIONS AT NON-CONCRETE AREAS.
14. BRASS LAMB'S TONGUE TO BE PROVIDED AT ALL ROOF DRAIN OVERFLOWS THAT DAYLIGHT AT FACE OF BUILDING WALL.
15. GATES, FENCES, AND WALLS MAY BE SUBJECT TO DEFERRED SUBMITTAL REQUIREMENTS. GENERAL CONTRACTOR TO CONFIRM WITH CITY AND MUST SUBMIT SHOP DRAWINGS TO THE ARCHITECT FOR APPROVAL.

PROJECT
NEWCASTLE FREDERICK ST.
MORENO VALLEY, CA
3RD PLANNING SUBMITTAL

HERDMAN
ARCHITECTURE + DESIGN

A17-2100
08/06/2018

NORTH

SITE PLAN

A1

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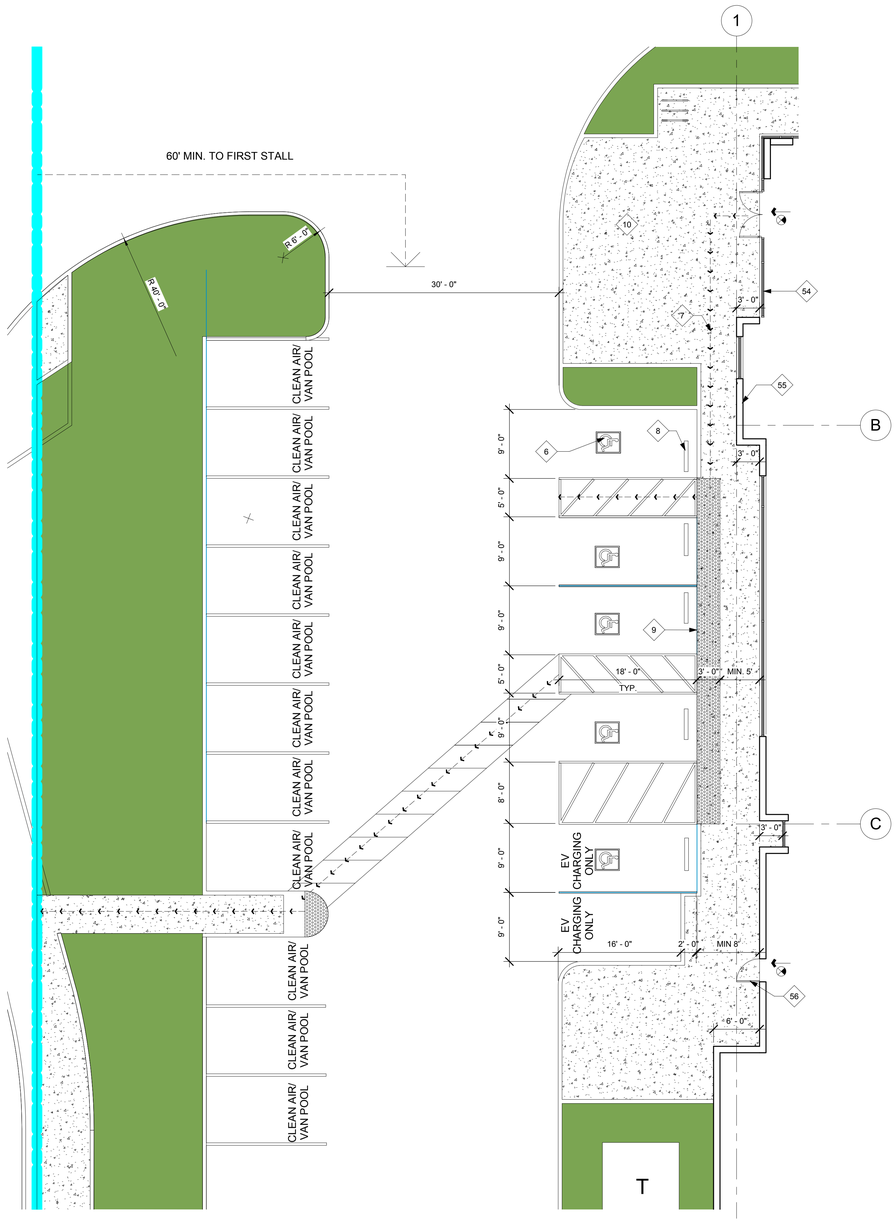
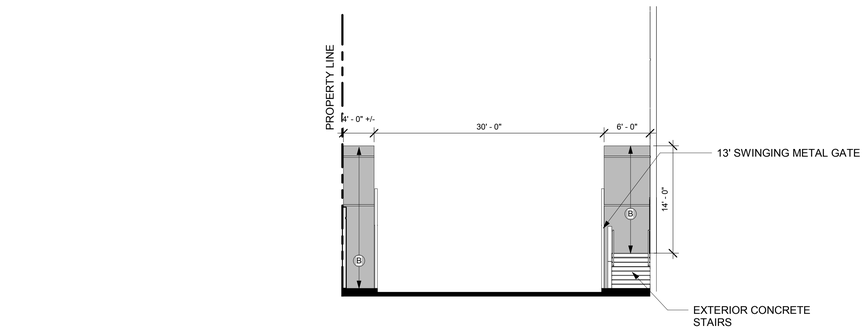
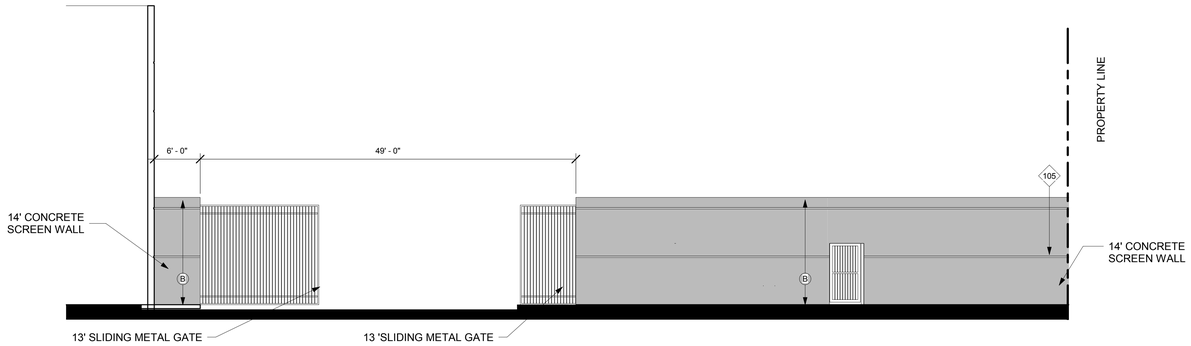


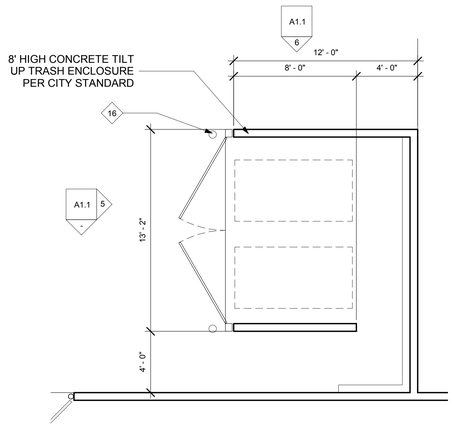
1 ENLARGED ACCESSIBLE PARKING PLAN
1/8" = 1'-0"



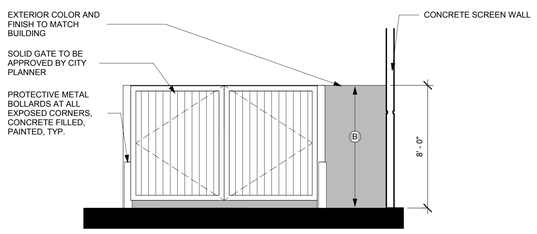
2 NORTH WEST GATE
1/8" = 1'-0"



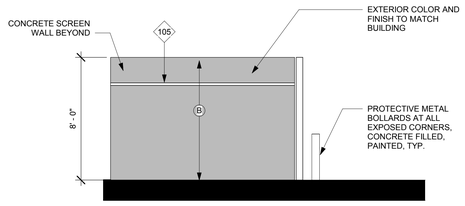
3 SOUTH EAST GATE
1/8" = 1'-0"



4 ENLARGED TRASH ENCLOSURE
1/4" = 1'-0"



5 TRASH ENCLOSURE ELEVATION A
1/4" = 1'-0"



6 TRASH ENCLOSURE B
1/4" = 1'-0"

KEYNOTES

6	ADA PARKING STALL SIGN PER CODE, TYP. PROVIDE AT ALL ADA STALLS.
7	ADA PATH OF TRAVEL
8	PRECAST CONCRETE WHEEL STOP
9	ZERO CURB FACE.
10	CONCRETE WALK, SEE SITE PLAN FOR ADA PATH OF TRAVEL, 4" MIN THICKNESS, SCORE CONCRETE @ 5' O.C., PROVIDE A LIGHT BROOM FINISH, REFER TO LANDSCAPE DRAWINGS FOR SPECIALTY CONCRETE FINISHING, TYP, REFER TO SOILS REPORT FOR ADDITIONAL MIN. REQ.
16	PROTECTIVE METAL BOLLARDS, CONCRETE FILLED, PAINTED, TYP.
54	STOREFRONT, SEE ELEVATIONS & EXTERIOR COLOR SCHEDULE. STORE FRONT TO BE DESIGNED TO RESIST WIND LOAD AS REQUIRED BY BUILDING CODES AND LOCAL JURISDICTION. DESIGN OF STOREFRONT FRAMING SYSTEM AND STRUCTURAL CALCULATIONS TO BE DESIGN BUILD BY G.C. AND UNDER DEFERRED SUBMITTAL.
55	CONCRETE TILT-UP PANEL, TYP. PAINTED, SEE EXTERIOR COLOR SCHEDULE. REFER TO ELEVATIONS AND "S" DRAWINGS FOR ADDITIONAL INFORMATION.
56	EXTERIOR MAN DOOR 3'X7', HOLLOW METAL, PAINTED, SEE EXTERIOR COLOR SCHEDULE & DOOR SCHEDULE FOR ADDITIONAL INFO.
105	2" DECORATIVE CONCRETE REVEAL WITH CHAMFERED EDGES, TYP.

PROJECT
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MORENO VALLEY, CA
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ARCHITECTURE + DESIGN

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08/06/2018

NORTH

SITE DETAILS

A1.1

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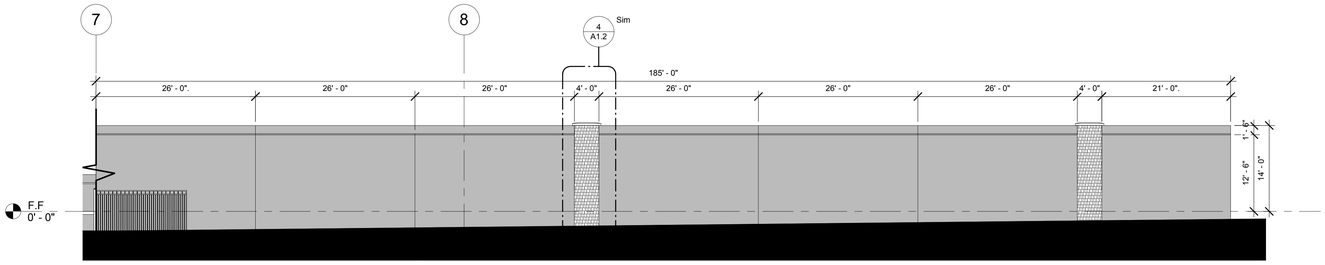
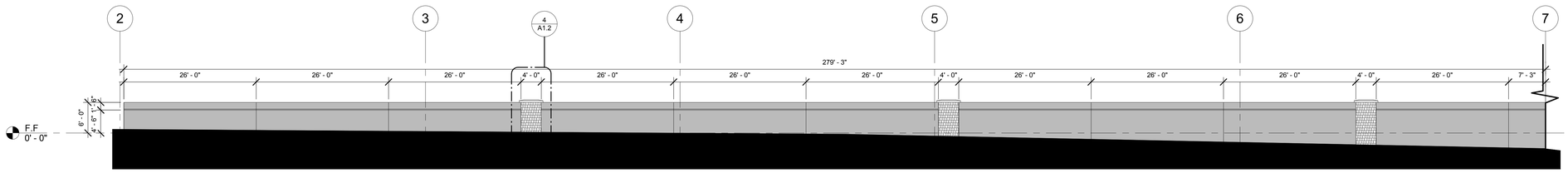
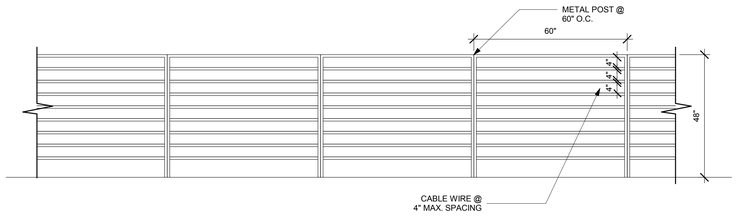


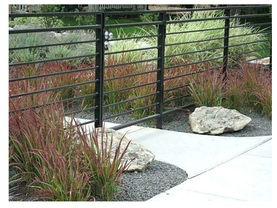
2 Elevation 5 - a
1" = 10'-0"



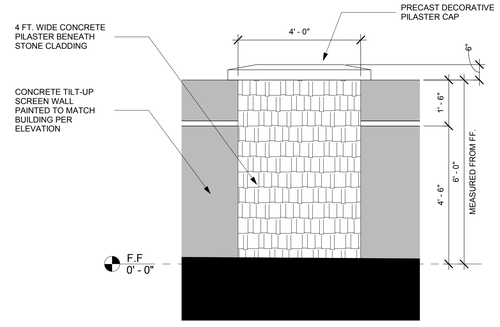
1 Elevation 3 - a
1" = 10'-0"



3 OPEN RAIL FENCING
1/2" = 1'-0"

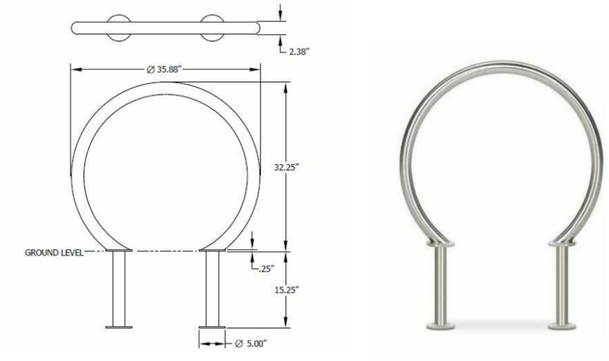


TYPICAL OPEN-RAIL FENCING



4 PILASTER AT NORTHERN SCREEN WALLS
1/2" = 1'-0"

PILASTER AT NORTHERN SCREEN WALL



5. BIKE RACK DETAIL

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MORENO VALLEY, CA
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SITE DETAILS

A1.2

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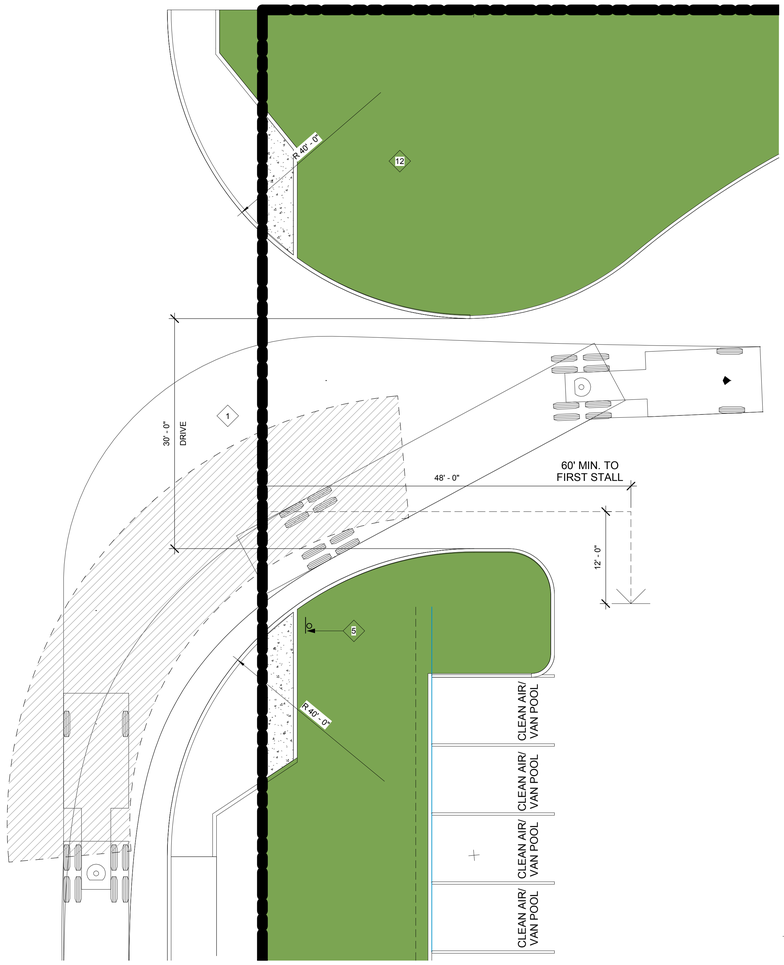
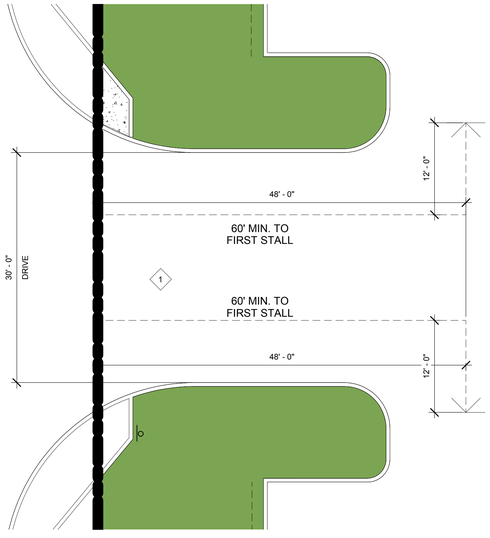
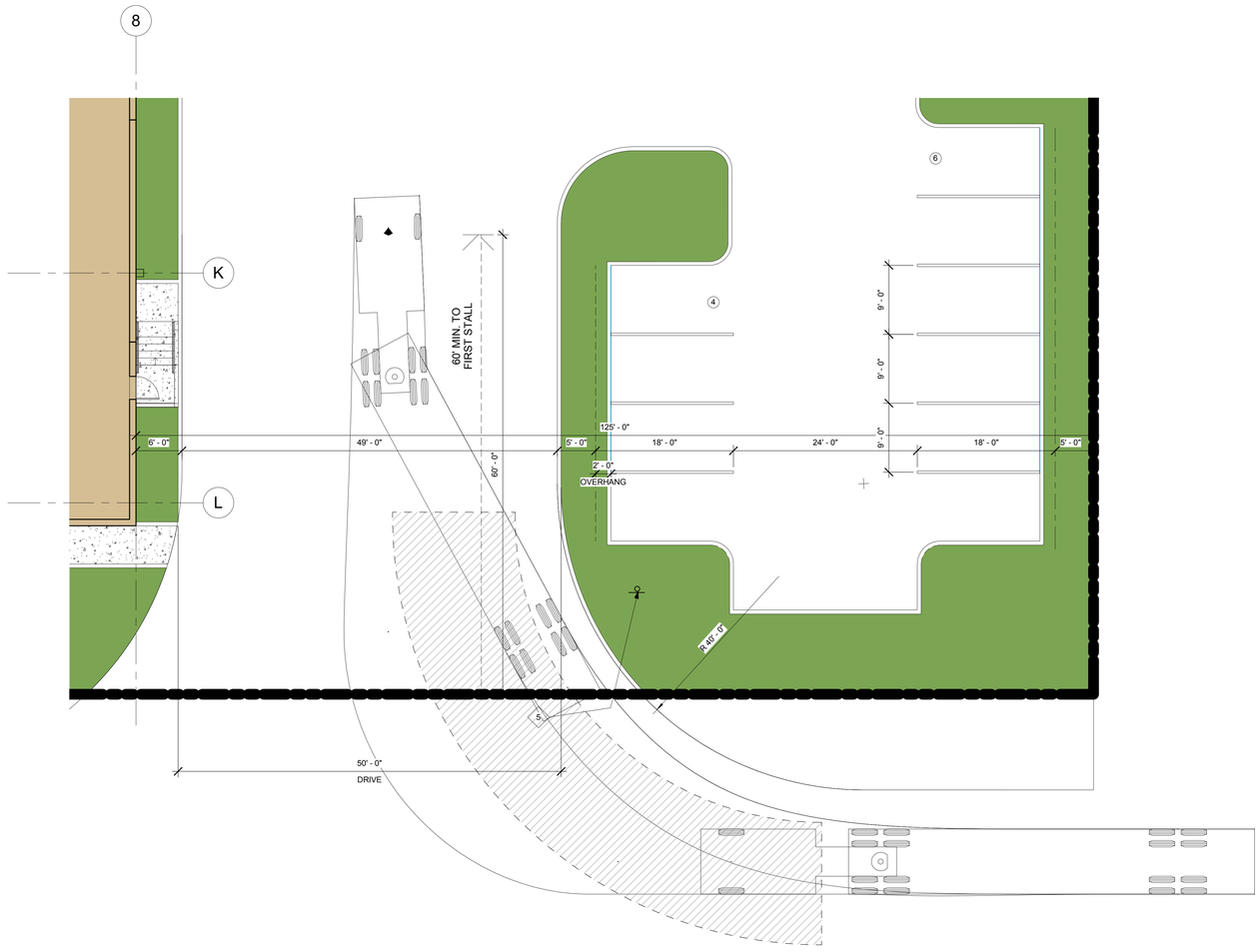


1 DRIVE ENLARGEMENT 2
1/8" = 1'-0"



3 DRIVE ENLARGEMENT 3
1/8" = 1'-0"



2 DRIVE ENLARGEMENT 1
1/8" = 1'-0"

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MORENO VALLEY, CA
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SITE ENLARGEMENTS

A1.3

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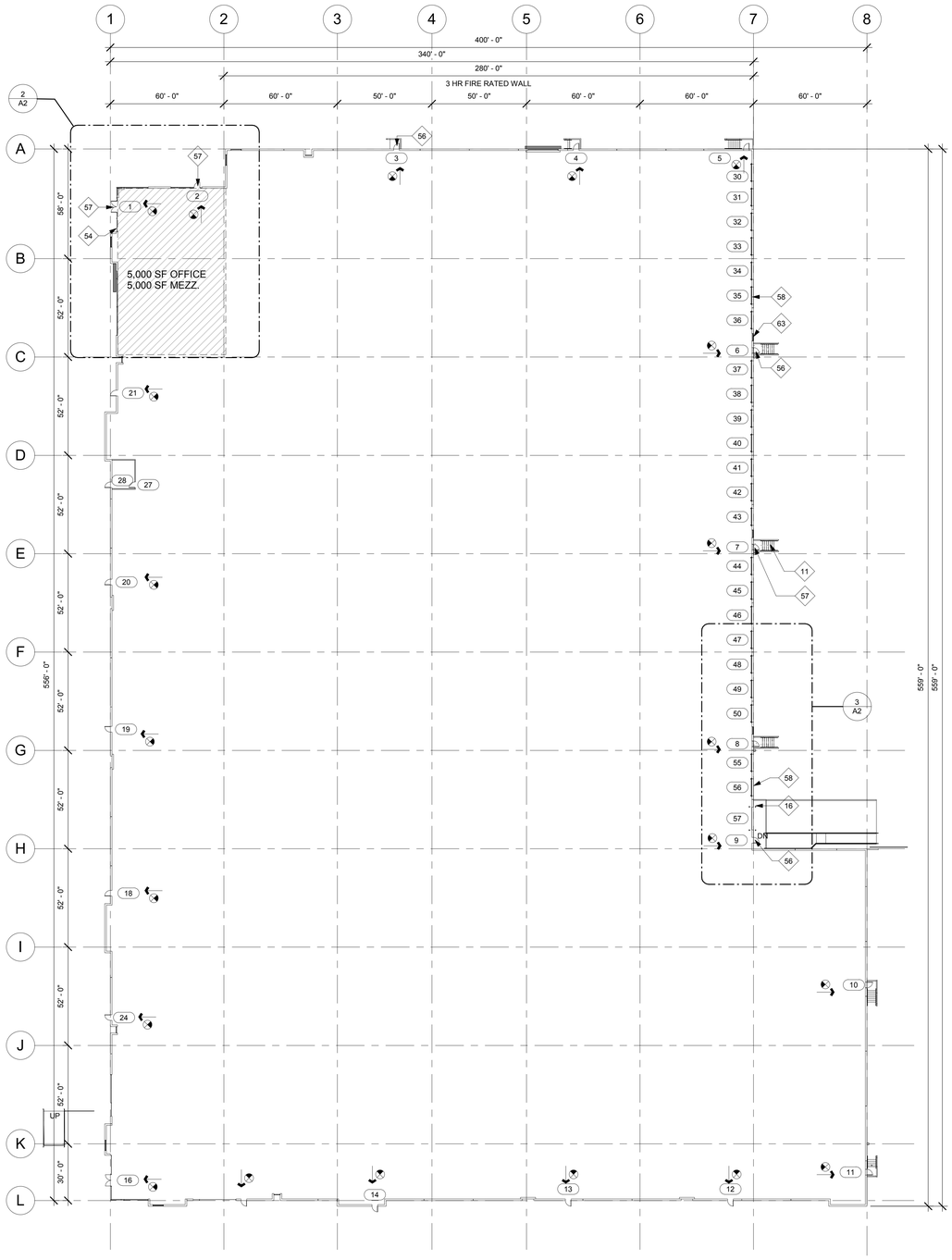
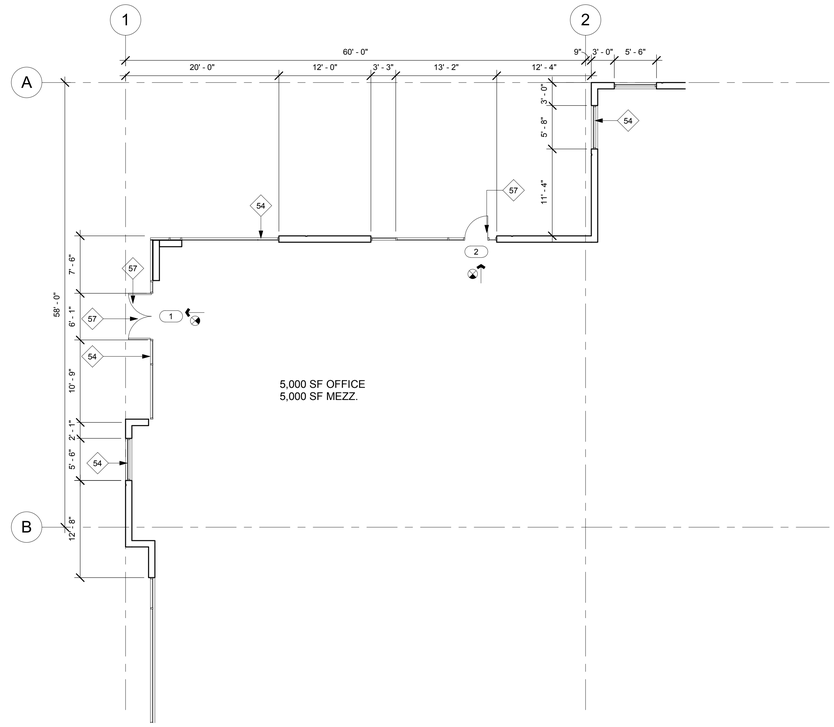
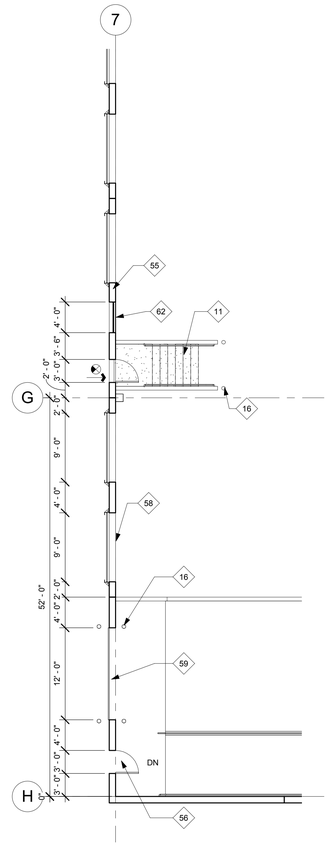


1 PROPOSED BUILDING FLOOR PLAN
1" = 30'-0"



2 ENLARGED FLOOR PLAN
1/8" = 1'-0"



3 DOCK SPACING PLAN
1/8" = 1'-0"

KEYNOTES

11	EXTERIOR CONCRETE STAIR W/CONCRETE WALLS. WALLS & RAILINGS PAINTED PEREXTERIOR COLOR SCHEDULE. REFER TO CIVIL AND STRUCTURAL DRAWINGS
16	PROTECTIVE METAL BOLLARDS, CONCRETE FILLED, PAINTED, TYP.
54	STOREFRONT, SEE ELEVATIONS & EXTERIOR COLOR SCHEDULE. STORE FRONT TO BE DESIGNED TO RESIST WIND LOAD AS REQUIRED BY BUILDING CODES AND LOCAL JURISDICTION. DESIGN OF STOREFRONT FRAMING SYSTEM AND STRUCTURAL CALCULATIONS TO BE DESIGN BUILD BY G.C. AND UNDER DEFERRED SUBMITTAL.
55	CONCRETE TILT-UP PANEL, TYP. PAINTED, SEE EXTERIOR COLOR SCHEDULE. REFER TO ELEVATIONS AND "S" DRAWINGS FOR ADDITIONAL INFORMATION.
56	EXTERIOR MAN DOOR 3'X7', HOLLOW METAL, PAINTED, SEE EXTERIOR COLOR SCHEDULE & DOOR SCHEDULE FOR ADDITIONAL INFO.
57	EXTERIOR STOREFRONT DOOR, SEE EXTERIOR COLOR SCHEDULE & DOOR SCHEDULE FOR ADDITIONAL INFO.
58	DOCK-HI LOADING DOOR, 9'X10', WITH VISION GLAZING PRE FINISHED BY MANUFACTURER PER COLOR SCHEDULE.
59	DRIVE THRU LOADING DOOR 12'X14' WITH VISION GLAZING, PRE FINISHED BY MANUFACTURER PER COLOR SCHEDULE.
62	AIR INTAKE LOUVER. PAINT TO MATCH BUILDING WALL, TYP. SIZE HORIZONTAL 4'X 8', PROVIDE BIRD SCREEN, FILTER AND BURGLAR BARS.
63	AIR INTAKE LOUVER. PAINT TO MATCH BUILDING WALL, TYP. SIZE VERTICAL 4'X 8', PROVIDE BIRD SCREEN, FILTER AND BURGLAR BARS.

FLOOR PLAN WALL LEGEND

- CONCRETE TILT UP WALL. SEE "S" DRAWINGS FOR ADDITIONAL INFORMATION. PROVIDE METAL STUD FURRING (SEE STUD SCHEDULE A0.2) AND FULL HEIGHT BATT INSULATION PER TITLE 24 REQUIREMENTS. SEE 3/A0.2 FOR CONNECTION DETAIL.
- STOREFRONT SYSTEM, UNDER DEFERRED SUBMITTAL. SEE ELEVATIONS FOR ARCHITECTURAL DETAILS
- METAL STUD WALL, SEE 13/A0.6 FOR STUD SIZE & DETALS
- METAL STUD FURRING. INSTALL INSULATION PER TITLE 24 REQUIREMENTS. PROVIDE 5/8" TYPE X GYP. BD. ON THE INTERIOR SIDE
- ONE HOUR FIRE RATED WALL. SEE WALL CALL OUTS AND STUD SCHEDULE FOR ADDITIONAL INFORMATION
- STRUCTURAL BUILDING COLUMNS
- ILLUMINATED EMERGENCY EXIT SIGN PER CBC AND FIRE DEPT. SEE "E" DRAWINGS FOR LOCATION. SIGN SHALL BE CONTINUOUSLY ILLUMINATED FOR DURATION OF 90 MIN. IN CASE OF PRIMARY POWER LOSS.

FLOOR PLAN GENERAL NOTES

1. FINISH FLOOR SLAB SLOPES. REFER TO CIVIL DRAWINGS FOR ELEVATIONS AND ADDITIONAL INFORMATION.
2. PROVIDE STEGO WRAP 15MIL BARRIER BELOW SLAB PER MANUFACTURERS INSTRUCTIONS AND PER SOILS REPORT IN LOCATIONS FOR PROPOSED OFFICE AREAS. SEE FLOOR PLAN LEGEND FOR HATCHED AREAS.
3. REFER TO STRUCTURAL DRAWINGS FOR DESIGN OF FOUNDATION.
4. POUR STRIP TO BE SLOPED TO EXTERIOR DOORS 1/2".
5. PROVIDE FIRE EXTINGUISHERS AS REQUIRED BY FIRE DEPARTMENT AND CBC/CFC.
6. PROVIDE ILLUMINATED EXIT SIGNS AT ALL EXTERIOR EXIT DOORS, DOORS EXITING FROM TENANT SPACES, DOORS INTO EXIT ENCLOSURES, AND ANY ADDITIONAL LOCATIONS NOTED ON PLANS. SEE "E" DRAWINGS FOR ADDITIONAL REQUIREMENTS.SIGN TO BE CONTINUOUSLY ILLUMINATED FOR DURATION OF 90 MIN IN CASE OF PRIMARY POWER LOSS.
7. ALL FIRE RATED PARTITIONS TO EXTEND TO DECK ABOVE, AND PENETRATIONS TO BE SEALED.
8. DO NOT USE CURING COMPOUND OR RELEASE AGENTS TO CURE SLAB.
9. CRANES, CONCRETE TRUCKS, AND SIMILAR HEAVY EQUIPMENT PROHIBITED ON SLAB.
10. FLY-ASH PROHIBITED IN CONCRETE SLAB MIX.
11. FLOOR SLAB TO BE CLASS V PER ACI 302-IR-89
12. FLOOR COMPACTION TO BE 95% MIN
13. TRENCH COMPACTION TO BE 90% MIN
14. SLAB FINISH TO BE STEEL FLOAT HARD TROWEL BURNISHED FINISH.
15. DIMENSIONS ARE TO FACE OF CONCRETE PANEL, FINISH FACE OF DRYWALL, FINISH OPENING, TYPICAL UNLESS NOTED OTHERWISE.
16. PROVIDE EXIT SIGNS INCLUDING TACTILE SIGN REQUIRED BY SECTION 1011 OF 2013 CBC. SIGN TO BE CONTINUOUSLY ILLUMINATED FOR DURATION OF 90 MIN IN CASE OF PRIMARY POWER LOSS.
17. ALL MAN DOORS, OVERHEAD DOORS, AND ROLL-UP DOORS TO BE DESIGNED FOR WIND LOAD AND EXPOSURE DETERMINED BY BUILDING CODE AND LOCAL JURISDICTION.
18. ALL STOREFRONT SYSTEMS TO BE DESIGNED FOR WIND LOAD AND EXPOSURE DETERMINED BY THE BUILDING CODE AND LOCAL JURISDICTION.STOREFRONT SYSTEMS TO BE DESIGN BUILD.G.C. TO PROVIDE SHOP DRAWINGS FOR ARCHITECT'S REVIEW
19. REFER TO CIVIL DRAWINGS FOR ALL POINT OF CONNECTIONS FOR UTILITIES.CONTRACTOR TO VERIFY LOCATIONS.
20. PROVIDE STEEL BOLLARDS FILLED WITH CONCRETE AND PAINTED PER FINISH SCHEDULE AT FIRE RISERS, PIVS, TRANSFORMERS, AND OTHER LOCATIONS AS REQUIRED.
21. CONTRACTOR TO MAINTAIN A CLEAN FLOOR SLAB, ALL TRUCKS AND EQUIPMENT TO BE DIAPERED
22. NO ACCESS HARDWARE ON THE EXTERIOR SIDE OF THE NON-ENTRY DOORS
23. FOR TYPICAL DOOR LANDING CLEARANCES, REFER 2/A0.2.2 FOR MORE INFORMATION
24. NO SMOKING WITIHN 25' OF BUILDING ENTRIES, ACCORDING TO GREEN BUILDING STANDARD CODE DIVISION 5.504.7

PROJECT
NEWCASTLE FREDERICK ST.
MORENO VALLEY, CA

3RD PLANNING SUBMITTAL

HERDMAN
ARCHITECTURE + DESIGN

A17-2100
08/06/2018

NORTH

BUILDING FLOOR PLAN

A2

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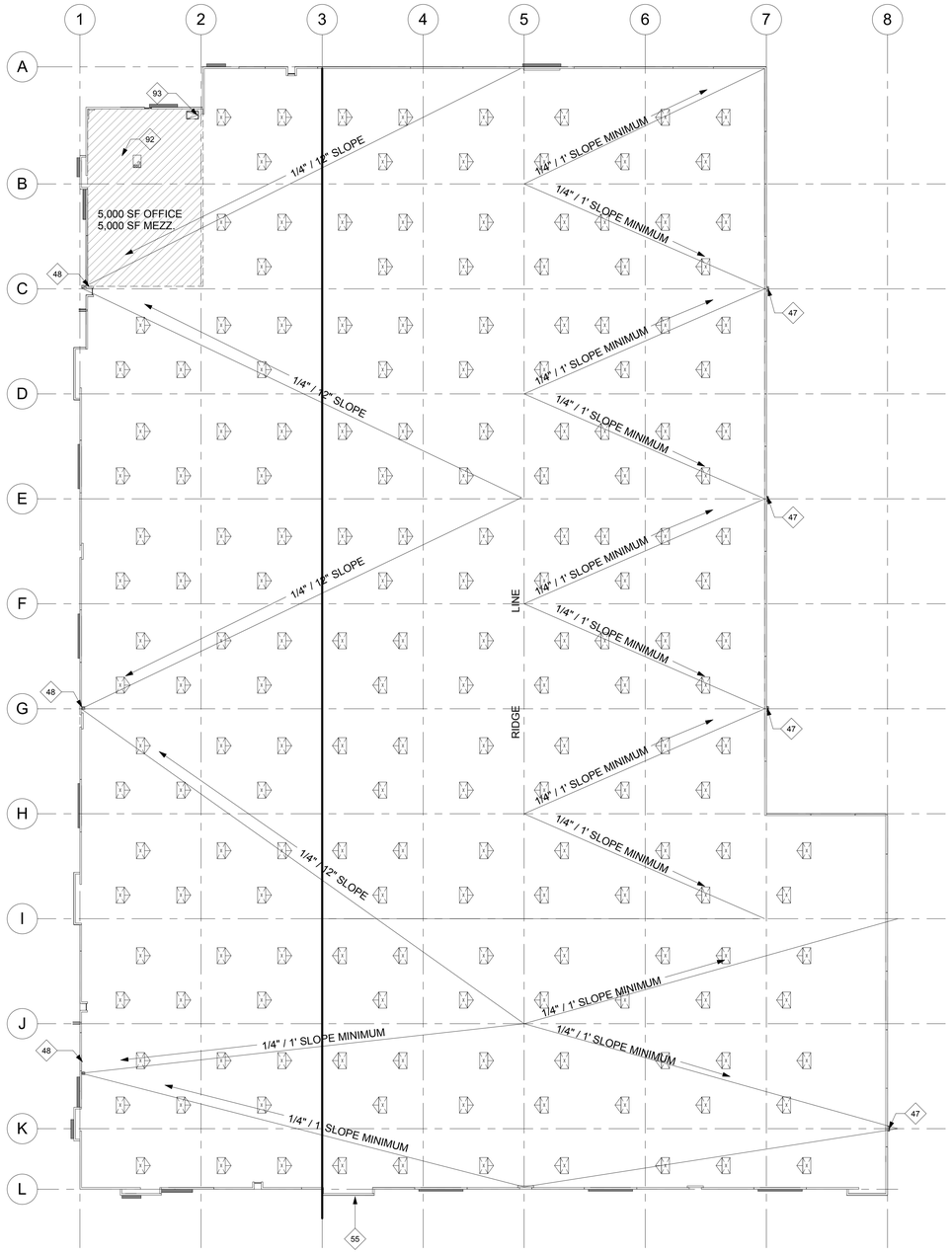
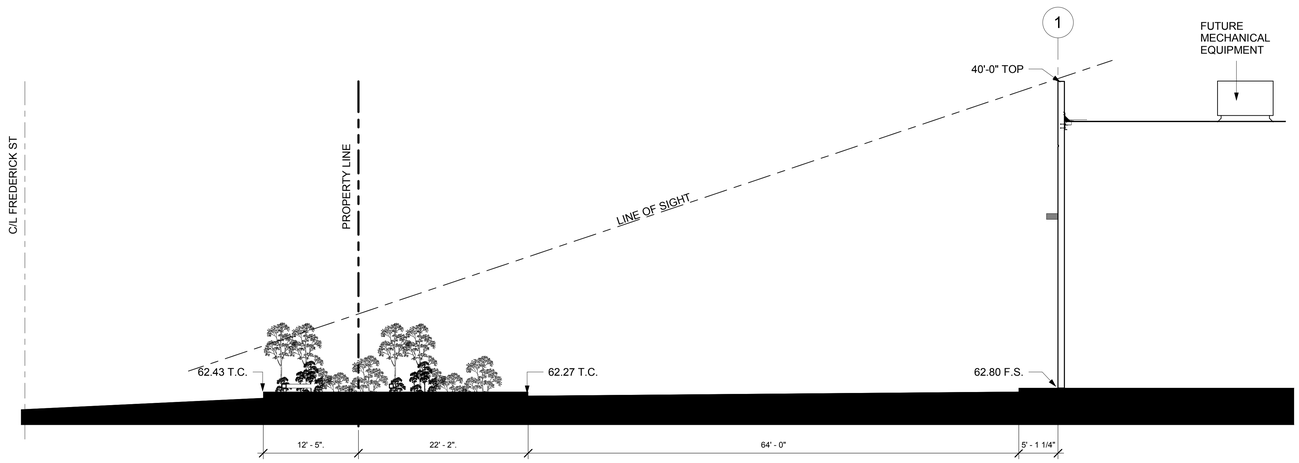


1 ROOF PLAN
1" = 30'-0"



2 LINE OF SIGHT

SKYLIGHTS NOTES

PROPOSED BLDG:
ROOF AREA = 197,089 SF.
SKYLIGHTS : 3% OF ROOF AREA = 5,913 SF.
EACH UNIT: 32 SF (4'X8')
UNITS PROVIDED: 185 = 5,920 SF

SMOKE HATCHES NOTE TO BIDDING CONTRACTORS:
% OF SMOKE HATCHES TO BE DETERMINED BY D.B. FIRE PROTECTION CONSULTANT TO MEET CODE REQUIREMENT TO ALLOW FOR HIGH PILE STORAGE. COMBINED TOTAL OF SMOKE HATCH + SKYLIGHTS TO EQUAL 3% OF TOTAL ROOF AREA

MECHANCIAL EXHAUST NOTE TO BIDDING CONTRACTORS:
QUANTITY & LOCATION OF ROOFTOP EXHAUST FANS & WALL MOUNTED LOUVERS TO BE DETERMINED BY DESIGN BUILD MECHANICAL ENGINEER TO PROVIDE MINIMUM 1 AIR CHANGE PER HOUR LOCATIONS TP BE COORDINATED WITH THE ARCHITECT, STRUCTURAL ENGINEER AND FIRE SPRINKLERS.

KEYNOTES

47 EXTERIOR METAL DOWNSPOUT AND OVERFLOW SCUPPERS PAINTED TO MATCH BUILDING. REFER TO PLUMBING PLANS FOR MINIMUM SCUPPER OPENINGS ALLOWABLE PER CODE.
48 INTERIOR ROOF DRAIN AND INTERIOR OVERFLOW DRAIN.
55 CONCRETE TILT-UP PANEL, TYP. PAINTED, SEE EXTERIOR COLOR SCHEDULE. REFER TO ELEVATIONS AND "S" DRAWINGS FOR ADDITIONAL INFORMATION.
92 FUTURE MECHANICAL EQUIPMENT
93 ROOF ACCESS HATCH.

ROOF PLAN GENERAL NOTES

1. CONTRACTOR TO VERIFY POSITIVE ROOF DRAINAGE. ROOFING CONTRACTOR TO VERIFY PRIOR TO INSTALLING RIGID INSULATION OR ROOFING. SEE "S" DRAWINGS FOR CRICKETS, ETC.
2. BUILT UP ROOFING TO BE CLASS 1 UL LISTED ROOFING ASSEMBLY DESIGNED TO RESIST 90MPH OR AS REQUIRED.
3. SEE STRUCTURAL DRAWINGS FOR ROOF ELEVATIONS, TYP.
4. REFER TO DETAIL 1/AD.1 FOR TYPICAL ROOF SECTION.
5. PROVIDE CRICKETS ON (HIGH SIDE) OF ALL MECHANICAL UNITS AND ROOF EQUIPMENT AT SKYLIGHTS & SMOKE HATCHES. PROVIDE POSITIVE DRAINAGE AROUND UNITS AT 1/2" PER SLOPE MINIMUM.
6. CONTRACTOR TO COORDINATE ALL ROOF PENETRATIONS. SEE ROOF DETAIL SHEET FOR PENETRATIONS.
7. ALL SKYLIGHTS AND SMOKEHATCHES TO BE DESIGNED TO MEET WINDLOAD AS DETERMINED BY THE BUILDING CODE AND LOCAL JURISDICTION.
8. ALL MECHANICAL CONDENSATE DRAINS TO BE BELOW ROOF.
9. G.C. TO CONFIRM REQUIREMENT FOR ROOF WALK PADS WITH OWNER.
10. ROOFING CAP SHEET TO HAVE MINIMUM AGED SOLAR REFLECTANCE EQUAL TO OR GREATER THAN 0.63, AND AN SRI EQUAL TO OR GREATER THAN 72 PER 2014 COUNTY OF LOS ANGELES GREEN BUILDING STANDARDS CODE
11. ROOF ELEVATIONS TO BE VERIFIED WITH TABLE A5.106.11.2.2 STRUCTURAL DRAWINGS.
12. FOR ALL PIPE AND DUCT PENETRATIONS THRU ROOF, SEE DETAILS ON AD SHEETS
13. ALL CONDESATE LINES FROM HVAC UNITS MUST BE INSTALLED BELOW ROOF
14. ALL MECHANICAL EQUIPMENT WEIGHTS ARE OPERATING WEIGHTS.
15. PROVIDE A FULL TIME OSB MOISTURE INSPECTION AND GAP DISTANCE, BY A QUALIFIED ROOFING INSPECTION FIRM APPROVED BY THE OWNER AND THE OSB MANUFACTURER. INSPECTION FIRM TO BE ON SITE PRIOR TO THE START OF ANY BUILT UP ROOFING WORK.
16. ALL WOOD CURBS TO BE P.T.D.F.
17. ROOF EXHAUST FANS SHALL BE CENTERED DIRECTLY ABOVE A SPRINKLER HEAD. VERIFY WITH FIRE PROTECTION PLANS PRIOR TO INSTALLATION.
18. ALL SUB-PURLIN HANGERS HALL BE "Z-MAX" TRIPLE ZINC COATED AS MANUF. BY SIMPSON OR APPROVED EQUAL.
19. AUTOMATIC SPRINKLER SYSTEMS SERVING MORE THAN 100 SPRINKLER HEADS SHALL BE SUPERVISED BY AN APPROVED CENTRAL PROPRIETARY, OR REMOTE STATION SERVICE, OR A LOCAL ALARM WHICH WILL GIVE AN AUDIBLE SIGNAL AT CONSTANTLY ATTENDED LOCATION.

PROJECT
NEWCASTLE FREDERICK ST.
MORENO VALLEY, CA

3RD PLANNING SUBMITTAL

HERDMAN
ARCHITECTURE + DESIGN

A17-2100
08/06/2018

NORTH

ROOF PLAN

A3

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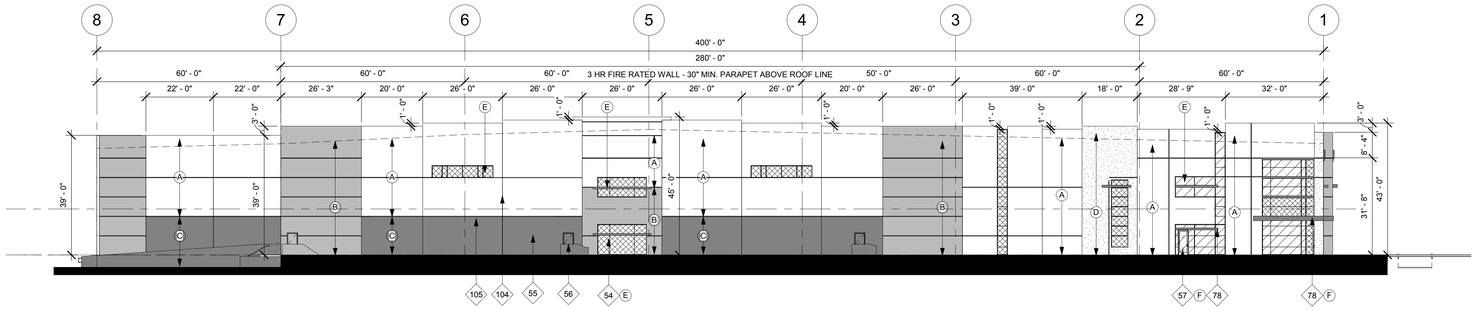
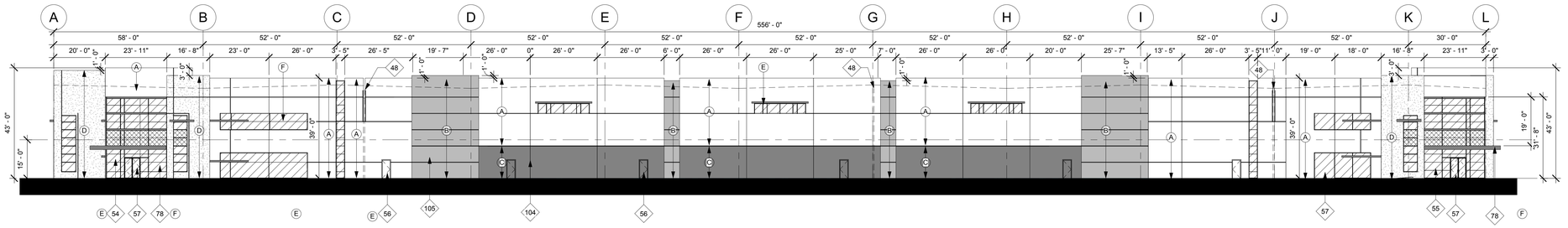
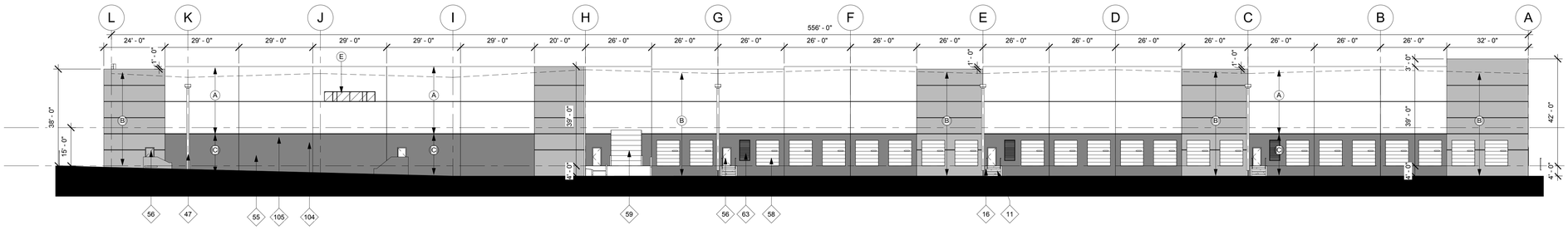


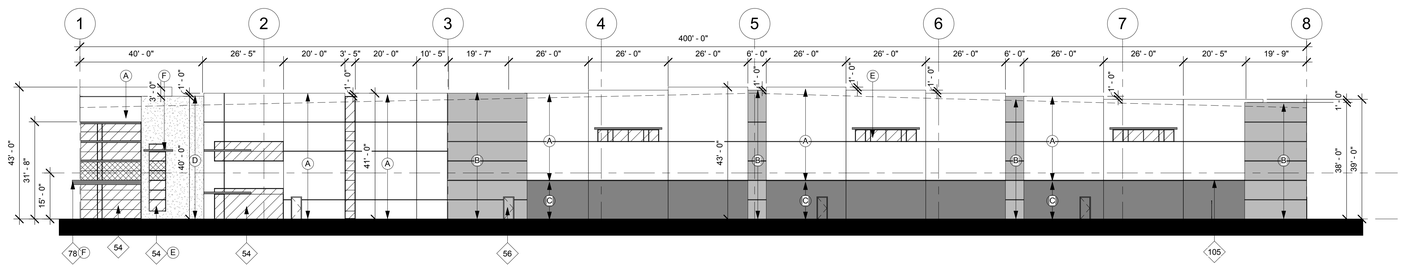
1 PROPOSED NORTH ELEVATION
1" = 20'-0"



2 PROPOSED WEST ELEVATION - FREDERICK AVE.
1" = 20'-0"



3 PROPOSED EAST ELEVATION
1" = 20'-0"



4 PROPOSED SOUTH ELEVATION
1" = 20'-0"

PROJECT
3RD PLANNING SUBMITTAL

NEWCASTLE FREDERICK ST.
MORENO VALLEY, CA

	KEYNOTES
11	EXTERIOR CONCRETE STAIR W/CONCRETE WALLS. WALLS & RAILINGS PAINTED PEREXTERIOR COLOR SCHEDULE. REFER TO CIVIL AND STRUCTURAL DRAWINGS
16	PROTECTIVE METAL BOLLARDS, CONCRETE FILLED, PAINTED, TYP.
47	EXTERIOR METAL DOWNSPOUT AND OVERFLOW SCUPPERS PAINTED TO MATCH BUILDING. REFER TO PLUMBING PLANS FOR MINIMUM SCUPPER OPENINGS ALLOWABLE PER CODE.
48	INTERIOR ROOF DRAIN AND INTERIOR OVERFLOW DRAIN.
54	STOREFRONT, SEE ELEVATIONS & EXTERIOR COLOR SCHEDULE. STORE FRONT TO BE DESIGNED TO RESIST WIND LOAD AS REQUIRED BY BUILDING CODES AND LOCAL JURISDICTION. DESIGN OF STOREFRONT FRAMING SYSTEM AND STRUCTURAL CALCULATIONS TO BE DESIGN BUILD BY G.C. AND UNDER DEFERRED SUBMITTAL.
55	CONCRETE TILT-UP PANEL, TYP. PAINTED, SEE EXTERIOR COLOR SCHEDULE. REFER TO ELEVATIONS AND "S" DRAWINGS FOR ADDITIONAL INFORMATION.
56	EXTERIOR MAN DOOR 3'X7', HOLLOW METAL, PAINTED, SEE EXTERIOR COLOR SCHEDULE & DOOR SCHEDULE FOR ADDITIONAL INFO.
57	EXTERIOR STOREFRONT DOOR, SEE EXTERIOR COLOR SCHEDULE & DOOR SCHEDULE FOR ADDITIONAL INFO.
58	DOCK-HI LOADING DOOR, 9'X10', WITH VISION GLAZING PRE FINISHED BY MANUFACTURER PER COLOR SCHEDULE.
59	DRIVE THRU LOADING DOOR 12'X14' WITH VISION GLAZING, PRE FINISHED BY MANUFACTURER PER COLOR SCHEDULE.
63	AIR INTAKE LOUVER, PAINT TO MATCH BUILDING WALL, TYP. SIZE VERTICAL 4'X 8', PROVIDE BIRD SCREEN, FILTER AND BURGLAR BARS.
78	DECORATIVE METAL BROW. REFER TO ARCHITECTURAL-STRUCTURAL DETAILS.
104	PANEL JOINT, TYP.
105	2" DECORATIVE CONCRETE REVEAL WITH CHAMFERED EDGES, TYP.

GLAZING LEGEND

VISION GLAZING:

NON VISION GLAZING:

TEMPERED: T

NOTE:
REFER TO ELEVATIONS FOR TEMPERED GLAZING LOCATIONS.

NON VISION GLAZING NOTES:
1. SINGLE PANE GLAZING PAINT FACE OF CONCRETE PANEL BEHIND BLACK. NO COATING REQUIRED.
2. PROVIDE BREATHABLE MULLION SYSTEM @ NON-VISION GLAZING SECTIONS, NO HOLES REQUIRED IN CONCRETE.
3. PROVIDE SHADE CLOTH BEHIND GLASS IN AREAS INTENDED TO BE NON-VISION WHEN THERE IS NO SPANDREL CONCRETE: TENCATE MIRAFI 140N 12.5' X 360' FILTER FABRIC

TEMPERED GLAZING NOTES:
1. IN OPERABLE DOORS, WINDOWS AND WITHIN 18" OF WALKING SURFACE TO BE TEMPERED.

EXTERIOR COLOR SCHEDULE

- (A) WHITE EXTERIOR PAINT
  COLOR: SW7014 EIDER WHITE
- (B) EXTERIOR PAINT
  COLOR: SW9170 ACIER
- (C) EXTERIOR PAINT
  COLOR: SW7669 SUMMIT GRAY
- (D) STONE VENEER
  COLOR: CORONADO STONE 6" SPLIT LIMESTONE - CREAM
- (E) STOREFRONT
  MEDIUM PERFORMANCE BLUE REFLECTIVE GLAZING & CLEAR ANODIZED MULLIONS
- (F) ANODIZED BRONZE DECORATIVE METAL BROW

TYP PAINT NOTES:
PAINT MAN DOORS, GUARD WALLS, RAMP WALLS, STAIR WALLS, GUARD RAILS, ROOF DRAINS, AND LOUVERS TO MATCH ADJACENT BUILDING WALL U.N.O.

TRUCK DOORS TO BE PRE-FINISHED BY MANUFACTURER IN WHITE FINISH

HERDMAN
ARCHITECTURE + DESIGN

A17-2100
08/06/2018

EXTERIOR ELEVATIONS

A4

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NORTH ELEVATION

FREDERICK AVE - WEST ELEVATION

EAST ELEVATION

SOUTH ELEVATION

ENLARGED VIEW @ MAIN OFFICE ENTRY

HERDMAN
ARCHITECTURE + DESIGN

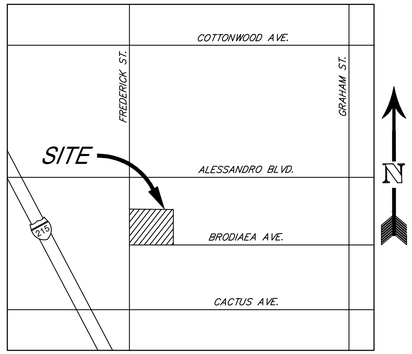
NEWCASTLE
FREDERICK ST - MORENO VALLEY, CA
02.06.2018_SCHEME 3
H-A+D JOB NO: A17-2100

IN THE CITY MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

CENTERPOINTE INDUSTRIAL PRELIMINARY GRADING PLAN

LOT 5, BLOCK 242 OF MAP 1
BEAR VALLEY & ALESSANDRO DEVELOPMENTS

PREPARED AUGUST 2, 2018



VICINITY MAP
NOT TO SCALE

OWNER/APPLICANT

NEWCASLE PARTNERS, INC.
470 GREEN RIVER, STE 118
CORONA, CA 92880
TEL: (951) 582-9800
ATTN: JACKSON SMITH

ENGINEER

SDH & ASSOCIATES, INC
5225 CANYON CREST DRIVE 71439
RIVERSIDE, CA. 92507
VOICE: (951) 683-3691
FAX: (951) 788-2314

ARCHITECT

HERDMAN ARCHITECTURE + DESIGN
16201 SCIENTIFIC WAY
IRVINE, CA 92618
VOICE: (714) 389-2800

SOURCE OF TOPO

AERIAL PHOTOGRAMMETRY BY ARROWHEAD MAPPING
431 W MACKAY DR
SAN BERNARDINO, CA 92408
VOICE: (909) 889-2420
PREPARED: NOVEMBER 2017

PROJECT INFO

AREA OF SITE = 382,428 S.F. (8.78 AC.)
LANDSCAPE AREA = 51,184 S.F. (13.4%)

TOTAL BUILDING AREA = 198,925 S.F. (4.6 AC)
- OFFICES = 5,000 S.F.
- WAREHOUSE = 193,925 S.F.

UTILITY PURVEYORS

WATER.....EMWD
GAS.....SO. CALIF. GAS
ELECTRICAL.....MVU
SEWER.....EMWD

SHEET INDEX

PROJECT NOTES

IF ANY SUSPECTED ARCHEOLOGICAL RESOURCES ARE DISCOVERED DURING GROUND DISTURBING ACTIVITIES AND THE PROJECT ARCHEOLOGIST OR NATIVE AMERICAN TRIBAL REPRESENTATIVES ARE NOT PRESENT, THE CONSTRUCTION SUPERVISOR IS OBLIGATED TO HALT WORK IN A 100-FOOT RADIUS AROUND THE FIND AND CALL THE PROJECT ARCHEOLOGIST AND THE TRIBAL REPRESENTATIVES TOT THE SITE TO ASSESS THE SIGNIFICANCE OF THE FIND.

EARTHWORK

RAW CUT= 15,000 C.Y.
RAW FILL= 15,000 C.Y.

ZONING AND LAND USE

EXISTING ZONING - O OFFICE
PROPOSED ZONING - LI LIGHT INDUSTRIAL

SURROUNDING ZONING

NORTH..... CC COMMUNITY COMMERCIAL
EAST..... LI LIGHT INDUSTRIAL
SOUTH..... LI LIGHT INDUSTRIAL
WEST..... O OFFICE/ BP BUSINESS PARK

SURROUNDING LAND USE

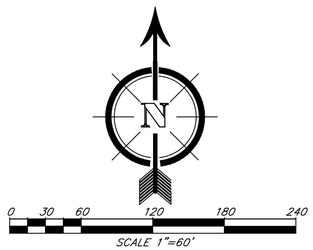
NORTH..... VACANT
EAST..... INDUSTRIAL
SOUTH..... INDUSTRIAL
WEST..... BUSINESS PARK/ CITY HALL

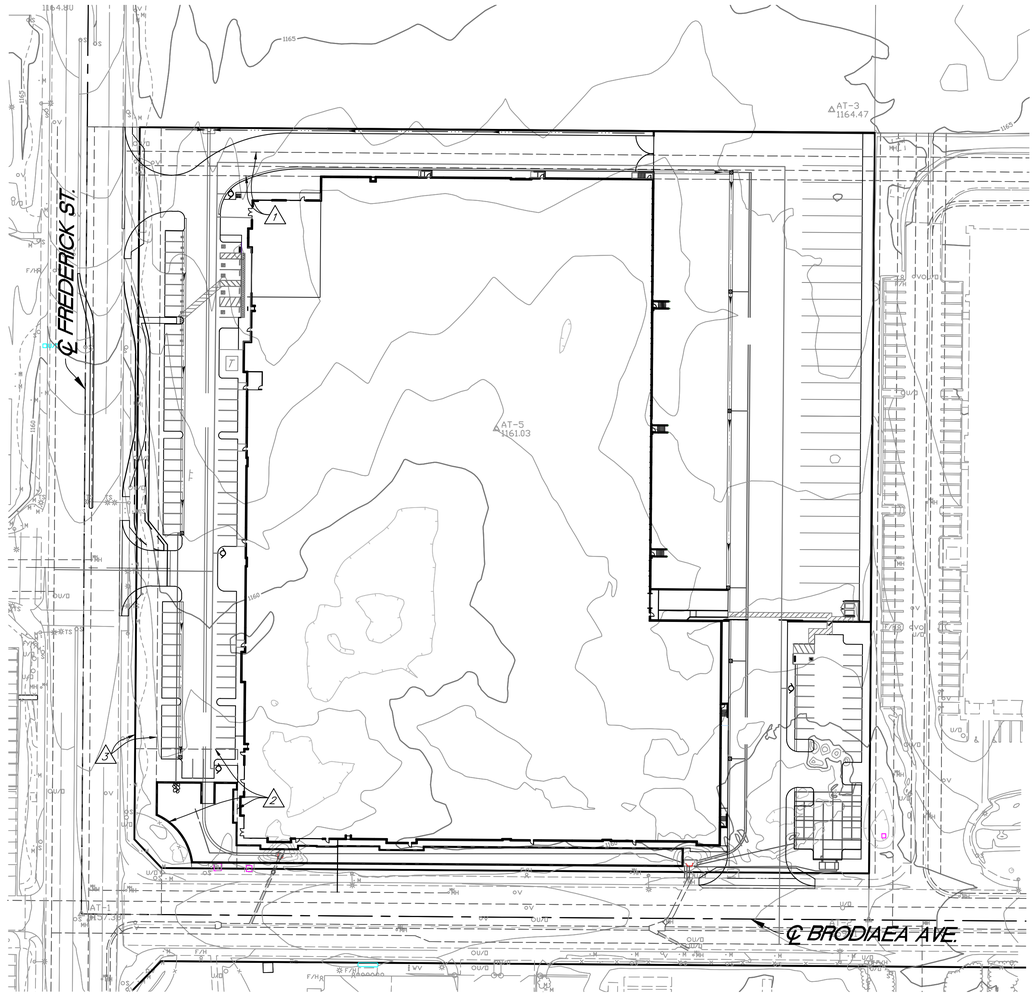
SCHOOL DISTRICT

MORENO VALLEY UNIFIED
SCHOOL DISTRICT

APN

297-170-029





INDEX MAP
1"=60'

CONSTRUCTION NOTES

1. CONSTRUCT P.C.C. DRIVE ISLE & PARKING AREAS
2. CONSTRUCT 6" CURB ONLY
3. CONSTRUCT 6" CURB AND GUTTER
4. CONSTRUCT P.C.C. SIDEWALK (FINISHED SURFACE MATERIALS PER ARCH. PLANS)
5. CONSTRUCT A.D.A. COMPLIANT HANDICAP RAMP
6. CONSTRUCT 3' WIDE CONC. RIBBON GUTTER
7. CONSTRUCT MODULAR WETLAND MWS-L-8-12 (SEE DETAIL ON SHEET 4)
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23. CONSTRUCT MANHOLE FOR EX. STORM DRAIN IN PARKWAY

LEGEND

L.P. - LOW POINT
H.P. - HIGH POINT
F.S. - FINISHED GRADE
F.G. - FINISHED GRADE
F.L. - FLOW LINE
O.G. - ORIGINAL GROUND
EXIST. - EXISTING
P.E. - PAD ELEVATION
G.B. - GRADE BREAK
T.G. - TOP OF GRATE
T.A.D. - TOP OF AREA DRAIN
- CONSTRUCTION NOTE
- STEM WALL HEIGHT
- TRACT BOUNDARY
- CENTERLINE
- CURB AND GUTTER
- 1280 EXISTING CONTOUR
- LOT LINE
- SLOPE

EASEMENTS

AN EASEMENT GRANTED TO SOUTHERN CALIFORNIA GAS COMPANY AND SOUTHERN COUNTIES GAS COMPANY FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED JUNE 05, 1948 AS BOOK 911, PAGE 345 OF OFFICIAL RECORDS.
DOCUMENT(S) DECLARING MODIFICATIONS THEREOF RECORDED DECEMBER 10, 1987 AS INSTRUMENT NO. 350003, DECEMBER 5, 1988 AS INSTRUMENT NO. 355360, AND JUNE 29, 2001 AS INSTRUMENT NO. 2001-299177 ALL OF OFFICIAL RECORDS. (FALLS OUTSIDE OF SURVEY PROPERTY) (PLOTTED HEREON)

AN EASEMENT GRANTED TO CALIFORNIA ELECTRIC POWER COMPANY FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 12, 1952 AS BOOK 1399, PAGE 471 OF OFFICIAL RECORDS. (PLOTTED HEREON).

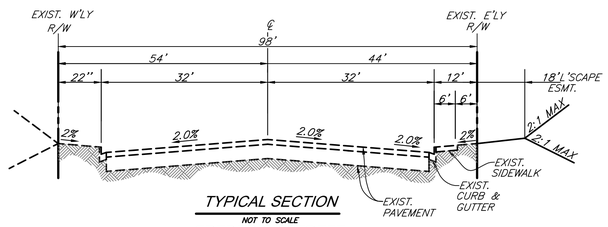
1. AN EASEMENT GRANTED TO FOUR CORNERS PIPELINE COMPANY FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 10, 1958 AS BOOK 2205, PAGE 147 AND FEBRUARY 11, 1958 IN BOOK 2221, PAGE 126, BOTH OF OFFICIAL RECORDS. (FALLS OUTSIDE OF SURVEY PROPERTY) (PLOTTED HEREON)

2. AN EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED MAY 16, 1988 AS INSTRUMENT NO. 129273 OF OFFICIAL RECORDS.
IN FAVOR OF EASTERN MUNICIPAL WATER DISTRICT. (PLOTTED HEREON)

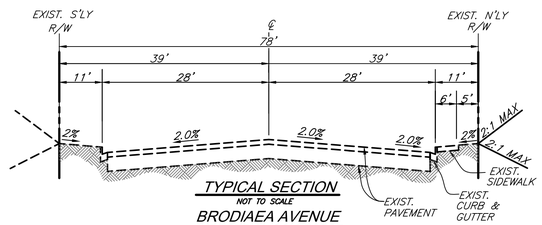
AN OFFER OF DEDICATION FOR PUBLIC ROAD AND DRAINAGE, INCLUDING PUBLIC UTILITY AND PUBLIC SERVICES AND INCIDENTAL PURPOSES, RECORDED AUGUST 11, 1988 AS INSTRUMENT NO. 227048 OF OFFICIAL RECORDS. TO: CITY OF MORENO VALLEY. (PLOTTED HEREON)

3. AN EASEMENT FOR LANDSCAPE, CONSTRUCTION AND MAINTENANCE AND INCIDENTAL PURPOSES, RECORDED JANUARY 25, 1991 AS INSTRUMENT NO. 27208 OF OFFICIAL RECORDS.
IN FAVOR OF MORENO VALLEY COMMUNITY SERVICES DISTRICT (PLOTTED HEREON)

△ - DENOTES PLOTTABLE EASEMENT WITHIN THE PROJECT'S BOUNDARY (SEE INDEX MAP HEREON)



TYPICAL SECTION
NOT TO SCALE
FREDERICK STREET
MINOR ARTERIAL (MODIFIED)



TYPICAL SECTION
NOT TO SCALE
BRODIAEA AVENUE
INDUSTRIAL COLLECTOR

PEN18-0023

DIGALERT — DIAL BEFORE YOU DIG — TOLL FREE 1-800-227-2600 — TWO WORKING DAYS BEFORE YOU DIG
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

ENGINEER SEAL
REGISTERED PROFESSIONAL ENGINEER
ROBERT C. VAN ZANTEN
No. 62325
Exp. 9-30-19
CIVIL
STATE OF CALIFORNIA

SDH ASSOCIATES INCORPORATED
SDH AND ASSOCIATES INC.
5225 CANYON CREST DRIVE 71439
Riverside, California 92507
TEL: (951) 683-3691 FAX (951) 788-2314

UNDER THE SUPERVISION OF:
DATE

CITY OF MORENO VALLEY

CENTERPOINTE INDUSTRIAL
PRELIMINARY GRADING PLAN
LOT 5, BLOCK 242 OF MAP 1
BEAR VALLEY & ALESSANDRO DEVELOPMENTS

ACCT. NO.

SHEET 1 OF 4

CITY I.D. NO.

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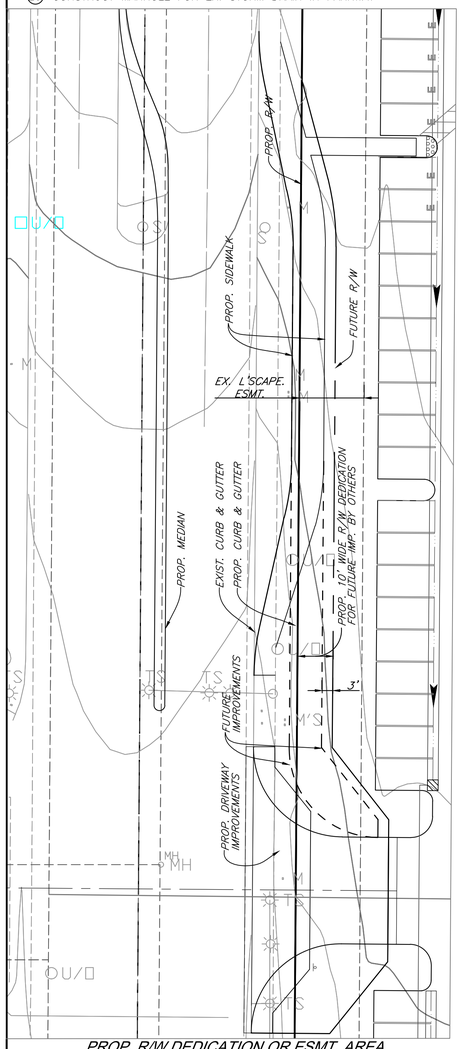
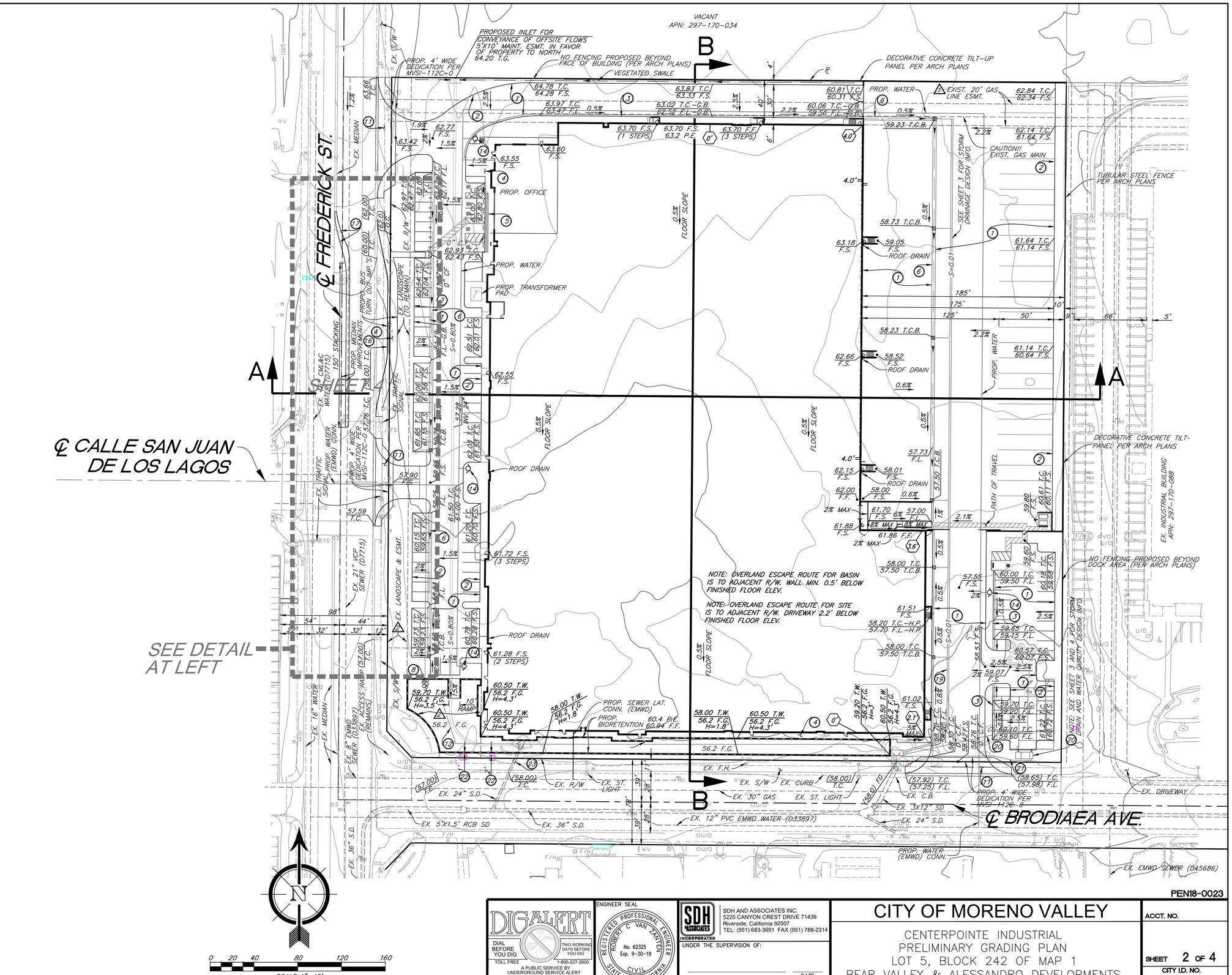


PROP. R/W DEDICATION OR ESMT. AREA
SCALE:1"=20'



PEN18-0023

DIGALERT — DIAL BEFORE YOU DIG — TOLL FREE 1-800-227-2600 — TWO WORKING DAYS BEFORE YOU DIG — A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

ENGINEER SEAL
REGISTERED PROFESSIONAL ENGINEER — ROBERT C. VAN DAYTEN — No. 62325 Exp. 9-30-19 — CIVIL — STATE OF CALIFORNIA

SDH & ASSOCIATES INCORPORATED
SDH AND ASSOCIATES INC.
5225 CANYON CREST DRIVE 71439
Riverside, California 92507
TEL: (951) 683-3691 FAX (951) 788-2314

UNDER THE SUPERVISION OF: _____ DATE

CITY OF MORENO VALLEY

CENTERPOINTE INDUSTRIAL
PRELIMINARY GRADING PLAN
LOT 5, BLOCK 242 OF MAP 1
BEAR VALLEY & ALESSANDRO DEVELOPMENTS

ACCT. NO.

SHEET 2 OF 4

CITY I.D. NO.

CONSTRUCTION NOTES

1. CONSTRUCT P.C.C. DRIVE ISLE & PARKING AREAS
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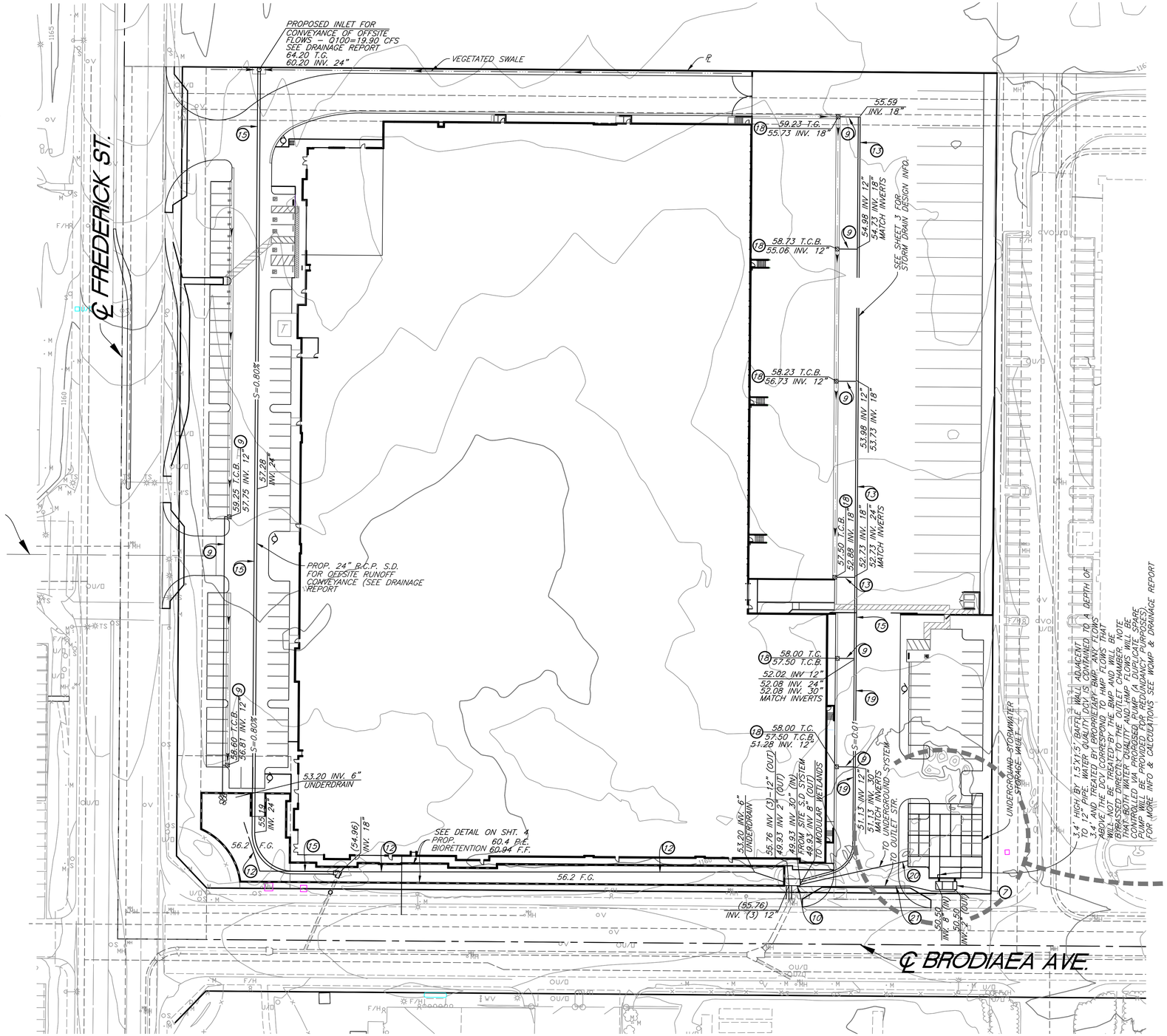

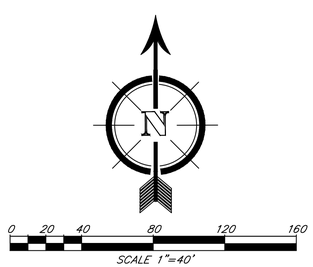

PEN18-0023

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UNDER THE SUPERVISION OF: _____ DATE _____

CITY OF MORENO VALLEY

CENTERPOINTE INDUSTRIAL
PRELIMINARY GRADING PLAN
LOT 5, BLOCK 242 OF MAP 1
BEAR VALLEY & ALESSANDRO DEVELOPMENTS

ACCT. NO.

SHEET 3 OF 4

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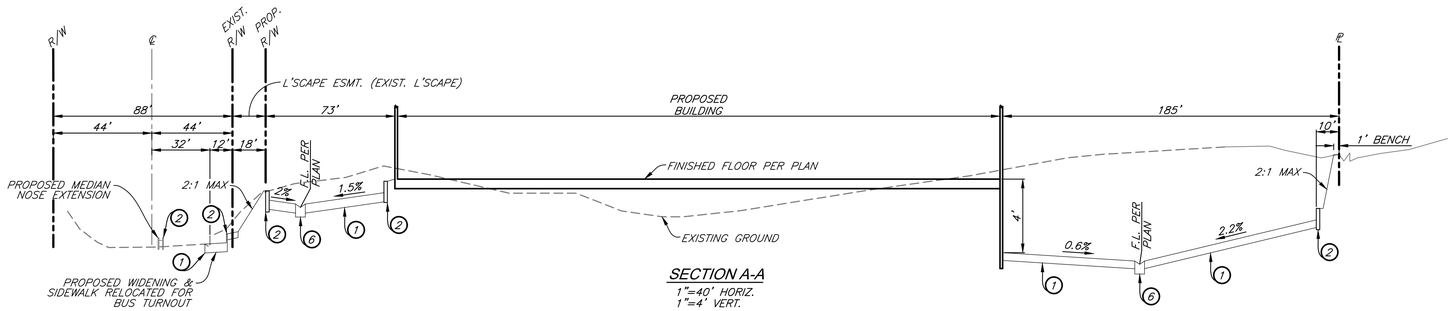
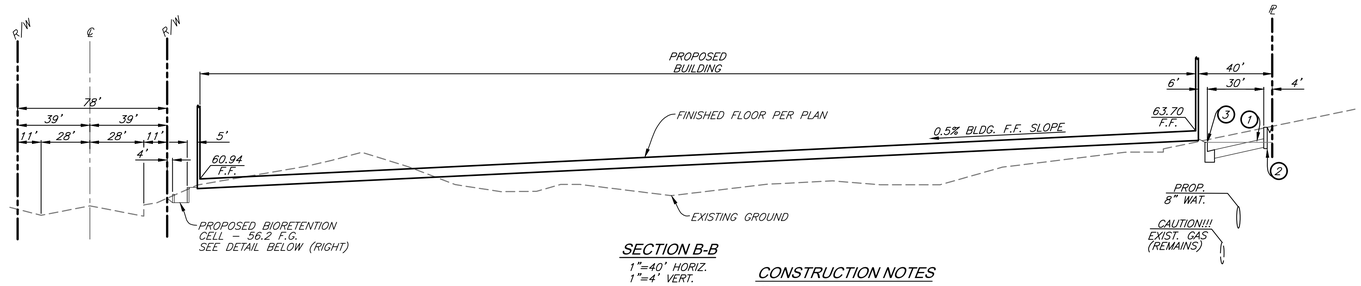


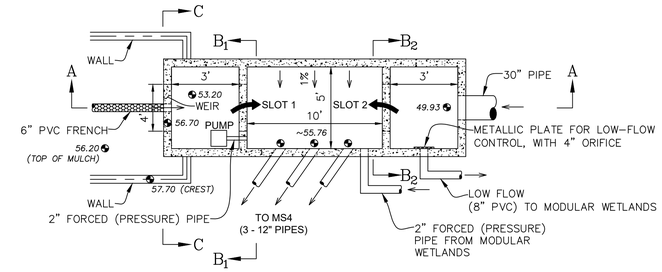
SECTION A-A

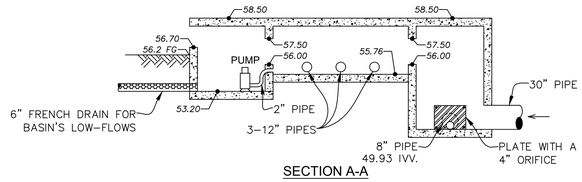
1"=40' HORIZ.
1"=4' VERT.



SECTION B-B

1"=40' HORIZ.
1"=4' VERT.

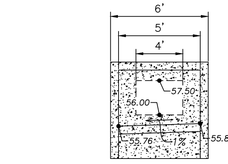




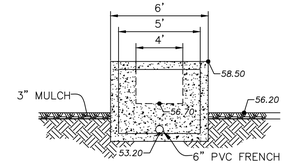
SECTION A-A

10 OUTLET STRUCTURE (DETAIL 1)

NOT TO SCALE

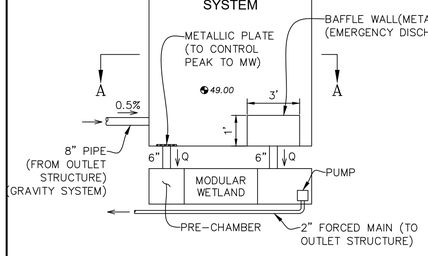


SECTION B1-B1 SLOT DETAILS
(SLOT 1 = SLOT 2) = SECTION B2-B2



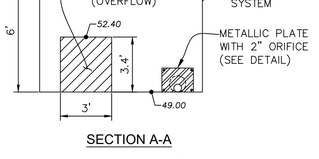
SECTION C-C

NOTE:
FOR MODULAR WETLAND, UNDERGROUND SYSTEM & PRESSURE SYSTEM FOR EAST SIDE, SEE DETAIL 2. @ LEFT

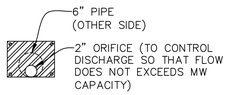


UNDERGROUND STORAGE SYSTEM (DETAIL 2)

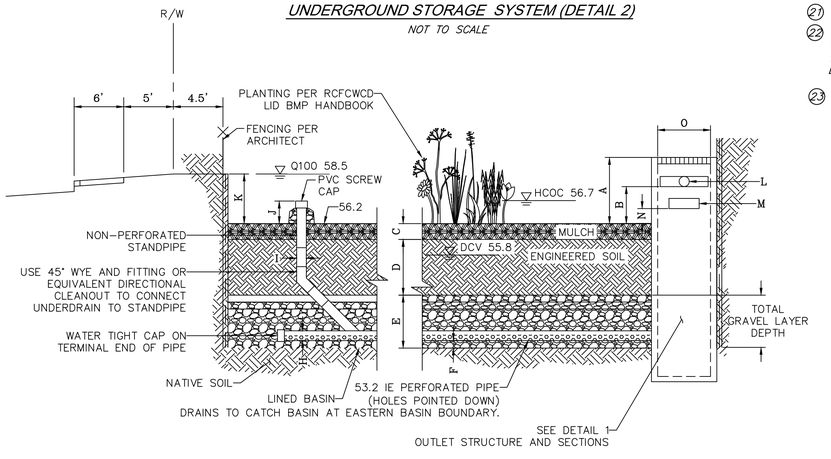
NOT TO SCALE



SECTION A-A



ORIFICE DETAIL



BIORETENTION CELL

NOT TO SCALE

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TABULATED DATA
BASIN WEST

A	9"
B	N/A"
C	3"
D	24"
E	12"
F	3"
G	N/A
H	6"
I	6"
J	6"
K	2.8'
L	SEE DETAIL 1
M	N/A
N	N/A
O	SEE DETAIL 1
P	N/A

NOTE: ALL SPECIFICATIONS PER LID BMP MANUAL FACT SHEET FOR BIORETENTION BMP

SITE SPECIFIC DATA

PROJECT NUMBER	7211		
PROJECT NAME	MORENO VALLEY INDUSTRIAL		
PROJECT LOCATION	MORENO VALLEY, CA		
STRUCTURE ID	BASIN B		
TREATMENT REQUIRED			
VOLUME BASED (CF)	FLOW BASED (CFS)		
8,575	N/A		
TREATMENT HGL AVAILABLE (FT)		N/A	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE		OFFLINE	
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	1550.50	PVC	6"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	1550.00	PVC	6"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	1558.00	1558.00	1558.00
SURFACE LOAD	H20 IN-DIRECT	H20 IN-DIRECT	H20 IN-DIRECT
FRAME & COVER	ø30"	30" X 48"	ø24"
WETLANDMEDIA VOLUME (CY)			5.58
WETLANDMEDIA DELIVERY METHOD			PER CONTRACT
ORIFICE SIZE (DIA. INCHES)			ø1.03"

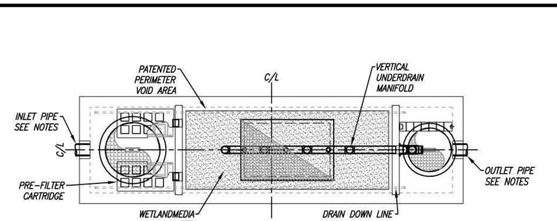
NOTES: PRELIMINARY; NOT FOR CONSTRUCTION. ENGINEER TO SET UPSTREAM BYPASS AT 1553.48.

INSTALLATION NOTES

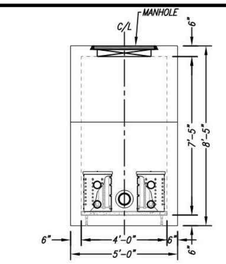
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS; UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING MODULAR WETLANDS FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A MODULAR WETLANDS REPRESENTATIVE.

GENERAL NOTES

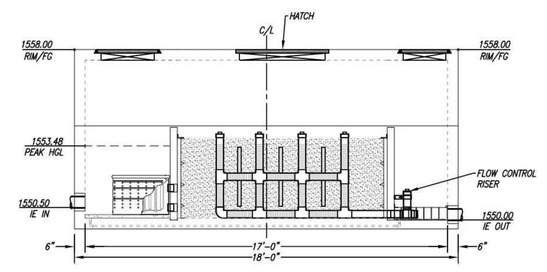
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.



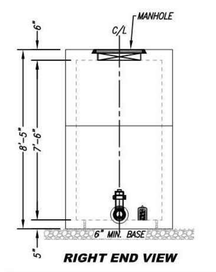
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

REQUIRED TREATMENT VOLUME (CF)	8575
DRAINDOWN DURATION (HOURS)	46
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	23.34
OPERATING HEAD (FT)	3.4
WETLANDMEDIA INFILTRATION RATE (IN/HR) OR WETLANDMEDIA LOADING RATE (GPM/SF)	26 / 0.26

Bio Clean — A Forterra Company

MWS-L-4-17-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

PEN18-0023

DIGALERT — DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG — TOLL FREE 1-800-227-2600 — A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

ENGINEER SEAL
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UNDER THE SUPERVISION OF:

DATE

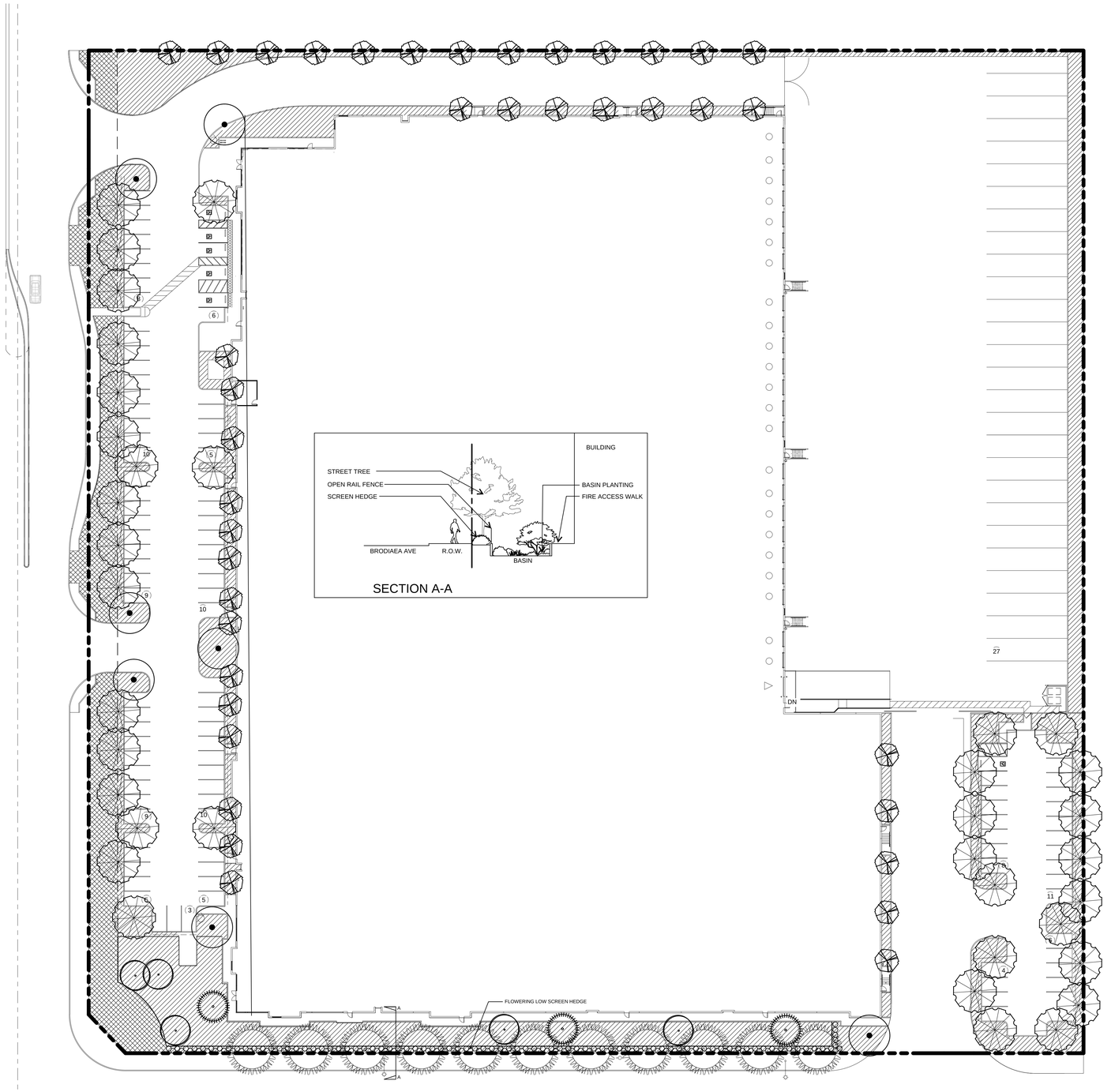
CITY OF MORENO VALLEY

CENTERPOINTE INDUSTRIAL
DETAILS & SECTIONS
LOT 5, BLOCK 242 OF MAP 1
BEAR VALLEY & ALESSANDRO DEVELOPMENTS

ACCT. NO.

SHEET 4 OF 4

CITY I.D. NO.



PLANTING LEGEND

TREES

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Cercidium 'Desert Museum' Blue Palo Verde	24" Box	9	L	Multi
	Chilopsis linearis Desert Willow	24" Box	3	L	Multi
	Chitalpa tashkentensis Chitalpa	24" Box	36	L	Standard
	Heteromeles arbutifolia Toyon	15 Gal	5	L	Multi
	Pinus eldenica Afghan Pine	24" Box	7	M	Standard
	Platanus acerifolia London Plane	24" Box	15	M	Standard
	Tristania conferta Brisbane Box	15 Gal	39	M	Standard

SHRUBS

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Acca sellowiana Pineapple Gauva	5 Gal	0	M	
	Artemisia 'Powis Castle' Artemisia	5 Gal	0	L	
	Callistemon 'Little John' Dwarf Bottle Brush	5 Gal	0	M	
	Cistus 'Sunset Pink' Sunset Pink Rockrose	5 Gal	0	M	
	Elaeagnus pungens Silverberry	5 Gal	0	L	
	Leucophyllum f. 'Green Cloud' Texas Ranger	5 Gal	0	L	
	Ligustrum j. Texanum Texas Privet	5 Gal	0	M	
	Rosmarinus o. 'Tuscan Blue' Rosemary	5 Gal	0	L	
	Salvia c. 'Allen Chickering' Allen Chickering Sage	5 Gal	0	L	
	Salvia greggii Autumn Sage	5 Gal	0	L	
	Salvia leucantha Mexican Sage	5 Gal	0	L	
	Senna artemisioides Feathery Cassia	5 Gal	0	L	
	Westringia fruticosa Coast Rosemary	5 Gal	0	L	

ACCENTS

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Agave spp. Agave	5 Gal	0	L	
	Aloe spp. Aloe	5 Gal	0	L	
	Dasylerion wheeleri Desert Spoon	5 Gal	0	L	
	Echeveria 'Ruffles' Ruffles Echeveria	5 Gal	0	L	
	Hesperaloe parviflora Red Yucca	5 Gal	0	L	
	Lantana 'Gold Mound' Yellow Lantana	5 Gal	0	L	

GROUNDCOVER

SYMBOL	BOTANICAL/COMMON NAME	SIZE	SPACING	WUCOLS	REMARKS
	Acacia redolens 'Low Boy' Dwarf Acacia	1 Gal	8' O.C.	L	
	Festuca mairei Atlas Fescue	1 Gal	24" O.C.	M	Grass
	Lonicera j. 'Halliana' Hall's Honeysuckle	1 Gal	48" O.C.	L	
	Muhlenbergia capillaris Pink Muhly	1 Gal	36" O.C.	L	Grass
	Myoporum parvifolium Myoporum	1 Gal	36" O.C.	L	
	Nassella tenuissima Mexican Feather Grass	1 Gal	24" O.C.	VL	Grass
	Pennisetum messiacum Red Bunny Tails Fountain Grass	1 Gal	30" O.C.	L	Grass
	Pennisetum a. 'Little Bunny' Little Bunny Fountain Grass	1 Gal	12" O.C.	L	Grass
	Pennisetum orientale Oriental Fountain Grass	1 Gal	30" O.C.	L	Grass
	Rosa 'Flower Carpet' -Red Red Flower Carpet Rose	1 Gal	30" O.C.	L	
	Rosmarinus o. 'Huntington Carpet' Prostrate Rosemary	1 Gal	48" O.C.	L	
	Salvia 'Bee's Bliss' Bee's Bliss Sage	1 Gal	48" O.C.	L	
	Senecio mandraliscae Blue Fingers	4" Pots	12" O.C.	M	
	Sesleria autumnalis Moor Grass	1 Gal	18" O.C.	M	Grass

Existing Landscape to Remain

Bioretention seed mix

2000 lbs/ac	Wood cellulose fiber	
800 lbs/ac	7-2-1 Biosol organic fertilizer	
150 lbs/ac	Stabilizing binder	
20 lbs/ac	Endo net mycorrhizal inoculum	
1 lbs/ac	Achillea millefolium	
1 lbs/ac	Eschshholzia caespitosa	
1 lbs/ac	Juncus bufonius	
6 lbs/ac	Leymus triticoides Rio	
4 lbs/ac	Descampsia cespitosa	
20 lbs/ac	Festuca rubra 'Molate'	
6 lbs/ac	Hordium brachyantherum	
1 lbs/ac	Muhlenbergia rigens	
3 lbs/ac	Muhlenbergia microsperma	
3 lbs/ac	Hordium depressum	

N

0 15' 30' 60'

Centerpointe

Newcastle Partners

Moreno Valley, California

18-001
02.05.18
03.23.18
08.2.18

HUNTER LANDSCAPE
711 FEE ANA STREET PLACENTIA, CA 92870
714.986.2400 FAX 714.986.2408