Appendix A

Notices, Scoping, and Tribal Consultation

Appendix A1
Notice of Preparation

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT AND NOTICE OF PUBLIC SCOPING MEETINGS

LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29 PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS

DATE:	November 9, 2017
TO:	State Clearinghouse, Responsible and Trustee Agencies, and Interested Individuals
SUBJECT:	Notice of Preparation of a Program Environmental Impact Report and Public Scoping Meetings
PROJECT TITLE:	Los Angeles County Waterworks District No. 29 Priority Capital Deficiencies Improvements
LEAD AGENCY:	Los Angeles County Waterworks District No. 29, Malibu, through the County of Los Angeles Department of Public Works

Los Angeles County Waterworks District No. 29, Malibu (Waterworks District No. 29), a legal entity governed by the County of Los Angeles Board of Supervisors, as the lead agency under the California Environmental Quality Act (CEQA), will be preparing an Environmental Impact Report (EIR) through the County of Los Angeles Department of Public Works (Public Works) for the Priority Capital Deficiencies Improvements (proposed project) described below. The proposed project would consist of several projects in the Malibu and Topanga areas. On behalf of Waterworks District No. 29, Public Works is soliciting input from responsible and trustee agencies under CEQA, other agencies required to receive this notice, members of the public organizations, and any other interested parties on the scope and content of the information to be included and analyzed in the proposed project's EIR. Agencies should comment on the elements of the environmental information that are relevant to their statutory responsibilities in connection with the proposed project. The EIR will serve as the environmental document for the lead agency, responsible agencies, and trustee agencies when considering any discretionary approvals related to the proposed project.

The proposed project description, location, and potential environmental effects of the proposed project are described in this Notice of Preparation (NOP). This notice meets the requirements set forth in CEQA.

Scoping comments on the EIR should be sent to Public Works in writing, either by U.S. mail or e-mail, no later than 39 days after issuance of the NOP. Waterworks District No. 29 will accept written comments regarding the NOP through the close of business on December 18, 2017. Please send all written comments, including e-mailed comments, to Alma Fuentes Quintana at the address below. Comments should include the name of a contact person.

Copies of the NOP are available for public review at the following Public Library and County office locations:

County of Los Angeles Department of Public Works
Waterworks Division
1000 South Fremont Avenue
Building A9-E, 4th Floor
Alhambra, CA 91803-1331

County of Los Angeles Department of Public Works
Malibu Office
23533 West Civic Center Way
Malibu, CA 90265

Topanga Library
122 North Topanga Canyon Boulevard
Topanga, CA 90290

The NOP is also available for public review at the following website: www.lacwaterworks.org.

Interested parties may submit their comments to:

Alma Fuentes Quintana, Project Manager
County of Los Angeles Department of Public Works
Waterworks Division
P.O. Box 1460
Alhambra, CA 91802-1460
e-mail: waterworksprojects@dpw.lacounty.gov

Questions regarding this notice should be directed to Ms. Fuentes Quintana at (626) 300-3339 (Monday through Thursday, between 8 a.m. and 5 p.m.) or at the e-mail address shown above. Parties that are interested in receiving future information related to the proposed project may submit their name and mailing address with that request to Ms. Fuentes Quintana, Project Manager.

Project Location:

The proposed project, which consists of several separate improvements, would be located in Waterworks District No. 29's service area (**Figure 1**). Waterworks District No. 29's water service area consists of the City of Malibu and the unincorporated area of Topanga. The City of Malibu is located on a narrow strip of land along the coastline with numerous canyons extending northward. Waterworks District No. 29 service area is bounded on the north by the steep and rugged Santa Monica Mountains, on the east by Topanga Canyon and the City of Los Angeles boundary, on the west by Ventura County, and on the south by the Pacific Ocean. Waterworks District No. 29 occupies an area of about 47 square miles (30,000 acres).

Existing Conditions:

Major water system infrastructure facilities in Waterworks District No. 29 include approximately 200 miles of water main, 70 pump and pressure regulating stations, and 50 tanks with a total storage capacity of 20 million gallons. Waterworks District No. 29 serves approximately 20,000 people. Waterworks District No. 29 was established in 1959. Historically, water system facilities were acquired from various small mutual water companies and the infrastructure is aging. Some of the acquired facilities were originally constructed in the 1940s and 1950s. Waterworks District No. 29 is supplied by a 30-inch-diameter transmission pipeline that was built during the 1960s.

Project Description:

Public Works is committed to completing the most critical projects in Waterworks District No. 29 over the next 10 years in order to provide a more reliable water system for existing customers. The eight projects that comprise the proposed project would correct the most critical capital infrastructure deficiencies to provide a more reliable water system for existing customers. The projects will be analyzed at a project level. The eight projects, listed in **Table 1** and shown on **Figure 2**, were identified based on operational imperatives, importance to overall system, and capacity.

The proposed project includes: the demolition of two water tanks and construction of one tank reservoir in the unincorporated area of Topanga; replacement of approximately 34,300 feet of underground water pipeline in the City of Malibu, 19,000 feet of which are along Pacific Coast Highway (PCH); construction of approximately 6,300 feet of new underground pipeline in the City of Malibu; and repairing several creek crossing locations by replacing and recoating segments of pipe and air release valves on PCH. The pipeline segments would be constructed underground in existing roadways. Approximate addresses are provided in **Table 1**.

Table 1

Waterworks District No. 29 Proposed Project

	Project	Approximate Address	Description
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements	3873 Carbon Canyon Road to 22576 Carbon Mesa Road, Malibu, 90265	Replace over 7,000 feet of aging and severely deteriorating waterlines that are subject to leaks, ranging in size from 1.5 to 4 inches in diameter, with 8- and 12-inch-diameter steel pipe.
2	Coastline Drive 12-Inch Waterline Improvements	18000 to 18303 Coastline Drive, Malibu, 90265	Replace over 2,000 feet of aging and severely deteriorating waterlines that are subject to leaks by replacing a 12-inch-diameter waterline with a 12-inch-diameter steel waterline.
3	Waterworks District No. 29 Creek Crossing Repair Project	18788 PCH, Malibu, 90265 19399 PCH, Malibu, 90265 21203 PCH, Malibu, 90265 21857 PCH, Malibu, 90265 25712 PCH, Malibu, 90265 27519 PCH, Malibu, 90265 29497 PCH, Malibu, 90265 30626 PCH, Malibu, 90265	Repair the region's water main at several creek crossing locations on PCH. The waterline at these locations is aging, severely deteriorating, and subject to leaks.
4	Fernwood Tank Improvement	19837 Horseshoe Drive, Topanga, 90290	Replace two aging and severely deteriorating 50,000-gallon tanks with a single 300,000-gallon tank.
5	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	27200 to 28734 PCH, Malibu, 90265	Replace over 9,500 feet of aging and deteriorating 6-inch-diameter waterline that is subject to leaks with an 8-inch-diameter steel waterline.
6	PCH and Topanga Beach Drive Waterline Improvements	18808 to 18980 PCH, Malibu, 90265 21150 to 21434 PCH, Malibu, 90265 21746 to 22716 PCH, Malibu, 90265	Replace over 8,000 feet of aging, severely deteriorating waterlines that are subject to leaks, replacing 4- and 6-inch-diameter waterline with an 8-inch-diameter steel waterline.
7	Emergency Source of Water Supply Connection (Las Virgenes Connection)	3525 to 4400 Encinal Canyon Road, Malibu, 90265	Construct 6,300 feet of 12-inch-diameter emergency use steel transmission waterline to connect to Las Virgenes Municipal Water District to provide a mutual water source capability for the region in case of emergencies if the 30-inch-diameter mainline is interrupted.
8	Big Rock Bypass Improvements	19562 to 19742 PCH, Malibu, 90265	Construct a 1,500-foot bypass for the region's mainline. The bypass would consist of three parallel pipelines in PCH to preserve the integrity of the Malibu water supply and prevent water leaks below PCH at Big Rock. Replace three 10-inch-diameter and one 30-inch-diameter parallel water mains with three 18-inch-diameter steel water mains.

Scoping Meetings

Two public scoping meetings will be held on November 14 and 16, 2017, at the locations identified below to solicit input from interested parties on the scope and content of the EIR in conformance with Section 21083.9 of the Public Resources Code.

Tuesday, November. 14, 2017 6:30 - 8:30 p.m. Topanga Elementary School 22075 Topanga School Road Topanga, CA 90290	Thursday, November 16, 2017 6:30 - 8:30 p.m. Malibu City Hall – Multipurpose Room 23825 Stuart Ranch Road Malibu, CA 90265

Probable Environmental Effects

A comprehensive EIR will be prepared to analyze the likely short- and long-term, direct and indirect construction and operational effects of the proposed project and will cover all of the following potential environmental impacts identified in Appendix G of the State CEQA Guidelines: aesthetics, agriculture and forestry resources, air quality, biological resources, cultural resources, 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, tribal cultural resources, transportation and traffic, utilities and service systems, energy conservation, and cumulative impacts. An Initial Study has not been prepared for the proposed project as permitted by CEQA Guidelines Section 15060(d).

Feasible mitigation measures will be proposed for impacts that are determined to be potentially significant. A mitigation monitoring and reporting program will also be developed for any mitigation incorporated in the analysis.

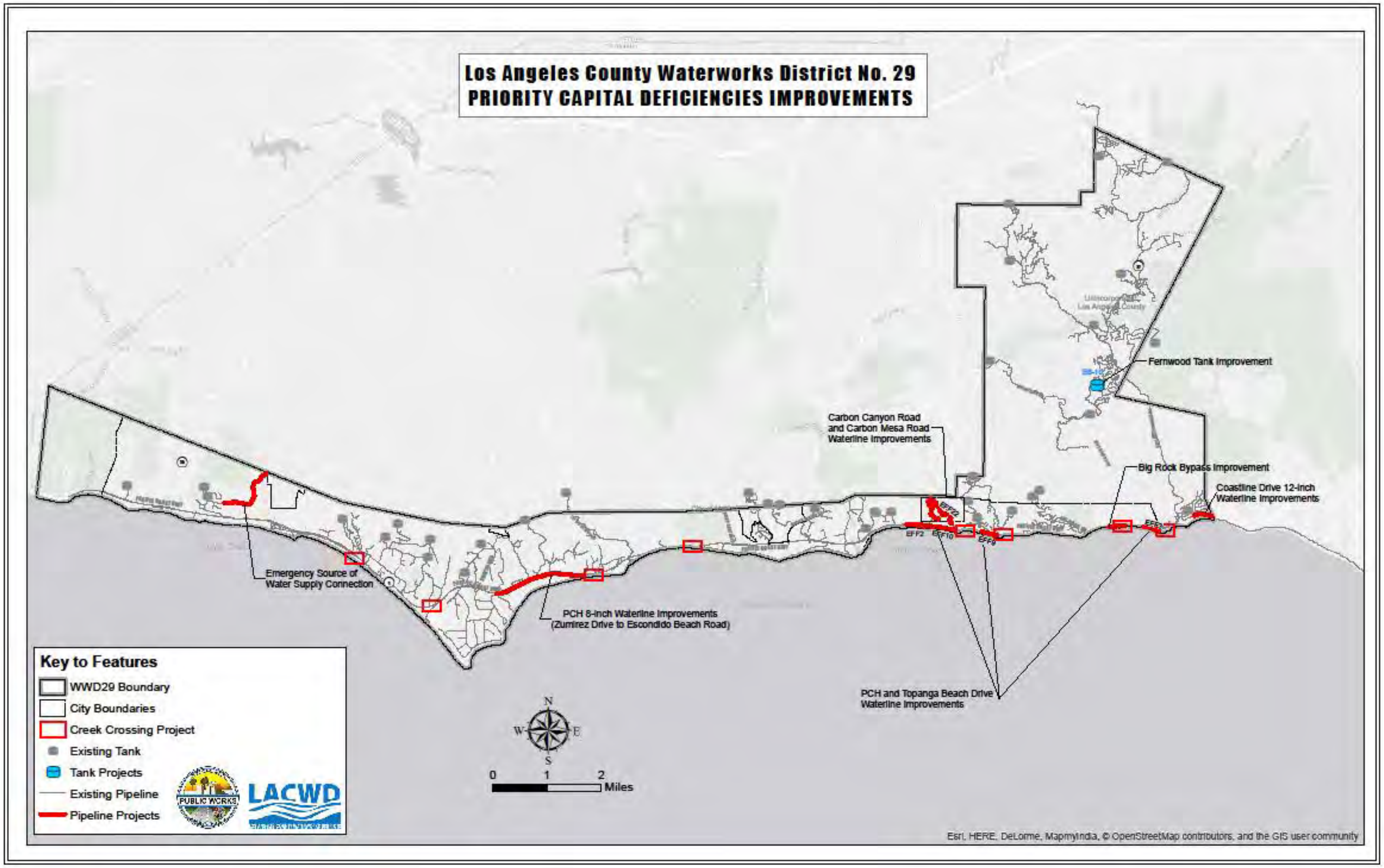
Si desea obtener más información o necesita traducción de este aviso en español, por favor llame al (626) 300-3384.

To request for auxiliary aids or other ADA accommodations, please contact the ADA Coordinator Katie Mac at (626) 458-7901, e-mail kmac@dpw.lacounty.gov, or dial the California Relay Service at 7-1-1, at least 72 hours before the scheduled event.

Source: MWH (2016)

K:\Irvine\GIS\Projects\LACDPW\00489_16\mapdoc\Fig01_Dist29.mxd Date: 10/14/2016 24991

Figure 1
Regional Vicinity Map
Los Angeles County Waterworks District 29



Source: LACWD, 2017.

Figure 2
Project Location Map
Los Angeles County Waterworks District 29

Appendix A2
Notice of Completion

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Los Angeles County Waterworks District 29 Priority Capital Deficiencies Improvements
Lead Agency: Los Angeles County Waterworks District 29
Contact Person: Alma Fuentes Quintana
Mailing Address: LACDPW Waterworks Division, 1000 S. Fremont Ave.
Phone: (626) 300-3339
City: Alhambra
Zip: 91803-1331
County: Los Angeles

Project Location: County: Los Angeles
City/Nearest Community: Malibu and Topanga
Cross Streets: multiple locations (see NOP)
Zip Code:
Longitude/Latitude (degrees, minutes and seconds): ° ′ ″ N / ° ′ ″ W Total Acres:
Assessor's Parcel No.:
Section: Twp.: Range: Base:
Within 2 Miles: State Hwy #:
Waterways:
Airports:
Railways:
Schools:

Document Type:

CEQA:
- ☒ NOP
- ☐ Early Cons
- ☐ Neg Dec
- ☐ Mit Neg Dec
- ☐ Draft EIR
- ☐ Supplement/Subsequent EIR
- (Prior SCH No.)
- Other:

NEPA:
- ☐ NOI
- ☐ EA
- ☐ Draft EIS
- ☐ FONSI

Other:
- ☐ Joint Document
- ☐ Final Document
- ☐ Other:

Governor's Office of Planning & Research

NOV 09 2017

10:17 am

STATE CLEARINGHOUSE

Local Action Type:

- ☐ General Plan Update
- ☐ General Plan Amendment
- ☐ General Plan Element
- ☐ Community Plan
- ☐ Specific Plan
- ☐ Master Plan
- ☐ Planned Unit Development
- ☐ Site Plan
- ☐ Rezone
- ☐ Prezone
- ☐ Use Permit
- ☐ Land Division (Subdivision, etc.)
- ☐ Annexation
- ☐ Redevelopment
- ☐ Coastal Permit
- ☒ Other: Infrastructure

Development Type:

- ☐ Residential: Units Acres
- ☐ Office: Sq.ft. Acres Employees
- ☐ Commercial: Sq.ft. Acres Employees
- ☐ Industrial: Sq.ft. Acres Employees
- ☐ Educational:
- ☐ Recreational:
- ☒ Water Facilities: Type Tanks, pipelines MGD varies
- ☐ Transportation: Type
- ☐ Mining: Mineral
- ☐ Power: Type MW
- ☐ Waste Treatment: Type MGD
- ☐ Hazardous Waste: Type
- ☐ Other:

Project Issues Discussed in Document:

- ☒ Aesthetic/Visual
- ☒ Agricultural Land
- ☒ Air Quality
- ☒ Archeological/Historical
- ☒ Biological Resources
- ☒ Coastal Zone
- ☒ Drainage/Absorption
- ☐ Economic/Jobs
- ☐ Fiscal
- ☒ Flood Plain/Flooding
- ☒ Forest Land/Fire Hazard
- ☒ Geologic/Seismic
- ☒ Minerals
- ☒ Noise
- ☒ Population/Housing Balance
- ☒ Public Services/Facilities
- ☒ Recreation/Parks
- ☐ Schools/Universities
- ☐ Septic Systems
- ☐ Sewer Capacity
- ☒ Soil Erosion/Compaction/Grading
- ☒ Solid Waste
- ☒ Toxic/Hazardous
- ☒ Traffic/Circulation
- ☒ Vegetation
- ☒ Water Quality
- ☒ Water Supply/Groundwater
- ☒ Wetland/Riparian
- ☒ Growth Inducement
- ☒ Land Use
- ☒ Cumulative Effects
- ☒ Other: Energy use

Present Land Use/Zoning/General Plan Designation:
various

Project Description: *(please use a separate page if necessary)*
Improvements in Waterworks Division No. 29, including demolition of two water tanks and construction on one tank reservoir in the unincorporated area of Topanga; replacement of approximately 34,300 feet of underground water pipeline in City of Malibu; construction of approximately 6,300 feet of new underground pipeline in City of Malibu; and repairing several creek crossing locations by replacing and recoating segments of pipe and release valves.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Revised 2010

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

X Air Resources Board
______ Boating & Waterways, Department of
X California Emergency Management Agency
X California Highway Patrol
X Caltrans District #7
______ Caltrans Division of Aeronautics
______ Caltrans Planning
______ Central Valley Flood Protection Board
______ Coachella Valley Mtns. Conservancy
X Coastal Commission
______ Colorado River Board
______ Conservation, Department of
______ Corrections, Department of
______ Delta Protection Commission
______ Education, Department of
______ Energy Commission
X Fish & Game Region #5
______ Food & Agriculture, Department of
X Forestry and Fire Protection, Department of
______ General Services, Department of
______ Health Services, Department of
______ Housing & Community Development
X Native American Heritage Commission

X Office of Historic Preservation
______ Office of Public School Construction
______ Parks & Recreation, Department of
______ Pesticide Regulation, Department of
X Public Utilities Commission
X Regional WQCB #4
______ Resources Agency
______ Resources Recycling and Recovery, Department of
______ S.F. Bay Conservation & Development Comm.
______ San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
______ San Joaquin River Conservancy
X Santa Monica Mtns. Conservancy
X State Lands Commission
______ SWRCB: Clean Water Grants
X SWRCB: Water Quality
______ SWRCB: Water Rights
______ Tahoe Regional Planning Agency
______ Toxic Substances Control, Department of
X Water Resources, Department of

______ Other: ______
______ Other: ______

Local Public Review Period (to be filled in by lead agency)

Starting Date November 8, 2017 Ending Date December 18, 2017

Lead Agency (Complete if applicable):

Consulting Firm: ICF
Address: 601 W. 5th Street, Suite 900
City/State/Zip: Los Angeles, CA 90071
Contact: Donna McCormick
Phone: 949-333-6611

Applicant:
Address:
City/State/Zip:
Phone:

Signature of Lead Agency Representative: on behalf of Donna McCormick **Date:** 11/8/17

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Revised 2010

Appendix A3
Notice of Preparation Mailing List

District 29 Priority Capital Deficiencies Improvements
Environmental Impact Report

Notice of Preparation Mailing List

State Clearinghouse Attn: CEQA Document 1400 Tenth Street Sacramento, CA 95814	
California Department of Parks and Recreation Attn: CEQA Document 1416 9th Street Sacramento, CA 95814	**U.S. Fish and Wildlife Service** Attn: CEQA Document 2493 Portola Road, Suite B Ventura, CA 93003
California Department of Water Resources Attn: CEQA Document 1416 9th Street Sacramento, CA 95814	**U.S. Army Corps of Engineers** Attn: CEQA Document P.O. Box 532711 Los Angeles, CA 90053-2325
California Department of Fish and Wildlife, Region #5 Attn: CEQA Document 3883 Ruffin Road San Diego, CA 92123	**California Air Resources Board** Attn: CEQA Document 1001 "I" Street Sacramento, CA 95814
California Department of Public Health Attn: CEQA Document 1615 Capitol Avenue Sacramento, CA 95814	**California Coastal Commission** Attn: CEQA Document 89 South California St., #200 Ventura, CA 93001
U.S. EPA Region 9, Southern Field Office Attn: CEQA Document CA 600 Wilshire Blvd., Suite 1460 Los Angeles, CA 90017	**California Highway Patrol** Attn: CEQA Document 610 Spring Road Moorpark, CA 93021-1278
California Department of Toxic Substance Control Attn: CEQA Document 1001 "I" Street Sacramento, CA 95814	**State Office of Historic Preservation** Attn: CEQA Document 1725 23rd Street, Ste. 100 Sacramento, CA 95816
State Water Resources Control Board Regulatory Section Attn: CEQA Document P.O. Box 100 Sacramento, CA 95812-0100	**Native American Heritage Commission** Attn: CEQA Document 915 Capitol Mall, Room 364 Sacramento, CA 95814
California Department of Transportation, District #7 Attn: CEQA Document 100 South Main Street Los Angeles, CA 90012	**Santa Monica Mountains Conservancy** Attn: CEQA Document 5750 Ramirez Canyon Road Malibu, CA 90265
California Regional Water Quality Control Board, **Los Angeles Region** Attn: CEQA Document 320 West 4th Street, Suite 200 Los Angeles, CA 90013	**Resource Conservation District** **of the Santa Monica Mountains** Attn: CEQA Document 30000 Mulholland Highway Agoura Hills, CA 91301

South Coast Air Quality Management District Attn: CEQA Document 21865 Copley Drive Diamond Bar, CA 91765	**City of Calabasas** **Planning Division** 100 Civic Center Way Calabasas, CA 91302
City of Santa Monica Planning & Community Development 1685 Main Street, Room 212 Santa Monica, CA 90401	**City of Malibu** Robert Brager 23825 Stuart Ranch Road Malibu, CA 90265-4861
Mountains Recreation & Conservation Authority Attn: CEQA Document 570 West Avenue 26, Suite 100 Los Angeles, CA 90065	**City of Malibu** Attn: Planning Department 23825 Stuart Ranch Road Malibu, CA 90265-4861
City of Los Angeles Planning Department 201 North Figueroa Street Los Angeles, CA 90012	**City of Oxnard Planning Division** 214 South C St Oxnard, CA 93030
City of Thousand Oaks Planning Division 2100 Thousand Oaks Boulevard Thousand Oaks, CA 91362	**Topanga Library** 122 North Topanga Canyon Boulevard Topanga, CA 90290
City of Westlake Village **Planning Department** 31200 Oak Crest Drive Westlake Village, CA 91361	**Las Virgenes Municipal Water District** Attn: CEQA Document 4232 Las Virgenes Road Calabasas, CA 91302-1994
City of Camarillo **Community Development Department** 601 Carmen Drive Camarillo, CA 93010	**City of Agoura Hills** **Planning & Community Development** 30001 Ladyface Ct Agoura Hills, CA 91301

Appendix A4
Tribal Consultation

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

November 22, 2017

IN REPLY PLEASE
REFER TO FILE WW-3

Mr. Andrew Salas, Chairman
Gabrieleno Band of Mission Indians-Kizh Nation
P.O. Box 393
Covina, CA 91723

Dear Mr. Salas:

COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE
REQUEST CONSULTATION ON TRIBAL CULTURAL RESOURCES
LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU
PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS

We are contacting you in compliance with the California Assembly Bill (AB) 52, including the California Public Resources Code Section 21080.3.1. You are listed as the tribal contact person for projects in the Malibu/Topanga area. The Los Angeles County Waterworks District No. 29, Malibu, through the County of Los Angeles Department of Public Works, is the lead agency for compliance with the California Environmental Quality Act. In compliance with formal notification requirements, we are issuing the following proposed project notification:

Project Name: Los Angeles County Waterworks District No. 29, Malibu, Priority Capital Deficiencies Improvements

Proposed Project: Public Works has identified numerous capital infrastructure improvements in Waterworks District No. 29 that would provide a more reliable water system for its customers. Public Works is committed to completing the most critical projects in Waterworks District No. 29 over the next ten years. The eight infrastructure improvement projects that comprise the proposed project would correct the most critical deficiencies. The projects will be analyzed at a project level. The eight projects, listed in Table 1 and shown on Figure 1, were identified based on operational imperatives, importance to overall system, and capacity.

The proposed projects include the demolition of two water tanks and construction of one tank in the unincorporated area of Topanga; replacement of approximately 34,300 feet of underground water pipeline in the City of Malibu, 19,000 feet of which are along Pacific Coast Highway (PCH); construction of approximately 6,300 feet of new underground pipeline in the City of Malibu; and repair of several creek crossing locations by replacing and recoating segments of pipe and air-release valves on PCH. The pipeline segments would be constructed underground in existing roadways. Approximate addresses are provided in Table 1.

Table 1

Waterworks District No. 29 Proposed Projects

	Projects	Approximate Address	Description
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements	3873 Carbon Canyon Road to 22576 Carbon Mesa Road, Malibu, 90265	Replace over 7,000 feet of aging and severely deteriorating waterlines that are subject to leaks, ranging in size from 1.5 to 4 inches in diameter, with 8- and 12-inch-diameter steel pipe.
2	Coastline Drive 12-Inch Waterline Improvements	18000 to 18303 Coastline Drive, Malibu, 90265	Replace over 2,000 feet of aging and severely deteriorating waterlines that are subject to leaks by replacing a 12-inch-diameter waterline with a 12-inch-diameter steel waterline.
3	Waterworks District No. 29 Creek Crossing Repair Projects	18788 PCH, Malibu, 90265 19399 PCH, Malibu, 90265 21203 PCH, Malibu, 90265 21857 PCH, Malibu, 90265 25712 PCH, Malibu, 90265 27519 PCH, Malibu, 90265 29497 PCH, Malibu, 90265 30626 PCH, Malibu, 90265	Repair the region's water main at several creek crossing locations on PCH. The waterline at these locations is aging, severely deteriorating, and subject to leaks.
4	Fernwood Tank Improvement	19837 Horseshoe Drive, Topanga, 90290	Replace two aging and severely deteriorating 50,000-gallon tanks with a single 300,000-gallon tank.

	Projects	Approximate Address	Description
5	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	27200 to 28734 PCH, Malibu, 90265	Replace over 9,500 feet of an aging and deteriorating 6-inch-diameter waterline that is subject to leaks with an 8-inch-diameter steel waterline.
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Location: The proposed projects, which consist of several separate improvements, would be located in Waterworks District No. 29's service area (Figure 1). Waterworks District No. 29's water service area consists of the City of Malibu and the unincorporated area of Topanga. The City of Malibu is located on a narrow strip of land along the coastline with numerous canyons extending northward.

Waterworks District No. 29's service area is bounded on the north by the steep and rugged Santa Monica Mountains, on the east by Topanga Canyon and the City of Los Angeles boundary, on the west by Ventura County, and on the south by the Pacific Ocean. Waterworks District No. 29 occupies an area of about 47 square miles (30,000 acres).

If you wish to begin processing a formal consultation under AB 52, your deadline to request consultation with the County is set by State law California Public Resources Code Section 21080.3.1(d) and requires that you send a written request for consultation to the address below within 30 days of the receipt of this notice.

If you do not wish to initiate formal consultation on the proposed projects, no response to this notice is needed. If you do not wish to formally consult under AB 52 on the proposed projects, you may participate in the California Environmental Quality Act process for the projects on any issue of concern as an interested California Native American tribe, person, citizen, or member of the public.

Please send written responses for the proposed projects to:

Ms. Alma Fuentes Quintana, Project Manager
County of Los Angeles Department of Public Works
Waterworks Division
P.O. Box 1460
Alhambra, CA 91802-1460
e-mail: waterworksprojects@dpw.lacounty.gov

If you have any questions, please contact Ms. Quintana at (626) 300-3339 or waterworksprojects@dpw.lacounty.gov.

Very truly yours,

MARK PESTRELLA
Director of Public Works

ADAM ARIKI
Assistant Deputy Director
Waterworks Division

AQ:kh
h:\wwhome\admin\letters\2017\lr83 - assembly bill 52 notification\lr83-assemblybill52formalnotification.docx

Enc.

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

November 22, 2017

IN REPLY PLEASE
REFER TO FILE: WW-3

Mr. Anthony Morales, Chief
San Gabriel Band of Mission Indians
P.O. Box 693
San Gabriel, CA 91778

Dear Mr. Morales:

COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE
REQUEST CONSULTATION ON TRIBAL CULTURAL RESOURCES
LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU
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The proposed projects include the demolition of two water tanks and construction of one tank in the unincorporated area of Topanga; replacement of approximately 34,300 feet of underground water pipeline in the City of Malibu, 19,000 feet of which are along Pacific Coast Highway (PCH); construction of approximately 6,300 feet of new underground pipeline in the City of Malibu; and repair of several creek crossing locations by replacing and recoating segments of pipe and air-release valves on PCH. The pipeline segments would be constructed underground in existing roadways. Approximate addresses are provided in Table 1.

Table 1

Waterworks District No. 29 Proposed Projects

	Projects	Approximate Address	Description
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements	3873 Carbon Canyon Road to 22576 Carbon Mesa Road, Malibu, 90265	Replace over 7,000 feet of aging and severely deteriorating waterlines that are subject to leaks, ranging in size from 1.5 to 4 inches in diameter, with 8- and 12-inch-diameter steel pipe.
2	Coastline Drive 12-Inch Waterline Improvements	18000 to 18303 Coastline Drive, Malibu, 90265	Replace over 2,000 feet of aging and severely deteriorating waterlines that are subject to leaks by replacing a 12-inch-diameter waterline with a 12-inch-diameter steel waterline.
3	Waterworks District No. 29 Creek Crossing Repair Projects	18788 PCH, Malibu, 90265 19399 PCH, Malibu, 90265 21203 PCH, Malibu, 90265 21857 PCH, Malibu, 90265 25712 PCH, Malibu, 90265 27519 PCH, Malibu, 90265 29497 PCH, Malibu, 90265 30626 PCH, Malibu, 90265	Repair the region's water main at several creek crossing locations on PCH. The waterline at these locations is aging, severely deteriorating, and subject to leaks.
4	Fernwood Tank Improvement	19837 Horseshoe Drive, Topanga, 90290	Replace two aging and severely deteriorating 50,000-gallon tanks with a single 300,000-gallon tank.

	Projects	Approximate Address	Description
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7	Emergency Source of Water Supply Connection (Las Virgenes Connection)	3525 to 4400 Encinal Canyon Road, Malibu, 90265	Construct 6,300 feet of a 12-inch-diameter emergency use steel transmission waterline to connect to Las Virgenes Municipal Water District to provide a mutual water source capability for the region in case of emergencies if the 30-inch-diameter mainline is interrupted.
8	Big Rock Bypass Improvements	19562 to 19742 PCH, Malibu, 90265	Construct a 1,500-foot bypass for the region's mainline. The bypass would consist of three parallel pipelines in PCH to preserve the integrity of the Malibu water supply and prevent water leaks below PCH at Big Rock. Replace three 10-inch-diameter and one 30-inch-diameter parallel water mains with three 18-inch-diameter steel water mains.

Location: The proposed projects, which consist of several separate improvements, would be located in Waterworks District No. 29's service area (Figure 1). Waterworks District No. 29's water service area consists of the City of Malibu and the unincorporated area of Topanga. The City of Malibu is located on a narrow strip of land along the coastline with numerous canyons extending northward.

> Waterworks District No. 29's service area is bounded on the north by the steep and rugged Santa Monica Mountains, on the east by Topanga Canyon and the City of Los Angeles boundary, on the west by Ventura County, and on the south by the Pacific Ocean. Waterworks District No. 29 occupies an area of about 47 square miles (30,000 acres).

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Please send written responses for the proposed projects to:

Ms. Alma Fuentes Quintana, Project Manager
County of Los Angeles Department of Public Works
Waterworks Division
P.O. Box 1460
Alhambra, CA 91802-1460
e-mail: waterworksprojects@dpw.lacounty.gov

If you have any questions, please contact Ms. Quintana at (626) 300-3339 or waterworksprojects@dpw.lacounty.gov.

Very truly yours,

MARK PESTRELLA
Director of Public Works

ADAM ARIKI
Assistant Deputy Director
Waterworks Division

AQ:kh
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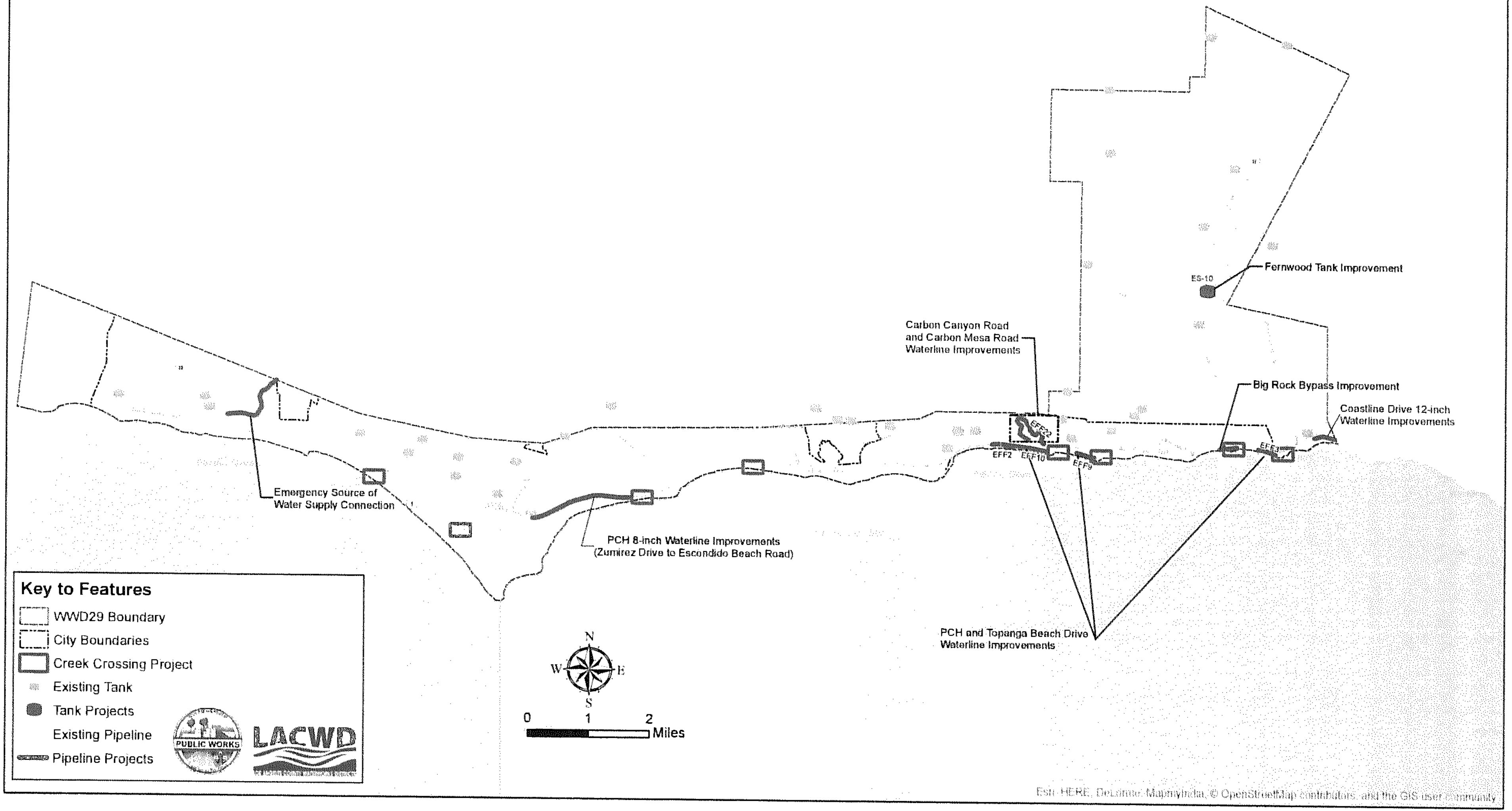
Enc.

Los Angeles County Waterworks District No. 29
PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS



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COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

November 22, 2017

IN REPLY PLEASE
REFER TO FILE: WW-3

Ms. Kimia Fatehi
Tribal Historic and Cultural Preservation Officer
Fernandeño Tataviam Band of Mission Indians
1019 Second Street
San Fernando, CA 91340

Dear Ms. Fatehi:

COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE
REQUEST CONSULTATION ON TRIBAL CULTURAL RESOURCES
LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU
PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS

We are contacting you in compliance with the California Assembly Bill (AB) 52, including the California Public Resources Code Section 21080.3.1. You are listed as the tribal contact person for projects in the Malibu/Topanga area. The Los Angeles County Waterworks District No. 29, Malibu, through the County of Los Angeles Department of Public Works, is the lead agency for compliance with the California Environmental Quality Act. In compliance with formal notification requirements, we are issuing the following proposed project notification:

Project Name: Los Angeles County Waterworks District No. 29, Malibu, Priority Capital Deficiencies Improvements

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Waterworks District No. 29 Proposed Projects

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	Projects	Approximate Address	Description
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Location: The proposed projects, which consist of several separate improvements, would be located in Waterworks District No. 29's service area (Figure 1). Waterworks District No. 29's water service area consists of the City of Malibu and the unincorporated area of Topanga. The City of Malibu is located on a narrow strip of land along the coastline with numerous canyons extending northward.

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County of Los Angeles Department of Public Works
Waterworks Division
P.O. Box 1460
Alhambra, CA 91802-1460
e-mail: waterworksprojects@dpw.lacounty.gov

If you have any questions, please contact Ms. Quintana at (626) 300-3339 or waterworksprojects@dpw.lacounty.gov.

Very truly yours,

MARK PESTRELLA
Director of Public Works

ADAM ARIKI
Assistant Deputy Director
Waterworks Division

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Enc.

COUNTY OF LOS ANGELES

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MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

November 22, 2017

IN REPLY PLEASE
REFER TO FILE: WW-3

Mr. Octavio Escobedo, Tribal Chair
Tejon Indian Tribe
1761 Hasti Acres Drive, Suite 108
Bakersfield, CA 93309

Dear Mr. Escobedo:

COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE
REQUEST CONSULTATION ON TRIBAL CULTURAL RESOURCES
LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU
PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS

We are contacting you in compliance with the California Assembly Bill (AB) 52, including the California Public Resources Code Section 21080.3.1. You are listed as the tribal contact person for projects in the Malibu/Topanga area. The Los Angeles County Waterworks District No. 29, Malibu, through the County of Los Angeles Department of Public Works, is the lead agency for compliance with the California Environmental Quality Act. In compliance with formal notification requirements, we are issuing the following proposed project notification:

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Proposed Project: Public Works has identified numerous capital infrastructure improvements in Waterworks District No. 29 that would provide a more reliable water system for its customers. Public Works is committed to completing the most critical projects in Waterworks District No. 29 over the next ten years. The eight infrastructure improvement projects that comprise the proposed project would correct the most critical deficiencies. The projects will be analyzed at a project level. The eight projects, listed in Table 1 and shown on Figure 1, were identified based on operational imperatives, importance to overall system, and capacity.

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MARK PESTRELLA
Director of Public Works

ADAM ARIKI
Assistant Deputy Director
Waterworks Division

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Enc.

COUNTY OF LOS ANGELES

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MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

November 22, 2017

IN REPLY PLEASE
REFER TO FILE: WW-3

Mr. Lee Clauss
San Manuel Band of Mission Indians
26569 Community Center Drive
Highland, CA 92346

Dear Mr. Clauss:

COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE
REQUEST CONSULTATION ON TRIBAL CULTURAL RESOURCES
LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU
PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS

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County of Los Angeles Department of Public Works
Waterworks Division
P.O. Box 1460
Alhambra, CA 91802-1460
e-mail: waterworksprojects@dpw.lacounty.gov

If you have any questions, please contact Ms. Quintana at (626) 300-3339 or waterworksprojects@dpw.lacounty.gov.

Very truly yours,

MARK PESTRELLA
Director of Public Works

ADAM ARIKI
Assistant Deputy Director
Waterworks Division

AQ:kh
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Enc.

Eduardo Maguino

From:	Eduardo Maguino
Sent:	Tuesday, April 09, 2019 2:35 PM
To:	Eduardo Maguino
Subject:	FW: AB52: LA County Waterworks District No. 29, Malibu, Priority Capital Deficiencies Improvements

---

From: DPW-Waterworks Projects
Sent: Wednesday, November 29, 2017 4:47 PM
To: Jessica Mauck <JMauck@sanmanuel-nsn.gov>
Subject: RE: AB52: LA County Waterworks District No. 29, Malibu, Priority Capital Deficiencies Improvements

Good Afternoon Jessica: Thank you for confirming.

Alma Fuentes Quintana
Civil Engineer
Los Angeles County Public Works
Office: (626)300-3339

From: Jessica Mauck [mailto:JMauck@sanmanuel-nsn.gov]
Sent: Wednesday, November 29, 2017 11:45 AM
To: DPW-Waterworks Projects <waterworksprojects@dpw.lacounty.gov>
Subject: AB52: LA County Waterworks District No. 29, Malibu, Priority Capital Deficiencies Improvements

Hello Alma,

Thank you for contacting the San Manuel Band of Mission Indians (SMBMI) regarding the above referenced project. SMBMI appreciates the opportunity to review the project documentation, which was received by our Cultural Resources Management Department on 29 November 2017. The proposed project area is located outside of Serrano ancestral territory and, as such, SMBMI will not be requesting consulting party status with the lead agency or requesting to participate in the scoping, development, and/or review of documents created pursuant to these legal and regulatory mandates.

Regards,

Jessica Mauck
CULTURAL RESOURCES ANALYST
O: (909) 864-8933 x3249
M: (909) 725-9054
26569 Community Center Drive, Highland California 92346
SAN MANUEL
BAND OF MISSION INDIANS

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

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MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

October 15, 2020

IN REPLY PLEASE
REFER TO FILE: WW-2

Mr. Andrew Salas, Chairman
Gabrieleno Band of Mission Indians-Kizh Nation
P.O. Box 393
Covina, CA 91723

Dear Mr. Salas:

COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE REQUEST
CONSULTATION ON TRIBAL CULTURAL RESOURCES FOR
REVISED LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU,
PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS

Los Angeles County Waterworks District No. 29, Malibu, through the Los Angeles County Public Works, is the lead agency for compliance with the California Environmental Quality Act for Priority Capital Deficiencies Improvements in the City of Malibu and Topanga area. In November 2017, we contacted you in compliance with California Assembly Bill 52, including the California Public Resources Code Section 21080.3.1, because you are listed as the tribal contact person in a tribal request for notice of proposed projects in this geographic area. An additional water system improvement has been added to the proposed project. These improvements are within a previously disturbed site and are adjacent to the improvements identified in 2017. The modified project description and modified map are enclosed.

If you wish to consult on the additional proposed improvements, please send a written request for consultation to the address on page 2 within 30 days of receipt of this notice. If you do not wish to initiate formal consultation on the additional improvements, no response to this notice is needed. If you do not wish to formally consult, you may participate in the California Environmental Quality Act process for this project on any issue of concern as an interested California Native American tribe, person, citizen, or member of the public.

Please send written responses for the proposed project to:

Mr. Eduardo Maguino, Project Manager
Los Angeles County Public Works
Waterworks Division
P.O. Box 1460
Alhambra, CA 91802-1460
E-mail: waterworksprojects@pw.lacounty.gov

If you have any questions, please contact Mr. Maguino, Project Manager, at (626) 300-3318 or waterworksprojects@pw.lacounty.gov.

Very truly yours,

MARK PESTRELLA
Director of Public Works

RUSS BRYDEN
Acting Assistant Deputy Director
Waterworks Division

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Enc.

The changes from the November 2017 notification are listed in **bold** print below and outlined in blue on the attached map.

Project Name: Los Angeles County Waterworks District No. 29 Priority Capital Deficiencies Improvements

Proposed Project: Public Works has identified numerous capital infrastructure improvements in Waterworks District (WWD) 29 that would provide a more reliable water system. Public Works is committed to completing the most critical projects in WWD 29 over the next 10 years in order to provide a more reliable water system for existing customers. The **nine** projects that comprise the proposed project would correct the most critical capital infrastructure deficiencies to provide a more reliable water system for existing customers. The projects will be analyzed at a project level. The **nine** projects, listed in Table 1 and shown on **the attached map**, were identified based on operational imperatives, importance to overall system, and capacity. The proposed project includes: the demolition of two water tanks and construction of one tank reservoir in the unincorporated area of Topanga**; replacement of a tank in the City of Malibu**; replacement of approximately 34,300 feet of underground water pipeline in the City of Malibu, 19,000 feet of which are along Pacific Coast Highway (PCH); construction of approximately 6,300 feet of new underground pipeline in the City of Malibu; and repairing several creek crossing locations by replacing and recoating segments of pipe and air release valves on PCH. The pipeline segments would be constructed underground in existing roadways. Approximate addresses are provided in Table 1.

Table 1: Waterworks District No. 29 Proposed Project

	Project	Approximate Address	Description
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements	3873 Carbon Canyon Road to 22576 Carbon Mesa Road, Malibu, 90265	Replace over 7,000 feet of aging and severely deteriorating waterlines that are subject to leaks, ranging in size from 1.5 to 4 inches in diameter, with 8- and 12-inch-diameter steel pipe.
2	Coastline Drive 12-Inch Waterline Improvements	18000 to 18303 Coastline Drive, Malibu, 90265	Replace over 2,000 feet of aging and severely deteriorating waterlines that are subject to leaks by replacing a 12-inch-diameter waterline with a 12-inch-diameter steel waterline.
3	Waterworks District No. 29 Creek Crossing Repair Project	18788 PCH, Malibu, 90265 19399 PCH, Malibu, 90265 21203 PCH, Malibu, 90265 21857 PCH, Malibu, 90265 25712 PCH, Malibu, 90265 27519 PCH, Malibu, 90265 29497 PCH, Malibu, 90265 30626 PCH, Malibu, 90265	Repair the region's water main at several creek crossing locations on PCH. The waterline at these locations is aging, severely deteriorating, and subject to leaks.

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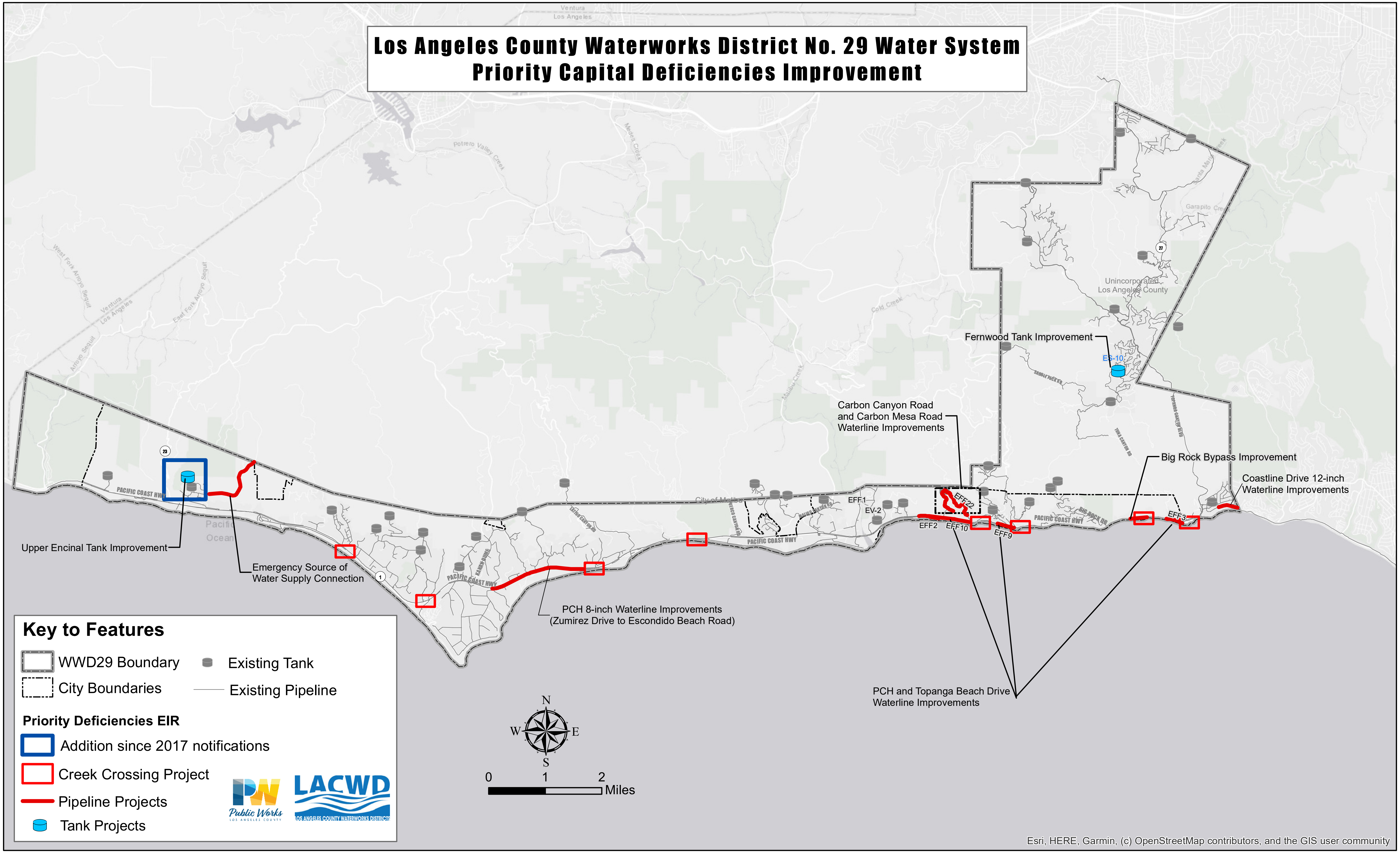
6	PCH and Topanga Beach Drive Waterline Improvements	18808 to 18980 PCH, Malibu, 90265 21150 to 21434 PCH, Malibu, 90265 21746 to 22716 PCH, Malibu, 90265	Replace over 8,000 feet of aging, severely deteriorating waterlines that are subject to leaks, replacing 4- and 6-inch-diameter waterline with an 8-inch-diameter steel waterline.
7	Emergency Source of Water Supply Connection (Las Virgenes Connection)	3525 to 4400 Encinal Canyon Road, Malibu, 90265	Construct 6,300 feet of 12-inch-diameter emergency use steel transmission waterline to connect to Las Virgenes Municipal Water District to provide a mutual water source capability for the region in case of emergencies if the 30-inch-diameter mainline is interrupted.
8	Big Rock Bypass Improvements	19562 to 19742 PCH, Malibu, 90265	Construct a 1,500-foot bypass for the region's mainline. The bypass would consist of three parallel pipelines in PCH to preserve the integrity of the Malibu water supply and prevent water leaks below PCH at Big Rock. Replace three 10-inch-diameter and one 30-inch-diameter parallel water mains with three 18-inch-diameter steel water mains.
9	**Upper Encinal Tank Improvements**	**32911 W. Camino De Buena Ventura, Malibu, 90265**	**Replace an aging 70,000-gallon tank with a 225,000-gallon tank.**

Location: The proposed project, which consists of several separate improvements, would be located in Waterworks District No. 29's service area (**attached map**). Waterworks District No. 29's water service area consists of the City of Malibu and the unincorporated area of Topanga. The City of Malibu is located on a narrow strip of land along the coastline with numerous canyons extending northward. Waterworks District No. 29 service area is bounded on the north by the steep and rugged Santa Monica Mountains, on the east by Topanga Canyon and the City of Los Angeles boundary, on the west by Ventura County, and on the south by the Pacific Ocean. Waterworks District No. 29 occupies an area of about 47 square miles (30,000 acres).

Los Angeles County Waterworks District No. 29 Water System
Priority Capital Deficiencies Improvement



Key to Features

- ▭ WWD29 Boundary
- ⬚ City Boundaries
- ● Existing Tank
- — Existing Pipeline

Priority Deficiencies EIR

- 🟦 Addition since 2017 notifications
- 🟥 Creek Crossing Project
- — Pipeline Projects
- ● Tank Projects

PW Public Works Los Angeles County

LACWD Los Angeles County Waterworks Districts

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: WW-2

October 15, 2020

Mr. Anthony Morales, Chief
San Gabriel Band of Mission Indians
P.O. Box 693
San Gabriel, CA 91778

Dear Mr. Morales:

COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE REQUEST
CONSULTATION ON TRIBAL CULTURAL RESOURCES FOR
REVISED LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU,
PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS

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Los Angeles County Public Works
Waterworks Division
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Alhambra, CA 91802-1460
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Very truly yours,

MARK PESTRELLA
Director of Public Works

RUSS BRYDEN
Acting Assistant Deputy Director
Waterworks Division

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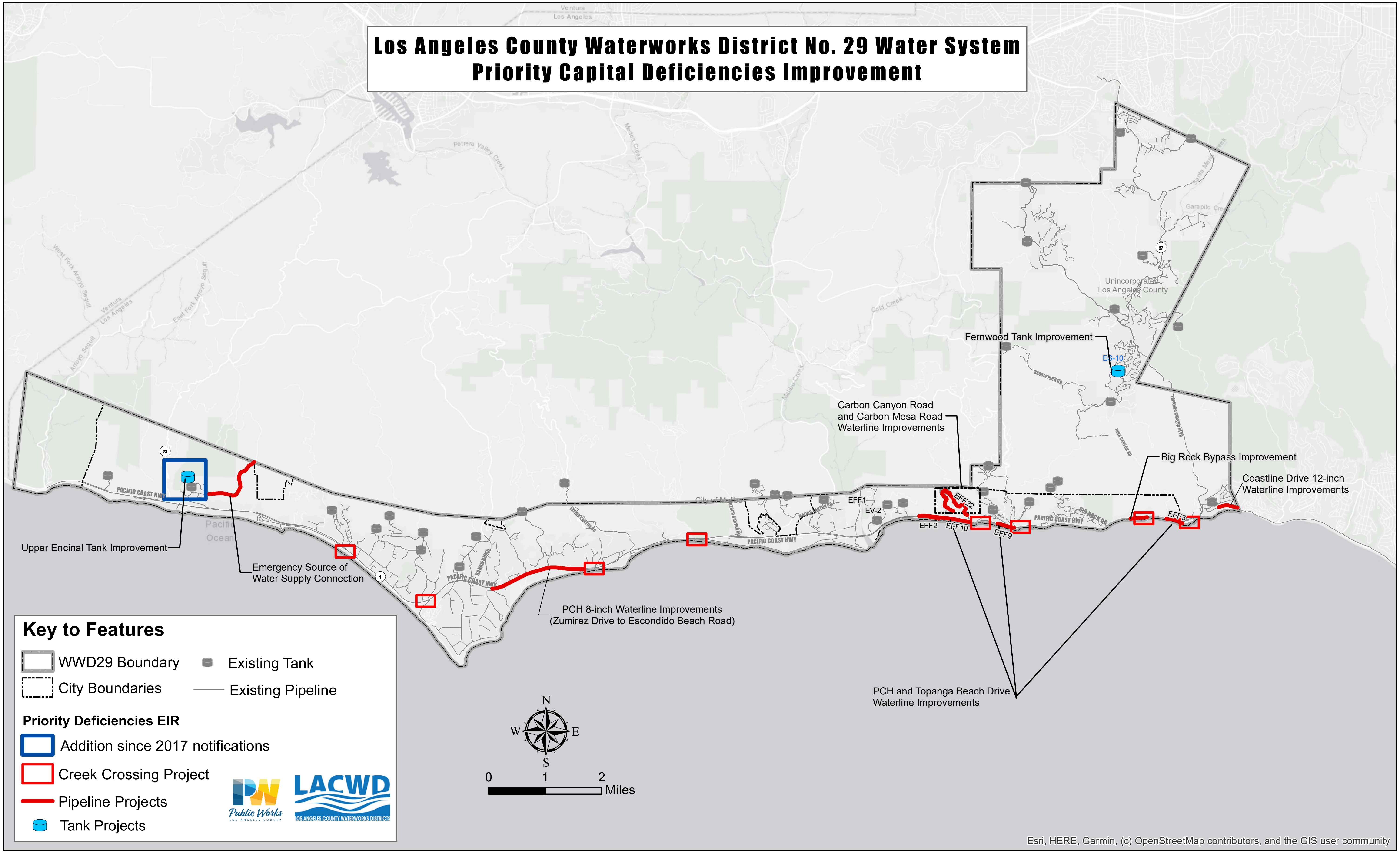
Location: The proposed project, which consists of several separate improvements, would be located in Waterworks District No. 29's service area (**attached map**). Waterworks District No. 29's water service area consists of the City of Malibu and the unincorporated area of Topanga. The City of Malibu is located on a narrow strip of land along the coastline with numerous canyons extending northward. Waterworks District No. 29 service area is bounded on the north by the steep and rugged Santa Monica Mountains, on the east by Topanga Canyon and the City of Los Angeles boundary, on the west by Ventura County, and on the south by the Pacific Ocean. Waterworks District No. 29 occupies an area of about 47 square miles (30,000 acres).

Los Angeles County Waterworks District No. 29 Water System
Priority Capital Deficiencies Improvement



COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

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MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: WW-2

October 15, 2020

Mr. Jairo Avila
Tribal Historic and Cultural Preservation Officer
Fernandeño Tataviam Band of Mission Indians
1019 Second Street
San Fernando, CA 91340

Dear Mr. Avila:

COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE REQUEST
CONSULTATION ON TRIBAL CULTURAL RESOURCES FOR
REVISED LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU,
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MARK PESTRELLA
Director of Public Works

RUSS BRYDEN
Acting Assistant Deputy Director
Waterworks Division

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8	Big Rock Bypass Improvements	19562 to 19742 PCH, Malibu, 90265	Construct a 1,500-foot bypass for the region's mainline. The bypass would consist of three parallel pipelines in PCH to preserve the integrity of the Malibu water supply and prevent water leaks below PCH at Big Rock. Replace three 10-inch-diameter and one 30-inch-diameter parallel water mains with three 18-inch-diameter steel water mains.
9	**Upper Encinal Tank Improvements**	**32911 W. Camino De Buena Ventura, Malibu, 90265**	**Replace an aging 70,000-gallon tank with a 225,000-gallon tank.**

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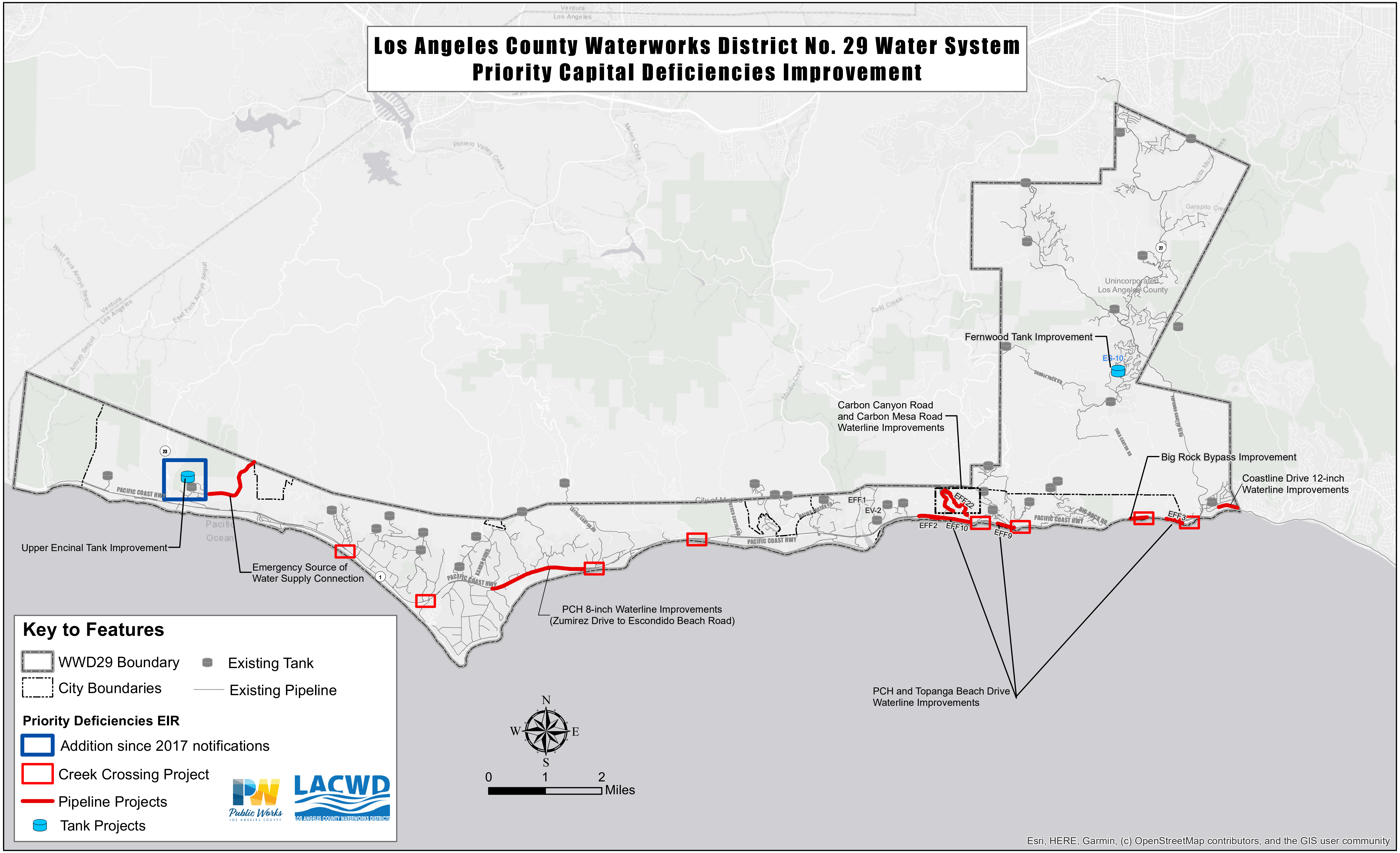
Los Angeles County Waterworks District No. 29 Water System
Priority Capital Deficiencies Improvement



COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

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MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: WW-2

October 15, 2020

Mr. Lee Clauss
San Manuel Band of Mission Indians
26569 Community Center Drive
Highland, CA 92343

Dear Mr. Clauss:

COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE REQUEST
CONSULTATION ON TRIBAL CULTURAL RESOURCES FOR
REVISED LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU,
PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS

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Director of Public Works

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Acting Assistant Deputy Director
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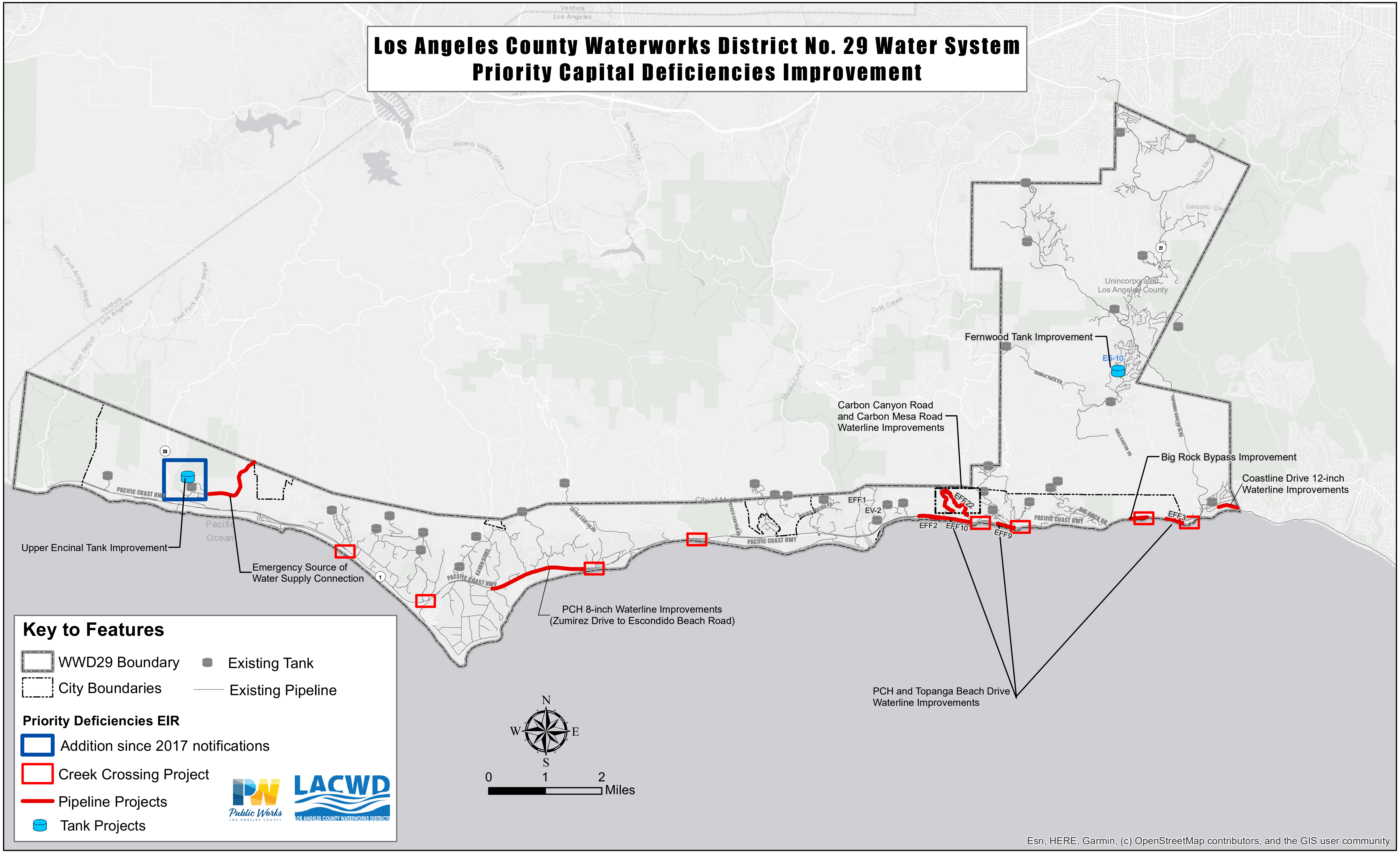
8	Big Rock Bypass Improvements	19562 to 19742 PCH, Malibu, 90265	Construct a 1,500-foot bypass for the region's mainline. The bypass would consist of three parallel pipelines in PCH to preserve the integrity of the Malibu water supply and prevent water leaks below PCH at Big Rock. Replace three 10-inch-diameter and one 30-inch-diameter parallel water mains with three 18-inch-diameter steel water mains.
9	**Upper Encinal Tank Improvements**	**32911 W. Camino De Buena Ventura, Malibu, 90265**	**Replace an aging 70,000-gallon tank with a 225,000-gallon tank.**

Location: The proposed project, which consists of several separate improvements, would be located in Waterworks District No. 29's service area (**attached map**). Waterworks District No. 29's water service area consists of the City of Malibu and the unincorporated area of Topanga. The City of Malibu is located on a narrow strip of land along the coastline with numerous canyons extending northward. Waterworks District No. 29 service area is bounded on the north by the steep and rugged Santa Monica Mountains, on the east by Topanga Canyon and the City of Los Angeles boundary, on the west by Ventura County, and on the south by the Pacific Ocean. Waterworks District No. 29 occupies an area of about 47 square miles (30,000 acres).

Los Angeles County Waterworks District No. 29 Water System
Priority Capital Deficiencies Improvement



Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

October 15, 2020

IN REPLY PLEASE
REFER TO FILE: WW-2

Mr. Octavio Escobedo, Tribal Chair
Tejon Indian Tribe
1761 Hasti Acres Drive, Suite 108
Bakersfield, CA 93309

Dear Mr. Escobedo:

**COUNTY OF LOS ANGELES ASSEMBLY BILL 52
FORMAL NOTIFICATION OF DEADLINE REQUEST
CONSULTATION ON TRIBAL CULTURAL RESOURCES FOR
REVISED LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29, MALIBU,
PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS**

Los Angeles County Waterworks District No. 29, Malibu, through the Los Angeles County Public Works, is the lead agency for compliance with the California Environmental Quality Act for Priority Capital Deficiencies Improvements in the City of Malibu and Topanga area. In November 2017, we contacted you in compliance with California Assembly Bill 52, including the California Public Resources Code Section 21080.3.1, because you are listed as the tribal contact person in a tribal request for notice of proposed projects in this geographic area. An additional water system improvement has been added to the proposed project. These improvements are within a previously disturbed site and are adjacent to the improvements identified in 2017. The modified project description and modified map are enclosed.

If you wish to consult on the additional proposed improvements, please send a written request for consultation to the address on page 2 within 30 days of receipt of this notice. If you do not wish to initiate formal consultation on the additional improvements, no response to this notice is needed. If you do not wish to formally consult, you may participate in the California Environmental Quality Act process for this project on any issue of concern as an interested California Native American tribe, person, citizen, or member of the public.

Please send written responses for the proposed project to:

Mr. Eduardo Maguino, Project Manager
Los Angeles County Public Works
Waterworks Division
P.O. Box 1460
Alhambra, CA 91802-1460
E-mail: waterworksprojects@pw.lacounty.gov

If you have any questions, please contact Mr. Maguino, Project Manager, at (626) 300-3318 or waterworksprojects@pw.lacounty.gov.

Very truly yours,

MARK PESTRELLA
Director of Public Works

RUSS BRYDEN
Acting Assistant Deputy Director
Waterworks Division

AFQ:lb
H:\WWHOME\ADMIN\LETTERS\2020\LR313.DOCX

Enc.

The changes from the November 2017 notification are listed in **bold** print below and outlined in blue on the attached map.

Project Name: Los Angeles County Waterworks District No. 29 Priority Capital Deficiencies Improvements

Proposed Project: Public Works has identified numerous capital infrastructure improvements in Waterworks District (WWD) 29 that would provide a more reliable water system. Public Works is committed to completing the most critical projects in WWD 29 over the next 10 years in order to provide a more reliable water system for existing customers. The **nine** projects that comprise the proposed project would correct the most critical capital infrastructure deficiencies to provide a more reliable water system for existing customers. The projects will be analyzed at a project level. The **nine** projects, listed in Table 1 and shown on **the attached map**, were identified based on operational imperatives, importance to overall system, and capacity. The proposed project includes: the demolition of two water tanks and construction of one tank reservoir in the unincorporated area of Topanga**; replacement of a tank in the City of Malibu**; replacement of approximately 34,300 feet of underground water pipeline in the City of Malibu, 19,000 feet of which are along Pacific Coast Highway (PCH); construction of approximately 6,300 feet of new underground pipeline in the City of Malibu; and repairing several creek crossing locations by replacing and recoating segments of pipe and air release valves on PCH. The pipeline segments would be constructed underground in existing roadways. Approximate addresses are provided in Table 1.

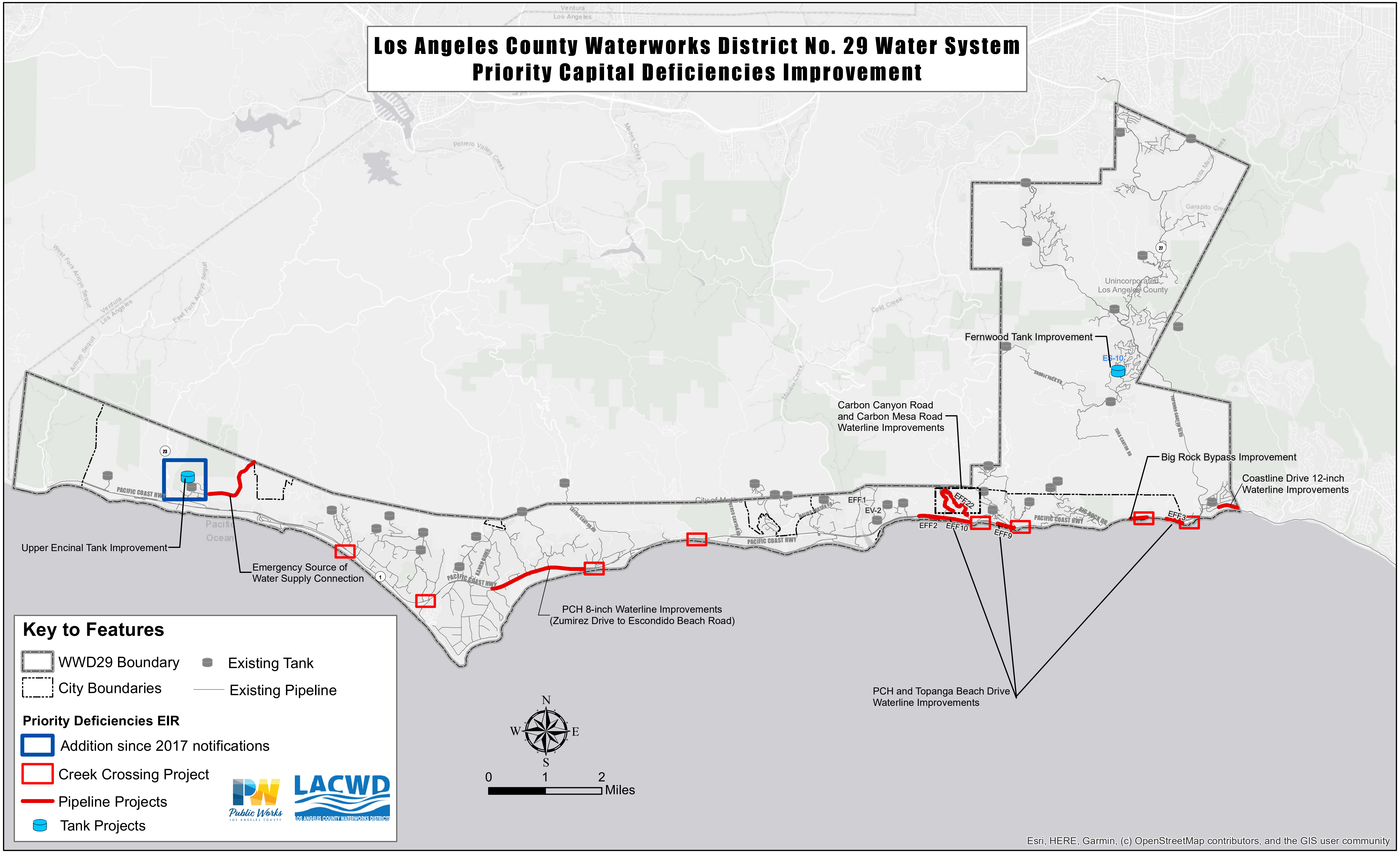
Table 1: Waterworks District No. 29 Proposed Project

	Project	Approximate Address	Description
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements	3873 Carbon Canyon Road to 22576 Carbon Mesa Road, Malibu, 90265	Replace over 7,000 feet of aging and severely deteriorating waterlines that are subject to leaks, ranging in size from 1.5 to 4 inches in diameter, with 8- and 12-inch-diameter steel pipe.
2	Coastline Drive 12-Inch Waterline Improvements	18000 to 18303 Coastline Drive, Malibu, 90265	Replace over 2,000 feet of aging and severely deteriorating waterlines that are subject to leaks by replacing a 12-inch-diameter waterline with a 12-inch-diameter steel waterline.
3	Waterworks District No. 29 Creek Crossing Repair Project	18788 PCH, Malibu, 90265 19399 PCH, Malibu, 90265 21203 PCH, Malibu, 90265 21857 PCH, Malibu, 90265 25712 PCH, Malibu, 90265 27519 PCH, Malibu, 90265 29497 PCH, Malibu, 90265 30626 PCH, Malibu, 90265	Repair the region's water main at several creek crossing locations on PCH. The waterline at these locations is aging, severely deteriorating, and subject to leaks.

	Project	Approximate Address	Description
4	Fernwood Tank Improvement	19837 Horseshoe Drive, Topanga, 90290	Replace two aging and severely deteriorating 50,000-gallon tanks with a single 300,000-gallon tank.
5	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	27200 to 28734 PCH, Malibu, 90265	Replace over 9,500 feet of aging and deteriorating 6-inch-diameter waterline that is subject to leaks with an 8-inch-diameter steel waterline.
6	PCH and Topanga Beach Drive Waterline Improvements	18808 to 18980 PCH, Malibu, 90265 21150 to 21434 PCH, Malibu, 90265 21746 to 22716 PCH, Malibu, 90265	Replace over 8,000 feet of aging, severely deteriorating waterlines that are subject to leaks, replacing 4- and 6-inch-diameter waterline with an 8-inch-diameter steel waterline.
7	Emergency Source of Water Supply Connection (Las Virgenes Connection)	3525 to 4400 Encinal Canyon Road, Malibu, 90265	Construct 6,300 feet of 12-inch-diameter emergency use steel transmission waterline to connect to Las Virgenes Municipal Water District to provide a mutual water source capability for the region in case of emergencies if the 30-inch-diameter mainline is interrupted.
8	Big Rock Bypass Improvements	19562 to 19742 PCH, Malibu, 90265	Construct a 1,500-foot bypass for the region's mainline. The bypass would consist of three parallel pipelines in PCH to preserve the integrity of the Malibu water supply and prevent water leaks below PCH at Big Rock. Replace three 10-inch-diameter and one 30-inch-diameter parallel water mains with three 18-inch-diameter steel water mains.
9	**Upper Encinal Tank Improvements**	**32911 W. Camino De Buena Ventura, Malibu, 90265**	**Replace an aging 70,000-gallon tank with a 225,000-gallon tank.**

Location: The proposed project, which consists of several separate improvements, would be located in Waterworks District No. 29's service area (**attached map**). Waterworks District No. 29's water service area consists of the City of Malibu and the unincorporated area of Topanga. The City of Malibu is located on a narrow strip of land along the coastline with numerous canyons extending northward. Waterworks District No. 29 service area is bounded on the north by the steep and rugged Santa Monica Mountains, on the east by Topanga Canyon and the City of Los Angeles boundary, on the west by Ventura County, and on the south by the Pacific Ocean. Waterworks District No. 29 occupies an area of about 47 square miles (30,000 acres).

Los Angeles County Waterworks District No. 29 Water System
Priority Capital Deficiencies Improvement



Appendix A5
Scoping Meeting Presentation

CEQA Process

- California Environmental Quality Act (CEQA)
- Purpose
  - Disclose to public significant environmental effects and agencies decision-making process
  - Prevent or minimize damage to the environment
  - Improve interagency coordination
  - **Enhance public participation in environmental review process**
- Environmental Impact Report (EIR)

CEQA Process

NOTICE OF PREPARATION – EIR

SCOPING MEETING

We are here

PREPARE DRAFT EIR

NOTICE OF COMPLETION

PUBLIC COMMENT PERIOD

RESPOND TO COMMENTS

PREPARE FINAL EIR

NOTICE OF DETERMINATION

CEQA Process

- What is "scoping"?
  - Opportunity for public to participate in CEQA process
  - Allows public to provide input on potential impacts to be analyzed in the EIR
- How to provide input
  - Verbal comments tonight
  - Written comments on cards provided
  - Send comments by mail or email

Appendix A6
Scoping Comment Cards

County of Los Angeles Department of Public Works
Los Angeles County Waterworks District No. 29
Priority Capital Deficiencies Improvements Project
Scoping Meeting Comment Card

Please use this form to provide feedback and comments to the County of Los Angeles Department of Public Works (Public Works) Waterworks District No. 29 on the proposed project and the content of the Draft Environmental Impact Report (EIR). Your input will become part of the public record and will be included in the Draft EIR.

Please check one: ☐ November 14, 2017 (Topanga) ☑ November 16, 2017 (Malibu)	
Name: Philip Faraci	Organization:
Address: 32700 Vista De Los Ondas St.	
Phone: 562-230-4166	Email Address: pafaraci@yahoo.com

Comment:
Why is there a change in the priority of the work?

☐ I wish to speak tonight.

County of Los Angeles Department of Public Works
Los Angeles County Waterworks District No. 29
Priority Capital Deficiencies Improvements Project
Scoping Meeting Comment Card

Please use this form to provide feedback and comments to the County of Los Angeles Department of Public Works (Public Works) Waterworks District No. 29 on the proposed project and the content of the Draft Environmental Impact Report (EIR). Your input will become part of the public record and will be included in the Draft EIR.

Please check one: ☐ November 14, 2017 (Topanga)	☑ November 16, 2017 (Malibu)
Name: JOHN MAZZA	Organization: Member Malibu Planning Comm
Address: 6613 ZUMIREZ DR	MALIBU, CA 90265
Phone: 310 457-2075	Email Address: res02igg@gte.net

Comment: PLEASE CONCENTRATE ON THE MAIN WATER SUPPLY especially in Western Malibu

☐ I wish to speak tonight.

County of Los Angeles Department of Public Works
Los Angeles County Waterworks District No. 29
Priority Capital Deficiencies Improvements Project
Scoping Meeting Comment Card

Please use this form to provide feedback and comments to the County of Los Angeles Department of Public Works (Public Works) Waterworks District No. 29 on the proposed project and the content of the Draft Environmental Impact Report (EIR). Your input will become part of the public record and will be included in the Draft EIR.

Please check one: ☐ November 14, 2017 (Topanga) ☐ November 16, 2017 (Malibu)

Name: Paul Grisanti

Organization: Malibu Pub. Works Comm.

Address: 23676 Malibu Rd

Phone: 310-505-5006

Email Address: Paul@MalibuRE.com

Comment:
What happened! Does anyone meet Fire Dept standards during this project? How much does the Dist. have set aside NOW?

☒ I wish to speak tonight.

County of Los Angeles Department of Public Works
Los Angeles County Waterworks District No. 29
Priority Capital Deficiencies Improvements Project
Scoping Meeting Comment Card

Please use this form to provide feedback and comments to the County of Los Angeles Department of Public Works (Public Works) Waterworks District No. 29 on the proposed project and the content of the Draft Environmental Impact Report (EIR). Your input will become part of the public record and will be included in the Draft EIR.

Please check one: ☑ November 14, 2017 (Topanga) ☐ November 16, 2017 (Malibu)

Name: PAUL GRZYNKOWSKI

Organization: RESIDENT HORSESHOE

Address: 19847 HORSESHOE DR

Phone: 455-3395

Email Address: PAULG@PURATIVE.COM

Comment: Concerns about Road access + Construction.

☑ I wish to speak tonight.

County of Los Angeles Department of Public Works
Los Angeles County Waterworks District No. 29
Priority Capital Deficiencies Improvements Project
Scoping Meeting Comment Card

Please use this form to provide feedback and comments to the County of Los Angeles Department of Public Works (Public Works) Waterworks District No. 29 on the proposed project and the content of the Draft Environmental Impact Report (EIR). Your input will become part of the public record and will be included in the Draft EIR.

Please check one: ☐ November 14, 2017 (Topanga) ☒ November 16, 2017 (Malibu)

Name: ALY DUNNE	Organization: Coldwell Banker
Address: 29160 Heathercliff road #4091 Malibu CA 90264	
Phone: 310 321 2571	Email Address: alydunne@gmail.com.

Comment:

Encinal Cyn was on the schedule to be updated with new pipes + watertower starting last Quarter in 2018 - Now it is off the list. This has effected my clients so badly, and for one couple, who've been waiting for 10 years - its ~~[illegible]~~ effected them terribly - please put Encenal back on the list

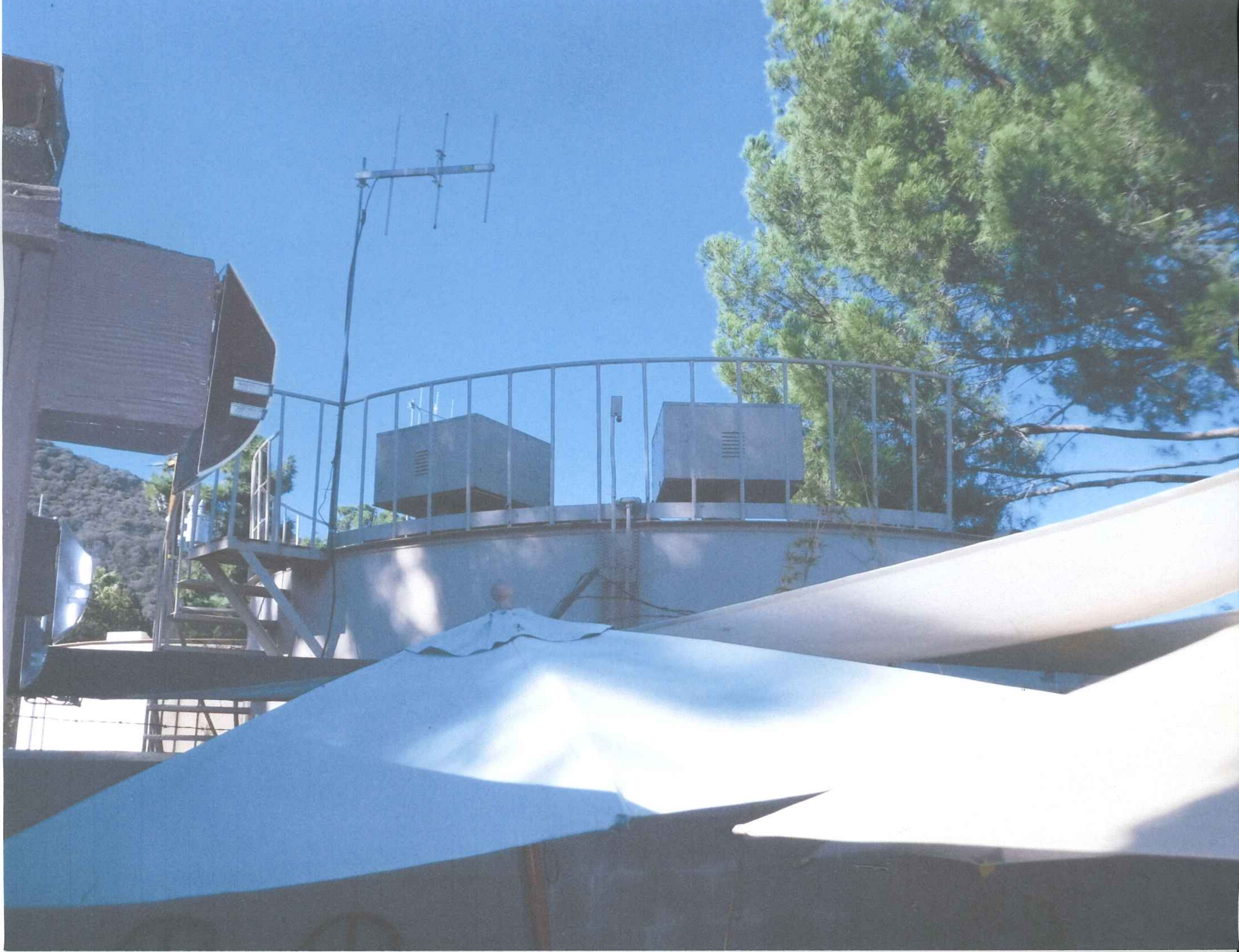
☒ I wish to speak tonight.

David Reitman – engineer for water
29

Mail comments to:

or email to:
waterworksprojects@dpw.lacounty.gov

Alma Fuentes Quintana, Project Manager
County of Los Angeles Department of Public Works
Waterworks Division
P.O. Box 1460
Alhambra, CA 91802-1460



Appendix A7
Scoping Notes: Topanga

Los Angeles County Waterworks District No. 29

Priority Capital Deficiencies Improvements

Scoping Meeting, Topanga, November 14, 2017

Topics Discussed

1. **Horseshoe-Fernwood Tanks**

   Narrow cul-de-sac, houses close (near as 3 feet)

   Construction impacts: fire (equipment, access)

   How will old tanks be removed?

   Configuration of tanks?

   What materials for tanks?

2. **Geology**

   Landslide

   Take cores

3. **Timing of construction**

4. **Noise**

   Home-based businesses

   Recording studios

5. **Access during construction**

   Staging areas for trucks?

   Street conditions to support trucks?

6. **Fire flow to neighbors that are deficient**

7. **Environmental process is too slow, expensive**

Appendix A8
Scoping Notes: Malibu

Los Angeles County Waterworks District No. 29

Priority Capital Deficiencies Improvements

Scoping Meeting, Malibu, November 16, 2017

Topics Discussed

1. **Why has priority list changed?**

   Lack of adequate service holding up building

2. **Traffic and access during construction**

Appendix B

Air Quality Data

LACDPW District 29 Waterworks

Construction Schedule and Assumptions

		2020												2021												2022												2023												2024												2025												2026											
	Project Element	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements																		🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦																																																											
2	Coastline Drive 12-Inch Waterline Improvement																					🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧																																																												
3	District No. 29 Creek Crossing Repair Project							🟦	🟦	🟦	🟦	🟦	🟦	🟦																																																																									
4	Fernwood Tank Improvement																																				🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦																																																	
5	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)						🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧																																																																										
6	PCH and Topanga Beach Drive Waterline Improvements																																																🟧	🟧	🟧	🟧	🟧																																							
7	Emergency Source of Water Supply Connection (Las Virgenes Connection)																																																																				🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦								
8	Big Rock Bypass Improvements																																																																												🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧			
	OVERLAP							3,5	3,5	3,5	3,5	3,5	3,5	3,5								1,2	1,2	1,2	1,2	1,2																																																					7,8	7,8	7,8	7,8								

	Project Element	Project Length (ft)	Project Length (mi)	Soil Export (cy/day)	Soil Import (cy/day)	Export (cy/day)	Import (cy/day)
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements	7239	1.37	89	89	15	15
2	Coastline Drive 12-Inch Waterline Improvement	2000	0.38	89	89	15	15
3	District No. 29 Creek Crossing Repair Project	3900	0.74	0	0	0	0
4	Fernwood Tank Improvement	Not linear	Not linear	33	0	0	33
5	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	9500	1.80	89	89	15	15
6	PCH and Topanga Beach Drive Waterline Improvements	8000	1.52	89	89	15	15
7	Emergency Source of Water Supply Connection (Las Virgenes Connection)	6300	1.19	89	89	15	15
8	Big Rock Bypass Improvements	1500	0.28	89	89	15	15

Assumptions

a. All project elements modeled as 4) Other Linear Project Type.
b. Soil export assumes 100 linear feet of pipeline would be replaced per day for project elements 1, 2, 5, 6, 7, and 8, with an excvation depth of 6 feet and width of 4 feet. ~89 cy/day. Assumptions confirmed as appropriate by Eduardo Maguino, LACDPW Civil Engineer, email dated 4/8/2019
c. All soil export is assumed to be disposed of offsite (default model round trip length of 30 miles used)
d. Soil import assumes all excavated material is backfilled with new material. ~89 cy/day
e. Asphalt export assumes that the top 1 foot of the area excavated is asphalt and road base materials (100 linear feet x 1 foot depth x 4 foot width) ~15 cy/day
f. Asphalt import assumes all excavated asphalt material material is backfilled with new material. ~15 cy/day
g. Maximum disturbed area per day at each site would be 0.05 acres, which would allow for five 100'x4' excavation areas to be open at any given time.
h. Haul truck capacity assumed to be 20 cy.
i. All construction activities grouped into the Drainage/Utilities/Sub-Grade phase and equipment list based on list provided by LACDPW engineering staff. All equipment assumed to have model default horsepower and be running concurrently for 8 hours.
j. According to LACDPW, about 3 to 6 workers would be required at each site. Six workers were assumed, and model default round trip distance of 40 miles assumed)
k. Fernwood Tank Improvement - pad removal assumed to require 1,860 cy of export according to LACDPW engineering estimates; assumed to be divide evenly over 7-day grading/excavation stage.
l. Fernwood Tank Improvement - depth of 4', 30' diameter to accommodate foundation for 25' diameter tank and 3.5' minimum depth of foundation = 33 cy; aggregate base and AC pavement both modeled as asphalt import = 33 cy; all assumed in a single day
m. Fernwood Tank Improvement - assumed that approximately half of the 0.25-acre site would be disturbed per day during grading/excavation phase
n. Creek Crossing Repair - 0 cubic yards of import/export based on LACDPW engineering staff estimates; equipment list provided by LACDPW engineering staff. Assumed approximately 300 linear feet for each pipe replaced at the 7 locations (13 pipes crossing total)

LACDPW District 29 Waterworks

Daily Construction Emissions (Criteria and Precursor Pollutants)

REGIONAL MASS EMISSIONS

		ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)
		2020								
5	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	5.0	34.0	49.6	2.9	2.4	2.3	2.2	0.1	0.1
3	District No. 29 Creek Crossing Repair Project	5.0	33.9	48.6	3.4	2.4	2.4	2.2	0.2	0.1
	Maximum Concurrent Emissions	**10.0**	**67.9**	**98.2**	**6.2**	**4.7**	**4.7**	**4.4**	**0.3**	**0.2**
		2021								
5	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	5.0	34.0	49.6	2.9	2.4	2.3	2.2	0.1	0.1
3	District No. 29 Creek Crossing Repair Project	5.0	33.9	48.6	3.4	2.4	2.4	2.2	0.2	0.1
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements	4.7	33.4	46.4	2.7	2.2	2.1	2.0	0.1	0.1
2	Coastline Drive 12-Inch Waterline Improvement	4.4	33.0	44.0	2.5	2.0	2.0	1.9	0.1	0.1
	Maximum Concurrent Emissions	**10.0**	**67.9**	**98.2**	**6.2**	**4.7**	**4.7**	**4.4**	**0.3**	**0.2**
		2022								
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements	4.7	33.4	46.4	2.7	2.2	2.1	2.0	0.1	0.1
2	Coastline Drive 12-Inch Waterline Improvement	4.4	33.0	44.0	2.5	2.0	2.0	1.9	0.1	0.1
4	Fernwood Tank Improvement									
	Grading/Excavation	1.4	12.3	17.2	2.1	0.8	1.0	0.7	0.3	0.0
	Drainage/Utilities/Sub-Grade	1.3	11.9	9.4	1.8	0.5	0.7	0.4	0.3	0.0
	Maximum Concurrent Emissions	**9.1**	**66.5**	**90.4**	**5.2**	**4.2**	**4.0**	**3.8**	**0.3**	**0.2**
		2023								
4	Fernwood Tank Improvement									
	Grading/Excavation	1.4	12.3	17.2	2.1	0.8	1.0	0.7	0.3	0.0
	Drainage/Utilities/Sub-Grade	1.3	11.9	9.4	1.8	0.5	0.7	0.4	0.3	0.0
6	PCH and Topanga Beach Drive Waterline Improvements	3.7	31.7	34.8	2.0	1.5	1.5	1.3	0.1	0.1
	Maximum Concurrent Emissions	**3.7**	**31.7**	**34.8**	**2.1**	**1.5**	**1.5**	**1.3**	**0.3**	**0.1**
		2024								
6	PCH and Topanga Beach Drive Waterline Improvements	3.7	31.7	34.8	2.0	1.5	1.5	1.3	0.1	0.1
	Maximum Concurrent Emissions	**3.7**	**31.7**	**34.8**	**2.0**	**1.5**	**1.5**	**1.3**	**0.1**	**0.1**
		2025								
7	Emergency Source of Water Supply Connection (Las Virgenes Connection)	3.4	31.2	31.6	1.8	1.3	1.3	1.2	0.1	0.1
	Maximum Concurrent Emissions	**3.4**	**31.2**	**31.6**	**1.8**	**1.3**	**1.3**	**1.2**	**0.1**	**0.1**
		2026								
7	Emergency Source of Water Supply Connection (Las Virgenes Connection)	3.4	31.2	31.6	1.8	1.3	1.3	1.2	0.1	0.1
8	Big Rock Bypass Improvements	3.4	31.2	31.6	1.8	1.3	1.3	1.2	0.1	0.1
	Maximum Concurrent Emissions	**6.8**	**62.5**	**63.2**	**3.6**	**2.6**	**2.5**	**2.3**	**0.2**	**0.2**

SCAQMD Regional Mass Emissions Thresholds	75	550	100	150	N/A	55	N/A	N/A	150
Thresholds Exceeded?	No	No	No	No	N/A	No	N/A	N/A	No

LOCALIZED EMISSIONS

		ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
5	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)					
	Air Compressors	0.3	2.4	2.2	0.1	0.1
	Concrete/Industrial Saws	0.4	3.7	3.2	0.2	0.2
	Cranes	0.4	2.1	5.2	0.2	0.2
	Excavators	0.2	3.3	2.3	0.1	0.1
	Generator Sets	0.4	3.7	3.4	0.2	0.2
	Graders	0.5	1.8	6.2	0.2	0.2
	Off-Highway Trucks	0.6	3.7	5.9	0.2	0.2
	Rollers	0.2	1.9	2.0	0.1	0.1
	Rubber Tired Dozers	1.1	4.1	11.2	0.5	0.5
	Tractors/Loaders/Backhoes	0.4	4.5	4.0	0.2	0.2
	Welders	0.3	1.7	1.5	0.1	0.1
	Total On-Site	**4.9**	**32.9**	**47.1**	**2.3**	**2.1**
3	District No. 29 Creek Crossing Repair Project					
	Air Compressors	0.3	2.4	2.2	0.1	0.1
	Concrete/Industrial Saws	0.4	3.7	3.3	0.2	0.2
	Cranes	0.4	2.1	5.3	0.2	0.2
	Excavators	0.2	3.3	2.4	0.1	0.1
	Generator Sets	0.4	3.7	3.4	0.2	0.2
	Graders	0.5	1.8	6.3	0.2	0.2
	Off-Highway Trucks	0.7	3.8	6.2	0.2	0.2
	Rollers	0.2	1.9	2.1	0.1	0.1
	Rubber Tired Dozers	1.1	4.1	11.3	0.6	0.5
	Tractors/Loaders/Backhoes	0.4	4.6	4.2	0.3	0.2
	Welders	0.3	1.8	1.6	0.1	0.1
	Total On-Site	**5.0**	**33.1**	**48.1**	**2.3**	**2.2**
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements					
	Air Compressors	0.3	2.4	2.0	0.1	0.1
	Concrete/Industrial Saws	0.4	3.7	3.0	0.2	0.2
	Cranes	0.4	2.0	4.8	0.2	0.2
	Excavators	0.2	3.3	2.1	0.1	0.1
	Generator Sets	0.4	3.7	3.1	0.2	0.2
	Graders	0.4	1.8	5.8	0.2	0.2
	Off-Highway Trucks	0.6	3.6	5.1	0.2	0.2
	Rollers	0.2	1.9	1.9	0.1	0.1
	Rubber Tired Dozers	1.0	4.0	10.7	0.5	0.5
	Tractors/Loaders/Backhoes	0.4	4.5	3.7	0.2	0.2
	Welders	0.3	1.7	1.5	0.1	0.1
	Total On-Site	**4.6**	**32.4**	**43.8**	**2.1**	**1.9**
2	Coastline Drive 12-Inch Waterline Improvement					
	Air Compressors	0.3	2.4	2.0	0.1	0.1
	Concrete/Industrial Saws	0.4	3.7	2.9	0.2	0.2
	Cranes	0.4	1.9	4.5	0.2	0.2
	Excavators	0.2	3.3	2.0	0.1	0.1
	Generator Sets	0.3	3.7	3.0	0.2	0.2
	Graders	0.4	1.7	5.6	0.2	0.2
	Off-Highway Trucks	0.6	3.5	4.6	0.2	0.2
	Rollers	0.2	1.9	1.8	0.1	0.1
	Rubber Tired Dozers	0.9	3.8	9.9	0.5	0.4
	Tractors/Loaders/Backhoes	0.4	4.5	3.6	0.2	0.2
	Welders	0.3	1.7	1.5	0.1	0.1
	Total On-Site	**4.4**	**32.1**	**41.4**	**1.9**	**1.8**

4	Fernwood Tank Improvement					
	Grading/Excavation					
	Excavators	0.2	3.3	1.8	0.1	0.1
	Rubber Tired Dozers	0.8	3.6	8.8	0.4	0.4
	Tractors/Loaders/Backhoes	0.3	4.5	3.4	0.2	0.2
	Total On-Site	**1.4**	**11.3**	**13.9**	**0.7**	**0.6**
	Drainage/Utilities/Subgrade					
	Air Compressors	0.3	2.4	1.8	0.1	0.1
	Generator Sets	0.3	3.7	2.7	0.1	0.1
	Rollers	0.2	1.9	1.6	0.1	0.1
	Welders	0.5	3.4	2.8	0.1	0.1
	Total On-Site	**1.2**	**11.3**	**9.0**	**0.4**	**0.4**
6	PCH and Topanga Beach Drive Waterline Improvements					
	Air Compressors	0.2	2.4	1.6	0.1	0.1
	Concrete/Industrial Saws	0.3	3.7	2.4	0.1	0.1
	Cranes	0.3	1.8	3.6	0.1	0.1
	Excavators	0.2	3.3	1.4	0.1	0.1
	Generator Sets	0.3	3.7	2.6	0.1	0.1
	Graders	0.4	1.7	4.3	0.1	0.1
	Off-Highway Trucks	0.5	3.3	3.4	0.1	0.1
	Rollers	0.1	1.9	1.5	0.1	0.1
	Rubber Tired Dozers	0.7	3.1	7.1	0.3	0.3
	Tractors/Loaders/Backhoes	0.3	4.5	2.9	0.1	0.1
	Welders	0.2	1.7	1.4	0.0	0.0
	Total On-Site	**3.6**	**30.8**	**32.3**	**1.4**	**1.3**
7	Emergency Source of Water Supply Connection (Las Virgenes Connection)					
	Air Compressors	0.2	2.4	1.5	0.1	0.1
	Concrete/Industrial Saws	0.3	3.6	2.3	0.1	0.1
	Cranes	0.3	1.7	3.2	0.1	0.1
	Excavators	0.2	3.3	1.2	0.1	0.1
	Generator Sets	0.3	3.7	2.4	0.1	0.1
	Graders	0.3	1.6	3.5	0.1	0.1
	Off-Highway Trucks	0.5	3.2	2.9	0.1	0.1
	Rollers	0.1	1.8	1.4	0.1	0.1
	Rubber Tired Dozers	0.6	3.0	6.6	0.3	0.3
	Tractors/Loaders/Backhoes	0.3	4.5	2.7	0.1	0.1
	Welders	0.2	1.7	1.3	0.0	0.0
	Total On-Site	**3.3**	**30.4**	**29.0**	**1.2**	**1.1**
8	Big Rock Bypass Improvements					
	Air Compressors	0.2	2.4	1.5	0.1	0.1
	Concrete/Industrial Saws	0.3	3.6	2.3	0.1	0.1
	Cranes	0.3	1.7	3.2	0.1	0.1
	Excavators	0.2	3.3	1.2	0.1	0.1
	Generator Sets	0.3	3.7	2.4	0.1	0.1
	Graders	0.3	1.6	3.5	0.1	0.1
	Off-Highway Trucks	0.5	3.2	2.9	0.1	0.1
	Rollers	0.1	1.8	1.4	0.1	0.1
	Rubber Tired Dozers	0.6	3.0	6.6	0.3	0.3
	Tractors/Loaders/Backhoes	0.3	4.5	2.7	0.1	0.1
	Welders	0.2	1.7	1.3	0.0	0.0
	Total On-Site	**3.3**	**30.4**	**29.0**	**1.2**	**1.1**

SCAQMD Localized Significance Thresholds (1-acre site with 25-m receptor distance in SRA 2)	N/A	562	103	4	3
Thresholds Exceeded?	N/A	No	No	No	No

LACDPW District 29 Waterworks

Total Construction Emissions (Greenhouse Gases)

		MT CO2e
5	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	818
3	District No. 29 Creek Crossing Repair Project	486
1	Carbon Canyon Road and Carbon Mesa Road Waterline Improvements	653
2	Coastline Drive 12-Inch Waterline Improvement	652
4	Fernwood Tank Improvement	171
6	PCH and Topanga Beach Drive Waterline Improvements	404
7	Emergency Source of Water Supply Connection (Las Virgenes Connection)	965
8	Big Rock Bypass Improvements	723
	TOTAL	**4871**
	Amortized Emissions (30-year amortization period)	**162**

LACDPW District 29 Waterworks

Energy Conversions

Construction

1	2	3		4	5	6
C02 (metric tons)	**pounds per ton**	**pounds CO2**	**kg of CO2 per gallon of motor gasoline**	**pounds of CO2 per gallon diesel**	**gallons diesel**	**Btu/gal (gross)**
4,871.33	2,000	9,742,662	10.21	22.51	432,831	138,700
		=Col 1* Col 2			=Col 3 / Col 4	
Road Construction Emissions Model output			Climate Registry 2017	Conversion factor		Oak Ridge National Lab 2019

7
MMBTU
60,033.63
=Col 5*Col6/1 mill

Construction MMBTU	**60,034**

Sources:

Oak Ridge National Laboratory. 2019. Transportation Energy Data Book, Edition 37. Table B.4: Heat Content for Various Fuels.

Climate Registry. 2017. Default Emissions Factors. Table 13.1.1.

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> 01 Carbon Cyn and Carbon Mesa Rd Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	4.65	33.44	46.41	2.67	2.17	0.50	2.08	1.98	0.10	0.08	8,050.97	1.63	0.28	8,175.90
Paving	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
Maximum (pounds/day)	4.65	33.44	46.41	2.67	2.17	0.50	2.08	1.98	0.10	0.08	8,050.97	1.63	0.28	8,175.90
Total (tons/construction project)	0.41	2.94	4.08	0.23	0.19	0.04	0.18	0.17	0.01	0.01	708.49	0.14	0.02	719.48

Notes:

Project Start Year -> 2021

Project Length (months) -> 8

Total Project Area (acres) -> 10

Maximum Area Disturbed/Day (acres) -> 0

Water Truck Used? -> Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	178	30	270	60	240	30
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 01 Carbon Cyn and Carbon Mesa Rd Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	0.41	2.94	4.08	0.23	0.19	0.04	0.18	0.17	0.01	0.01	708.49	0.14	0.02	652.71
Paving	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
Maximum (tons/phase)	0.41	2.94	4.08	0.23	0.19	0.04	0.18	0.17	0.01	0.01	708.49	0.14	0.02	652.71
Total (tons/construction project)	0.41	2.94	4.08	0.23	0.19	0.04	0.18	0.17	0.01	0.01	708.49	0.14	0.02	652.71

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model

Version 9.0.0

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	01 Carbon Cyn and Carbon Mesa Rd	
Construction Start Year	2021	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	8.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	1.37	miles
Total Project Area	10.00	acres
Maximum Area Disturbed/Day	0.05	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	89.00	89.00
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	15.00	15.00
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.00	0.80		1/1/2021
Grading/Excavation	0.00	3.20		1/1/2021
Drainage/Utilities/Sub-Grade	8.00	2.80	6/1/2021	1/1/2021
Paving	0.00	1.20		9/2/2021
Totals (Months)		8		

Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			9	270.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,775.46	0.00	0.28	1,858.68
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.02	0.25	1.90	0.07	0.03	0.01	1,056.84	0.00	0.17	1,106.37
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.02	0.17	0.01	0.00	0.00	93.00	0.00	0.01	97.36
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.02	0.17	0.01	0.00	0.00	93.00	0.00	0.01	97.36

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			2	60.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,775.46	0.00	0.28	1,858.68
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.06	0.42	0.01	0.01	0.00	234.85	0.00	0.04	245.86
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.04	0.00	0.00	0.00	20.67	0.00	0.00	21.64
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.04	0.00	0.00	0.00	20.67	0.00	0.00	21.64

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
User Input				
Miles/ one-way trip	20			
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing			0	0.00
No. of employees: Grading/Excavation			0	0.00
No. of employees: Drainage/Utilities/Sub-Grade	6		12	240.00
No. of employees: Paving			0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.02	1.09	0.10	0.05	0.02	0.00	338.42	0.00	0.01	340.87
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	1.17	2.93	0.34	0.00	0.00	0.00	72.53	0.08	0.04	85.02
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.04	0.65	0.06	0.02	0.01	0.00	180.98	0.00	0.01	182.61
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.06	0.01	0.00	0.00	0.00	15.93	0.00	0.00	16.07
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.06	0.01	0.00	0.00	0.00	15.93	0.00	0.00	16.07

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values	Calculated	User Override of	Default Values	Calculated
User Input	Default # Water Trucks	Number of Water Trucks	Round Trips/Vehicle/Day	Round Trips/Vehicle/Day	Trips/day	Miles/Round Trip	Miles/Round Trip	Daily VMT
Grubbing/Land Clearing - Exhaust								0.00
Grading/Excavation - Exhaust								0.00
Drainage/Utilities/Subgrade	1		1.00			30.00		30.00
Paving								0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,775.46	0.00	0.28	1,858.68
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.03	0.21	0.01	0.00	0.00	117.43	0.00	0.02	122.93
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.02	0.00	0.00	0.00	10.33	0.00	0.00	10.82
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.02	0.00	0.00	0.00	10.33	0.00	0.00	10.82

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			0.50	0.04	0.10	0.01

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Grading/Excavation	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.29	2.42	2.02	0.12	0.12	0.00	375.26	0.03	0.00	376.75
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.38	3.67	3.01	0.17	0.17	0.01	592.67	0.03	0.00	594.85
1.00			Model Default Tier	Cranes	0.41	1.97	4.77	0.19	0.18	0.01	558.75	0.18	0.01	564.77
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.23	3.27	2.11	0.10	0.09	0.01	500.17	0.16	0.00	505.56
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.35	3.68	3.14	0.17	0.17	0.01	623.04	0.03	0.00	625.22
1.00			Model Default Tier	Graders	0.45	1.76	5.84	0.19	0.17	0.01	641.63	0.21	0.01	648.55
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.60	3.57	5.11	0.19	0.17	0.01	1,278.58	0.41	0.01	1,292.35
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.19	1.88	1.90	0.12	0.11	0.00	254.09	0.08	0.00	256.83
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Dozers	1.02	3.98	10.70	0.52	0.48	0.01	827.31	0.27	0.01	836.22
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.37	4.51	3.74	0.22	0.20	0.01	601.89	0.19	0.01	608.36
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Welders	0.30	1.72	1.50	0.07	0.07	0.00	207.48	0.03	0.00	208.66

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles		Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade		pounds per day		4.58	32.45	43.82	2.05	1.93	0.07	6,460.87	1.63	0.06	6,518.12
	Drainage/Utilities/Sub-Grade		tons per phase		0.40	2.86	3.86	0.18	0.17	0.01	568.56	0.14	0.00	573.59

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>			0.40	2.86	3.86	0.18	0.17	0.01	568.56	0.14	0.00	573.59

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> 02 Coastline Drive 12-Inch Waterline

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	4.44	33.05	43.98	2.53	2.03	0.50	1.96	1.85	0.10	0.08	8,039.64	1.63	0.28	8,164.01
Paving	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
Maximum (pounds/day)	4.44	33.05	43.98	2.53	2.03	0.50	1.96	1.85	0.10	0.08	8,039.64	1.63	0.28	8,164.01
Total (tons/construction project)	0.39	2.91	3.87	0.22	0.18	0.04	0.17	0.16	0.01	0.01	707.49	0.14	0.02	718.43

Notes: Project Start Year -> 2021
Project Length (months) -> 8
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 0
Water Truck Used? -> Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	178	30	270	60	240	30
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 02 Coastline Drive 12-Inch Waterline

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	0.39	2.91	3.87	0.22	0.18	0.04	0.17	0.16	0.01	0.01	707.49	0.14	0.02	651.76
Paving	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
Maximum (tons/phase)	0.39	2.91	3.87	0.22	0.18	0.04	0.17	0.16	0.01	0.01	707.49	0.14	0.02	651.76
Total (tons/construction project)	0.39	2.91	3.87	0.22	0.18	0.04	0.17	0.16	0.01	0.01	707.49	0.14	0.02	651.76

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model **Version 9.0.0**

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

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Input Type

Project Name	02 Coastline Drive 12-Inch Waterline	
Construction Start Year	2021	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	8.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.38	miles
Total Project Area	1.00	acre
Maximum Area Disturbed/Day	0.05	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	89.00	89.00
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	15.00	15.00
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation	
Off-road Equipment Emissions Mitigation	

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation).
Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.00	0.80		1/1/2021
Grading/Excavation	0.00	3.20		1/1/2021
Drainage/Utilities/Sub-Grade	8.00	2.80	9/1/2021	1/1/2021
Paving	0.00	1.20		9/2/2021
Totals (Months)	8			

Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			9	270.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,763.85	0.00	0.28	1,846.52
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.02	0.25	1.90	0.07	0.03	0.01	1,049.93	0.00	0.17	1,099.14
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.02	0.17	0.01	0.00	0.00	92.39	0.00	0.01	96.72
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.02	0.17	0.01	0.00	0.00	92.39	0.00	0.01	96.72

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			2	60.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,763.85	0.00	0.28	1,846.52
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.06	0.42	0.01	0.01	0.00	233.32	0.00	0.04	244.25
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.04	0.00	0.00	0.00	20.53	0.00	0.00	21.49
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.04	0.00	0.00	0.00	20.53	0.00	0.00	21.49

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions User Input	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
Miles/ one-way trip	20			
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing			0	0.00
No. of employees: Grading/Excavation			0	0.00
No. of employees: Drainage/Utilities/Sub-Grade	6		12	240.00
No. of employees: Paving			0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.02	1.05	0.09	0.05	0.02	0.00	334.23	0.00	0.01	336.59
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	1.14	2.90	0.33	0.00	0.00	0.00	71.67	0.08	0.03	83.90
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.04	0.63	0.06	0.02	0.01	0.00	178.74	0.00	0.00	180.31
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.06	0.00	0.00	0.00	0.00	15.73	0.00	0.00	15.87
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.06	0.00	0.00	0.00	0.00	15.73	0.00	0.00	15.87

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions User Input	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust								0.00
Grading/Excavation - Exhaust								0.00
Drainage/Utilities/Subgrade	1		1.00			30.00		30.00
Paving								0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,763.85	0.00	0.28	1,846.52
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.03	0.21	0.01	0.00	0.00	116.66	0.00	0.02	122.13
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.02	0.00	0.00	0.00	10.27	0.00	0.00	10.75
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.02	0.00	0.00	0.00	10.27	0.00	0.00	10.75

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			0.50	0.04	0.10	0.01

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.28	2.42	1.96	0.12	0.12	0.00	375.26	0.03	0.00	376.73
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.37	3.67	2.92	0.16	0.16	0.01	592.67	0.03	0.00	594.83
1.00			Model Default Tier	Cranes	0.39	1.94	4.51	0.19	0.17	0.01	558.79	0.18	0.01	564.81
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.22	3.26	1.96	0.10	0.09	0.01	500.10	0.16	0.00	505.50
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.34	3.68	3.05	0.16	0.16	0.01	623.04	0.03	0.00	625.20
1.00			Model Default Tier	Graders	0.43	1.74	5.59	0.18	0.16	0.01	641.48	0.21	0.01	648.39
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.57	3.48	4.64	0.17	0.16	0.01	1,278.76	0.41	0.01	1,292.53
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.18	1.87	1.82	0.11	0.10	0.00	254.10	0.08	0.00	256.83
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Dozers	0.94	3.81	9.88	0.47	0.44	0.01	827.19	0.27	0.01	836.10
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.35	4.50	3.57	0.20	0.19	0.01	602.14	0.19	0.01	608.62
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Welders	0.29	1.71	1.49	0.07	0.07	0.00	207.48	0.03	0.00	208.64

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	4.37	32.08	41.38	1.92	1.80	0.07	6,461.00	1.62	0.06	6,518.18
Drainage/Utilities/Sub-Grade	tons per phase	0.38	2.82	3.64	0.17	0.16	0.01	568.57	0.14	0.00	573.60

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>			0.38	2.82	3.64	0.17	0.16	0.01	568.57	0.14	0.00	573.60

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> 03 Creek Crossing Repair

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	5.02	33.88	48.59	3.36	2.36	1.00	2.41	2.20	0.21	0.07	6,886.26	1.64	0.10	6,956.77
Paving	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
Maximum (pounds/day)	5.02	33.88	48.59	3.36	2.36	1.00	2.41	2.20	0.21	0.07	6,886.26	1.64	0.10	6,956.77
Total (tons/construction project)	0.39	2.61	3.74	0.26	0.18	0.08	0.19	0.17	0.02	0.01	530.24	0.13	0.01	535.67

Notes:

Project Start Year -> 2020

Project Length (months) -> 8

Total Project Area (acres) -> 1

Maximum Area Disturbed/Day (acres) -> 0

Water Truck Used? -> No

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	40	0	60	240	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 03 Creek Crossing Repair

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	0.39	2.61	3.74	0.26	0.18	0.08	0.19	0.17	0.02	0.01	530.24	0.13	0.01	485.96
Paving	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
Maximum (tons/phase)	0.39	2.61	3.74	0.26	0.18	0.08	0.19	0.17	0.02	0.01	530.24	0.13	0.01	485.96
Total (tons/construction project)	0.39	2.61	3.74	0.26	0.18	0.08	0.19	0.17	0.02	0.01	530.24	0.13	0.01	485.96

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model

Version 9.0.0

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	03 Creek Crossing Repair	
Construction Start Year	2020	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	8.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.74	miles
Total Project Area	1.00	acre
Maximum Area Disturbed/Day	0.05	acres
Water Trucks Used?	2	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	20.00	20.00
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.00	0.80		1/1/2020
Grading/Excavation	0.00	3.20		1/1/2020
Drainage/Utilities/Sub-Grade	7.00	2.80	7/1/2020	1/1/2020
Paving	0.00	1.20		8/1/2020
Totals (Months)	7			

Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.

Please note: You have entered a different number of months than the project length shown in cell D16.
Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
User Input					
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			0	0.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.03	0.11	0.05	0.02	1,798.60	0.00	0.28	1,882.90
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
User Input					
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			2	60.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.03	0.11	0.05	0.02	1,798.60	0.00	0.28	1,882.90
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.06	0.42	0.01	0.01	0.00	237.91	0.00	0.04	249.06
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.03	0.00	0.00	0.00	18.32	0.00	0.00	19.18
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.03	0.00	0.00	0.00	18.32	0.00	0.00	19.18

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
User Input				
Miles/ one-way trip	20			
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing			0	0.00
No. of employees: Grading/Excavation			0	0.00
No. of employees: Drainage/Utilities/Sub-Grade	6		12	240.00
No. of employees: Paving			0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.02	1.21	0.11	0.05	0.02	0.00	349.34	0.01	0.01	352.07
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	1.24	3.04	0.37	0.00	0.00	0.00	74.76	0.09	0.04	87.93
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.05	0.72	0.07	0.02	0.01	0.00	186.82	0.01	0.01	188.61
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.06	0.01	0.00	0.00	0.00	14.38	0.00	0.00	14.52
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.06	0.01	0.00	0.00	0.00	14.38	0.00	0.00	14.52

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions **User Input**	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust								0.00
Grading/Excavation - Exhaust								0.00
Drainage/Utilities/Subgrade								0.00
Paving								0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.03	0.11	0.05	0.02	1,798.60	0.00	0.28	1,882.90
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			1.00	0.08	0.21	0.02

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing

Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.32	2.44	2.22	0.14	0.14	0.00	375.26	0.03	0.00	376.82
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.41	3.68	3.26	0.19	0.19	0.01	592.67	0.04	0.00	594.92
1.00			Model Default Tier	Cranes	0.45	2.10	5.32	0.22	0.20	0.01	558.78	0.18	0.01	564.81
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.24	3.27	2.38	0.12	0.11	0.01	500.13	0.16	0.00	505.52
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.39	3.70	3.43	0.19	0.19	0.01	623.04	0.03	0.00	625.30
1.00			Model Default Tier	Graders	0.47	1.81	6.27	0.20	0.18	0.01	642.57	0.21	0.01	649.49
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.66	3.78	6.17	0.23	0.21	0.01	1,278.61	0.41	0.01	1,292.38
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.21	1.89	2.06	0.13	0.12	0.00	254.07	0.08	0.00	256.81
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Dozers	1.07	4.12	11.28	0.55	0.51	0.01	827.34	0.27	0.01	836.26
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.41	4.55	4.15	0.26	0.24	0.01	601.57	0.19	0.01	608.05
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Welders	0.34	1.76	1.56	0.09	0.09	0.00	207.48	0.03	0.00	208.75

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	4.97	33.11	48.10	2.32	2.18	0.07	6,461.53	1.64	0.06	6,519.10
Drainage/Utilities/Sub-Grade	tons per phase	0.38	2.55	3.70	0.18	0.17	0.01	497.54	0.13	0.00	501.97

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>		0.38	2.55	3.70	0.18	0.17	0.01	497.54	0.13	0.00	501.97

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> 04 Fernwood Tank Improvement

Project Phases (Pounds)	**ROG (lbs/day)**	**CO (lbs/day)**	**NOx (lbs/day)**	**Total PM10 (lbs/day)**	**Exhaust PM10 (lbs/day)**	**Fugitive Dust PM10 (lbs/day)**	**Total PM2.5 (lbs/day)**	**Exhaust PM2.5 (lbs/day)**	**Fugitive Dust PM2.5 (lbs/day)**	**SOx (lbs/day)**	**CO2 (lbs/day)**	**CH4 (lbs/day)**	**N2O (lbs/day)**	**CO2e (lbs/day)**
Grubbing/Land Clearing	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
Grading/Excavation	1.45	12.34	17.16	2.12	0.82	1.30	0.96	0.69	0.27	0.04	3,840.05	0.63	0.29	3,943.63
Drainage/Utilities/Sub-Grade	1.27	11.91	9.44	1.77	0.47	1.30	0.71	0.44	0.27	0.02	2,065.11	0.18	0.05	2,085.55
Paving	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
Maximum (pounds/day)	2.72	24.25	26.60	3.89	1.29	2.60	1.67	1.12	0.54	0.06	5,905.16	0.81	0.35	6,029.18
Total (tons/construction project)	0.11	1.05	0.85	0.16	0.04	0.11	0.06	0.04	0.02	0.00	186.61	0.02	0.01	188.64

Notes:
Project Start Year -> 2022
Project Length (months) -> 8
Total Project Area (acres) -> 0
Maximum Area Disturbed/Day (acres) -> 0
Water Truck Used? -> Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	266	0	420	0	240	30
Drainage/Utilities/Sub-Grade	33	33	0	60	240	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 04 Fernwood Tank Improvement

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	**ROG (tons/phase)**	**CO (tons/phase)**	**NOx (tons/phase)**	**Total PM10 (tons/phase)**	**Exhaust PM10 (tons/phase)**	**Fugitive Dust PM10 (tons/phase)**	**Total PM2.5 (tons/phase)**	**Exhaust PM2.5 (tons/phase)**	**Fugitive Dust PM2.5 (tons/phase)**	**SOx (tons/phase)**	**CO2 (tons/phase)**	**CH4 (tons/phase)**	**N2O (tons/phase)**	**CO2e (MT/phase)**
Grubbing/Land Clearing	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
Grading/Excavation	0.00	0.03	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	10.56	0.00	0.00	9.84
Drainage/Utilities/Sub-Grade	0.11	1.02	0.80	0.15	0.04	0.11	0.06	0.04	0.02	0.00	176.05	0.02	0.00	161.29
Paving	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
Maximum (tons/phase)	0.11	1.02	0.80	0.15	0.04	0.11	0.06	0.04	0.02	0.00	176.05	0.02	0.00	161.29
Total (tons/construction project)	0.11	1.05	0.85	0.16	0.04	0.11	0.06	0.04	0.02	0.00	186.61	0.02	0.01	171.13

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model Version 9.0.0

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

Input Type

Project Name	04 Fernwood Tank Improvement	
Construction Start Year	2022	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	8.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.10	miles
Total Project Area	0.25	acres
Maximum Area Disturbed/Day	0.13	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation	20.00		265.71
	Drainage/Utilities/Sub-Grade	20.00		33.00
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	33.00	
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation	
Off-road Equipment Emissions Mitigation	

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation).
Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.00	0.80		1/1/2022
Grading/Excavation	0.25	3.20	12/1/2022	1/1/2022
Drainage/Utilities/Sub-Grade	7.75	2.80	12/8/2022	1/9/2022
Paving	0.00	1.20		9/2/2022
Totals (Months)	8			

Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation	30.00			14	420.00
Miles/round trip: Drainage/Utilities/Sub-Grade				2	0.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.04	0.42	3.08	0.11	0.05	0.02	1,748.57	0.00	0.27	1,830.52
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	2.99	0.11	0.05	0.02	1,718.27	0.00	0.27	1,798.79
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.04	0.39	2.97	0.10	0.05	0.02	1,619.08	0.00	0.25	1,694.96
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	4.45	0.00	0.00	4.66
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.01	0.00	0.00	0.00	4.45	0.00	0.00	4.66

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			2	60.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.04	0.42	3.08	0.11	0.05	0.02	1,748.57	0.00	0.27	1,830.52
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	2.99	0.11	0.05	0.02	1,718.27	0.00	0.27	1,798.79
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.05	0.42	0.01	0.01	0.00	227.29	0.00	0.04	237.94
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.04	0.00	0.00	0.00	19.38	0.00	0.00	20.28
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.04	0.00	0.00	0.00	19.38	0.00	0.00	20.28

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions **User Input**	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
Miles/ one-way trip	20			
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing			0	0.00
No. of employees: Grading/Excavation	6		12	240.00
No. of employees: Drainage/Utilities/Sub-Grade	6		12	240.00
No. of employees: Paving			0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.02	1.00	0.08	0.05	0.02	0.00	328.72	0.00	0.01	330.96
Draining/Utilities/Sub-Grade (grams/mile)	0.02	0.92	0.07	0.05	0.02	0.00	318.74	0.00	0.01	320.78
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	1.11	2.85	0.32	0.00	0.00	0.00	70.54	0.08	0.03	82.43
Draining/Utilities/Sub-Grade (grams/trip)	1.05	2.76	0.29	0.00	0.00	0.00	68.48	0.07	0.03	79.79
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.04	0.60	0.05	0.02	0.01	0.00	175.80	0.00	0.00	177.29
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.49
Pounds per day - Drainage/Utilities/Sub-Grade	0.04	0.56	0.05	0.02	0.01	0.00	170.46	0.00	0.00	171.84
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.05	0.00	0.00	0.00	0.00	14.53	0.00	0.00	14.65
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.05	0.00	0.00	0.00	0.00	15.02	0.00	0.00	15.14

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions **User Input**	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust								0.00
Grading/Excavation - Exhaust	1		1.00			30.00		30.00
Drainage/Utilities/Subgrade								0.00
Paving								0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.04	0.42	3.08	0.11	0.05	0.02	1,748.57	0.00	0.27	1,830.52
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	2.99	0.11	0.05	0.02	1,718.27	0.00	0.27	1,798.79
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.03	0.21	0.01	0.00	0.00	115.65	0.00	0.02	121.07
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.33
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.33

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			1.30	0.00	0.27	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			1.30	0.11	0.27	0.02

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.20	3.26	1.78	0.09	0.08	0.01	500.02	0.16	0.00	505.41
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Dozers	0.84	3.58	8.79	0.42	0.38	0.01	827.04	0.27	0.01	835.94
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.33	4.48	3.35	0.18	0.17	0.01	602.48	0.19	0.01	608.96
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	1.37	11.31	13.92	0.68	0.63	0.02	1,929.53	0.62	0.02	1,950.31
Grading/Excavation	tons per phase	0.00	0.03	0.04	0.00	0.00	0.00	5.31	0.00	0.00	5.36

Drainage/Utilities/Subgrade	Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.26	2.42	1.75	0.10	0.10	0.00	375.26	0.02	0.00	376.67
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.31	3.67	2.74	0.13	0.13	0.01	623.04	0.03	0.00	625.12
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.15	1.85	1.62	0.09	0.08	0.00	254.11	0.08	0.00	256.85
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Welders	0.51	3.36	2.85	0.11	0.11	0.01	414.96	0.05	0.00	417.13

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Drainage/Utilities/Sub-Grade	pounds per day	1.23	11.30	8.96	0.43	0.42	0.02	1,667.36	0.18	0.01	1,675.77
	Drainage/Utilities/Sub-Grade	tons per phase	0.11	0.96	0.76	0.04	0.04	0.00	142.14	0.02	0.00	142.86

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>			0.11	0.99	0.80	0.04	0.04	0.00	147.45	0.02	0.00	148.22

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> 05 PCH 8-Inch Waterline

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	4.95	33.98	49.63	2.87	2.37	0.50	2.27	2.17	0.10	0.08	8,069.49	1.64	0.28	8,195.41
Paving	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
Maximum (pounds/day)	4.95	33.98	49.63	2.87	2.37	0.50	2.27	2.17	0.10	0.08	8,069.49	1.64	0.28	8,195.41
Total (tons/construction project)	0.54	3.74	5.46	0.32	0.26	0.06	0.25	0.24	0.01	0.01	887.64	0.18	0.03	901.50

Notes: Project Start Year -> 2020
Project Length (months) -> 10
Total Project Area (acres) -> 10
Maximum Area Disturbed/Day (acres) -> 0
Water Truck Used? -> Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	178	30	270	60	240	30
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 05 PCH 8-Inch Waterline

Project Phases (**Tons for all except CO2e. Metric tonnes for CO2e**)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	0.54	3.74	5.46	0.32	0.26	0.06	0.25	0.24	0.01	0.01	887.64	0.18	0.03	817.83
Paving	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
Maximum (tons/phase)	0.54	3.74	5.46	0.32	0.26	0.06	0.25	0.24	0.01	0.01	887.64	0.18	0.03	817.83
Total (tons/construction project)	0.54	3.74	5.46	0.32	0.26	0.06	0.25	0.24	0.01	0.01	887.64	0.18	0.03	817.83

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model Version 9.0.0
Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN
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Input Type

Project Name	05 PCH 8-Inch Waterline	
Construction Start Year	2020	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	10.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	1.80	miles
Total Project Area	10.00	acres
Maximum Area Disturbed/Day	0.05	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	89.00	89.00
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	15.00	15.00
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation	
Off-road Equipment Emissions Mitigation	

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation).
Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.00	1.00		1/1/2020
Grading/Excavation	0.00	4.00		1/1/2020
Drainage/Utilities/Sub-Grade	10.00	3.50	7/1/2020	1/1/2020
Paving	0.00	1.50		11/1/2020
Totals (Months)	10			

Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			9	270.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.04	0.11	0.05	0.02	1,792.81	0.00	0.28	1,876.83
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.03	0.25	1.88	0.07	0.03	0.01	1,067.17	0.00	0.17	1,117.18
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.03	0.21	0.01	0.00	0.00	117.39	0.00	0.02	122.89
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.03	0.21	0.01	0.00	0.00	117.39	0.00	0.02	122.89

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			2	60.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.04	0.11	0.05	0.02	1,792.81	0.00	0.28	1,876.83
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.06	0.42	0.01	0.01	0.00	237.15	0.00	0.04	248.26
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.01	0.05	0.00	0.00	0.00	26.09	0.00	0.00	27.31
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.01	0.05	0.00	0.00	0.00	26.09	0.00	0.00	27.31

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions **User Input**	User Override of Worker Commute Default Values	Default Values		
Miles/ one-way trip	20		Calculated Daily Trips	Calculated Daily VMT
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing			0	0.00
No. of employees: Grading/Excavation			0	0.00
No. of employees: Drainage/Utilities/Sub-Grade	6		12	240.00
No. of employees: Paving			0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.02	1.17	0.11	0.05	0.02	0.00	346.48	0.01	0.01	349.13
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	1.22	3.01	0.36	0.00	0.00	0.00	74.18	0.09	0.04	87.16
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.04	0.70	0.07	0.02	0.01	0.00	185.29	0.01	0.01	187.04
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.08	0.01	0.00	0.00	0.00	20.38	0.00	0.00	20.57
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.08	0.01	0.00	0.00	0.00	20.38	0.00	0.00	20.57

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions **User Input**	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust								0.00
Grading/Excavation - Exhaust								0.00
Drainage/Utilities/Subgrade	1		1.00			30.00		30.00
Paving								0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.04	0.11	0.05	0.02	1,792.81	0.00	0.28	1,876.83
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.03	0.21	0.01	0.00	0.00	118.57	0.00	0.02	124.13
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.02	0.00	0.00	0.00	13.04	0.00	0.00	13.65
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.02	0.00	0.00	0.00	13.04	0.00	0.00	13.65

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			0.50	0.06	0.10	0.01

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing

Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.31	2.43	2.16	0.14	0.14	0.00	375.26	0.03	0.00	376.80
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.40	3.68	3.19	0.19	0.19	0.01	592.67	0.04	0.00	594.90
1.00			Model Default Tier	Cranes	0.44	2.06	5.18	0.21	0.20	0.01	558.77	0.18	0.01	564.79
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.24	3.27	2.31	0.11	0.10	0.01	500.15	0.16	0.00	505.54
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.38	3.70	3.35	0.18	0.18	0.01	623.04	0.03	0.00	625.28
1.00			Model Default Tier	Graders	0.47	1.80	6.17	0.20	0.18	0.01	642.31	0.21	0.01	649.22
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.64	3.73	5.90	0.22	0.20	0.01	1,278.58	0.41	0.01	1,292.35
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.20	1.89	2.02	0.13	0.12	0.00	254.08	0.08	0.00	256.81
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Dozers	1.07	4.09	11.19	0.55	0.50	0.01	827.35	0.27	0.01	836.26
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.40	4.54	4.04	0.25	0.23	0.01	601.64	0.19	0.01	608.12
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Welders	0.33	1.75	1.55	0.08	0.08	0.00	207.48	0.03	0.00	208.73

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	4.88	32.94	47.06	2.25	2.12	0.07	6,461.32	1.64	0.06	6,518.80
Drainage/Utilities/Sub-Grade	tons per phase	0.54	3.62	5.18	0.25	0.23	0.01	710.74	0.18	0.01	717.07

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>			0.54	3.62	5.18	0.25	0.23	0.01	710.74	0.18	0.01	717.07

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> 06 PCH and Topanga Bch Dr. Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	3.65	31.66	34.84	1.99	1.49	0.50	1.45	1.35	0.10	0.08	7,975.56	1.61	0.27	8,096.72
Paving	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
Maximum (pounds/day)	3.65	31.66	34.84	1.99	1.49	0.50	1.45	1.35	0.10	0.08	7,975.56	1.61	0.27	8,096.72
Total (tons/construction project)	0.20	1.74	1.92	0.11	0.08	0.03	0.08	0.07	0.01	0.00	438.66	0.09	0.01	445.32

Notes: Project Start Year -> 2023
Project Length (months) -> 5
Total Project Area (acres) -> 10
Maximum Area Disturbed/Day (acres) -> 0
Water Truck Used? -> Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	178	30	270	60	240	30
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 06 PCH and Topanga Bch Dr. Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	0.20	1.74	1.92	0.11	0.08	0.03	0.08	0.07	0.01	0.00	438.66	0.09	0.01	403.99
Paving	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
Maximum (tons/phase)	0.20	1.74	1.92	0.11	0.08	0.03	0.08	0.07	0.01	0.00	438.66	0.09	0.01	403.99
Total (tons/construction project)	0.20	1.74	1.92	0.11	0.08	0.03	0.08	0.07	0.01	0.00	438.66	0.09	0.01	403.99

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model Version 9.0.0

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN
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MANAGEMENT DISTRICT

Input Type

Project Name	06 PCH and Topanga Bch Dr.	
Construction Start Year	2023	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	5.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	1.52	miles
Total Project Area	10.00	acres
Maximum Area Disturbed/Day	0.05	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	89.00	89.00
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	15.00	15.00
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation	
Off-road Equipment Emissions Mitigation	

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation).
Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.00	0.50		1/1/2023
Grading/Excavation	0.00	2.00		1/1/2023
Drainage/Utilities/Sub-Grade	5.00	1.75	12/1/2023	1/1/2023
Paving	0.00	0.75		6/3/2023
Totals (Months)	5			

Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			9	270.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.01	0.11	0.05	0.02	1,697.78	0.00	0.27	1,777.34
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.02	0.24	1.88	0.07	0.03	0.01	1,010.60	0.00	0.16	1,057.96
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.01	0.10	0.00	0.00	0.00	55.58	0.00	0.01	58.19
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.01	0.10	0.00	0.00	0.00	55.58	0.00	0.01	58.19

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			2	60.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.01	0.11	0.05	0.02	1,697.78	0.00	0.27	1,777.34
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.05	0.42	0.01	0.01	0.00	224.58	0.00	0.04	235.10
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.02	0.00	0.00	0.00	12.35	0.00	0.00	12.93
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.02	0.00	0.00	0.00	12.35	0.00	0.00	12.93

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions **User Input**	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
Miles/ one-way trip	20			
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing			0	0.00
No. of employees: Grading/Excavation			0	0.00
No. of employees: Drainage/Utilities/Sub-Grade	6		12	240.00
No. of employees: Paving			0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.01	0.85	0.07	0.05	0.02	0.00	308.86	0.00	0.01	310.74
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.99	2.68	0.27	0.00	0.00	0.00	66.44	0.07	0.03	77.18
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.03	0.52	0.04	0.02	0.01	0.00	165.18	0.00	0.00	166.46
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.03	0.00	0.00	0.00	0.00	9.08	0.00	0.00	9.16
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.03	0.00	0.00	0.00	0.00	9.08	0.00	0.00	9.16

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions **User Input**	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust								0.00
Grading/Excavation - Exhaust								0.00
Drainage/Utilities/Subgrade	1		1.00			30.00		30.00
Paving								0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.01	0.11	0.05	0.02	1,697.78	0.00	0.27	1,777.34
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.03	0.21	0.01	0.00	0.00	112.29	0.00	0.02	117.55
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.01	0.00	0.00	0.00	6.18	0.00	0.00	6.47
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.01	0.00	0.00	0.00	6.18	0.00	0.00	6.47

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			0.50	0.03	0.10	0.01

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.24	2.41	1.65	0.08	0.08	0.00	375.26	0.02	0.00	376.64
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.32	3.65	2.45	0.11	0.11	0.01	592.67	0.03	0.00	594.70
1.00			Model Default Tier	Cranes	0.34	1.79	3.57	0.15	0.14	0.01	558.81	0.18	0.01	564.83
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.18	3.26	1.43	0.07	0.06	0.01	500.23	0.16	0.00	505.63
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.29	3.66	2.58	0.11	0.11	0.01	623.04	0.03	0.00	625.07
1.00			Model Default Tier	Graders	0.36	1.66	4.25	0.14	0.13	0.01	640.58	0.21	0.01	647.48
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.50	3.26	3.38	0.12	0.11	0.01	1,280.26	0.41	0.01	1,294.04
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.15	1.85	1.54	0.08	0.08	0.00	254.14	0.08	0.00	256.88
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Dozers	0.69	3.13	7.13	0.32	0.30	0.01	826.99	0.27	0.01	835.89
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.29	4.47	2.93	0.14	0.13	0.01	603.46	0.20	0.01	609.95
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Welders	0.24	1.67	1.39	0.05	0.05	0.00	207.48	0.02	0.00	208.53

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	3.60	30.81	32.29	1.38	1.30	0.07	6,462.91	1.61	0.06	6,519.65
Drainage/Utilities/Sub-Grade	tons per phase	0.20	1.69	1.78	0.08	0.07	0.00	355.46	0.09	0.00	358.58

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>		0.20	1.69	1.78	0.08	0.07	0.00	355.46	0.09	0.00	358.58

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> 07 Emergency Sources (Las Virgenes)

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	3.38	31.24	31.58	1.79	1.29	0.50	1.26	1.16	0.10	0.08	7,941.45	1.60	0.27	8,061.09
Paving	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
Maximum (pounds/day)	3.38	31.24	31.58	1.79	1.29	0.50	1.26	1.16	0.10	0.08	7,941.45	1.60	0.27	8,061.09
Total (tons/construction project)	0.45	4.12	4.17	0.24	0.17	0.07	0.17	0.15	0.01	0.01	1,048.27	0.21	0.04	1,064.06

Notes:
Project Start Year -> 2025
Project Length (months) -> 12
Total Project Area (acres) -> 10
Maximum Area Disturbed/Day (acres) -> 0
Water Truck Used? -> Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	178	30	270	60	240	30
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 07 Emergency Sources (Las Virgenes)

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	0.45	4.12	4.17	0.24	0.17	0.07	0.17	0.15	0.01	0.01	1,048.27	0.21	0.04	965.31
Paving	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
Maximum (tons/phase)	0.45	4.12	4.17	0.24	0.17	0.07	0.17	0.15	0.01	0.01	1048.27	0.21	0.04	965.31
Total (tons/construction project)	0.45	4.12	4.17	0.24	0.17	0.07	0.17	0.15	0.01	0.01	1048.27	0.21	0.04	965.31

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model Version 9.0.0

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	07 Emergency Sources (Las Virgenes)	
Construction Start Year	2025	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	12.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	1.19	miles
Total Project Area	10.00	acres
Maximum Area Disturbed/Day	0.05	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	89.00	89.00
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	15.00	15.00
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation	
Off-road Equipment Emissions Mitigation	

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation).
Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.00	1.20		1/1/2025
Grading/Excavation	0.00	4.80		1/1/2025
Drainage/Utilities/Sub-Grade	12.00	4.20	5/1/2025	1/1/2025
Paving	0.00	1.80		1/1/2026
Totals (Months)	12			

Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			9	270.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.07	0.11	0.05	0.02	1,666.12	0.00	0.26	1,744.20
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.02	0.25	1.92	0.07	0.03	0.01	991.76	0.00	0.16	1,038.23
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.03	0.25	0.01	0.00	0.00	130.91	0.00	0.02	137.05
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.03	0.25	0.01	0.00	0.00	130.91	0.00	0.02	137.05

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			2	60.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.07	0.11	0.05	0.02	1,666.12	0.00	0.26	1,744.20
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.05	0.43	0.01	0.01	0.00	220.39	0.00	0.03	230.72
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.01	0.06	0.00	0.00	0.00	29.09	0.00	0.00	30.45
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.01	0.06	0.00	0.00	0.00	29.09	0.00	0.00	30.45

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions **User Input**	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
Miles/ one-way trip	20			
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing			0	0.00
No. of employees: Grading/Excavation			0	0.00
No. of employees: Drainage/Utilities/Sub-Grade	6		12	240.00
No. of employees: Paving			0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.01	0.76	0.05	0.05	0.02	0.00	292.53	0.00	0.01	294.17
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.91	2.53	0.24	0.00	0.00	0.00	63.02	0.06	0.03	72.88
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.03	0.47	0.03	0.02	0.01	0.00	156.45	0.00	0.00	157.58
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.06	0.00	0.00	0.00	0.00	20.65	0.00	0.00	20.80
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.06	0.00	0.00	0.00	0.00	20.65	0.00	0.00	20.80

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions **User Input**	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust								0.00
Grading/Excavation - Exhaust								0.00
Drainage/Utilities/Subgrade	1		1.00			30.00		30.00
Paving								0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.07	0.11	0.05	0.02	1,666.12	0.00	0.26	1,744.20
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.03	0.21	0.01	0.00	0.00	110.20	0.00	0.02	115.36
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.03	0.00	0.00	0.00	14.55	0.00	0.00	15.23
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.03	0.00	0.00	0.00	14.55	0.00	0.00	15.23

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			0.50	0.07	0.10	0.01

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles	Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Grading/Excavation	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.23	2.41	1.53	0.07	0.07	0.00	375.26	0.02	0.00	376.62
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.30	3.64	2.27	0.09	0.09	0.01	592.67	0.03	0.00	594.65
1.00			Model Default Tier	Cranes	0.31	1.74	3.17	0.13	0.12	0.01	558.83	0.18	0.01	564.85
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.17	3.26	1.22	0.06	0.06	0.01	500.34	0.16	0.00	505.73
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.27	3.66	2.40	0.10	0.10	0.01	623.04	0.02	0.00	625.01
1.00			Model Default Tier	Graders	0.31	1.59	3.46	0.11	0.10	0.01	640.24	0.21	0.01	647.14
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.48	3.19	2.87	0.10	0.09	0.01	1,279.68	0.41	0.01	1,293.45
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.14	1.85	1.44	0.07	0.07	0.00	254.06	0.08	0.00	256.80
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Dozers	0.65	3.00	6.63	0.29	0.27	0.01	826.96	0.27	0.01	835.87
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.26	4.46	2.67	0.11	0.10	0.01	604.11	0.20	0.01	610.61
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Welders	0.22	1.65	1.34	0.04	0.04	0.00	207.48	0.02	0.00	208.49

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	3.33	30.45	28.99	1.18	1.11	0.07	6,462.66	1.60	0.06	6,519.21
Drainage/Utilities/Sub-Grade	tons per phase	0.44	4.02	3.83	0.16	0.15	0.01	853.07	0.21	0.01	860.54

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>			0.44	4.02	3.83	0.16	0.15	0.01	853.07	0.21	0.01	860.54

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> 08 Big Rock Bypass Improvements Project Phases (**Pounds**)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	3.38	31.22	31.60	1.79	1.29	0.50	1.26	1.16	0.10	0.08	7,927.05	1.60	0.27	8,046.14
Paving	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
Maximum (pounds/day)	3.38	31.22	31.60	1.79	1.29	0.50	1.26	1.16	0.10	0.08	7,927.05	1.60	0.27	8,046.14
Total (tons/construction project)	0.33	3.09	3.13	0.18	0.13	0.05	0.12	0.11	0.01	0.01	784.78	0.16	0.03	796.57

Notes: Project Start Year -> 2026
Project Length (months) -> 9
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 0
Water Truck Used? -> Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	178	30	270	60	240	30
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 08 Big Rock Bypass Improvements Project Phases (**Tons for all except CO2e. Metric tonnes for CO2e**)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	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
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	0.33	3.09	3.13	0.18	0.13	0.05	0.12	0.11	0.01	0.01	784.78	0.16	0.03	722.64
Paving	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
Maximum (tons/phase)	0.33	3.09	3.13	0.18	0.13	0.05	0.12	0.11	0.01	0.01	784.78	0.16	0.03	722.64
Total (tons/construction project)	0.33	3.09	3.13	0.18	0.13	0.05	0.12	0.11	0.01	0.01	784.78	0.16	0.03	722.64

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model Version 9.0.0
Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

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Input Type

Project Name	08 Big Rock Bypass Improvements	
Construction Start Year	2026	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	9.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.28	miles
Total Project Area	1.00	acre
Maximum Area Disturbed/Day	0.05	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	89.00	89.00
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade	20.00	15.00	15.00
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation	
Off-road Equipment Emissions Mitigation	

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation).
Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.00	0.90		1/1/2026
Grading/Excavation	0.00	3.60		1/1/2026
Drainage/Utilities/Sub-Grade	9.00	3.15	1/1/2026	1/1/2026
Paving	0.00	1.35		10/2/2026
Totals (Months)	9			

Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			9	270.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.10	0.11	0.05	0.02	1,652.48	0.00	0.26	1,729.92
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.02	0.25	1.93	0.07	0.03	0.01	983.64	0.00	0.15	1,029.73
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.02	0.19	0.01	0.00	0.00	97.38	0.00	0.02	101.94
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.02	0.19	0.01	0.00	0.00	97.38	0.00	0.02	101.94

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			2	60.00
Miles/round trip: Paving				0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.10	0.11	0.05	0.02	1,652.48	0.00	0.26	1,729.92
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.05	0.43	0.01	0.01	0.00	218.59	0.00	0.03	228.83
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.01	0.04	0.00	0.00	0.00	21.64	0.00	0.00	22.65
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.01	0.04	0.00	0.00	0.00	21.64	0.00	0.00	22.65

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions **User Input**	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
Miles/ one-way trip	20			
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing			0	0.00
No. of employees: Grading/Excavation			0	0.00
No. of employees: Drainage/Utilities/Sub-Grade	6		12	240.00
No. of employees: Paving			0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.01	0.72	0.05	0.05	0.02	0.00	285.85	0.00	0.01	287.41
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.87	2.47	0.23	0.00	0.00	0.00	61.59	0.06	0.03	71.10
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.03	0.45	0.03	0.02	0.01	0.00	152.87	0.00	0.00	153.95
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.04	0.00	0.00	0.00	0.00	15.13	0.00	0.00	15.24
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.04	0.00	0.00	0.00	0.00	15.13	0.00	0.00	15.24

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions **User Input**	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust								0.00
Grading/Excavation - Exhaust								0.00
Drainage/Utilities/Subgrade	1		1.00			30.00		30.00
Paving								0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.10	0.11	0.05	0.02	1,652.48	0.00	0.26	1,729.92
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.03	0.21	0.01	0.00	0.00	109.29	0.00	0.02	114.41
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.02	0.00	0.00	0.00	10.82	0.00	0.00	11.33
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.02	0.00	0.00	0.00	10.82	0.00	0.00	11.33

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			0.50	0.05	0.10	0.01

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing

Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade

Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.23	2.41	1.53	0.07	0.07	0.00	375.26	0.02	0.00	376.62
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.30	3.64	2.27	0.09	0.09	0.01	592.67	0.03	0.00	594.65
1.00			Model Default Tier	Cranes	0.31	1.74	3.17	0.13	0.12	0.01	558.83	0.18	0.01	564.85
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.17	3.26	1.22	0.06	0.06	0.01	500.34	0.16	0.00	505.73
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.27	3.66	2.40	0.10	0.10	0.01	623.04	0.02	0.00	625.01
1.00			Model Default Tier	Graders	0.31	1.59	3.46	0.11	0.10	0.01	640.24	0.21	0.01	647.14
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.48	3.19	2.87	0.10	0.09	0.01	1,279.68	0.41	0.01	1,293.45
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.14	1.85	1.44	0.07	0.07	0.00	254.06	0.08	0.00	256.80
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Dozers	0.65	3.00	6.63	0.29	0.27	0.01	826.96	0.27	0.01	835.87
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.26	4.46	2.67	0.11	0.10	0.01	604.11	0.20	0.01	610.61
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Welders	0.22	1.65	1.34	0.04	0.04	0.00	207.48	0.02	0.00	208.49

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	3.33	30.45	28.99	1.18	1.11	0.07	6,462.66	1.60	0.06	6,519.21
Drainage/Utilities/Sub-Grade	tons per phase	0.33	3.01	2.87	0.12	0.11	0.01	639.80	0.16	0.01	645.40

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles		Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>				0.33	3.01	2.87	0.12	0.11	0.01	639.80	0.16	0.01	645.40

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

Appendix C
Biological Resources

Appendix C1
Biological Technical Report

BIOLOGICAL REPORT

WATERWORKS DISTRICT 29 PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS
LOS ANGELES COUNTY, CALIFORNIA

PREPARED FOR:

County of Los Angeles Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803

PREPARED BY:

ICF
601 W. 5th Street
Los Angeles, CA 90071
Contact: Sarah Horwath

February 2020

ICF. 2020. Biological Report, Waterworks District 29 Priority Capital Deficiencies Improvements, Los Angeles County, California. November. (ICF 489.16). Los Angeles, CA. Prepared for County of Los Angeles, Department of Public Works.

Contents

Tables

Acronyms and Abbreviations

˚F	degrees Fahrenheit
BMP	best management practices
BPGs	Biogeographic Population Groups
BSAs	biological study areas
CCA	California Coastal Act
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CDP-OT	Coastal Development Permit-Oak Tree
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CHU	Critical Habitat Unit
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRAs	Coastal Resource Areas
CRPR	California Rare Plant Rank
CWA	Clean Water Act
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
ESA	environmentally sensitive area
ESHA	Environmentally Sensitive Habitat Areas
ESU	Evolutionarily Significant Unit
FESA	Federal Endangered Species Act
I	Interstate
IPaC	Information for Planning and Consultation
LCP	Local Coastal Program
LIP	Local Implementation Program

LUP	Land Use Plan
MBTA	Migratory Bird Treaty Act
mph	miles per hour
NMFS	National Marine Fisheries Service’s
NRCS	Natural Resources Conservation Service
PCH	Pacific Coast Highway
ppt	parts per thousand
project area	All individual project sites and staging areas combined
ROW	right-of-way
SEAs	Significant Ecological Areas
SR	State Route
SSC	Species of Special Concern
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Chapter 1
Project Information

This Biological Report for the Waterworks District 29 Priority Capital Deficiencies Improvments contains the results of a biological literature search, vegetation mapping, and a special-status species habitat assessment conducted by ICF at 25 project sites and staging area locations along the Pacific Coast Highway (PCH), Encinal Canyon Road, Carbon Mesa Road, South Topanga Canyon Boulevard, Coastline Drive, and various staging areas (project area) in and around the city of Malibu, Los Angeles County, California (Appendix A, Figure 1; Table 1). Individual areas where work will occur at the projects and staging areas are referred to as project sites. The biological study areas (BSAs), defined as all project sites (including road right-of-way [ROW] and staging areas) plus a 100-foot buffer, are all located within the California Coastal Zone and are subject to oversight by the California Coastal Commission (CCC), in addition to standard state and federal regulatory authority. In this report, BSA also refers to the entire study area, including all individual project sites and study areas of individual project sites, as contextually necessary in the analysis.

This report describes current site conditions and results of habitat assessments for special-status species with the potential to occur in the BSAs as pertains to the federal Endangered Species Act (FESA), the California Endangered Species Act (CESA), and the California Fish and Game Code. The purpose of this report is to present our analysis of the BSAs, including the potential for the occurrence of special-status biological resources (i.e., plant and wildlife species). Judgments regarding likelihood of occurrence are based upon an evaluation of available biological information regarding regional and local conditions, species biology, available evaluations of the BSAs and vicinity, and professional experience from conducting field investigations.

1.1 Project Location

The BSAs are located on approximately 280 acres within Los Angeles County, in and around the city of Malibu (Appendix A, Figure 2). Regionally, the BSAs are located north of Interstate (I) 10 in the northwestern corner of Los Angeles County. Specifically, the BSAs are located on and in areas adjacent to State Route (SR) 1, Encinal Canyon Road, Carbon Mesa Road, South Topanga Canyon Boulevard, Coastline Drive, and various staging area locations. The project sites are mapped in the following portions of U.S. Geological Survey (USGS) 7.5-minute quadrangle maps: Township 1S, Range 16W, Sections 18, 31, 32, and 33 of the Topanga quadrangle map (USGS 2015a); Township 1S, Range 17W, Sections 24, 27, 28, 31, 33, 34, and 35 of the Malibu Beach quadrangle map (USGS 2015b); Township 1S, Range 18W, Section 35 and Township 2S, Range 18W, Sections 4, 5, and 6 of the Point Dume quadrangle map (USGS 2015c); and Township 1S, Range 19W, Sections 25, 28, 29, 32, and 33 and Township 2S, Range 19W, Section 12 of the Triunfo Pass quadrangle map (USGS 2015d) (Appendix A, Figure 2).

1.2 Project Description

This existing-conditions biological report has been prepared to support the planning and preparation of an Environmental Impact Report (EIR) for the Project, which may include partial or complete replacement and maintenance of water-delivery pipelines within the evaluated BSAs.

Within the project area are nine improvements with components occurring at 15 locations on approximately 53.56 acres. Ten staging areas may be used for the project, covering an additional 13.35 acres. Thus, the total area within the limits of disturbance (i.e., sum of project sites and staging areas) is approximately 67 acres.

Table 1. Project Names, Project Activities, and Staging Areas to Potentially Be Used for the Project

		Staging Areas Potentially Used for Each Project									
Project	**Project Activities Summary**	**Las Tunas County Beach**	**Topanga County Beach**	**Topanga Field Yard**	**Sunset Mesa Tank**	**Zuma Beach**	**Applefield Lane Vacant Lot**	**RMD Winter Canyon Yard**	**Owen Tank Site**	**Point Dume Tank Site**	**NW intersection of Encinal Canyon RD & PCH**
Big Rock Bypass Improvements	Construct a 1,500-foot-long bypass for the region's main line. The bypass will consist of three parallel pipelines in PCH to accommodate continuing movement of a major landslide in the Big Rock area.	X	X	X							
Carbon Canyon Road & Carbon Mesa Road Waterline Improvements	Replace over 7,239 feet of leak-prone, aging, and severely deteriorated waterlines ranging in size from 1.5 to 4 inches.			X							
Coastline Drive 12-inch Waterline Improvements	Replace over 2,112 feet of leak-prone, aging, and severely deteriorated 12-inch waterline.			X	X						
District No. 29 Creek Crossing Repair Project	Pipeline recoating and maintenance at seven sites: 1. Topanga Canyon Creek 2. Pena Canyon Creek 3. Las Flores Canyon Creek 4. Coal (Carbon) Canyon Creek) 5. Escondido Creek 6. Corral Canyon Creek 7. Zuma Creek	X		X		X					

		Staging Areas Potentially Used for Each Project									
Project	**Project Activities Summary**	**Las Tunas County Beach**	**Topanga County Beach**	**Topanga Field Yard**	**Sunset Mesa Tank**	**Zuma Beach**	**Applefield Lane Vacant Lot**	**RMD Winter Canyon Yard**	**Owen Tank Site**	**Point Dume Tank Site**	**NW intersection of Encinal Canyon RD & PCH**
Emergency Source of Water Supply Connection (Las Virgenes Connection)	Construct a transmission waterline to connect to Las Virgenes Municipal Water District to provide a water source for the region in case of emergency.					X					X
Fernwood Tank	Replace two aging and severely deteriorated 50,000-gallon tanks. Site is located at 19837 Horseshoe Drive, Topanga, Los Angeles County.			X			X		X		
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	Replace over 9,500 feet of leak prone, aging, and deteriorated 6-inch waterline. Also includes pipeline replacements at Corral Canyon Creek and Escondido Creek (sites included in the D29 Creek Crossings project above).			X		X		X		X	
PCH & Topanga Beach Drive Waterline Improvements	Three segments of PCH with a total length of 8,330 feet: 1. PCH & Topanga Beach Drive Segment 1. Replace over 1,604 feet of leak-prone, aging, and deteriorated 4-inch waterline. 2. PCH & Topanga Beach Drive Segment 2. Replace over 1,105 feet of leak-prone, aging, and deteriorated 4-inch waterline. 3. PCH & Topanga Beach Drive Segment 3. Replace over 5,616 feet (includes an 857-foot-long stretch and a 4,759-foot-long stretch) of leak-prone, aging, and deteriorated 4-inch waterline.	X	X	X							

Project	Project Activities Summary	Staging Areas Potentially Used for Each Project									
		Las Tunas County Beach	Topanga County Beach	Topanga Field Yard	Sunset Mesa Tank	Zuma Beach	Applefield Lane Vacant Lot	RMD Winter Canyon Yard	Owen Tank Site	Point Dume Tank Site	NW intersection of Encinal Canyon RD & PCH
Upper Encinal Tank Improvements	Replace two aging and severely deteriorated 70,000-gallon tanks with a single 225,000 gallon tank. Construction staging would occur in close proximity to the improvement site. Construction activities would include groundbreaking activities. Area needs significant grading and erosion control, as well as earth-retaining structures to increase buildable area for housing a larger-diameter water tank.			X		X					X

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Chapter 2
Methodology

2.1 Literature Review

A literature review was conducted to evaluate the environmental setting of the BSAs and identify potential special-status biological resources that may be found on the site. The review included a search of the California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife [CDFW] 2019) and the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2019) for the 7.5-minute USGS quadrangles containing project sites (Point Dume, Malibu Beach, Topanga, Triunfo Pass) and the surrounding quadrangles (Point Mugu, Camarillo, Newbury Park, Thousand Oaks, Calabasas, Canoga Park, Van Nuys, Beverly Hills, and Venice). The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) database, which maintains a list of threatened and endangered plant and wildlife species, was also queried for the BSAs (USFWS 2019), as was the National Marine Fisheries Service's (NMFS) quadrangle-based database (NMFS 2019). Additionally, literature detailing the habitat requirements of special-status species, the most recent USFWS critical habitat maps (USFWS 2019), and the Calfora database of rare plant observations (Calflora 2018) were reviewed.

For this report, special-status species are those that are (1) listed, proposed for listing, or candidates for listing under the FESA as threatened or endangered; (2) listed or candidates for listing under CESA as threatened or endangered; (3) a state fully protected species; (4) a CDFW California Species of Special Concern (SSC); or (5) identified with a CNPS California Rare Plant Rank (CRPR) of 1A, 1B, 2A, 2B, 3, or 4.

In addition, the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA/NRCS 2018) was reviewed for the BSAs. The soil data were then evaluated for the potential to support rare vegetation communities, plants, and/or wildlife.

2.2 Field Investigation

2.2.1 General Habitat Assessment

The BSAs were defined as all areas in which work will occur, including road ROW and staging areas, plus a 100-foot buffer (Appendix A, Figure 3). ICF biologists Paul Schwartz, Ryan Winkleman, and Sarah Horwath conducted site visits on April 23, 2018; April 25, 2018; May 2, 2018; June 1, 2018; and November 6, 2019, between 0800 and 1600 (Table 2-1). Weather conditions during the sites visits consisted of temperatures ranging from 68 to 85 degrees Fahrenheit (˚F), winds ranging from 0 to 10 miles per hour (mph), and generally clear skies with good visibility. The site visits focused on mapping vegetation and conducting habitat assessments for special-status wildlife species that could occur within the BSAs.

Each of the BSAs was evaluated for the likelihood of occurrence of special-status species and vegetation types, as well as more general biological resource issues that could pose a constraint to the project through applicable laws and regulations. Special-status parameters for wildlife included connectivity to documented and potentially occurring habitat, hydrology, access to the site, foraging and nesting habitat, the site's operational activities, and life history needs for each species. Focused surveys for determining presence/absence of special-status plants or wildlife were not performed during these site visits.

All plant and wildlife species observed during the site visit were recorded in field notes. Plants were observed and identified through direct sight or by photographing or sampling plant species for identification with plant keys. Special-status rankings for plant species were identified through a review of the CDFW Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2018a), CNPS Inventory of Rare Plants (CNPS 2019), and the Calflora website (Calflora 2018). Wildlife species were detected by sight, calls, tracks, scat, or other sign. Special-status rankings for wildlife were identified through a review of the CDFW Special Animals List (CDFW 2018b), USFWS IPaC database (USFWS 2019), and NMFS California Species List Tools database (NMFS 2019).

Table 2. Field Visits Conducted for Biological Surveys

Date	Activities	Locations	Staff
April 23, 2018	Biological reconnaissance visits	Carbon Canyon Road & Carbon Mesa Road Waterline Improvements, Corral Canyon Creek, Escondido Creek, Zuma Creek, Pena Canyon Creek, Topanga Creek, Coal-Carbon Creek	Paul Schwartz Ryan Winkleman
April 25, 2018	Vegetation mapping and habitat assessments	Las Flores Creek, Fernwood Tank Site, Owen Tank Site, Applefield Lane Vacant Lot, Coastline Drive 12-inch, Sunset Mesa Tank Site, Topanga Field Yard, PCH and Topanga Beach Drive Waterline Improvements, Carbon Canyon Road & Carbon Mesa Road Waterline Improvements, RMD Winter Canyon yard	Paul Schwartz Ryan Winkleman
May 2, 2018	Vegetation mapping and habitat assessments	Emergency Source of Water Supply Connection, Zuma Beach, Zuma Creek, Corral Canyon Creek	Paul Schwartz Sarah Horwath
June 1, 2018	Vegetation mapping and habitat assessments	Escondido Creek, PCH 8-Inch Waterline Improvements, Las Flores Creek, Big Rock Bypass Improvements, Pena Canyon Creek, Las Tunas County Beach	Paul Schwartz James Hickman
November 6, 2019	Vegetation mapping and habitat assessments	Upper Encinal Tank Improvements, NW Corner of Encinal Canyon Road & PCH	Ryan Winkleman

2.2.2 Vegetation Mapping

Vegetation mapping was conducted in the field using aerial photos with an approximate scale of 1 inch to 300 feet, which were later transferred to a digital file using Google Earth, and then converted to GIS shape files. Where possible, the vegetation mapping followed the classifications defined in *A Manual of California Vegetation* (Sawyer et al. 2009); however, Holland (1986) was also consulted for clarification, particularly with sensitive vegetation communities in the CNDDB, which formerly used Holland as its primary classification system and still uses Holland in parts of the state that have not been classified according to updated state standards.

2.2.3 Regulatory Constraints

All applicable local, state, and federal laws and regulations, as well as court precedent, enacted to protect and/or manage biological resources were evaluated for their relevance and potential to constrain the proposed project. The analysis of constraints provided in this report is based upon a combination of direct evaluation of the site, current regulatory information, and professional judgment. The following list includes those federal, state, and local regulations that were deemed to be relevant to this project, but may not include all pertinent regulations, as noted below.

2.2.3.1 Federal Laws

The federal laws listed below are considered to apply to the regulation of this project. This list is provided as a general background for the project, and therefore may not be exhaustive.

- Bald and Golden Eagle Protection Act
- Endangered Species Act of 1973 (including designated critical habitat for listed species)
- Executive Order 11990 Protection of Wetlands
- Executive Order 13112 Invasive Species
- Federal Noxious Weed Act of 1974
- Federal Water Pollution Control Act (Clean Water Act [CWA])
- Magnuson-Stevens Fishery Conservation and Management Act of 1976
- Migratory Bird Treaty Act (MBTA).
- National Environmental Policy Act

2.2.3.2 State Laws and Regulations

The state laws listed below are considered to apply to the regulation of this project. This list is provided as a general background for the project, and therefore may not be exhaustive.

- California Coastal Act (CCA) (The entire project is located within the California Coastal Zone [Appendix A, Figure 1 and Figure 3])
- CESA
- California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000–21177, State CEQA Guidelines Sections 15000–15387)
- California Fish and Game Code Sections 1600–1616, 3503, 3503.5, 3505, 3511, 3513, 3800, 3801.6, 4000, 4002, and 4150.

2.2.3.3 Local Regulations

Los Angeles County

Significant Ecological Areas

Significant Ecological Areas (SEAs) are officially designated areas within Los Angeles County determined to have irreplaceable biological resources, as shown on Figure 9.3, Significant Ecological Areas and Coastal Resource Areas Policy Map, of the *Los Angeles County General Plan* (County of Los Angeles Department of Regional Planning 2015). The SEA Ordinance establishes the permitting, design standards, and review process for development within SEAs, while balancing the preservation of Los Angeles County's natural biodiversity with the protection of its citizens' private-property rights.

Los Angeles County considers the biological resources in the Santa Catalina Island and Santa Monica Mountains coastal zones to be of significance; thus, the management and review of biological resources in those zones (referred to as Coastal Resource Areas [CRAs]) differs from the countywide SEA regulatory program. Biological resource management in the Santa Monica Mountains Coastal Zone is currently implemented through the Santa Monica Mountains Local Coastal Program (LCP), and management of CRAs is implemented through the CCC. Thus, there are no SEAs under the review jurisdiction of Los Angeles County within the BSAs.

Oak Tree Permits

As specified in the Los Angeles County Code, Title 22, Division 1, Chapter 22.56, Part 16, the oak tree permit was established to preserve and maintain healthy oak trees, a significant environmental resources in Los Angeles County, in the project-development process (Los Angeles County Code 22.56.2050). The code states that, "Except as otherwise provided in Section 22.56.2070, a person will not cut, destroy, remove, relocate, inflict damage, or encroach into a protected zone of any tree of the oak genus…" that meets certain size or planting requirements, as detailed in the original text of the code, which also contains additional definitions and exemptions. Portions of the project sites within unincorporated Los Angeles County may require oak tree permits if oak species are to be removed or damaged.

Local Coastal Programs

The project sites fall within the boundaries of two different LCPs. The CCC requires preparation of an LCP for each local government lying in whole or in part within the coastal zone. The project sites fall within the boundaries of the City of Malibu LCP (City of Malibu 2002a,b) and the Santa Monica Mountains LCP (County of Los Angeles Department of Regional Planning 2014). The BSA for the Coastline Drive project encroaches into the boundaries of Pacific Palisades, which falls within the jurisdiction of the City of Los Angeles and does not have a certified LCP (CCC 2017), but the project site itself is still outside of the Pacific Palisades boundary.

Generally, *development activity*, as defined by the CCA, occurring within the California Coastal Zone requires a Coastal Development Permit from the CCC or local government with a certified LCP. Development includes, but is not limited to, demolition, construction, replacement or change to size of a structure; grading, removal, or placement of fills or other materials, clearing of vegetation in sensitive habitat; impeding access to beach or public trails; and repair or maintenance activities that could result in environmental impacts. Thus, the project may require a Coastal Development Permit from the following LCPs.

Santa Monica Mountains Local Coastal Program

In addition to other purposes, the Santa Monica Mountains LCP protects coastal habitat resources through a system of resource-based categories, with development standards for each category. Significant Environmental Resource Areas (SERA) are areas designated as H1 and H2 (County of Los Angeles Department of Regional Planning 2018a), as defined below. These designated areas are shown on Map 2: *Biological Resources of the Santa Monica Mountains LCP Land Use Plan* (LUP) (County of Los Angeles Department of Regional Planning 2018b), which depicts the general distribution of habitat categories (as of the date of effective certification of the LCP); however, boundaries of habitat categories are to be determined on a site-specific basis by biological surveys and/or inventories. The following H1, H2, H2 High Scrutiny, and H3 habitat definitions are from the Santa Monica Mountains Local Implementation Program (LIP) (County of Los Angeles Department of Regional Planning 2018a):

- The H1 Habitat category consists of habitats of highest biological significance, rarity, and sensitivity.
- The H2 Habitat category consists of habitats of high biological significance, rarity, and sensitivity that are important for the ecological vitality and diversity of the Santa Monica Mountains Mediterranean ecosystem.
- The H2 High Scrutiny Habitat category is a subcategory of H2 Habitat, comprising extra-sensitive H2 Habitat species/habitats that should be given avoidance priority over other H2 habitat.
- The H3 Habitat category consists of areas that would otherwise be designated as H2 Habitat, but where native vegetation communities have been significantly disturbed or removed as part of lawfully established development.

Figure 3 (Appendix A) shows previously mapped SERA within the vicinity of the BSAs. The LCP prohibits development in wetlands, streams, H1 habitat areas, H1 Habitat Buffer (all land within 100 feet of H1 habitat), and H1 Quiet Zone (all land within 100 feet of H1 Habitat Buffer) and requires avoidance or minimization of impacts to H2 habitat areas and native trees, with the exception of permitted uses listed in the LIP and covered under a Coastal Development Permit (County of Los Angeles Department of Regional Planning 2018b). A Coastal Development Permit-Oak Tree (CDP-OT), a specific type of minor Coastal Development Permit, is also required for removal or damage to oak trees subject to provisions of the LIP (County of Los Angeles Department of Regional Planning 2018b).

City of Malibu Local Coastal Program

Among other purposes, the City of Malibu LCP ensures that development in the coastal zone preserves and enhances coastal resources. Policies described in the LUP protect the Environmentally Sensitive Habitat Areas (ESHA) of the City of Malibu (City of Malibu 2002a). ESHA are recognized as rare and necessary for wildlife, notwithstanding the disturbances resulting from adjacent residential development. The LUP’s ESHA map shows the areas that are designated ESHA, which include, but are not limited to:

- Entire canyon habitats, riparian corridors, coastal sage scrub, chaparral, and woodlands in undeveloped areas
- Riparian corridors in developed areas, coastal dunes, and bluff-face areas.
- Valuable marine resource areas, including kelp forests, intertidal areas, and near-shore, shallow-water fish habitats.

Figure 3 (Appendix A) shows mapped ESHA in the vicinity of the BSAs. Requirements for protection of ESHA are described in the ordinances of the LIP (City of Malibu 2002b).

In addition to protection as an ESHA, in order to maintain the biological productivity and quality of coastal areas and waters, the LCP also protects streams, associated riparian habitat, native trees, and water quality. Requirements for protection of ESHA, these resources, and exceptions covered under Coastal Development Permits, are described in the ordinances of the LIP (City of Malibu 2002b). The Native Tree Protection Ordinance applies to areas containing one or more native oak (*Quercus* species), California walnut (*Juglans californica*), western sycamore (*Platanus racemosa*), white alder (*Alnus rhombifolia*), or toyon (*Heteromeles arbutifolia*) trees of sizes specified in the LIP (City of Malibu 2002b). An arborist report would be obtained where trees of these species would be directly affected. The Water Quality Protection Ordinance applies to all properties within the City of Malibu and requires a local Stormwater Prevention Plan, Stormwater Management Plan, and Water Quality Mitigation Plan, in addition to other verification and best management practices (BMP) requirements (City of Malibu 2002b).

Chapter 3
Results

3.1 Existing Conditions Overview

The land within the BSAs is largely developed, consisting of mostly residential and commercial developments along SR 1 and residential roads, with natural or seminatural vegetation communities and habitats in surrounding areas. The BSAs are generally located along the Malibu coastline, between Coastline Drive and Encinal Canyon Road, with additional areas near Fernwood. Project sites include portions of PCH, Encinal Canyon Road, Carbon Canyon Road, Carbon Mesa Road, and Coastline Drive; four tank sites along Tuna Canyon Road, Fernwood Pacific Drive, Kingsport Drive, and Vista del Preseas and staging areas at Zuma Beach and Las Tunas County Beach, along Applefield Lane, Winter Canyon Road, and Topanga Canyon Road, at Topanga State Beach, and along Encinal Canyon Road. Topographically, the BSAs are diverse. Some sites, such as along PCH, are relatively flat where located adjacent to the shoreline along SR 1. Other sites are relatively steep, particularly those on the far western and eastern sides of the region, in the foothills of the Santa Monica Mountains. Average slopes of project sites range from approximately 0–20 percent inclines. Elevations within the BSAs range from approximately 6 to 1,918 feet above mean sea level, with the highest elevations occurring at the Applefield Lane staging area site. The BSAs are vegetated with a mixture of scrub communities, woodlands, nonnative grassland, and riparian areas (Appendix A, Figure 4). Surrounding land uses primarily include residential and commercial Malibu, as well as the Pacific Ocean shoreline and the Santa Monica Mountains National Recreation Area.

3.2 Vegetation Communities and Land Uses

A total of 19 plant communities/land uses were observed within the BSAs (Appendix A, Figure 4). These included five alliances of scrub, six types of woodlands, willow thickets, nonnative grasslands, wetland marsh, open water, dune mat, open sand, cobble, and ruderal (i.e., disturbed with nonnative vegetation dominant) communities and land-cover types. Additionally, the BSAs contain ornamental landscape and/or developed areas. Table 3-1 summarizes the acreages of these communities/land uses within the BSAs, and each vegetation community/land use is briefly discussed below. Photographs of the vegetation communities and land uses were taken and examples are presented in Appendix B.

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Table 3. Summary of Vegetation Community/Land Use Acreages within Biological Study Areas and Project Sites (Limits of Disturbance)

Project/Staging Area			CSS	CSS/LSS	D-CSS/ LSS	LSS	D-LSS	FSS	CSW	CWG	CLOW	RWT	D-RWT	S/CM	DM	ABG	O/D	D/R	OS	OW	C	Total Acreage by Project
Project Sites																						
Big Rock Bypass Improvements		**BSA**	--	0.18	1.86	--	--	--	0.04	--	--	--	--	--	--	--	4.79	0.39	0.19	0.87	0.14	**8.46**
		LOD	--	--	0.15	--	--	--		--	--	--	--	--	--	--	2.51	0.14	--	--	--	**2.80**
Carbon Canyon Road & Carbon Mesa Road Waterline Improvements		**BSA**	--	0.95	3.57	--	--	--	0.74	--	--	0.80	0.29			3.75	22.91	0.56	--	--	--	**33.57**
		LOD	--	0.02	0.66	--	--	--	0.14	--	--	< 0.01	--	--	--	0.36	7.02	0.08	--	--	--	**8.28**
Coastline Drive 12-inch Waterline Improvements		**BSA**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.33	--	--	--	--	**10.33**
		LOD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.37	--	--	--	--	**2.37**
District No. 29 Creek Crossing Repair Project	Topanga Canyon Creek	**BSA**	--	--	0.05	--	--	--		--	--	--	0.19	--	--	--	1.50	0.03	--	0.21	--	**1.98**
		LOD	--	--	--	--	--	--		--	--	--	--	--	--	--	0.37	--	--	--	--	**0.37**
	Pena Canyon Creek	**BSA**	--	--	0.35	--	--	--	0.02	--	--	--	--	--	--	--	1.05	0.10	--	--	0.05	**1.57**
		LOD	--	--	0.01	--	--	--	--	--	--	--	--	--	--	--	0.21	< 0.01	--	--	--	**0.22**
	Las Flores Canyon Creek	**BSA**	--	--	--	--	--	--	--	--	--	0.08	--	0.01	--	--	1.49	0.02	0.02	0.08	--	**1.70**
		LOD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.26	--	--	--	--	**0.26**
	Coal (Carbon) Canyon Creek	**BSA**	--	--	0.36	--	--	--	--	--	--	--	--	--	--	--	1.16	0.06	0.03	--	--	**1.61**
		LOD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.23	--	--	--	--	**0.23**
	Escondido Creek	**BSA**	--	--	--	--	--	0.70	--	--	--	--	--	0.02	--	--	0.62	0.17	0.25	0.03	--	**1.79**
		LOD	--	--	--	--	--	0.30	--	--	--	--	--		--	--	--	--	--	--	--	**0.30**
	Corral Canyon Creek	**BSA**	--	0.39	0.03	--	--	--	--	--	--	0.03		0.10	--	--	0.60	0.09	0.38	0.04	--	**1.66**
		LOD	--	< 0.01	--	--	--	--	--	--	--	--	--	0.01	--	--	0.24	0.01	--	< 0.01	--	**0.26**
	Zuma Creek	**BSA**	--	--	0.12	--	--	--	0.31	--	--	0.34	--	--	--	--	1.07	0.09	--	--	--	**1.93**
		LOD	--	--	< 0.01	--	--	--		--	--	0.01	--	--	--	--	0.34	< 0.01	--	--	--	**0.35**
Emergency Source of Water Supply Connection (Las Virgenes Connection)		**BSA**	0.36	13.63	7.05	1.30	--	--	1.53	0.41	0.32	--	--	--	--	--	--	2.52	--	--	--	--
		LOD	--	0.38	0.54	0.01	--	--	< 0.01	0.04	0.12	--	--	--	--	--	--	2.15	--	--	--	--
Fernwood Tank		**BSA**	--	--	--	--	--	--	--	--	< 0.01	--	--	--	--	--	--	0.03	--	--	--	--
		LOD	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	0.09	--	--	--	--
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)		**BSA**	--	0.72	2.80	0.08		0.30	--	0.45	0.61	0.62	--	0.01	--	0.47	35.44	4.54	0.28	0.03	--	**46.35**
		LOD	--	< 0.01	0.04	--	--	0.70	--	--	--	--	--	--	--	--	16.28	0.03	--	--	--	**17.05**
PCH & Topanga Beach Drive Waterline Improvements		**BSA**	--	--	2.86	--	--	--	0.09	--	--	0.03	--	< 0.01	--	2.58	30.20	1.05	0.98	0.03	0.10	**37.92**
		LOD	--	--	0.08	--	--	--	< 0.01	--	--	--	--	--	--	0.04	12.82	0.18	< 0.01	--	--	**13.12**
Upper Encinal Tank Improvements		**BSA**	--	--	0.66	--	1.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.68**
		LOD	--	--	0.04	--	0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**1.04**
Staging Areas																						
Las Tunas County Beach		BSA	--	--	0.03	--	--	--	--	--	--	--	--	--	--	--	1.53	0.08	0.04	0.36	0.06	**2.10**
		LOD	--	--		--	--	--	--	--	--	--	--	--	--	--	0.24	< 0.01	--	--	--	**0.24**

Project/Staging Area		**CSS**	**CSS/LSS**	**D-CSS/ LSS**	**LSS**	**D-LSS**	**FSS**	**CSW**	**CWG**	**CLOW**	**RWT**	**D-RWT**	**S/CM**	**DM**	**ABG**	**O/D**	**D/R**	**OS**	**OW**	**C**	**Total Acreage by Project**
Topanga County Beach	BSA	--	--	0.09	--	--	--	--	--	--	--	--	--	--	--	1.98	0.51	--	0.27	--	**2.85**
	LOD	--	--	0.02	--	--	--	--	--	--	--	--	--	--	--	0.66	--	--	--	--	**0.68**
Topanga Field Yard	BSA	--	0.32	0.30	1.22	--	--	--	--	--	--	--	--	--	--	1.55	--	--	--	--	**3.39**
	LOD	--	--	< 0.01	< 0.01	--	--	--	--	--	--	--	--	--	--	1.21	--	--	--	--	**1.21**
Sunset Mesa Tank	BSA	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	2.60	0.12	--	--	--	**2.84**
	LOD	--	--	--	--	--	--	--	--	--	--	--	--	--	0.22	0.19	0.46	--	--	--	**0.87**
Zuma Beach	BSA	--	--	--	--	--	--	--	--	--	--	--	--	0.14	--	2.71	0.43	1.81	--	--	**5.09**
	LOD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.29	--	--	--	--	**2.29**
Applefield Lane Vacant Lot	BSA	--	0.33	0.02	--	--	--	--	--	0.40	--	--	--	--	--	0.99	0.27	--	--	--	**2.01**
	LOD	--	--	--	--	--	--	--	--	< 0.01	--	--	--	--	--	< 0.01	0.41	--	--	--	**0.41**
RMD Winter Canyon Yard	BSA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.33	0.24	--	--	--	**4.57**
	LOD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.92	--	--	--	--	**2.92**
Owen Tank Site	BSA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.68	--	--	--	--	**2.68**
	LOD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.02	--	--	--	--	**1.02**
Point Dume Tank Site	BSA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.04	--	--	--	--	**4.04**
	LOD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.09	--	--	--	--	**3.09**
NW Corner of Encinal Canyon Road & PCH	BSA	--	--	0.29	--	--	0.16	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.28**
	LOD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.62**
Total acreage by veg community/land use	**within all BSAs**	**0.36**	**16.52**	**20.44**	**2.60**	**1.27**	**1.16**	**2.73**	**0.86**	**1.33**	**1.90**	**0.48**	**0.14**	**0.14**	**6.92**	**136.84**	**12.77**	**3.98**	**1.92**	**0.35**	**212.17**
	within all LODs	**0.00**	**0.40**	**1.54**	**0.01**	**0.10**	**1.00**	**0.14**	**0.04**	**0.17**	**0.01**	**0.00**	**0.01**	**0.00**	**0.62**	**57.81**	**5.07**	**0.00**	**0.00**	**0.00**	**66.92**

Note: These communities are described in detail in the following pages.

3.2.1 California Sagebrush Scrub

An area of intact California sagebrush scrub (CSS) [*Artemisia californica* Shrubland Alliance] is present within the Emergency Source of Water Supply Connection BSA. The California sagebrush scrub is dominated by California sagebrush (*Artemisia californica*), but also has some cover of black sage (*Salvia mellifera*), California buckwheat (*Eriogonum fasciculatum*), and California encelia (*Encelia californica*) present.

3.2.2 California Sagebrush Scrub/Laurel Sumac Scrub

Areas of California sagebrush scrub/laurel sumac scrub (CSS/LSS) [*Artemisia californica* Shrubland Alliance/ *Malosma laurina* Shrubland Alliance] are present throughout the majority of the BSAs within the canyons and higher elevation areas, as well as within larger tracks of lower-elevation open space. The coastal sage scrub/laurel sumac scrub (chaparral) vegetation areas consist of a mix of both sage scrub species and chaparral, which makes it difficult to distinguish between the two vegetation communities. These areas are dominated by native shrubs, grasses, and forbs commonly found in coastal sage scrub, such as California sagebrush, black sage, California buckwheat, California encelia, coastal prickly pear (*Opuntia littoralis*), canyon sunflower (*Venegasia carpesioides*), giant wild rye (*Leymus condensatus*), and shrubs commonly found in chaparral communities, such as laurel sumac (*Malosma laurina*), toyon (*Heteromeles arbutifolia*), mountain mahogany (*Cercocarpus betuloides*), lemonade berry (*Rhus integrifolia*), heart-leaved bush-penstemon (*Keckiella cordifolia*), ceanothus (*Ceanothus* sp.), holly-leaved cherry (*Prunus ilicifolia*), poison oak (*Toxicodendron diversilobum*), and wild cucumber (*Marah macrocarpus*).

3.2.3 Disturbed California Sagebrush Scrub/Laurel Sumac Scrub

Areas of disturbed California sagebrush scrub/laurel sumac scrub (D-CSS/LSS) [disturbed *Artemisia californica* shrubland alliance/*Malosma laurina* shrubland Alliance] are vegetated with the same species as California sagebrush scrub/laurel sumac scrub, but the overall cover of native shrubs is lower, and there is a noticeably higher cover of nonnative species, such as smilograss (*Stipa miliaceum*), red brome (*Bromus madritensis*), rip-gut brome (*Bromus diandrus*), fountain grass (*Pennisetum setaceum*), tree tobacco (*Nicotiana glauca*), fennel (*Foeniculum vulgare*), Russian thistle (*Salsola tragus*), and summer mustard (*Hirschfeldia incana*). Areas mapped as disturbed coastal sage scrub/laurel sumac scrub are located throughout the BSA, adjacent to residential areas and along the edges of the intact California sagebrush scrub/laurel sumac scrub, and are associated with vegetation disturbances, such as fuel modification and light grading.

Some areas of disturbed California sagebrush scrub/laurel sumac scrub along PCH have are located on very steep slopes and have a very high cover of fountain grass, Russian thistle, rip-gut brome, red brome, wild oats (*Avena* sp.), pampas grass (*Cortaderia selloana*), and a low cover of natives, such as California buckwheat, laurel sumac, lemonade berry, and our lord’s candle (*Yucca whipplei* [syn. *Hesperoyucca whipplei*]).

3.2.4 Laurel Sumac Scrub

Areas of laurel sumac scrub (LSS) [*Malosma laurina* Shrubland Alliance](or chaparral) are found within the PCH 8-inch Waterline Improvements Project (Zumirez Drive to Escondido Beach Road), Topanga Field Yard Staging Area, and Emergency Source of Water Supply Connection BSAs. These chaparral communities are dominated by large shrubs, such as laurel sumac, toyon, lemonade berry, and mountain mahogany. Additional species observed in the community include heart-leaved bush-penstemon, ceanothus, holly-leaved cherry, poison oak, and wild cucumber.

3.2.5 Disturbed Laurel Sumac Scrub

Disturbed laurel sumac scrub (D-LSS) [disturbed *Malosma laurina* Shrubland Alliance](or chaparral) was found within the Upper Encinal Tank Improvements BSA. Prior to the 2018 Woolsey Fire, this area was probably vegetated much the same as other patches of laurel sumac scrub. However, at the time of the assessment on November 6, 2019, fire damage to this community resulted in the widespread proliferation of summer mustard and tocalote (*Centaurea melitensis*), with only the occasional intact laurel sumac shrub.

3.2.6 Fourwing Saltbush Scrub

An area dominated by fourwing saltbush scrub (FSS) (*Atriplex canescens* Shrubland Alliance] occurs in the Escondido Creek and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) BSAs. This community is located along the banks and upper terrace area of Escondido Creek, where soils appear to be more alkaline.

3.2.7 California Sycamore Woodlands

Areas of California sycamore woodlands (CSW) [*Platanus racemosa* Woodland Alliance] are found throughout the overall BSA, including the Emergency Source of Water Supply Connection, Zuma Creek, Carbon Canyon and Carbon Mesa Road, and Las Tunas County Beach BSAs. These areas are dominated by western sycamore (*Platanus racemosa*), but also contain some annual brome grassland, arroyo willow (*Salix lasiolepis*), and mule fat (*Baccharis salicifolia*).

3.2.8 California Walnut Grove

Areas of California walnut grove (CWG) [*Juglans californica* Woodland Alliance] occur within the northern portion of the Emergency Source of Water Supply Connection and within the western portion of the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) BSA. These areas are dominated by southern California black walnut (*Juglans californica* var. *californica*). Other plants observed in the California walnut grove community consist of Canyon sunflower, California wishbone bush (*Mirabalis laevis*), and nonnative grasses, such as red brome, ripgut brome, and smilograss.

3.2.9 Coast Live Oak Woodland

Areas of coast live oak woodland (CLOW) [*Quercus agrifolia* Woodland Alliance] are located throughout the BSA, mostly in the canyons and the western portion of the BSA along the coast. Areas of coast live oak woodland are dominated by coast live oak (*Quercus agrifolia*), but also contain other understory native shrubs, such as mountain mahogany, laurel sumac, ceanothus, and native forbs, such as wild cucumber and poison oak. Single individuals and small groupings of coast live oak trees occur within some of the dense ornamental vegetation associated with many of the residential areas of the BSAs.

3.2.10 Red Willow Thicket

Areas of red willow thicket (RWT) [*Salix laevigata* Woodland Alliance] are associated with the various creeks and drainage crossings in the BSA. These areas are dominated by riparian trees and shrubs, such as arroyo willow, red willow (*Salix laevigata*), and mule fat. Some portions of areas mapped as red willow thicket also contain individuals of western sycamore. Other plants observed in association with the red willow thicket community include wild cucumber, California blackberry (*Rubus ursinus*), poison oak, laurel sumac, umbrella sedge (*Cyperus esculentus*), castor bean (*Ricinus communis*), giant reed (*Arundo donax*), acacia (*Acacia* sp.), eucalyptus (*Eucalyptus* sp.), and Mexican fan palm (*Washingtonia robusta*). The understory of the majority of the red willow thicket in the BSA is not developed and appears to be hindered by the extreme storm flows associated with the short steep drainages along the Santa Monica coastline.

3.2.11 Disturbed Red Willow Thicket

Areas of disturbed red willow thicket (D-RWT) [Disturbed *Salix laevigata* Woodland Alliance] occur in the Topanga Canyon Creek and Carbon Canyon Carbon Mesa Road BSAs. Within Topanga Canyon Creek, this community is dominated by giant reed, and has very low cover of willow (*Salix* sp.). Within Carbon Canyon the disturbed red willow thicket community is dominated by arroyo willow and giant reed. Additional plants associated with this community in Carbon Canyon include sand bar willow (*Salix exigua*), western sycamore, poison oak, California blackberry, pampas grass (*Cortaderia selloana*), and Mexican fan palm.

3.2.12 Saltgrass/Cattail Marsh

Areas of saltgrass/cattail marsh (S/CM) [*Distichlis spicata* Herbaceous Alliance/*Typha domingensis* Herbaceous Alliance] occur throughout the overall BSA associated with creek outlets. These areas are dominated by herbaceous salt and freshwater species, such as saltgrass (*Distichlis spicata*), cattail (*Typha domingensis*), great water speedwell (*Veronica anagallis-aquatica*), fleshy jaumea (*Jaumea carnosa*), alkali mallow (*Malvella leprosa*), tule (*Schoenoplectus* sp.), common spike rush (*Eleocharis palustris*), African brass-buttons (*Cotula coronopifolia*), and cocklebur (*Xanthium strumarium*).

3.2.13 Dune Mat

Areas of dune mat (DM) [*Ambrosia chamissonis* Herbaceous Alliance] are found associated with the Zuma Beach Staging Area. These areas are dominated by beach bur (*Ambrosia chamissonis*), and sea rocket (*Cakile maritima*). The Zuma Beach staging area contains some cover of beach sand verbena (*Abronia umbellata*) and red sand verbena (*Abronia maritima* [CNPS 1B.1]).

3.2.14 Annual Brome Grasslands

Areas of annual brome grasslands (ABG) [*Bromus* (*diandrus, madritensis*) – *Brachypodium distachyon* seminatural Herbaceous Stands] occur throughout the overall BSA. These areas are dominated by nonnative grasses, such as red brome, rip-gut brome, wild oats, smilograss, purple false brome (*Brachypodium distachyon*), and fountain grass. Additional plants observed in these areas include deer weed (*Acmispon glaber*), doveweed (*Croton setigerus*), California aster (*Corethrogyne filaginifolia*), and fennel.

3.2.15 Ornamental/Developed

Areas of ornamental/developed (O/D) [N/A to California Manual of Vegetation] are located throughout the overall BSA. These areas are associated with roads, residential houses, and businesses and contain structures, as well as associated vegetation. Vegetation associated with these areas is chiefly nonnative ornamental, including jacaranda (*Jacaranda* sp.), Mexican fan palm, date palm (*Phoenix canariensis*), myoporum (*Myoporum* sp.), acacia, ash (*Fraxinus* sp.), cape honeysuckle (*Tecomaria* sp.), Ligustrum (*Ligustrum* sp.), bottle brush tree (*Melaleuca* sp.), olive (*Olea* sp.), bougainvillea (*Bougainvillea* sp.), pine (*Pinus* sp.), Peruvian pepper tree (*Schinus molle*), Brazilian pepper tree (*Schinus terebenthifolius*), and a variety of different eucalyptus trees. Some areas of ornamental/developed, chiefly located in the canyons, have higher percentages of native shrubs and trees, such as coast live oak, mountain mahogany, laurel sumac, toyon, lemonade berry, and ceanothus.

3.2.16 Disturbed/Ruderal

The areas of disturbed/ruderal (D/R) [N/A to California Manual of Vegetation] have been previously disturbed, either by grading or vegetation management. This vegetation type is predominately located along the edges of PCH and in disturbed dirt parking lots and vacant lots in the BSA. Disturbed/ruderal areas are dominated by nonnatives and native plants that are commonly found in disturbed areas. Nonnative grasses and forbs, such as wild oat, rip-gut brome, red brome, fountain grass, smilograss, red-stemmed filaree (*Erodium cicutarium*), chrysanthemum (*Chrysanthemum coronarium*), long-beaked filaree (*Erodium botrys*), castor bean, Russian thistle, and summer mustard. Native vegetation associated with disturbed/ruderal areas consists of native forbs, such as telegraph weed (*Heterotheca grandiflora*), as well as scatted individuals of native shrubs, such as deer weed, laurel sumac, and California buckwheat.

3.2.17 Open Sand

Areas of open sand (OS) [N/A to California Manual of Vegetation] consist of sandy beaches along the coastline of the BSA. These areas are mostly unvegetated.

3.2.18 Open Water

Areas of open water (OW) [N/A to California Manual of Vegetation] are found along the coastline within the BSA. These areas consist of open ocean.

3.2.19 Cobble

Areas of cobble (C) [N/A to California Manual of Vegetation] consist of beach cobble and sand found along the coastline of the BSA. These areas are associated with tidal portions of beach environs and creek outlets. These areas are unvegetated.

3.3 Soils

A total of 20 soil types are found in the BSAs within the following soil map units: Abaft-Beaches-Urban land complex; Calcic Argixerolls; Chumash-Boades-Malibu association; Cropley, coastal-Urban land-Haploxererts complex; Cumulic Haploxerolls; Danville-Urban land complex; Elder fine sandy loam, coastal; Lockwood-Urban land complex; Mipolomol-Topanga association; Pachic Argixerolls, coastal; Rock outcrop-Sumiwawa-Hipuk complex; Sapwi-Urban land complex; Topanga-Mipolomol-Sapwi association; Urban land-Xerorthents, landscaped complex; Urban land-Xerorthents, landscaped, complex, rarely flooded; and Zumaridge-Kawenga association (Appendix A, Figure 5). Soils within the BSA have been heavily disturbed and altered due to development along the Malibu coastline and from being part of a dynamic, ocean-influenced shoreline.

3.3.1 Abaft

The Abaft series consists of very deep, excessively drained soils found on stabilized dunes and beach areas along the coast. This soil is not extensive and mostly found in Santa Barbara County, California, on Santa Cruz Island. The soils formed in eolian and wave reworked sands from mixed sources. Elevations are 1 to 300 feet, and slopes range from 0 to 25 percent with negligible runoff and rapid permeability. Dominant vegetation supported is low shrubs and annual grasses.

Abaft soils are located in the BSAs of the following projects and sites: PCH & Topanga Beach Drive (Segment 1), PCH & Topanga Beach Drive (Segment 2), PCH & Topanga Beach Drive (Segment 3), Corral Canyon Creek, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Coal (Carbon) Canyon Creek, Las Flores Canyon Creek, Escondido Creek, Coastline Drive, Topanga Canyon Creek, Pena Canyon Creek, Big Rock Bypass Improvements, Las Tunas County Beach Staging Area, Topanga County Beach Staging Area, and Zuma Beach Staging Area.

3.3.2 Calcic Argixerolls

Calcic Argixerolls have a calcic horizon (i.e., identifiable secondary carbonates) at a moderate depth, but are otherwise like Typic Argixerolls in their defined properties. Typic Argixerolls are deep to secondary carbonates with a high base saturation that are dry in summer, but receive and store enough water in winter and early spring to provide moisture for spring and early summer crops. Slopes of Calcic Argixerolls are nearly level to very steep. Calcic Argixerolls are found widespread in the western U.S. Most dominant vegetation on these soils are grasses and shrubs, and most of the soils used as rangeland, pasture, or cropland.

Calcic Argixerolls are located in the BSAs of the following projects and sites: PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Emergency Source of Water Supply Connection (Las Virgenes Connection), Corral Canyon Creek, Zuma Creek, RMD Winter Canyon Yard Staging Area, and NW Corner of Encinal Canyon Road & PCH Staging Area.

3.3.3 Chumash

Chumash soils consist of very shallow and shallow-to-soft bedrock, well-drained soils that formed in residuum and colluvium derived from shale and sandstone. Chumash soils lack a mollic epipedon and have low to high runoff and moderate permeability. These soils are found on hills and mountains, at elevations of 10 to 1,570 feet, and on slopes of 5 to 75 percent. They are moderately extensive, occurring in Ventura and Los Angeles counties. Native vegetation found on these soils is dominated by California sagebrush, purple sage (*Salvia leucophylla*), white sage (*Salvia apiana*), black sage, California buckwheat, golden bush (*Isocoma* sp.), and deer weed.

Chumash soils are located in the BSAs of the following projects and sites: PCH & Topanga Beach Drive (Segment 1), PCH & Topanga Beach Drive (Segment 2), PCH & Topanga Beach Drive (Segment 3), Big Rock Bypass Improvements, Emergency Source of Water Supply Connection (Las Virgenes Connection), Carbon Canyon Carbon Mesa Rd, Coal (Carbon) Canyon Creek, Pena Canyon Creek, Upper Encinal Tank Improvements, Las Tunas County Beach Staging Area, and NW Corner of Encinal Canyon Road & PCH Staging Area.

3.3.4 Boades

The Boades series consists of shallow-to-soft bedrock, well-drained soils that formed in residuum and colluvium derived from bedded shale and sandstone. They have mollic epipedons, very low to medium runoff, and moderate to moderately slow permeability. Boades soils are found on hills and mountains, at elevations of 10 to 1,570 feet, and on slopes of 5 to 75 percent. They are moderately extensive, occurring in Ventura and Los Angeles counties. Native vegetation found on these soils is dominated by California sagebrush, purple sage, white sage, black sage, buckwheat, golden bush, and deer weed.

Boades soils are located in the BSAs of the following projects and sites: PCH & Topanga Beach Drive (Segment 1), PCH & Topanga Beach Drive (Segment 2), PCH & Topanga Beach Drive (Segment 3), Big Rock Bypass Improvements, Emergency Source of Water Supply Connection (Las Virgenes Connection), Carbon Canyon Carbon Mesa Rd, Coal (Carbon) Canyon Creek, Pena Canyon Creek, Upper Encinal Tank Improvements, Las Tunas County Beach Staging Area, and NW Corner of Encinal Canyon Road & PCH Staging Area.

3.3.5 Malibu

The Malibu series consists of moderately deep to soft bedrock, moderately well-drained soils that formed in residuum and colluvium derived from inter-bedded shale and sandstone. They have mollic epipedons, high to very high runoff, and very slow permeability. Malibu soils are found on hills and mountains, at elevations of 10 to 1,570 feet, and on slopes of 4 to 75 percent. Malibu soils are moderately extensive, occurring in Ventura and Los Angeles counties. Native vegetation found on these soils is dominated by California sagebrush, purple sage, white sage, black sage, buckwheat, golden bush, and deer weed.

Malibu soils are located in the BSAs of the following projects and sites: PCH & Topanga Beach Drive (Segment 1), PCH & Topanga Beach Drive (Segment 2), PCH & Topanga Beach Drive (Segment 3), Big Rock Bypass Improvements, Emergency Source of Water Supply Connection (Las Virgenes Connection), Carbon Canyon Carbon Mesa Rd, Coal (Carbon) Canyon Creek, Pena Canyon Creek, Upper Encinal Tank Improvements, Las Tunas County Beach Staging Area, and NW Corner of Encinal Canyon Road & PCH Staging Area.

3.3.6 Cropley

The Cropley series consists of very deep, moderately well- and well-drained soils that formed in alluvium from mixed rock sources, often in fine-textured alluvium weathered from shale, sandstone, and mudstone. These soils are found on alluvial fans, floodplains, and in small basins, at elevations of

10 to 2,100 feet and slopes ranging from 0 to 15 percent. The soils are moderately extensive and mapped in Central California coastal valleys and on the southern California coastal plain. Cropley soils have medium to very high runoff, slow permeability, and are not flooded, although flooding may be controlled in some areas. These soils are used for irrigated crops, irrigated and dry pasture, some orchards, and urban development. Vegetation in uncultivated or undeveloped areas consists of annual grasses and forbs, with some scattered live oak.

Cropley soils are located in the BSAs of the following projects and sites: PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Escondido Creek, and Point Dume Tank Site Staging Area.

3.3.7 Haploxererts

Haploxererts are Xererts that do not have a calcic or petrocalcic horizon or a duripan and are the most common of the type. Xererts soils are found in Mediterranean climates, where the soils dry every summer and moisten in the winter, causing them to have cracks that regularly close and open each year. Haploxererts formed in a variety of parent materials, including volcanic and sedimentary rocks, lacustrine deposits, and alluvium. These soils are often used for grazing by livestock and sometimes used for citrus, small grain, rice, or other crops.

Haploxererts are located in the BSAs of the following projects and sites: PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Escondido Creek, and Point Dume Tank Site Staging Area.

3.3.8 Cumulic Haploxerolls

Cumulic Haploxerolls have a thick mollic epipedon. These soils are moderately extensive in parts of the western United States, found on nearly level or gently sloping areas, usually on flood plains, in low areas on stream terraces, or in concave areas where fresh sediments accumulate slowly. The native vegetation that grows in them is dominantly grasses and shrubs, but some of the soils support trees (mostly willow and cottonwood [*Populus* sp.]). Relatively large areas of these soils are used as cropland, while relatively smaller areas typically support rangeland, forest, or wildlife habitat.

Cumulic Haploxerolls are located in the BSAs of the following projects and sites: PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), PCH & Topanga Beach Drive (Segment 2), Emergency Source of Water Supply Connection (Las Virgenes Connection), Escondido Creek, and Las Flores Canyon Creek.

3.3.9 Danville

The Danville series consists of very deep, well-drained soils that formed in alluvium with some coarse sand derived from sedimentary and crystalline rocks. These soils are found on fans and terraces, at elevations of 20 to 1,500 feet, and have slopes of 0 to 9 percent. They are of moderate extent, primarily occurring in valleys in the central part of the Coast Range. Danville soils have slow to medium runoff and slow permeability and are often used for growing irrigated crops and some small grain, and uncultivated areas support annual grasses, forbs, and scattered trees.

Danville soils are located in the BSAs of the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) project and NW Corner of Encinal Canyon Road & PCH Staging Area.

3.3.10 Elder

The Elder series consists of very deep and deep, well-drained soils that formed in moderately coarse-textured alluvium derived from sedimentary, granitic, and basic igneous rock sources. Elder soils are on alluvial fans and in flood plains, at elevations of 20 to 1,500 feet, and have slopes of 0 to 15 percent. They are extensive in the Central Valley and valleys of the Coast Range. They have negligible to low runoff and moderately rapid permeability; small areas adjacent to drainage ways are often subject to overflow during severe storms, while some areas are protected with dams and levees. Elder soils are used for irrigated crops or small grain, hay, and other crops without irrigation, as well as for urban development. Vegetation in uncultivated areas consists of annual grasses and forbs, with scattered live oak.

Elder soils are located in the BSAs of the following projects and sites: Topanga Canyon Creek, Zuma Creek, Topanga Field Yard Staging Area, and Zuma Beach Staging Area.

3.3.11 Lockwood

The Lockwood series consists of very deep, well-drained soils that formed in alluvial material from dominantly siliceous shales. They are found on alluvial fans and bench terraces, at elevations of 100 to 2,000 feet, and have slopes of 0 to 15 percent. These soils have low to high runoff and moderately slow permeability. Lockwood soils are moderately extensive in California, occurring in valleys of the central and southern parts of the Coast Range. Lockwood soils are used for growing irrigated crops, some orchards, dryland grain, and some rangeland. Naturalized and native vegetation usually supported consists of annual grasses and forbs, occasional oaks, and some brush.

Lockwood soils are located in the BSAs of the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project and NW Corner of Encinal Canyon Road & PCH Staging Area.

3.3.12 Mipolomol

The Mipolomol series consists of very shallow or shallow-to-fractured bedrock, well-drained soils that formed in residuum and colluvium derived from bedded shale and sandstone. This soil is not extensive, but occurs in Ventura and Los Angeles counties. Mipolomol soils are found on hills and mountains, at elevations of 400 to 2,510 feet, with slopes of 30 to 75 percent. Native vegetation usually supported on these soils consists of big pod ceanothus (*Ceanothus megacarpus*) and chamise (*Adenostoma fasciculatum*).

Mipolomol soils are located in the BSAs of the following projects and sites: Emergency Source of Water Supply Connection (Las Virgenes Connection), Coastline Drive, Topanga Field Yard Staging Area, and Applefield Lane Vacant Lot Staging Area.

3.3.13 Topanga

The Topanga series consists of shallow to fractured bedrock, well-drained soils that formed in residuum and colluvium derived from bedded shale and sandstone. This soil is not extensive, but occurs in Ventura and Los Angeles counties. Topanga soils are found on hills and mountains, at elevations of 400 to 2,510 feet, with slopes of 30 to 75 percent. They have high runoff and moderate permeability. Native vegetation usually supported on these soils consists of big pod ceanothus, lupine (*Lupinus* sp.), mulberry (*Morus alba*), coffeeberry (*Frangula* sp.), and chamise.

Topanga soils are located in the BSAs of the following projects and sites: Emergency Source of Water Supply Connection (Las Virgenes Connection), Coastline Drive, Topanga Field Yard Staging Area, and Applefield Lane Vacant Lot Staging Area.

3.3.14 Pachic Argixerolls

Pachic Argixerolls have a thick mollic epipedon that commonly includes part of the argillic horizon. They are extensive in parts of the western U.S. and occur in an array of areas where slopes are nearly level to very steep. The natural vegetation is mostly grass and shrubs, although some of the soils support forest vegetation or oak savanna. Relatively less-sloping soils are often used as cropland, and moderately sloping areas are used mostly as rangeland or pasture.

Pachic Argixerolls are located in the BSAs of the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) project and NW Corner of Encinal Canyon Road & PCH Staging Area.

3.3.15 Sumiwawa

The Sumiwawa series consists of shallow to soft sandstone, somewhat excessively drained soils that formed in residuum and colluvium derived from sandstone. Sumiwawa soils are of limited extent, occurring in Los Angeles County. These soils are found on hills and mountains, at elevations of 1,400 to 2,500 feet, with slopes of 30 to 75 percent. They have high runoff and rapid permeability. Vegetation is dominated by chamise, ceanothus, laurel sumac, and various forbs and grasses.

Sumiwawa soils are located in the BSAs of the Applefield Lane Vacant Lot Staging Area site.

3.3.16 Hipuk

Hipuk soils consist of shallow to soft sandstone, well-drained soils that formed in residuum and colluvium derived from sandstone. They are of limited extent, occurring in Los Angeles County. These soils are found on hills and mountains, at elevations of 1,400 to 2,500 feet, and at slopes of 30 to 75 percent. They have medium runoff and moderately slow permeability. Vegetation is dominated by chamise, ceanothus, laurel sumac, and various forbs and grasses.

Hipuk soils are located in the BSAs of the Applefield Lane Vacant Lot Staging Area site.

3.3.17 Sapwi

The Sapwi series consists of moderately deep to bedrock, well-drained soils that formed in residuum and colluvium derived from sandstone. Sapwi soils are found on northerly and easterly facing, concave, side slopes of hills and mountains, at elevations of 500 to 3,000 feet, and at slopes of 15 to 75 percent. They have low to high runoff, and moderate to moderately slow permeability. These soils are not extensive, and occur in Ventura and Los Angeles counties. Vegetation is dominated by coast live oak, poison oak, and miscellaneous forbs and grasses.

Sapwi soils are located in the BSAs of the following projects and sites: Coastline Drive, Emergency Source of Water Supply Connection (Las Virgenes Connection), Fernwood Tank, Applefield Lane Vacant Lot Staging Area, and Owen Tank Staging Area.

3.3.18 Xerorthents

Xerorthents are orthents that have a xeric moisture regime and a frigid, mesic, or thermic soil temperature regime. They are generally neutral to moderately alkaline, but some are acidic. Slopes are mostly moderate to steep, but are gentle in a few areas. Xerorthents are usually in sandy-skeletal families or occur in areas of very recently exposed regolith, such as loess or till; in areas of weakly cemented rocks, such as shale; or in areas of very thin regolith over hard rocks. Some of these soils, particularly those that have been cultivated for a long time or reshaped for irrigation, consist of what was the C horizon of other Xeric great groups, primarily Xeralfs and Xerolls. The vegetation supported is usually commonly trees or shrubs, or the soils are used as pasture.

Xerorthents are located in the BSAs of the following projects and sites: Coastline Drive, Sunset Mesa Tank Staging Area, and RMD Winter Canyon Yard Staging Area.

3.3.19 Zumaridge

The Zumaridge series consist of shallow to bedrock, well-drained soils that formed in residuum and colluvium derived from sandstone. Zumaridge soils are found on convex side slopes of hills and mountains, at elevations of 600 to 3,100 feet, and with slopes of 15 to 75 percent. They have medium to very high runoff and moderate permeability. These soils are not extensive, but occur in Ventura and Los Angeles counties. Vegetation is dominated by big pod ceanothus, greenbark ceanothus (*Ceanothus spinosus*), and various forbs and grasses.

Zumaridge soils are located in the BSAs of the following projects and sites: Owen Tank Staging Area and Applefield Lane Vacant Lot Staging Area.

3.3.20 Kawenga

The Kawenga series consists of deep to bedrock, well-drained soils that formed in residuum and colluvium derived from sandstone. Kawenga soils are found on hills and mountains, at elevations of 500 to 3,000 feet, and with slopes of 15 to 75 percent. This soil is not extensive, but occurs in Ventura, Los Angeles, and Santa Clara counties. Vegetation is dominated by greenbark ceanothus, big pod ceanothus, chamise, and various forbs and grasses.

Kawenga soils are located in the BSAs of the following projects and sites: Owen Tank Staging Area and Applefield Lane Vacant Lot Staging Area.

3.4 Sensitive Natural Communities, Designated Critical Habitat, and Essential Fish Habitat

The literature and database reviews described in Chapter 2, *Methodology*, resulted in identification of 11 sensitive natural communities, federally designated critical habitat for three species, and three types of Essential Fish Habitat (EFH) that occur within the general geographic vicinity of the project. These were evaluated for their potential to occur within the BSAs and are discussed in the sections below.

3.4.1 Sensitive Natural Communities

Of the 11 sensitive natural communities that occur in the general geographic vicinity of the project (CDFW 2019), seven are known to occur within the BSA or were observed during surveys as discussed below (Table 4; Appendix A, Figure 6). Definitions of these seven sensitive natural communities are provided below, as defined in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). Holland (1986) was also consulted for clarification as needed; the CNDDB formerly used Holland as its primary classification system and still uses Holland in parts of the state that have not been classified according to updated state standards.

Table 4. Sensitive Natural Communities Evaluated within the Project Area and Biological Study Area

	Sensitive Natural Communities	
Project Site/Staging Area	**Project Site Overlap**	**Biological Study Area Overlap**
Big Rock Bypass Improvements	--	Southern Sycamore Alder Riparian Woodland
Carbon Canyon Road & Carbon Mesa Road Waterline Improvements	--	--
Coastline Drive 12-inch Waterline Improvements	--	--
Emergency Source of Water Supply Connection (Las Virgenes Connection)	Southern Coast Live Oak Riparian Forest	California Walnut Woodland, Southern Coast Live Oak Riparian Forest, Southern Sycamore Alder Riparian Woodland
Fernwood Tank	--	--
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	Coastal Lagoon	California Walnut Woodland, Southern Coast Live Oak Riparian Forest, Coastal Lagoon, Southern Coastal Salt Marsh
PCH & Topanga Beach Drive Waterline Improvements	--	Southern Coastal Salt Marsh (Segment 2 BSA)
Upper Encinal Tank	--	--
District No. 29 Creek Crossing Repair Project		
1. Topanga Canyon Creek	Coastal Lagoon, Southern California Steelhead Stream	Coastal Lagoon, Southern California Steelhead Stream
2. Pena Canyon Creek	--	Southern Riparian Forest, Southern Sycamore Alder Riparian Woodland
3. Las Flores Canyon Creek	Coastal Lagoon	Coastal Lagoon, Southern Coastal Salt Marsh
4. Coal (Carbon) Canyon Creek)	--	--
5. Escondido Creek	Coastal Lagoon	Coastal Lagoon, Southern Coastal Salt Marsh
6. Corral Canyon Creek	Coastal Lagoon, Southern Coastal Salt Marsh	Coastal Lagoon, Southern Coastal Salt Marsh
7. Zuma Creek	--	--

Staging Areas		
Applefield Lane Vacant Lot Staging Area	--	Southern Coast Live Oak Riparian Forest
Las Tunas County Beach Staging Area	--	--
Owen Tank Site Staging Area	--	--
Point Dume Tank Site Staging Area	--	--
RMD Winter Canyon Staging Area	--	--
Sunset Mesa Tank Staging Area	--	--
Topanga County Beach Staging Area	--	Coastal Lagoon, Southern California Steelhead Stream
Topanga Field Yard Staging Area	--	--
Zuma Beach Staging Area	--	--
NW Intersection of Encinal Canyon RD & PCH	--	--

3.4.1.1 California Walnut Woodland

California walnut is the dominant or co-dominant in the tree canopy with white alder, California ash (*Fraxinus dipetala*), toyon, coast live oak, valley oak (*Quercus lobata*), red willow, arroyo willow, black elderberry (*Sambucus nigra*), and California bay (*Umbellularia californica*). Trees are less than 50 feet tall; canopy is open to continuous. Shrub layer is sparse to intermittent. Herbaceous layer is sparse or grassy. California walnut is greater than 50 percent relative cover in the tree canopy or greater than 30 percent relative cover with coast live oak present (Keeler-Wolf and Evens 2006, as cited in Sawyer et al. 2009). California walnut can occur in riparian corridors, but most stands cover hillslopes. The USFWS Wetland Inventory (1996 national list) recognizes California walnut as a FAC plant.

The closest mapped community to California walnut woodland in the BSA is California walnut grove. There are no previously mapped occurrences of California walnut woodland within the BSA, although there are multiple habitats mapped within the foothills on the northern side of the Santa Monica Mountains (CDFW 2019). California walnut groves were observed during field surveys within the BSA of the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) and the Emergency Source of Water Supply Connection (Las Virgenes Connection).

3.4.1.2 Coastal Lagoon

Coastal lagoon habitat consists of locations where streams outlet to the ocean with various tidal zones, some of which transition into large freshwater complexes or sloughs. Lagoons are formed where the outlets are seasonally closed by sand bars, containing variably brackish water throughout the year.

Coastal lagoon habitat is present within the BSA and is generally characterized in the vegetation mapping as open sand and/or cobble, where associated with creeks emptying onto the beach and draining to the ocean. There are no previously mapped occurrences of Southern California Coastal Lagoon within the BSA, although there is nearby habitat mapped at the Malibu Creek mouth (CDFW 2019). Coastal lagoon habitats were observed during field surveys within the BSA of the Topanga County Beach Staging Area. Coastal lagoon habitats were observed within the project sites and BSAs at the Topanga Canyon Creek, Las Flores Canyon Creek, Escondido Creek, Corral Canyon Creek, and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) sites.

3.4.1.3 Riversidian Alluvial Fan Sage Scrub

Riversidian Alluvial Fan Sage Scrub is found on California's inner southern coast and inland along the base of the Transverse and Peninsular ranges, extending south into Baja California, Mexico. This alliance consists of shrublands dominated by California sagebrush, California buckwheat, white sage, and/or black sage. Other species present include brittlebush (*Encelia farinosa*), goldenbush (*Ericameria* spp.), coastal goldenbush (*Isocoma menziesii*), chaparral mallow (*Malacothamnus fasciculatus*), laurel sumac, sumac (*Rhus* spp.), and/or our lord's candle. In more mesic settings, on rockier soil, often closer to the coast, black sage increases in importance and this alliance shifts to a California sagebrush (black sage), purple sage Mesic Scrub Alliance. Habitats are slopes that are steep and south facing, sometimes bouldery, as well as intermittently flooded arroyos, channels and washes, and rarely flooded low-gradient deposits. Elevation ranges from 820–5,249 feet. Soils are coarse or fine-textured, well-drained, moderately acidic to slightly saline, and colluvial-derived or, in some cases, alluvial.

Riversidian alluvial fan sage scrub habitat is not present within the BSA. There are no previously mapped occurrences of Riversidian alluvial fan sage scrub within the BSA, and the nearest mapped occurrence is in the San Fernando Valley (CDFW 2019). Riversidian alluvial fan sage scrub habitat was not observed during field surveys within the BSA.

3.4.1.4 Southern California Steelhead Stream

Southern California Steelhead Stream consists of stream habitat suitable for southern California steelhead, generally characterized as areas with cold water with good water quality that are mostly low in turbidity, and with suitable spawning substrate ranging in size from gravel to cobble and free of fine sediments.

Southern California steelhead stream habitat is present within the BSA. There are no previously mapped occurrences of Southern California steelhead stream within the BSA, although there is nearby habitat mapped in Malibu Creek (CDFW 2019). Steelhead are also known to occur in Topanga Creek (CDFW 2019, NMFS 2005) and could occur within the BSA and project site of the Topanga Canyon Creek project, and the BSA of the Topanga County Beach Staging Area.

3.4.1.5 Southern Coast Live Oak Riparian Forest

Coast live oak is the dominant or co-dominant in the tree canopy, with bigleaf maple (*Acer macrophyllum*), boxelder maple (*Acer negundo*), Pacific madrone (*Arbutus menziesii*), California walnut, western sycamore, Fremont's cottonwood (*Populus fremontii*), blue oak (*Quercus douglasii*), Engelmann oak (*Quercus engelmannii*), California black oak (*Quercus kelloggii*), valley oak, arroyo willow, and California bay. Trees are less than 98 feet tall; canopy is open to continuous. Shrub layer is sparse to intermittent. Herbaceous layer is sparse or grassy. Coast live oak is greater than 50 percent relative cover in the tree canopy; if California bay trees are present, less than 33 percent relative cover in the tree canopy (Keeler-Wolf et al. 2003, as cited in Sawyer et al. 2009; Evens and San 2004, as cited in Sawyer et al. 2009; Keeler-Wolf and Evens 2006, as cited in Sawyer et al. 2009) or coast live oak greater than 60 percent relative cover in the tree canopy (Evens and San 2005, as cited in Sawyer et al. 2009; Klein and Evens 2005, as cited in Sawyer et al. 2009).

The closest mapped community to southern coast live oak riparian forest in the BSA is coast live oak woodland. There are no previously mapped occurrences of southern coast live oak riparian forest within the BSA, although there are multiple habitats mapped along the southern side of the Santa Monica Mountains; the nearest is at San Nicholas Canyon north of Highway 1 (CDFW 2019). Coast live oak woodland habitats were observed during field surveys within the BSA of the Applefield Lane Vacant Lot Staging Area, and within the project sites and BSAs of the Emergency Source of Water Supply Connection (Las Virgenes Connection) and the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road).

3.4.1.6 Southern Coastal Salt Marsh

Southern Coastal Salt Marsh, which occurs in bays, lagoons, and estuaries along the coast from about Point Conception to the Mexican border, is very similar to Northern Coastal Salt Marsh, but with warmer water and air temperatures. Southern specialty species include Watson's saltbush (*Atriplex watsonii*), saltwort (*Batis maritima*), California boxthorn (*Lycium californicum*), shoregrass (*Monanthochloe littoralis*), California seablite (*Suaeda californica*), and Parish's pickleweed (*Salicornia subterminalis*). Sea heath (*Frankenia* spp.), seablite (*Suaeda* spp.), and/or Parish's pickleweed often occur along the upper, landward edges of the marshes; Bigelow's pickleweed (*Salicornia bigelovii*), Virginia glasswort (*Salicornia virginica*), and saltwort at middle elevations; and cordgrass (*Spartina* spp.) closest to open water.

The closest mapped community to southern coastal salt marsh in the BSA is saltgrass/cattail marsh. There are no previously mapped occurrences of southern coastal salt marsh within the BSA, although there is nearby habitat mapped at the Malibu Creek Lagoon (CDFW 2019). Alkaline/emergent wetland habitats were observed during field surveys within the BSAs of the PCH & Topanga Beach Drive (Segment 2), Las Flores Canyon Creek, Escondido Creek, and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road). Alkaline/emergent wetland habitats were observed during field surveys within the BSA and project site of the Corral Canyon Creek site.

3.4.1.7 Southern Dune Scrub

The Southern Dune Scrub alliance occurs from southern Oregon to central and southern California along the Pacific Coast and in the interior of the Coast Ranges, as well as in the Transverse Ranges. The shrublands are scattered on river mouths, streamsides, terraces, stabilized dunes of coastal bars, spits along coastline, coastal bluffs, open slopes, and ridges. The dominant or codominant species coyote brush behaves similarly in southern California mountains as it does in other areas of northern California, where it often forms the first wave of woody species to recolonize cleared land. Other shrub species vary, depending upon the habitat and location within California, but even locally, no other shrub species are consistently present. South of San Francisco Bay, the coastal scrub is similar in structure, but different in species composition. Associated shrub species include California sagebrush, sticky monkeyflower (*Diplacus aurantiacus* [syn. *Mimulus aurantiacus*]), California buckwheat, golden yarrow (*Eriophyllum confertiflorum*), and sage (*Salvia* spp.). Herbaceous species decrease in abundance, and nonnative annual grasses, such as oats (*Avena* spp.), brome grasses (*Bromus* spp.), and rye grass (*Lolium* spp.), increase in cover.

Southern Dune Scrub habitat is not present within the BSA. There are no previously mapped occurrences of Southern Dune Scrub within the BSA, and the nearest mapped habitat is at El Segundo Dunes (CDFW 2019).

3.4.1.8 Southern Riparian Forest

The Southern Riparian Forest alliance consists of riparian woodlands dominated by western sycamore and/or coast live oak. Other trees present may include white alder, California walnut, Fremont's cottonwood, sand bar willow, black willow (*Salix gooddingii*), red willow, arroyo willow, yellow willow (*Salix lutea*), and California bay. Shrubs can be uncommon to frequent and may include mule fat and poison oak. The ground layer is grassy and may include slim oat (*Avena barbata*) and/or soft chess (*Bromus hordeaceus*). This alliance is not to be confused with upland stands of coast live oak and must have wetland understory indicators to belong to this riparian alliance. It is found in California and possibly Baja California in gullies, intermittent streams, springs, seeps, streambanks, and terraces adjacent to floodplains subject to flooding and seasonal saturation.

The closest mapped community to southern riparian forest in the BSA is red willow thicket. There are no previously mapped occurrences of southern riparian forest within the BSA, and the nearest mapped habitat is at Arroyo Conejo, north of Thousand Oaks (CDFW 2019). Red willow thicket habitats were observed during field surveys within the BSAs of the Zuma Creek, Corral Canyon Creek, Las Flores Canyon Creek, Carbon Canyon Carbon Mesa Road, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), and PCH & Topanga Beach Drive Waterline Improvements.

3.4.1.9 Southern Sycamore Alder Riparian Woodland

The Southern Sycamore Alder Riparian Woodland is a tall, open, broadleafed, winter-deciduous streamside woodland dominated by western sycamore (and often also white alder). These stands seldom form closed canopy forests and even may appear as trees scattered in a shrubby thicket of sclerophyllous and deciduous species. Vines include California blackberry and poison oak. Southern Sycamore Alder Riparian Woodland occurs on the Transverse and Peninsular ranges from Point Conception south into Baja California Norte, along very rocky streambeds subject to seasonally high-intensity flooding. Alders increase in abundance on more perennial streams, while sycamores favor more intermittent hydrographs.

The closest mapped community to southern sycamore alder riparian woodland in the BSA is California sycamore woodland. There are previously mapped occurrences of southern sycamore alder riparian woodland within the BSAs of the Topanga Field Yard Staging Area, Topanga Creek Project, and Topanga County Beach Staging Area (CDFW 2019). California sycamore woodland habitats were also observed during field surveys within the BSAs of the Emergency Source of Water Supply Connection (Las Virgenes Connection), Zuma Creek, Carbon Canyon Carbon Mesa Road, Big Rock Bypass Improvements, Pena Canyon Creek, and PCH & Topanga Beach Drive (Segment 1).

3.4.1.10 Valley Needlegrass Grassland

Purple needlegrass (*Stipa pulchra*) is dominant or characteristically present in the herbaceous layer with other perennial grasses and herbs, including milkvetch (*Astragalus* spp.), slim oat, wild oats (*Avena fatua*), soft chess, red brome (*Bromus madritensis* ssp. *rubens*), mariposa lily (*Calochortus* spp.), morning glory (*Calystegia* spp.), clarkia (*Clarkia* spp.), doveweed, cryptantha (*Cryptantha* spp.), blue wildrye (*Elymus glaucus*), filaree (*Erodium* spp.), California fescue (*Festuca californica*), summer mustard, narrow tarplant (*Holocarpha virgata*), meadow barley (*Hordeum brachyantherum*), June grass (*Koeleria macrantha*), goldfields (*Lasthenia* spp.), Lepidium nitidum, Lolium perenne, Lupinus spp., Melica californica, Melica imperfecta, nodding needlegrass (*Stipa cernua*), foothill needlegrass (*Stipa lepida*), plantain (*Plantago* spp.), pine bluegrass (*Poa secunda*), sanicle (*Sanicula* spp.), blueeyed grass (*Sisyrinchium bellum*), and clover (*Trifolium* spp.). Emergent trees and shrubs may be present at low cover, including oaks (*Quercus* spp.), California sagebrush, California buckwheat, and saw-toothed goldenbush (*Hazardia squarrosa*). Herbs are less than three feet tall; cover is open to continuous. Purple needlegrass is greater than 5 percent absolute cover as a characteristic to dominant species in the herbaceous layer (Klein et al. 2007, as cited in Sawyer et al. 2009); purple needlegrass is usually greater than 10 percent relative cover of the herbaceous layer (Evens and San 2005, as cited in Sawyer et al. 2009; Klein and Evens 2005, as cited in Sawyer et al. 2009; Keeler-Wolf and Evens 2006, as cited in Sawyer et al. 2009). Valley and foothill areas are on all topographic locations, and inland soils are deep with high clay content, or shallow and rocky near the coast.

Valley Needlegrass Grassland habitat is not present within the BSA. There are no previously mapped occurrences of Valley Needlegrass Grassland within the BSA, and the nearest mapped habitats are at Point Mugu and north of Calabasas (CDFW 2019).

3.4.1.11 Valley Oak Woodland

Valley Oak Woodland typically forms a grassy-understoried savanna, rather than a closed woodland. Valley oak is usually the only tree present. This winter-deciduous species is California's largest broadleafed tree, with mature individuals reaching 50–115 feet. Most stands consist of open-canopy growth form trees and seldom exceed 30–40 percent absolute cover. Valley Oak Woodland occurs in the Sacramento and San Joaquin valleys adjacent to the Sierra Nevada foothills and in valleys of the Coast Ranges from Lake County to western Los Angeles County. Valley Oak Woodland usually occurs below 2,000 feet on deep, well-drained alluvial soils, usually in valley bottoms; also found on nonalluvial settings in the South Coast and Transverse ranges.

Valley Oak Woodland is not present within the BSA. There are no previously mapped occurrences of Valley Oak Woodland within the BSA, and the nearest mapped habitat is in Malibu Creek State Park on the north side of the Santa Monica Mountains (CDFW 2019).

3.4.2 Designated Critical Habitat

Based upon a review of USFWS and NMFS critical habitat documentation and maps, the BSA is located within or adjacent to designated critical habitat for three species: tidewater goby (*Eucyclogobius newberryi*), western snowy plover (*Charadrius nivosus* ssp. *nivosus*), and the southern California DPS of steelhead trout (*Oncorhynchus mykiss*).

Table 5. Federally Designated Critical Habitat within the Project Area and Biological Study Area

Project Site/Staging Area	Designated Critical Habitat Overlap	
	Project Site	Biological Study Area
Big Rock Bypass Improvements	--	--
Carbon Canyon Road & Carbon Mesa Road Waterline Improvements	--	--
Coastline Drive 12-inch Waterline Improvements	--	--
Emergency Source of Water Supply Connection (Las Virgenes Connection)	--	--
Fernwood Tank	--	--
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	--	--
PCH & Topanga Beach Drive Waterline Improvements	--	--
Upper Encinal Tank Improvements	--	--
District No. 29 Creek Crossing Repair Project		
1. Topanga Canyon Creek	Tidewater goby	Tidewater goby; southern California steelhead (adjacent to BSA)
2. Pena Canyon Creek	--	-
3. Las Flores Canyon Creek	--	-
4. Coal (Carbon) Canyon Creek)	--	-
5. Escondido Creek	--	-
6. Corral Canyon Creek	--	-
7. Zuma Creek	--	-
Staging Areas		
Applefield Lane Vacant Lot Staging Area	--	-
Las Tunas County Beach Staging Area	--	-
Owen Tank Site Staging Area	--	-
Point Dume Tank Site Staging Area	--	-
RMD Winter Canyon Staging Area	--	-
Sunset Mesa Tank Staging Area	--	-
Topanga County Beach Staging Area	--	Tidewater goby
Topanga Field Yard Staging Area	--	-
Zuma Beach Staging Area	--	Western snowy plover
NW Corner of Encinal Canyon Road & PCH	--	--

Tidewater goby critical habitat Unit (CHU) LA-4: Topanga Creek is located at the mouth of Topanga Creek and upstream (USFWS 2013), which crosses directly through the Topanga Creek PCH crossing project site and BSA and overlaps the BSA of the Topanga County Beach staging area (Appendix A, Figure 6).

Western snowy plover CHU CA 43: Zuma Beach is located on Zuma Beach and into the mouth of Zuma Creek (USFWS 2012), which overlaps the BSA at the Zuma Beach Staging Area (Appendix A, Figure 6).

The BSA is located within the Santa Monica Bay Hydrologic Unit 4404, in which Topanga Creek is designated as critical habitat for the southern California steelhead (NMFS 2005). The designated steelhead critical habitat within Topanga Creek is located adjacent to (approximately less than 50 feet upstream of) the BSA at the Topanga Creek PCH Crossing (Appendix A, Figure 6).

3.4.3 Essential Fish Habitat

Maps from the NMFS show that EFH for a number of fish species, including groundfish, coastal pelagics, and highly migratory species, is located immediately offshore of the Malibu coast and/or a short distance up Malibu Creek, and the BSA overlaps two EFH types: groundfish and highly migratory species (Table 6; Appendix A, Figure 6).

Table 6. Essential Fish Habitat within the Project Area and Biological Study Area

	Essential Fish Habitat Overlap	
Project Site/Staging Area	**Project Site**	**Biological Study Area**
Big Rock Bypass Improvements	--	Groundfish EFH and Coastal Pelagics EFH
Carbon Canyon Road & Carbon Mesa Road Waterline Improvements	--	--
Coastline Drive 12-inch Waterline Improvements	--	--
Emergency Source of Water Supply Connection (Las Virgenes Connection)	--	--
Fernwood Tank	--	--
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	Groundfish EFH and Coastal Pelagics EFH	Groundfish EFH and Coastal Pelagics EFH
PCH & Topanga Beach Drive Waterline Improvements	--	Groundfish EFH and Coastal Pelagics EFH (at Segment 2)
Upper Encinal Tank Improvements	--	--
District No. 29 Creek Crossing Repair Project		
1. Topanga Canyon Creek	--	--
2. Pena Canyon Creek	--	Groundfish EFH and Coastal Pelagics EFH
3. Las Flores Canyon Creek	Groundfish EFH and Coastal Pelagics EFH	Groundfish EFH and Coastal Pelagics EFH
4. Coal (Carbon) Canyon Creek)	--	--
5. Escondido Creek	Groundfish EFH and Coastal Pelagics EFH	Groundfish EFH and Coastal Pelagics EFH
6. Corral Canyon Creek	Groundfish EFH and Coastal Pelagics EFH	Groundfish EFH and Coastal Pelagics EFH
7. Zuma Creek	--	--
Staging Areas		
Applefield Lane Vacant Lot Staging Area	--	--

Project Site/Staging Area	Essential Fish Habitat Overlap	
	Project Site	Biological Study Area
Las Tunas County Beach Staging Area	--	Groundfish EFH and Coastal Pelagics EFH
Owen Tank Site Staging Area	--	--
Point Dume Tank Site Staging Area	--	--
RMD Winter Canyon Staging Area	--	--
Sunset Mesa Tank Staging Area	--	--
Topanga County Beach Staging Area	--	--
Topanga Field Yard Staging Area	--	--
Zuma Beach Staging Area	--	--
NW Corner of Encinal Canyon Road & PCH	--	--

Groundfish EFH is defined as all waters and substrate within the following areas: depths less than or equal to 11,500 feet (1,914 fathoms) to mean higher high-water level or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 parts per thousand (ppt) during the period of average annual low flow; seamounts in depths greater than 11,500 feet as mapped in the EFH assessment GIS; and areas designated as Habitat Areas of Particular Concern not already identified by the above criteria (PFMC 2005). According to this definition, Groundfish EFH may occur within the BSAs of the Big Rock Bypass Improvements project, Pena Creek Project, and Las Tunas County Beach Staging Area below the mean higher high-water level. Groundfish EFH may occur within the BSAs and/or project sites of the Corral Canyon Creek, Las Flores Canyon Creek, PCH & Topanga Beach Drive (Segment 2), PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Escondido Creek, and Topanga Creek projects, and Topanga County Beach Staging Area, depending upon the upstream extent of saltwater intrusion in the small lagoons and coastal streams.

Coastal Pelagics EFH is defined as all marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington, offshore to the limits of the exclusive economic zone and above the thermocline, where sea surface temperatures range between 10–26 °C. The southern boundary is the U.S.-Mexico maritime boundary. The northern boundary is the position of the 10 °C isotherm, which varies seasonally and annually (PFMC 1998). According to this definition, Coastal Pelagics EFH may occur within the BSAs of Big Rock Bypass Improvements, Las Tunas County Beach Staging Area below the mean higher high-water level. Coastal Pelagics EFH may occur within the BSAs and/or project sites of the Corral Canyon Creek, Las Flores Canyon Creek, PCH & Topanga Beach Drive (Segment 2), PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Escondido Creek, and Topanga Creek projects, and Topanga County Beach Staging Area, depending upon the upstream extent of estuarine habitat.

Highly Migratory Species EFH varies by species, and generally, all Highly Migratory Species EFH consists of predominantly oceanic waters offshore the 360-foot (6 fathoms) isobath along coastal California from the U.S.-Mexico border to a northern boundary, depending upon water temperature (PFMC 2007). According to this definition, there is no Highly Migratory Species EFH within the BSA.

3.5 Wildlife and Plants

The literature and database reviews described in Chapter 2, *Methodology*, resulted in 140 sensitive and listed species to be evaluated for their potential to occur within the BSA. Appendix D provides summarized results of the potential-to-occur evaluation for all 140 species. Of the 140 species identified in the reviews, 35 plant and wildlife species were determined to have a moderate to high potential to occur or are present within the BSA, as discussed further below (Table 7). An additional eight plant and wildlife species were determined to have a low potential to occur within the BSA, but are state and/or federally listed and thus also discussed further below. Thirty-nine non-listed species were determined have a low potential to occur within the BSA, and 58 species were not expected to occur or are not present within the BSA; these species will not be discussed further in this document.

During the spring 2018 and fall 2019 site visits, a variety of plant species and wildlife were observed, which are listed in Appendix C. A total of 73 wildlife species were observed, including one fish species, three reptile species, 67 bird species, and two mammal species. One species, Black Skimmer (*Rynchops niger*), is a CDFW SSC. A total of 90 plant species were observed, including two rare plants: red sand verbena (*Abronia maritima*, CNPS 1B.1) and Southern California black walnut (*Juglans californica* var. *californica*, CNPS 4.2). No other sensitive species were observed during site visits.

Table 7. Sensitive and Listed Species with Moderate or Greater Potential to Occur within the Biological Study Areas

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Birds					
Charadrius nivosus ssp. *nivosus*	western snowy plover (Nesting)	FT/-/SSC	Sandy beaches, salt ponds levees, and shores of large alkali lakes. Needs sandy, gravelly, or friable soils for nesting. Forages in areas of sandy beach above and below the high-tide line, with occasional surf-cast wrack supporting small invertebrates, and generally barren to sparsely vegetated terrain.	Sandy beach habitats are present within BSA; however, they are heavily disturbed by adjacent residences and/or recreational use. Thus, they are generally not suitable for snowy plover nesting. The sandy beach habitats within the BSA may support marginal foraging habitat for snowy plover, with marginal breeding habitat at Malibu State Beach.	Low potential to nest within BSA; high potential for foraging within the BSA. This species is a regular non-breeding inhabitant of Malibu-area beaches. More recently, snowy plovers began nesting for the first time in 70 years in very small numbers in Los Angeles County in spring 2017, including two nests on Malibu State Beach. This species has continued to nest on Malibu State Beach in 2018, with a fenced enclosure surrounding the nest(s) for protection. It may be present year-round, albeit in small numbers during the breeding season.
Elanus leucurus	white-tailed kite (Nesting)	-/-/CFP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging, close to isolated, dense-topped trees for nesting and perching.	Small portions of the BSA may provide suitable nesting habitat where riparian woodland habitats are present in proximity to suitable foraging habitat, such as within the BSA of the Zuma Creek, Emergency Source of Water Supply Connection (Las Virgenes Connection), PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Carbon Canyon Road & Carbon Mesa Road, PCH	Moderate potential to occur/nest within the BSA. Suitable foraging and nesting habitat is present with the BSA. This species was documented to fledge at least three young at Malibu Lagoon in 2013, but is not known to have nested at this location since, although adults were still recorded until 2016; a lack of records anywhere in Malibu since 2016 would suggest that the pair that was previously living in Malibu is no longer present (eBird 2019). Therefore, there is a moderate potential for white-tailed kite to occur or nest within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
				& Topanga Beach Drive Segment 1, Big Rock Bypass Improvement, and Pena Canyon Creek sites.	
Falco peregrinus anatum	American peregrine falcon (Nesting)	FD/SD/C FP	Nests near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Suitable nesting habitat may be present where steep canyons, creek banks, or structures occur within the BSA.	Moderate potential to occur within the BSA at creek banks, ledges, or structures. This species is commonly found along cliffy coastlines. It is known to occur in the Santa Monica Mountains regional area (CDFW 2019). Not expected to nest within the BSA due to lack of suitable habitat.
Reptiles & Amphibians					
Anniella stebbinsi	southern California legless lizard	-/-/SSC	Generally found south of the Transverse Range, extending to the Northwestern Baja California. Occurs in sandy or loose, loamy soils under sparse vegetation. Disjunct populations occur in the Tehachapi and Piute Mountains in Kern County. Found in a variety of habitats; generally in moist, loose soils. Prefer soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrence of southern California legless lizard was documented at Point Dume in 2017, within the geographic extent of the project sites' distribution (CDFW 2019).
Aspidoscelis tigris stejnegeri	coastal whiptail (syn. San Diegan tiger whiptail)	-/-/SSC	Found in deserts and semiarid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. Ground may be firm soil, sandy, or rocky.	Suitable habitat present within the BSA in coastal sage scrub, chaparral, woodland, and riparian habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Multiple recent occurrence of coastal whiptail were documented in the Santa Monica Mountains during the 2000s (CDFW 2019).
*Emys marmorata (*syn.	western pond turtle (syn.	-/-/SSC	Aquatic turtle found in ponds, marshes, rivers, streams, and irrigation ditches, usually	Suitable aquatic and upland nesting habitat is present within the BSA.	High potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of

Scientific Name	**Common Name**	**Listing Status¹**	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Actinemys pallida)	southwestern pond turtle)		with aquatic vegetation, below 6,000 feet elevation. Requires basking sites and suitable upland habitat (usually sandy banks or grassy open fields) up to 0.3 mile from water for egg-laying.	Wetland habitats within the BSA could provide freshwater feeding areas, with exposed basking opportunities, and adjacent upland habitat for nesting.	southwestern pond turtle were in Triunfo, Las Virgenes, Malibu, and Topanga creeks in the 1980s through 2000s (CDFW 2019), and the species generally is known to occur in streams of the Santa Monica Mountains (Nafis 2018, RCD of the Santa Monica Mountains 2015).
Phrynosoma blainvillii	coast horned lizard (syn. Blainville's horned lizard)	-/-/SSC	Frequents a wide variety of habitats, including chaparral, cismontane woodland, coastal bluff scrub, coastal scrub, desert wash, pinon and juniper woodlands, riparian scrub, riparian woodland, and valley and foothill grassland. Most common in lowlands along sandy washes with scattered low bushes. Uses open areas for sunning, bushes for cover, patches of loose soil for burial, and requires an abundant supply of ants and other insects.	Suitable habitat present within the BSA in coastal sage scrub, chaparral, woodland, and riparian habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of horned lizard were in Latigo Canyon, Topanga Canyon areas in the 1990s (CDFW 2019), and the species generally is known to occur in the Santa Monica Mountains (Nafis 2018). If present, this species is most likely to occur at the more inland sites where coastal sage scrub and chaparral are present.
Fishes					
Eucyclogobius newberryi	tidewater goby	FE/-/SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches. The species needs fairly still, but not stagnant water and high oxygen levels.	Suitable habitat is present within the BSA where PCH crosses Malibu Lagoon/Malibu Creek and Topanga Creek, and may also be present at other perennial, brackish waters within the BSA.	High potential to occur. This species was reintroduced to Malibu Lagoon in the 1990s (CDFW 2019) and now occurs in both Malibu Lagoon/Creek and Topanga Creek (USFWS 2013). It is unknown if tidewater goby are present within the BSA at other locations at this time.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Gila orcuttii	arroyo chub	-/-/SSC	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mohave, and San Diego river basins. Found in slow-water stream sections with mud or sandy bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	Suitable habitat is present within the BSA where PCH crosses Malibu Lagoon/Malibu Creek, and may also be present at other perennial, fresh waters within the BSA.	High potential to occur. Arroyo chub are known to occur in Malibu Creek (CDFW 2019) and may occur in other coastal streams within the geographic area of the project. When sandbars block saltwater from entering lagoons and upstream areas may be dominated by freshwater, conditions may exist for this species to occur within the BSA. This species would not be expected when sandbars are open and water in the BSA is presumably brackish.
Oncorhynchus mykiss irideus pop. 10	steelhead - Southern California DPS	FE/-/-	Can be found in streams that have connectivity to the ocean. Federally listed populations occur from the Santa Maria River south to southern extent of the species' range (San Mateo Creek in San Diego County). Southern steelhead likely have greater physiological tolerances to warmer water more variable conditions than their northern counterparts.	Suitable habitat is present within the BSA where the BSA crosses Topanga Creek, and may also be present at other small coastal streams within the BSA depending upon hydrologic and water quality conditions.	High potential to occur. Within the BSA, steelhead are known to occur in Topanga Creek. They also occur nearby in Malibu Creek (CDFW 2019, NMFS 2016). When sandbars are open, adults or smolts may enter or exit through estuaries, and if sandbars are closed, smolts, juveniles, and/or resident adults may also be present in lagoons or lower creek reaches.
Mammals					
Eumops perotis californicus	western mastiff bat	-/-/SSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces, high buildings, trees, and tunnels, and might use bridges.	Suitable foraging habitat is present within the BSA in woodland, coastal scrub, and chaparral habitats. Potentially suitable roosting habitat occurs within the BSA at bridges, high buildings, or large trees.	Moderate potential to occur. Suitable foraging habitat and roosting habitat is present within the BSA. The nearest records of occurrence are approximately 4 to 5 miles north of the BSA, from Malibu Creek State Park in 2004, Topanga State Park in 2003, and Peter Strauss Ranch in 2004 (CDFW 2019). Thus, western mastiff bat has a

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
					moderate potential to occur within the BSA.
Lasiurus blossevillii	western red bat	-/-/SSC	Roosts primarily in trees, 2–40 feet above ground, from sea level up through mixed conifer forests. Not known to roost in bridges. Prefers habitat edges and mosaics, with trees that are protected from above and open below, with open areas for foraging.	Suitable foraging habitat is present within the BSA in relatively open coastal scrub and chaparral habitats. Suitable roosting habitat occurs within the BSA where large trees occur.	Moderate potential to occur. Suitable foraging habitat and roosting habitat is present within the BSA. The nearest records of occurrence are approximately 3 to 5 miles north of the BSA, at Paramount Ranch, Peter Strauss Ranch, and the Stunt Ranch Reserve in 2004 (CDFW 2019). Thus, western red bat has a moderate potential to occur within the BSA.
Neotoma lepida intermedia	San Diego desert woodrat	-/-/SSC	Found in coastal scrub of Southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. Particularly abundant in rock outcrops and in rocky cliffs and slopes.	Suitable coastal scrub habitat is present within the BSA.	Present. San Diego desert woodrat nest was observed within the BSA and suitable coastal scrub habitat occurs within the BSA. The nearest record of occurrence is from Pepperdine University campus in 1995 (CDFW 2019).
Plants					
Abronia maritima	red sand-verbena	-/-/4.2	Perennial herb. Occurs in coastal dunes. 0–328 feet. Blooms February-November.	Open sand habitat is present within the BSA, and some dune habitat is also present.	Present within the BSA at the Zuma Creek Staging Area. There are multiple occurrences of red sand-verbena along the Malibu coastline from the early 1900s through 2013, including at Zuma Beach (Calflora 2018).
Astragalus brauntonii	Braunton's milk-vetch	FE/-/1B.1	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in recent burns or disturbed areas, usually on sandstone with carbonate layers. Soil specialist; requires shallow soils to defeat pocket gophers	Chaparral, coastal scrub, and nonnative grassland habitats are present in portions of the BSA.	Moderate potential to occur in disturbed areas of suitable habitat. Chaparral, coastal scrub, and nonnative grassland habitats are within the BSA. In addition, recent local occurrences have been documented at Zuma Ridge in 2007, at upper Zuma Canyon near 2002, and at Malibu Lagoon in the 1980s (Calflora 2018, CDFW 2019).

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
			and open areas, preferably on hilltops, saddles, or bowls between hills. 10–2,100 feet. Blooms January–August.		Thus, there is a moderate potential for Braunton's milk-vetch to occur within the BSA. It may be more likely to occur in areas burned by the 2018 Woolsey Fire for the next several years.
Atriplex coulteri	Coulter's saltbush	-/-/1B.2	Perennial herb. Occurs in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland habitats. Found on ocean bluffs and ridgetops, as well as in low places in alkaline or clay soils. 6–1,509 feet. Blooms March–October.	Coastal dune, coastal scrub, and nonnative grassland habitats are present within the BSA.	Moderate potential to occur. Coastal dune, coastal scrub, and nonnative grassland habitats are within the BSA. In addition, recent local occurrences have been documented at Malibu Bluffs in 2009 and at Point Dume in 1991 (CDFW 2019, Calflora 2018). Thus, there is a moderate potential for Coulter's saltbush to occur within the BSA.
Baccharis malibuensis	Malibu baccharis	-/-/1B.1	Perennial deciduous shrub. Occurs in coastal scrub, chaparral, cismontane woodland, and riparian woodland habitats. Found in Conejo volcanic substrates, often on exposed roadcuts. Sometimes occupies oak woodland habitat. 492–1,050 feet. Blooms August.	Coastal scrub, chaparral, and riparian woodland habitats occur within the BSA; however, Conejo volcanic substrates may not be present, as indicated by existing soil map units (USDA/NRCS 2018).	Moderate potential to occur within the BSA. There are coastal scrub, chaparral, and riparian woodland habitats within the BSA and some volcanic and igneous soils in the BSA. In addition, a relatively recent local occurrence was documented in Solstice Canyon Park in 2000 (Calflora 2018). Thus, there is a moderate potential for Malibu baccharis to occur within the BSA.
Calandrinia breweri	Brewer's calandrinia	-/-/4.2	Annual herb. Occurs in chaparral and coastal scrub habitats, in sandy or loamy soils, and at disturbed sites and burns. 33–4,003 feet. Blooms March–June, and occasionally as early as January.	Chaparral and coastal scrub habitats with sandy or loamy soils, and disturbed sites occur within the BSA.	Moderate potential to occur within the BSA. Chaparral and coastal scrub habitats with and sandy loamy soils arewithin the BSA. In addition, multiple local occurrences have been documented in the Santa Monica Mountains and along the Malibu Coastline from the early 1900s through 2005 (Calflora 2018). Thus, there is a

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
					moderate potential for Brewer's calandrinia to occur within the BSA.
Calochortus catalinae	Catalina mariposa-lily	-/-/4.2	Perennial bulbiferous herb. Occurs in valley and foothill grassland, chaparral, coastal scrub, and cismontane woodland habitats. Found in heavy soils, open slopes, openings in brush. 49–2,297 feet. Blooms March–June, occasionally as early as February.	Chaparral, coastal scrub, and nonnative grassland habitats with sandy or loamy soils, and disturbed sites occur within the BSA.	Moderate potential to occur within the BSA. Coastal dune, coastal scrub, and nonnative grassland habitats are within the BSA. In addition, many occurrences have been documented in the Santa Monica Mountains and along the Malibu coastline from the early 1900s through 2010 (Calflora 2018). Thus, there is a moderate potential for Catalina mariposa-lily to occur within the BSA.
Calochortus plummerae	Plummer's mariposa-lily	-/-/4.2	Perennial bulbiferous herb. Occurs in coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest. Found at rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire. 197–8,202 feet. Blooms May–July.	Chaparral, coastal scrub, and nonnative grassland habitats occur within the BSA, including areas of rocky and sandy sites with granitic or alluvial soils (USDA/NRCS 2018).	Moderate potential to occur within the BSA. Chaparral, coastal scrub, and nonnative grassland habitats are within the BSA. In addition, multiple occurrences have been documented in the Santa Monica Mountains from the late 1800s through 2015 (Calflora 2018). The nearest recent record of occurrence was observed near Zuma Creek in 2010 (CDFW 2019). Thus, there is a moderate potential for Plummer's mariposa lily to occur within the BSA. It may be more likely to occur in areas burned by the 2018 Woolsey Fire for the next several years.
Camissoniopsis lewisii	Lewis' evening-primrose	-/-/3	Annual herb. Occurs in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland habitats, in sandy or clay soils. 0–984 feet.	Coastal dune, coastal scrub, nonnative grassland, and woodland habitats, with sandy soils, occur within the BSA.	Moderate potential to occur within the BSA. Coastal dune, coastal scrub, and nonnative grassland habitats are within the BSA. There are several historical occurrences recorded at Point Dume from the 1950s (Calflora 2018). Thus, there is a moderate

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
			Blooms March–May and occasionally as late as June.		potential for Lewis' evening-primrose to occur within the BSA.
Dichondra occidentalis	western dichondra	-/-/4.2	Perennial rhizomatous herb. Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. Found on sandy loam, clay, and rocky soils. 164–1,640 feet. Blooms March–July, occasionally as early as January.	Chaparral, woodland, coastal scrub, and nonnative grassland habitats are present within the BSA, and sandy loam, clay, and/or rocky soils have been mapped within the BSA (USDA/NRCS 2018).	Moderate potential to occur within the BSA. Chaparral, woodland, coastal scrub, and nonnative grassland are present in the BSA. The nearest record of occurrence was from Tuna Canyon in 1994 (Calflora 2018). Thus, there is a moderate potential for western dichondra to occur within the BSA.
Dudleya cymosa ssp. *ovatifolia*	Santa Monica dudleya	FT/-/1B.1	Perennial herb. Occurs in chaparral and coastal habitats. Found in canyons on volcanic or sedimentary substrates; primarily on north-facing slopes. 492–1,099 feet. Blooms March–June.	Chaparral and coastal habitats occur within the BSA, including with sedimentary soils (USDA/NRCS 2018).	Moderate potential to occur within the BSA in suitable habitat. Chaparral and coastal habitats and north facing slopes are within the BSA, including with sedimentary soils (USDA/NRCS 2018). Occurrences have been recorded at various locations in the Santa Monica Mountains from 1948 to 2011, including Malibu Canyon and Topanga Canyon (Calflora 2018). Thus, there is a moderate potential for Santa Monica dudleya to occur within the BSA.
Horkelia cuneata var. *puberula*	mesa horkelia	-/-/1B.1	Perennial herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, at sandy or gravelly sites. 49–5,397 feet. Blooms February–July, occasionally to September.	Chaparral, woodland, and coastal scrub habitats, including with sandy or gravelly sites, are present within the BSA.	Moderate potential to occur within the BSA. Chaparral, woodland, and coastal scrub habitats are within the BSA. The nearest occurrences were recorded at Charmlee Wilderness Park in 2008 and Point Dume in 1955 (Calflora 2018). Thus, there is a moderate potential for mesa horkelia to occur within the BSA.
Isocoma menziesii var. *decumbens*	decumbent goldenbush	-/-/1B.2	Perennial shrub. Occurs in coastal scrub and chaparral habitats. Found in sandy soils; often in disturbed sites.	Coastal scrub and chaparral habitats with sandy soils are present within the BSA.	Moderate potential to occur within the BSA. Coastal scrub and chaparral habitat are in the BSA. The nearest occurrence was recorded at Malibu

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
			3–3,002 feet. Blooms April–November.		Colony in 1975 (Calflora 2018). Thus, there is a moderate potential for decumbent goldenbush to occur within the BSA.
Juglans californica var. *californica*	Southern California black walnut	-/-/4.2	Perennial deciduous tree. Occurs in chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats, in alluvial soils. 164–2,953 feet.	Chaparral, woodland, coastal scrub, and riparian woodland habitats with alluvial soils are present within the BSA.	Present. Walnut woodland habitat (California walnut grove) with Southern California black walnut trees is present within the BSA. There are also areas in the BSA with individual Southern California black walnut trees intermixed within other habitats.
Lepechinia fragrans	fragrant pitcher sage	-/-/4.2	Perennial shrub. Occurs in chaparral habitat. 66–4,298 feet. Blooms March–October.	Chaparral habitat is present within the BSA.	Moderate potential to occur within the BSA. Chaparral habitat is present within the BSA, with multiple occurrences recorded from 1930s through 2000s in the Santa Monica Mountains, although the nearest records were from 1931 in Los Alisos Canyon (Calflora 2018). Thus, there is a moderate potential for fragrant pitcher sage to occur within the BSA.
Lilium humboldtii ssp. *ocellatum*	ocellated Humboldt lily	-/-/4.2	Perennial bulbiferous herb. Occurs within openings in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland habitats. 98–5,906 feet. Blooms March–July, and occasionally as late as August.	Chaparral, coastal scrub, and woodland habitats are present within the BSA.	Moderate potential to occur within the BSA. Chaparral, coastal scrub, and woodland habitat are present within the BSA. Multiple occurrences are recorded from early 1900s through 2000s in the Santa Monica Mountains, and the most recent and nearest record was from 2009 in lower Solstice Canyon (Calflora 2018). Thus, there is a moderate potential for ocellated Humboldt lily to occur within the BSA.
Monardella hypoleuca ssp. *hypoleuca*	white-veined monardella	-/-/1B.3	Perennial herb. Occurs in chaparral and cismontane woodland habitats, on dry slopes. 164–4,199 feet.	Chaparral and woodland habitats with dry slopes are present within the BSA.	Moderate potential to occur within the BSA. Chaparral and woodland habitats are present within the BSA. The nearest recent observation was

Scientific Name	Common Name	Listing Status¹	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
			Blooms May–August, occasionally as early as April or as late as December.		recorded in Santa Ynez Canyon in 2009 and is known historically in Malibu Canyon (1898) and Topanga Canyon (1907) (Calflora 2018). Thus, there is a moderate potential for white-veined monardella to occur within the BSA.
Pentachaeta lyonii	Lyon's pentachaeta	FE/SE/1 B.1	Annual herb. Occurs in chaparral, valley and foothill grassland, and coastal scrub habitats. Found at edges of clearings in chaparral, usually at the ecotone between grassland and chaparral or edges of firebreaks. 98–2,067 feet. Blooms March–August, occasionally as early as February.	Chaparral, nonnative grassland, and coastal scrub habitats occur within the BSA.	Moderate potential to occur within the BSA. Chaparral, grassland, and coastal scrub habitats are present within the BSA. There are multiple observations of Lyon's pentachaeta across the Santa Monica Mountains from the early 1900s through 2017. The most recent or nearby occurrences were recorded in 2017, approximately 4 miles north of Malibu Beach, in 2015-2016 along upper Malibu Creek, and in 2012 along Kanan-Dune Road. (Calflora 2018, CDFW 2019). Thus, Lyon's pentachaeta has a moderate potential to occur within the BSA.
Phacelia ramosissima var. *austrolitoralis*	south coast branching phacelia	-/-/3.2	Perennial herb. Occurs in chaparral, coastal dunes, coastal scrub, and marshes and swamps (coastal salt) habitats, in sandy and sometimes rocky soils. 16–984 feet. Blooms March–August.	Chaparral, coastal dune, coastal scrub, and coastal lagoon habitats with sandy soils occur within the BSA	Moderate potential to occur within the BSA. Chaparral, coastal dune, coastal scrub, and coastal lagoon habitats with sandy soils are present within the BSA. Multiple historical occurrences are recorded from the 1930s through 1980s across the Malibu Coastline at Point Dume, Carbon Canyon, and Topanga Canyon (Calflora 2018). Thus, south coast branching phacelia has a moderate potential to occur within the BSA.
Senecio aphanactis	chaparral ragwort	-/-/2B.2	Annual herb. Occurs in chaparral, cismontane woodland, and coastal scrub	Chaparral, woodland, and scrub habitats are present within the BSA.	Moderate potential to occur within the BSA. Chaparral, woodland, and coastal scrub habitats are present within the

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
			habitats, sometimes in alkaline soils. 49–2,625 feet. Blooms January–April, and occasionally as late as May.		BSA. The nearest observation was recorded at Deer Creek Canyon, east of Point Mugu in 1997 (Calflora 2018). Thus, there is a moderate potential for chaparral ragwort to occur within the BSA.
Suaeda taxifolia	woolly seablite	-/-/4.2	Perennial evergreen shrub. Occurs in coastal bluff scrub, coastal dunes, and marshes and swamps (margins of coastal salt) habitats. 0–164 feet. Blooms January–December.	Coastal dunes, coastal lagoon, and alkaline wetland habitats are present within the BSA.	High potential to occur within the BSA. Coastal dunes, coastal lagoon, and alkaline wetland habitats are present within the BSA. Multiple observations are recorded across the Malibu coastline from the 1930s through 1990s, including a 1997 observation at Zuma Beach (Calflora 2018). Thus, there is a high potential for woolly seablite to occur within the BSA.
Tortula californica	California screw moss	-/-/1B.2	Moss. Occurs in chenopod scrub and valley and foothill grassland habitats. Moss grows on sandy soil. 33–4,790 feet.	Nonnative grassland habitats with sandy soil are present within the BSA.	Moderate potential to occur within the BSA. Nonnative grassland habitats with sandy soil are present within the BSA. The nearest recent observation was recorded in Newton Canyon, just east of Zuma Canyon, in 2004, and near Triunfo Pass and upper Arroyo Sequit Creek in 2006 (CDFW 2019). Thus, California screw moss has a moderate potential to occur within the BSA.

[1] Federal Status/State Status/CDFW listing or CNPS Rare Plant Rank:

Federal Status

FE = federally listed as endangered under FESA
FT = federally listed as threatened under FESA
FPT = proposed to be federally listed as threatened under FESA

State Status

SE = State-listed as endangered under CESA
ST = State-listed as threatened under CESA
SR = State-listed as a rare plant under CESA
CFP = fully protected in California under Code of Regulations
SSC = California SSC as designated by CDFW

CNPS Rare Plant Ranks

1A. Presumed extirpated in California and either rare or extinct elsewhere
1B. Rare or Endangered in California and elsewhere
2A. Presumed extirpated in California, but more common elsewhere
2B. Rare or Endangered in California, but more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list

Threat Code extensions and their meanings:
.1 - Seriously threatened in California (over 80 percent of occurrences threatened / high degree and immediacy of threat)
.2 – Moderately threatened in California (20-80 percent of occurrences threatened / moderate degree and immediacy of threat)
.3 – Not very threatened in California (<20 percent of occurrences threatened / low degree and immediacy of threat or no current threats known)

3.5.1 Threatened and Endangered Plants

Eighteen state- and/or federally listed plant species, based upon the literature search, have potential to occur within the geographical vicinity of the project area; refer to Appendix D for summary of the evaluation of all species evaluated from the literature database queries. Of these, eight species have some potential to occur within the BSA: Lyon's pentachaeta (*Pentachaeta lyonii*), Santa Monica dudleya (*Dudleya cymosa* ssp. *ovatifolia*), Agoura Hills dudleya (*Dudleya cymosa* ssp. *agourensis*), San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), Braunton's milk-vetch (*Astragalus brauntonii*), Ventura Marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*), salt marsh bird's-beak (*Chloropyron maritimum* ssp*. maritimum*), and coastal dunes milk- vetch (*Astragalus tener* var. *titi*).

Based upon current habitat conditions and elevations within the BSA, as well as known geographic distributions of the aforementioned eight plant species, three state and/or federally listed plant species have a moderate potential to occur within the BSA and are discussed below: Lyon's pentachaeta, Santa Monica dudleya, and Braunton's milk-vetch. The remaining five state and/or federally listed plant species have a low potential to occur within the BSA and are listed below with detailed species descriptions, but otherwise are not expected to occur and are not discussed further in this document: Agoura Hills dudleya, San Fernando Valley spineflower, salt marsh bird's-beak, coastal dunes milk vetch, and Ventura Marsh milk-vetch. The remaining 10 listed plant species are not expected to occur and are not discussed further in this document.

3.5.1.1 Lyon's Pentachaeta (*Pentachaeta lyonii*) – moderate potential to occur within BSA

Lyon's pentachaeta is an annual herb that is state and federally listed as an endangered species and designated as a CNPS CRPR 1B.1 species. This species is known to occur within chaparral, valley and foothill grassland, and coastal scrub habitats, at elevations of 98 to 2,067 feet. It is most often found at edges of clearings in chaparral, usually at the ecotone between grassland and chaparral or edges of firebreaks. This species is identifiable during its blooming period from March through August, and occasionally as early as February.

There have been multiple observations of Lyon's pentachaeta across the Santa Monica Mountains from the early 1900s through 2017. The most recent and nearby occurrences recorded in the general vicinity of the project are: an observation in 2017 approximately 4 miles north of Malibu Beach, observations in 2015 and 2016 along upper Malibu Creek, and an observation in 2012 along Kanan-Dune Road (Calflora 2018; CDFW 2019). During the biological survey, it was determined that suitable habitats including areas of chaparral, grassland, and coastal scrub are present within the BSA, although most of these habitats are highly disturbed. Considering the proximity of recent observations and presence of suitable, but disturbed habitat, Lyon's pentachaeta has a moderate potential to occur within the BSA.

3.5.1.2 Santa Monica Dudleya (*Dudleya cymosa* ssp*. ovatifolia*) – moderate potential to occur within BSA

Santa Monica dudleya is a perennial herb that is federally listed as a threatened species and designated as a CNPS CRPR 1B.1 species. It occurs in chaparral and coastal habitats and is usually found in canyons on volcanic or sedimentary substrates, primarily on north-facing slopes. Its elevational range is 492 to 1,099 feet. This species is identifiable during its blooming period from March through June.

Previous observations of Santa Monica dudleya were recorded at various locations in the Santa Monica Mountains from 1948 to 2011, including in Malibu Canyon and Topanga Canyon (Calflora 2018; CDFW 2019). Chaparral and coastal habitats occur within the BSA, including with sedimentary soils (USDA/NRCS 2018) and some exposed rock slopes. Considering the proximity of recent observations and presence of suitable habitat, there is a moderate potential for Santa Monica dudleya to occur within the BSA.

3.5.1.3 Agoura Hills Dudleya (*Dudleya cymosa* ssp. *agourensis*) – low potential to occur within BSA

Agoura Hills dudleya is a perennial herb that is federally listed as a threatened species and designated as a CNPS CRPR 1B.2 species. It occurs in chaparral and cismontane woodland habitats and is usually found on volcanic or rocky substrates. Its elevational range is 656 to 1,640 feet. This species is identifiable during its blooming period from May through June.

Previous observations of Santa Monica dudleya were recorded at various locations in the Santa Monica Mountains from 1980 to 2016, but all known records are in the northwestern portion of the Santa Monica Mountains, on the tramontane side (Calflora 2018, CDFW 2019). Chaparral and woodland habitats occur within the BSA, as well as some exposed rock slopes. Considering the distance of all known observations with the presence of suitable habitat, there is a low potential for Agoura Hills dudleya to occur within the BSA.

3.5.1.4 San Fernando Valley Spineflower (*Chorizanthe parryi var. fernandina*) – low potential to occur within BSA

San Fernando Valley spineflower is an annual herb that is state-listed as an endangered species and designated as a CNPS CRPR 1B.1 species. It was formerly proposed for federal listing as a threatened species (USFWS 2016), but this status was withdrawn in a proposed rule in 2018 (USFWS 2018). A final rule withdrawing the status has not been published as of this writing, but the rescinded status is expected to be held. It occurs in sandy coastal scrub and in valley and foothill grassland. Its elevational range is 492 to 4,003 feet. This species is identifiable during its blooming period from April through July.

San Fernando Valley spineflower is only known to occur in two populations: one at Laskey Mesa in Ventura County and one on Newhall Ranch property in Los Angeles County (USFWS 2019). There are no other known extant populations of this species. Coastal scrub and grassland habitats are relatively limited on the project. Considering there are only two known extant populations of this species, there is a low potential for San Fernando Valley spineflower to occur within the BSA.

3.5.1.5 Braunton’s Milk-vetch (*Astragalus brauntonii*) – moderate potential to occur within BSA

Braunton’s milk-vetch is a perennial herb that is federally listed as an endangered species and designated as a CNPS CRPR 1B.1 species. It occurs in chaparral, coastal scrub, and valley and foothill grassland habitats and is usually found in recent burns or disturbed areas, usually on sandstone with carbonate layers. Its elevational range is 10 to 2,100 feet. This species is identifiable during its blooming period from January through August.

The nearest recent observations of Braunton's milk vetch were recorded at Zuma Ridge in 2007, at upper Zuma Canyon near 2002, and at Malibu Lagoon in the 1980s (Calflora 2018; CDFW 2019). During biological surveys of the BSAs, it was determined that most of the coastal scrub habitats within the BSAs are disturbed, which is suitable habitat for the species. Therefore, considering the proximity of recent observations and presence of suitable habitat, there is a moderate potential for Braunton's milk-vetch to occur within the BSA.

3.5.1.6 Ventura Marsh Milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*) – low potential to occur within BSA

Ventura marsh milk-vetch is a perennial herb that is both state and federally listed as an endangered species and designated as a CNPS CRPR 1B.1 species. It occurs in coastal dunes, coastal scrub, and along the edges of coastal saltmarshes or brackish marshes. Its elevational range is 3 to 115 feet. This species is identifiable during its blooming period from August through October, and occasionally as early as June.

The only known extant population of this species is near Mandalay Beach near Oxnard (Calflora 2018; CDFW 2019). All other known populations are likely or confirmed extirpated. Both coastal dunes and coastal scrub habitats occur within the BSAs, but because of the very small known population of this species and its distance from the project, there is only a low potential for Ventura marsh milk-vetch to occur within the BSA.

3.5.1.7 Salt Marsh Bird's-beak, (*Chloropyron maritimum* ssp. *maritimum*) – low potential to occur within BSA

Salt marsh bird's-beak is a hemiparasitic annual herb that is both state- and federally listed as an endangered species, and is designated as a CNPS CRPR 1B.2 species. It occurs in coastal dunes and in coastal saltmarshes and swamps. Its elevational range is 0 to 98 feet. This species is identifiable during its blooming period from May through October, and occasionally as late as November.

The closest known extant populations of this species are in Mugu Lagoon in Ventura County, with all known Los Angeles County records apparently extirpated (Calflora 2018; CDFW 2019). During biological surveys of the BSAs, it was determined that the onsite coastal dune and saltmarsh habitats that occur within the BSAs could support this species, but because of the distance from any known extant populations, there is only a low potential for salt marsh bird's-beak to occur within the BSA.

3.5.1.8 Coastal Dunes Milk-vetch (*Astragalus tener* var. *titi*) – low potential to occur within BSA

Coastal dunes milk-vetch is an annual herb that is both state and federally listed as an endangered species and designated as a CNPS CRPR 1B.1 species. It occurs in coastal dune, sandy areas of coastal bluff scrub, and coastal prairie habitat. It is often found in vernally mesic areas. Its elevational range is 3 to 148 feet. This species is identifiable during its blooming period from March through May.

The nearest historical occurrences of coastal dunes milk-vetch are from the Santa Monica area in 1903 and 1930 and are believed to be extirpated; there are no known extant records of this species within the BSA region (Calflora 2018, CDFW 2019). During biological surveys of the BSAs, it was determined that the on-site coastal dunes habitat that occurs within the BSAs is highly disturbed and unlikely to support this species. In addition, there are no known extant occurrences of this species within the region; thus, there is only a low potential for coastal dunes milk-vetch to occur within the BSA.

3.5.2 Threatened and Endangered Wildlife

There are 36 state and/or federally listed wildlife species that, based upon the literature search, have some potential to occur within the geographical vicinity of the project area; refer to Appendix D for a summary of the evaluation of all species evaluated from the literature database queries. Of these, six species have some potential to occur within the BSA: tidewater goby, southern California steelhead, western snowy plover, least Bell's vireo (*Vireo bellii pusillus*), California red-legged frog (*Rana draytonii*), and southwestern willow flycatcher (*Empidonax traillii extimus*).

Based upon current habitat conditions and known geographic distributions of these species, three state and/or federally listed wildlife species have a moderate or high potential to occur within the BSA and are discussed in more detail below: tidewater goby, southern California steelhead, and western snowy plover. The following three species have a low potential to occur within the BSA and are listed below with detailed species descriptions, but otherwise are not expected to occur and are not discussed further in this document: least Bell's vireo, California red-legged frog, and southwestern willow flycatcher. The remaining 31 listed wildlife species are not expected to occur and are not discussed further in this document.

3.5.2.1 Tidewater Goby (*Eucyclogobius newberryi*) – high potential to occur within BSA

The tidewater goby was listed as an endangered species by the USFWS in 1994 (USFWS 1994), and critical habitat was designated in 2013 (USFWS 2013). It is also a California SSC (CDFW 2018b) The BSA is located within the Los Angeles/Ventura Recovery Unit; within this unit, Malibu Creek was confirmed to have tidewater goby in 2016 (Mulder pers. comm. 2017), and Topanga Creek (USFWS 2005a; USFWS 2013) has been occupied in the recent past, but current population status is unknown.

The following information on the species and its life history is summarized from the *Recovery Plan for Tidewater Goby* (USFWS 2005a), the *Tidewater Goby 5-Year Review: Summary and Evaluation* (USFWS 2007), and the Designation of Critical Habitat for Tidewater Goby, Final Rule (USFWS 2013). Tidewater goby is a small, elongate fish with a maximum size of approximately 2 inches long. Rarely caught at sea, this benthic species generally occurs in brackish waters in lagoons and estuaries. This species may range upstream into freshwater and downstream into areas of approximately 75 percent saltwater (28 ppt), though it is usually found upper estuary environments with salinities of around 12 ppt and in water less than 3 feet deep. Individuals only live for about a year.

Reproduction can occur at any time of year, but peaks in spring and late summer, and can occur in water between 48 to 77 ˚F with salinities between 2 and 27 ppt, although salinities less than 10 ppt are preferred. Males excavate burrows within coarse, sandy sediments, and females lay eggs to be guarded by the male until hatched. Optimal conditions for this species occur in summer after sandbars close, creating calm lagoon environments. Periodic or seasonal breaching of sandbars by ocean waters shifts the habitat quality and estuarine zones, often resulting in movement of gobies upstream to less-dynamic environments. Elevated stream flows from winter storms can flush gobies out of small coastal streams and allow for dispersal to other nearby drainages.

Tidewater goby populations are considered to function under metapopulation dynamics, in which multiple subpopulations maintain a regional population with flow of individuals between subpopulations. Thus, although individual goby populations may or may not be present at a particular location any given year, if a source population is present in a region, gobies may have occupied suitable habitat in the past or may occupy suitable habitat in the future. Some populations persist consistently, but other populations appear to experience intermittent local extinctions. Although goby populations occupying coastal lagoons and estuaries are separated from each other by land and open ocean, some of the areas that have been extirpated apparently have been recolonized by nearby populations (within approximately 6 to 30 miles). Recolonization may occur when gobies are flushed out of localities to the open ocean and are able to return into nearby streams. Thus, absence of the species at any point in time does not mean that the habitat is not or could not be suitable.

The species has recently been recorded in Topanga Creek, which is crossed by the BSA, and also has been known to occur in the general vicinity of the project at Malibu Lagoon (CDFW 2019, USFWS 2013, Sutter 2018). It is not known to have been found in any other lagoons in the vicinity of the BSA. Zuma Canyon has been identified as a potential introduction location in the USFWS Recovery Plan (USFWS 2005a), but to date this species has not yet been introduced into this area. Therefore, considering the existence of recent and nearby observations, the species' ability to colonize habitats within up to 30 miles of source populations, the known presence of the species at Topanga Creek, and the presence of potentially suitable habitat within the BSA, tidewater goby has a high potential to occur in lagoon and stream habitats within the BSA.

3.5.2.2 Steelhead – Southern California Distinct Population Segment (*Oncorhynchus mykiss*) – high potential to occur within BSA

The southern California steelhead Evolutionarily Significant Unit (ESU) was proposed to be listed as an endangered species under FESA by NMFS in 1996 (NMFS 1996) but was subsequently reclassified as a Distinct Population Segment (DPS) and listed as endangered in 2006 (NMFS 2006). Critical habitat was designated for the species in 2005 and includes portions of three streams in the regional vicinity of the BSA: Topanga Creek, Malibu Creek, and Arroyo Sequit Creek (NMFS 2005). The *Southern California Steelhead Recovery Plan* (NMFS 2012) defined Biogeographic Population Groups (BPGs) for the species, and the BSA is located within the Santa Monica Mountain BPG. This BPG contains two creeks within the regional vicinity of the BSA where steelhead has been observed recently: Topanga Creek and Malibu Creek (NMFS 2012). Surveys conducted between 2001 and 2010 showed between 0 and 4 anadromous adult steelhead recorded each year in Topanga Creek and 5 to 60 resident adults each year. Between 2012 and 2015, snorkel surveys have resulted in positive observations of the species in Arroyo Sequit and Malibu Creek. One anadromous adult has been observed in Malibu Creek during each summer from 2007 through 2015 (NMFS 2016).

The following information on the species and its life history is summarized from the *Southern California Steelhead Recovery Plan* (NMFS 2012), the *5-Year Review: Summary and Evaluation of Southern California Coast Steelhead Distinct Population Segment* (NMFS 2016), and the Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California, Final Rule (NMFS 2005). Steelhead require several different habitats throughout their lifespan, generally spending 1 to 3 years in freshwater environments before migrating to the ocean, where they spend 2 to 4 years before returning to spawn in upstream freshwater areas with clear water and gravel, and then gradually move downstream as they grow, utilizing shaded areas and natural shelters and side channels for protection while foraging, growing, and developing.

Smolts, juveniles physiologically changing for life in saline conditions, outmigrate in winter and spring months to the ocean, where they mature before returning to freshwater as adults. Smolts may reside in lagoons/estuaries, where they continue to grow and develop before traveling to sea when the sandbar is open, typically in the winter months in association with high flow events. Some smolts may spend multiple years in lagoon/estuary habitat before leaving for the open ocean. Likewise, adult steelhead swim into estuaries from the ocean in the winter and spring, typically dying after spawning, but sometimes living long enough to complete two spawns in a single lifespan. Steelhead is also capable of completing their life cycle entirely within freshwater systems, and the resident form is commonly referred to as rainbow trout.

As described above, this species has been recently recorded in both its anadromous (steelhead) and resident (rainbow trout) forms in Topanga Creek and is likely to still be present in this stream. When sandbars are open, adults or smolts may enter or exit through estuaries, and if sandbars are closed, smolts, juveniles, and/or resident adults may also be present in lagoons or lower creek reaches. Therefore, considering the species' persistence in Topanga Creek and its potential use of other small coastal streams within the region, steelhead has a high potential to occur in lagoon and stream habitats within the BSA.

3.5.2.3 Western Snowy Plover (*Charadrius nivosus* spp. *nivosus*) – high potential to occur within BSA

Western snowy plover is federally listed as threatened and is designated as a California SSC (USFWS 1993; CDFW 2018b). The small shorebird occurs on the west coast of the U.S. in California, Oregon, and Washington (Cornell Lab of Ornithology 2015). As described above, according to the USFWS critical habitat shapefiles, western snowy plover critical habitat occurs within the BSA of the Zuma Beach Staging Area (USFWS 2019). The nearest extant occurrences of western snowy plover are regular wintering populations within designated critical habitat at Malibu Lagoon State Beach and Zuma Beach (USFWS 2012) and nesting at Malibu Lagoon State Beach in 2017 and 2018 (USFWS 2017; eBird 2019) within the distribution of the project sites along the coastline.

The following information on the species and its life history is summarized from the Western Snowy Plover Recovery Plan (USFWS 2007) and the 5-Year Review of the species (USFWS 2006a). The species requires areas for nesting that are below heavily vegetated or developed areas and above the daily high tides; areas for foraging between the low and high tide line that support their essential food source of small invertebrates (e.g., crabs, flies, clams, etc.), with no or very sparse vegetation; deposited organic debris (e.g., kelp or eelgrass) or driftwood that attracts small invertebrates for food, provides cover from predators and weather, and assists in obscuring nests, chicks, and incubating adults from view; and minimal disturbance from humans, domesticated animals, vehicles, or human-attracted predators. Western snowy plover in California consist of both resident and migrant populations. Nesting in California can occur from March through June, with a peak starting in mid-April. The species primarily breeds on beaches, other coastal sandy habitats, and saltpans at lagoons and estuaries. Nests are usually found on sandy substrates with little to no vegetation or driftwood. Males create scrapes, or depressions, in the substrate during courtship behavior, and then females choose which scrape will become their nest and lay eggs directly in the depression. Eggs can hatch from early April through mid-August, and chicks take approximately 1 month to fledge, which can occur as late as September.

Western snowy plover has a high potential to occur in marginal wintering/foraging habitat within the BSA at areas with sandy beach habitat. The sandy beach habitats within the BSA are heavily disturbed by adjacent residences and/or recreational use. Thus, they are likely mostly unsuitable for snowy plover nesting, and there is only a low potential for nesting to occur within the BSA.

3.5.2.4 Least Bell's Vireo (*Vireo bellii pusillus*) – low potential to occur within BSA

Least Bell's vireo is both state and federally listed as endangered (USFWS 1986, CDFW 2018b). This particular subspecies currently occurs only in the southwestern U.S. in southern California, although with continued recovery successes it seems likely that least Bell's vireo will slowly continue to recolonize its former range farther north up the state (Kus et al. 2010). According to the USFWS critical habitat shapefiles, least Bell's vireo critical habitat does not occur anywhere near the BSA (USFWS 2019). The nearest regularly occurring extant occurrences of least Bell's vireo are in low numbers at Ballona Freshwater Marsh (eBird 2019), with only a few very rare occurrences on the coastal slope of the Santa Monica Mountains.

The following information on the species and its life history is summarized from the *Draft Recovery Plan for the Least Bell's Vireo* (USFWS 1998). Least Bell's vireo has been found to require two major characteristics in order to make a site usable for breeding: dense vegetative cover within 3–6 feet of the ground for nesting, and an adjacent or nearby dense, stratified canopy for foraging. Vegetative structure is an important determinant in whether a site gets used for breeding; even if habitat is dominated by willows, if there not a sufficient dense understory for nesting, the site is unlikely to be used. Adjacent upland, non-riparian habitat (such as coastal sage scrub) may be used as part of a territory as well, if present. Adult males typically arrive in southern California beginning in mid-March, in advance of adult females and second-year birds, and are typically present in the region through September, with rare instances of birds staying later or wintering. Pairs begin forming once both sexes have arrived in the region, followed by nest building and egg laying. Eggs typically take 14 days to hatch and chicks up to 12 days to fledge. Up to five nesting attempts may occur over a single season, although not all attempts are likely to be successful. Historically, brown-headed cowbirds (*Molothrus ater*) and loss of suitable riparian habitat played a significant role in the drastic decline of least Bell's vireo in California, although with the post-listing implementation of cowbird trapping, vireo populations in southern California have grown by leaps and bounds compared to their pre-listing numbers.

At this time, least Bell's vireo is a very rare visitor to the coastal slope of the Santa Monica Mountains. There are occasional (rare) reports of single birds in the drainages in the mountains, but ultimately for the most part the Santa Monica Mountains drainages are likely too narrow and steep to be of much suitability or use for least Bell's vireo, which generally prefers broader riparian floodplains, which are absent within the BSA (Garrett pers. comm. 2018). Therefore, there is only a low potential for nesting to occur within the BSA.

3.5.2.5 California Red-legged Frog (*Rana draytonii*) – low potential to occur within BSA

California red-legged frog is federally listed as threatened (USFWS 1996) and is designated as a California SSC (CDFW 2018b). They are only known to occur in California. According to the USFWS critical habitat shapefiles, California red-legged frog critical habitat does not occur anywhere near the BSA (USFWS 2019). California red-legged frogs were considered to be extirpated from the Santa Monica Mountains after 1976, but were rediscovered in Las Virgenes Creek in 1999 (USFWS 2002a). In addition, beginning in 2014, the National Park Service has implemented an effort to reintroduce

California red-legged frogs to four additional streams within the Santa Monica Mountains, although reports suggest that the Woolsey Fire of 2018 may have destroyed most of those reintroduced populations (NPT 2019).

The following information on the species and its life history is summarized from the *Recovery Plan for the California Red-legged Frog* (USFWS 2002a). California red-legged frogs primarily live in areas with deep-water (2 feet or more) pools or slow-flowing water. This may include creeks, pools, backwaters, marshes, stock ponds, and, in rarer cases, even lagoons. These sites are utilized for breeding and for many frogs as year-round habitat. Some frogs leave their breeding habitat during the fall and winter and may move into upland areas or travel overland to different aquatic habitat up to 1 mile away or in rare cases up to 2 miles away. Upland habitat may consist of adjacent riparian habitat, grasslands, or areas with organic or industrial cover for shelter. Other than these small movements during the non-breeding season, California red-legged frogs are more or less sedentary within their year-round habitat. Although the 2005 survey protocol (USFWS 2005b) describes February 25 to April 30 as the best survey period for southern California (south of Santa Cruz County), frogs in Los Angeles County have often already laid egg masses by February. Eggs may take 14 to 22 days to hatch into tadpoles, with another 11 to 22 weeks to metamorphose into terrestrial frogs. Water temperature, water quality, and the presence of nutrients and food are all contributing factors as to how soon eggs will hatch and tadpoles will metamorphose.

Prior to the Woolsey Fire of 2018, the only location within the BSA where California red-legged frogs may have been present would be in Malibu Creek. All other relocation sites were outside of any drainages associated with the project. Prior to and after the Woolsey Fire, there is only a low potential for California red-legged frog to occur within the BSA.

3.5.2.6 Southwestern Willow Flycatcher (*Empidonax traillii extimus*) – low potential to occur within BSA

Southwestern willow flycatcher is both state and federally listed as endangered (USFWS 1995, CDFW 2018b). This particular subspecies currently occurs in suitable habitat in the Desert Southwest, including California, Nevada, Utah, Colorado, Texas, New Mexico, and Arizona. According to the USFWS critical habitat shapefiles, least Bell's vireo critical habitat does not occur anywhere near the BSA (USFWS 2019). There are no known breeding populations of this species anywhere near the BSA, although birds may pass through the BSA during migration (eBird 2019). The closest extant breeding population is probably in the Kernville area around Lake Isabella, over 100 miles to the north.

The following information on the species and its life history is summarized from the *Final Recovery Plan for the Southwestern Willow Flycatcher* (USFWS 2002b). Southwestern Willow Flycatchers utilize a complex mosaic of habitat involving a dense vegetative canopy generally within 10–13 feet above the ground, a series of openings or shorter vegetation to provide canopy stratification, riparian habitat at least 33 feet wide, and nearly always open surface water or saturated soil. Vegetation may be either native or nonnative. At low-elevation breeding sites, the canopy can be as high as 100 feet or in high-elevation sites, only up to about 23 feet. In general, willow flycatchers begin migrating through southern California in small numbers in the first and second weeks of May, with peak migration occurring in the second half of May and first half of June. Over a 4-year study, it was found that 66 to 78 percent of flycatchers returned to the same breeding site as the previous year. Eggs typically take 12 to 13 days to hatch, and chicks take 12 to 15 days to fledge. Like with least Bell's vireo, brown-headed cowbirds also played a significant role in the decline of southwestern willow flycatchers, although for unknown reasons the relative success of the cowbird-trapping program has not had the same positive effects as it has with least Bell's vireo.

Southwestern willow flycatchers may migrate through the area, but are not expected to breed anywhere in the BSA, and based upon the habitat that is present, likely never will. Therefore, there is only a low potential for this species to occur within the BSA, and only as a transitory migrant.

3.5.3 State Fully Protected Species

Nine state fully protected wildlife species reviewed were found to have some potential to occur within the geographical vicinity of the project area (CDFW 2019) (Appendix D. Two of these species, white-tailed kite (*Elanus leucurus*, nesting) and American peregrine falcon (Falco *peregrinus anatum*, nesting), are judged to have a moderate or greater potential for occurrence based upon current habitat conditions within the BSA and are discussed in more detail below. One species, golden eagle (*Aquila chrysaetos*), was determined to only have a low potential to occur for nesting or wintering within the BSA and is not discussed further in this document.

3.5.3.1 White-tailed Kite

White-tailed kite is a California Fully Protected Species[1] and is protected when nesting (CDFW 2018b). Suitable habitat for white-tailed kite includes rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. The species uses open grasslands, meadows, or marshes for foraging, close to isolated, dense-topped trees. White-tailed kites nest and perch in dense-topped trees and will also roost in saltgrass and Bermuda grass (*Cynodon dactylon*) in southern California. Nests are usually placed approximately 20 to 100 feet above the ground. Breeding occurs from February to October, with a peak from May to August, and young fledge in 35 to 40 days (Zeiner et al. 1988–1990).

Small portions of the BSA may provide suitable nesting habitat for white-tailed kite where riparian woodland habitats are present in proximity to suitable foraging habitat, which includes grasslands, meadows, and marshes. The nearest recent observation of nesting white-tailed kites was recorded at Malibu State Beach in 2013 (eBird 2019). This particular pair has not been known to nest at this location since 2013 and was last observed in Malibu in 2016, with no eBird reports of this species in Malibu since then. Potentially suitable nesting habitat is present within the BSAs of the Zuma Creek, Emergency Source of Water Supply Connection (Las Virgenes Connection), PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Carbon Canyon Road & Carbon Mesa Road, PCH & Topanga Beach Drive Segment 1, Big Rock Bypass Improvement, and Pena Canyon Creek sites. Therefore, considering previous nesting in the project vicinity in the last ten years, but the apparent extirpation of the nesting pair after 2016 (eBird 2019), there is a moderate potential for white-tailed kite to nest within the BSA at these locations.

3.5.3.2 American Peregrine Falcon

American peregrine falcon (*Falco peregrinus anatum*) is a California Fully Protected Species[1] that is protected when nesting. It was previously state and federally listed, but in both cases has been

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[1] CDFW designates the American peregrine falcon and the white-tailed kite as California Fully Protected Species only when nesting. All other non-nesting occurrences of peregrine falcon and white-tailed kite would not be considered to be sensitive.

delisted (CDFW 2018b). This species is a habitat generalist and widespread throughout the southern California region. However, for nesting it requires elevated perches (typically cliffs or, in urban areas, often on tall buildings or transmission towers) with open space for hunting (White et al. 2002). Abandoned nests from other species, including common raven (*Corvus corax*) and red-tailed hawk (*Buteo jamaicensis*), will be used opportunistically as well, if necessary. Perhaps because of the tendency for coastal areas to have more cliffside or coastal bluff habitat, peregrine falcons are often found nesting and/or foraging along the immediate coast (Zeiner et al. 1988–1990)..

Suitable nesting habitat may be present where steep canyons, creek banks, or structures occur. There is no suitable nesting habitat within the BSA, although the species may nest in areas outside of the BSA. This species is known to occur in the Santa Monica Mountains regional area and has been reported a large number of times in the Malibu area (CDFW 2019). The species has a moderate potential to forage in the BSA, but is not expected to nest within it due to general lack of nesting habitat.

3.5.4 Non-Listed Special-Status Plants

The literature review determined that a total of 62 non-state or federally listed special status plants could occur in the greater geographic vicinity of the BSA. These species are listed in Appendix D, which summarizes the evaluation of their potential to occur within the BSA.

Of these, 30 species have only a low potential to occur within the BSA and are not further discussed in this document: western spleenwort (*Asplenium vespertinum*, -/-/4.2), south coast saltscale (*Atriplex pacifica*, -/-/1B.2), Davidson's saltscale (*Atriplex serenana* var. *davidsonii*, -/-/1B.2), club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*, -/-/4.3), slender mariposa-lily (*Calochortus clavatus* var. *gracilis*, -/-/1B.2), southern tarplant (*Centromadia parryi* ssp. *australis*, -/-/1B.1), island mountain-mahogany (*Cercocarpus betuloides* var. *blancheae*, -/-/4.3), Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*, -/-/1B.1), Parry's spineflower (*Chorizanthe parryi* var. *parryi*, -/-/1B.1), small-flowered morning-glory (*Convolvulus simulans*, -/-/4.2), Santa Susana tarplant (*Deinandra minthornii*, -/SR/1B.2), paniculate tarplant (*Deinandra paniculata*, -/-/4.2), dune larkspur (*Delphinium parryi* ssp. *blochmaniae*, -/-/1B.2), Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*, -/-/1B.1), many-stemmed dudleya (*Dudleya multicaulis*, -/-/1B.2), suffrutescent wallflower (*Erysimum suffrutescens*, -/-/4.2), Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*, -/-/1B.1), Humboldt lily (*Lilium humboldtii* ssp. *humboldtii*, -/-/4.2), Davidson's bush-mallow (*Malacothamnus davidsonii*, -/-/1B.2), Gerry's curly-leaved monardella (*Monardella sinuata* ssp. *gerryi*, -/-/1B.1), southern curly-leaved monardella (*Monardella sinuata* ssp. *sinuata*, -/-/1B.2), mud nama (*Nama stenocarpa*, -/-/2B.2), Ojai navarretia (*Navarretia ojaiensis*, -/-/1B.1), chaparral nolina (*Nolina cismontana*, -/-/1B.2), Hubby's phacelia (*Phacelia hubbyi*, -/-/4.2), Brand's star phacelia (*Phacelia stellaris*, -/-/1B.1), salt spring checkerbloom (*Sidalcea neomexicana*, -/-/2B.2), estuary seablite (*Suaeda esteroa*, -/-/1B.2), woven-spored lichen (*Texosporium sancti-jacobi*, -/-/3), and Sonoran maiden fern (*Thelypteris puberula var. sonorensis*, -/-/2B.2).

Nineteen non-listed special status plants were determined to have a moderate or high potential to occur within the BSA and are discussed below: red sand-verbena (*Abronia maritima*, -/-/4.2, present), Coulter's saltbush (*Atriplex coulteri*, -/-/1B.2, moderate potential to occur), Malibu baccharis (*Baccharis malibuensis*, -/-/1B.1, moderate potential to occur), Brewer's calandrinia (*Calandrinia breweri*, -/-/4.2, moderate potential to occur), Catalina mariposa-lily (*Calochortus catalinae*, -/-/4.2, moderate potential to occur), Plummer's mariposa-lily (*Calochortus plummerae*, -/-/4.2, moderate potential to occur), Lewis' evening-primrose (*Camissoniopsis lewisii*, -/-/3, moderate potential to occur), western dichondra (*Dichondra occidentalis*, -/-/4.2, moderate potential to occur), mesa horkelia (*Horkelia cuneata* var. *puberula*, -/-/1B.1, moderate potential to occur), decumbent goldenbush (*Isocoma menziesii* var. *decumbens*, -/-/1B.2, moderate potential to occur), Southern California black walnut (*Juglans californica*, -/-/4.2, present), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*, -/-/4.2, moderate potential to occur), fragrant pitcher sage (*Lepechinia fragrans*, -/-/4.2, moderate potential to occur), ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*, -/-/4.2, moderate potential to occur), white-veined monardella (*Monardella hypoleuca* ssp. *hypoleuca*, -/-/1B.3, moderate potential to occur), south coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*, -/-/3.2, moderate potential to occur), chaparral ragwort (*Senecio aphanactis*, -/-/2B.2, moderate potential to occur), woolly seablite (*Suaeda taxifolia*, -/-/4.2, high potential to occur), and California screw moss (*Tortula californica*, -/-/1B.2, moderate potential to occur).

Red sand-verbena was observed within the Zuma Beach Staging Area BSA, and southern California black walnut was observed in several BSAs. No other sensitive plant species were observed within the BSA.

3.5.4.1 Red Sand-verbena

Red sand-verbena is a perennial herb designated as a CNPS CRPR 4.2 species. It occurs in coastal dunes, from 0 to 328 feet of elevation. Its blooming period is from February through November.

There are multiple occurrences of red sand-verbena along the Malibu coastline from the early 1900s through 2013, including at Zuma Beach (Calflora 2018). Suitable open sand and dune habitats are present within the BSA, and red sand-verbena was observed within the BSA of the Zuma Creek Staging Area site, the only location where dune mat habitat was present. Open sand habitat is present at numerous locations along the direct coast, but this species was only found at the Zuma Creek Staging Area site.

3.5.4.2 Coulter's Saltbush

Coulter’s saltbush is a perennial herb designated as a CNPS CRPR 1B.2 species. It occurs in alkaline or clay soils within coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland habitats. Its elevational range is 6 to 1,509 feet and its blooming period is from March through October.

Recent local occurrences of Coulter’s saltbush have been documented at Malibu Bluffs in 2009 and at Point Dume in 1991 (CDFW 2019, Calflora 2018). During biological surveys of the BSAs, it was determined that the coastal dune, coastal scrub, and nonnative grassland habitats within the BSA are suitable to support this species. Therefore, considering the proximity of recent observations and presence of suitable habitat, there is a moderate potential for Coulter's saltbush to occur within the BSA.

3.5.4.3 Malibu Baccharis

Malibu baccharis is a perennial deciduous shrub designated as a CNPS CRPR 1B.1 species. It occurs within coastal scrub, chaparral, cismontane woodland, and riparian woodland habitats and is found in Conejo volcanic substrates, often on exposed road cuts. Its elevational range is 492 to 1,050 feet and it blooms in August.

A recent local occurrence of Malibu baccharis was documented in Solstice Canyon Park in 2000 (Calflora 2018). During biological surveys of the BSAs, it was determined that the coastal scrub, chaparral, and riparian woodland habitats within the BSA are suitable to support this species. In addition, there are some igneous soils present in the BSA. Thus, there is a moderate potential for Malibu baccharis to occur within the BSA.

3.5.4.4 Brewer's Calandrinia

Brewer's calandrinia is an annual herb designated as a CNPS CRPR 4.2 species. It occurs in sandy or loamy soils within disturbed and burned sites in coastal scrub and chaparral habitats. Its elevational range is 33 to 4,003 feet and its blooming period is typically from March through June, occasionally blooming as early as January.

Multiple local occurrences of Brewer's calandrinia have been documented in the Santa Monica Mountains and along the Malibu Coastline from the early 1900s through 2005 (Calflora 2018). During biological surveys of the BSAs, it was determined that the chaparral and coastal scrub habitats within the BSA are suitable to support this species. In addition, there are sandy loamy soils present in the BSA. Thus, there is a moderate potential for Brewer's calandrinia to occur within the BSA.

3.5.4.5 Catalina Mariposa-lily

Catalina mariposa-lily is a perennial bulbiferous herb designated as a CNPS CRPR 4.2 species. It occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. It is often found in heavy soils, open slopes, and openings in brush. Its elevational range is 49 to 2,297 feet and its blooming period is typically from March through June, occasionally blooming as early as February.

Numerous occurrences of Catalina mariposa-lily have been documented in the Santa Monica Mountains and along the Malibu coastline from the early 1900s through 2010 (Calflora 2018). During biological surveys of the BSAs, it was determined that the chaparral, coastal scrub, and nonnative grassland habitats within the BSA are suitable to support this species. In addition, there are sandy loamy soils and disturbed open areas present in the BSA. Consequently, there is a moderate potential for Catalina mariposa-lily to occur within the BSA.

3.5.4.6 Plummer's Mariposa-lily

Plummer's mariposa-lily is a perennial bulbiferous herb designated as a CNPS CRPR 4.2 species. It occurs in granitic, rocky and sandy areas within chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland habitats. Its elevational range is 197 to 8,202 feet and its blooming period is from May through July.

Multiple occurrences of Plummer's mariposa-lily have been recorded along the Santa Monica Mountains from the late 1800s through 2015 (Calflora 2018). The nearest recent record of occurrence was observed near Zuma Creek in 2010 (CDFW 2019). During biological surveys of the BSAs, it was determined that the chaparral, coastal scrub, and nonnative grassland habitats within the BSA are suitable to support this species. In addition, there are rocky and sandy sites with granitic or alluvial soils and disturbed open areas present in the BSA. Consequently, there is a moderate potential for Plummer's mariposa-lily to occur within the BSA.

3.5.4.7 Lewis' Evening-primrose

Lewis' evening-primrose is an annual herb designated as a CNPS CRPR 3 species. It occurs in sandy or clay soils within coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland habitats. Its elevational range is 0 to 984 feet and its blooming period is typically from March through May, occasionally blooming as late as June.

Several historical occurrences of Lewis' evening-primrose have been recorded at Point Dume from the 1950s (Calflora 2018). During biological surveys of the BSAs, it was determined that the coastal dune, coastal scrub, and nonnative grassland habitats within the BSA are suitable to support this species. In addition, sandy soils are present in the BSA. Consequently, there is a moderate potential for Lewis' evening-primrose to occur within the BSA.

3.5.4.8 Western Dichondra

Western dichondra is a perennial rhizomatous herb designated as a CNPS CRPR 4.2 species. It occurs in sandy loam, clay, and rocky soils in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. Its elevational range is 164 to 1,640 feet and its blooming period is typically from March through July, occasionally blooming as early as January.

The nearest occurrence of this species was in Tuna Canyon in 1994 (Calflora 2018). During biological surveys of the BSAs, it was determined that the chaparral, woodland, coastal scrub, and nonnative grassland habitats within the BSA are suitable to support this species. In addition, sandy loam, clay, and rocky soils are present in the BSA. Consequently, there is a moderate potential for western dichondra to occur within the BSA.

3.5.4.9 Mesa horkelia

Mesa horkelia is a perennial herb designated as a CNPS CRPR 1B.1 species. It occurs in sandy or gravelly areas within chaparral, cismontane woodland, and coastal scrub habitats. Its elevational range is 49 to 5,397 feet and its blooming period is typically from February through July, occasionally blooming as late as September.

The nearest occurrences of mesa horkelia were recorded at Charmlee Wilderness Park in 2008 and Point Dume in 1955 (Calflora 2018, CDFW 2019). During biological surveys of the BSAs, it was determined that the chaparral, woodland, and coastal scrub habitats within the BSA are suitable to support this species. In addition, sandy and gravelly sites are present in the BSA. Consequently, there is a moderate potential for mesa horkelia to occur within the BSA.

3.5.4.10 Decumbent Goldenbush

Decumbent goldenbush is a perennial shrub designated as a CNPS CRPR 1B.2 species. It occurs in sandy soils within chaparral and coastal scrub habitats and is often found in disturbed areas. Its elevational range is 3 to 3,002 feet and its blooming period is from April through November.

The nearest occurrence of decumbent goldenbush was recorded at Malibu Colony in 1975 (Calflora 2018, CDFW 2019). During biological surveys of the BSAs, it was determined that the chaparral and coastal scrub habitats within the BSA are suitable to support this species. In addition, sandy soils and disturbed areas are present in the BSA. Consequently, there is a moderate potential for decumbent goldenbush to occur within the BSA.

3.5.4.11 Southern California Black Walnut

Southern California black walnut is a perennial deciduous tree designated as a CNPS CRPR 4.2 species. It occurs in alluvial soils within chaparral, coastal scrub, cismontane woodland, and riparian woodland habitats. Its elevational range is 164 to 2,953 feet, and its blooming period is from March through August.

There are multiple occurrences of southern California black walnut along the Malibu coastline from the late 1800s through 2017 (Calflora 2018). Suitable chaparral, woodland, coastal scrub, and riparian woodland habitats with alluvial soils are present within the BSA, and southern California black walnut was observed to be present in the California walnut grove vegetation community within the BSAs of the Emergency Source of Water Supply Connection (Las Virgenes Connection) and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) sites. There are also areas in the BSAs where individual southern California black walnut trees are intermixed within other habitats, including annual brome grasslands, red willow thicket, coast live oak woodland, disturbed California sagebrush scrub, ornamental/developed, and disturbed/ ruderal of the Emergency Source of Water Supply Connection (Las Virgenes Connection) and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) sites.

3.5.4.12 Southwestern Spiny Rush

Southwestern spiny rush is a perennial rhizomatous herb designated as a CNPS CRPR 4.2 species. It occurs in mesic coastal dunes, alkaline meadows and seeps, and coastal saltmarshes and swamp habitats. Its elevational range is 10 to 2,953 feet and its blooming period is typically from May through June, occasionally blooming as early as March.

Several historical occurrences of Lewis' evening-primrose have been recorded at Point Mugu in 1959 and 1977 and at Pacific Palisades in 1959 (Calflora 2018). During biological surveys of the BSAs, it was determined that the coastal dune and coastal lagoon habitats within the BSA are highly disturbed. Consequently, because of nearby historical presence, there is a moderate potential for southwestern spiny rush to occur within the BSA.

3.5.4.13 Fragrant Pitcher Sage

Fragrant pitcher sage is a perennial shrub designated as a CNPS CRPR 4.2 species. It occurs in chaparral habitat. Its elevational range is 66 to 4,298 feet and its blooming period is from March through October.

There are multiple occurrences of fragrant pitcher sage recorded from the 1930s through 2000s in the Santa Monica Mountains, although the records nearest the BSA are from 1931 in Los Alisos Canyon (Calflora 2018). During biological surveys of the BSAs, it was determined that the chaparral habitat within the BSA is suitable to support this species. Consequently, there is a moderate potential for fragrant pitcher sage to occur within the BSA.

3.5.4.14 Ocellated Humboldt Lily

Ocellated Humboldt lily is a perennial bulbiferous herb designated as a CNPS CRPR 4.2 species. It occurs in openings within chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland habitats. Its elevational range is 98 to 5,906 feet and its blooming period is typically from March through July, occasionally blooming as late as August.

There are multiple occurrences of ocellated Humboldt lily recorded from early 1900s through 2000s in the Santa Monica Mountains, with the most recent and nearest record from 2009 in lower Solstice Canyon (Calflora 2018). During biological surveys of the BSAs, it was determined that the chaparral, coastal scrub, and woodland habitats within the BSA are suitable to support this species. Consequently, there is a moderate potential for ocellated Humboldt lily to occur within the BSA.

3.5.4.15 White-veined Monardella

White-veined monardella is a perennial herb designated as a CNPS CRPR 1B.3 species. It occurs on dry slopes within chaparral and cismontane woodland habitats. Its elevational range is 164 to 4,199 feet and its blooming period is typically from May through August, occasionally blooming as early as April or as late as December.

The nearest recent observation of white-veined monardella was recorded in Santa Ynez Canyon in 2009, and it is known historically in Malibu Canyon (1898) and Topanga Canyon (1907) (Calflora 2018). During biological surveys of the BSAs, it was determined that the chaparral and woodland habitats within the BSA are suitable to support this species. In addition, dry slopes are present in the BSA. Consequently, there is a moderate potential for white-veined monardella to occur within the BSA.

3.5.4.16 South Coast Branching Phacelia

South coast branching phacelia is a perennial herb designated as a CNPS CRPR 3.2 species. It occurs in sandy and sometimes rocky soils within chaparral, coastal dunes, coastal scrub, and marshes and coastal salt swamp habitats. Its elevational range is 16 to 984 feet and its blooming period is from March through August.

Multiple historical occurrences of south coast branching phacelia are recorded from the 1930s through 1980s across the Malibu Coastline at Point Dume, Carbon Canyon, and Topanga Canyon (Calflora 2018). During biological surveys of the BSAs, it was determined that the chaparral, coastal dune, coastal scrub, and coastal lagoon habitats containing sandy soils within the BSA are suitable to support this species. Consequently, there is a moderate potential for south coast branching phacelia to occur within the BSA.

3.5.4.17 Chaparral Ragwort

Chaparral ragwort is an annual herb designated as a CNPS CRPR 2B.2 species. It occurs in chaparral, cismontane woodland, and coastal scrub habitats, sometimes in alkaline areas. Its elevational range is 49 to 2,625 feet and its blooming period is typically from January through April, occasionally blooming as late as May.

The nearest observation of chaparral ragwort was recorded at Deer Creek Canyon, east of Point Mugu in 1997 (Calflora 2018). During biological surveys of the BSAs, it was determined that the chaparral, woodland, and scrub habitats within the BSA are suitable to support this species. Consequently, there is a moderate potential for chaparral ragwort to occur within the BSA.

3.5.4.18 Woolly Seablite

Woolly seablite is a perennial evergreen shrub designated as a CNPS CRPR 4.2 species. It occurs in coastal bluff scrub, coastal dunes, marshes, and the margins of coastal salt swamp habitats. Its elevational range is 0 to 164 feet and its blooming period is from January through December.

Multiple observations of woolly seablite are recorded across the Malibu coastline from the 1930s through the 1990s, including a 1997 observation at Zuma Beach (Calflora 2018). During biological surveys of the BSAs, it was determined that the coastal dunes, coastal lagoon, and alkaline wetland habitats within the BSA are suitable to support this species. Consequently, there is a high potential for woolly seablite to occur within the BSA.

3.5.4.19 California Screw Moss

California screw moss is a moss designated as a CNPS CRPR 1B.2 species. It occurs in sandy soils within chenopod scrub and valley and foothill grassland habitats. Its elevational range is 33 to 4,790 feet.

The nearest recent observation of California screw moss was recorded in Newton Canyon just east of Zuma Canyon in 2004 and near Triunfo Pass and upper Arroyo Sequit Creek in 2006 (CDFW 2019). During biological surveys of the BSAs, it was determined that the nonnative grassland habitats with sandy soils within the BSA are suitable to support this species. Consequently, there is a moderate potential for California screw moss to occur within the BSA.

3.5.5 Non-Listed Special-Status Wildlife

Non-listed special-status wildlife species referred to in this document include those that are designated as a California Fully Protected Species or SCC, as defined by CDFW (CDFW 2018b). Appendix D lists the special-status wildlife species and their likelihood of occurrence within the BSA. There are 29 non-listed, special-status species reviewed to have some potential to occur within the geographical vicinity of the project (CDFW 2019). Of these, eight species were determined to have a moderate or greater potential for occurrence based upon current habitat conditions within the BSA and known geographic distribution, and are discussed in more detail below. Ten species were determined to have a low potential for occurrence within the BSA, and 11 are not expected to occur; these species are not discussed further in this document. A woodrat nest, presumably of San Diego desert woodrat (*Neotoma lepida intermedia*), a California species of special concern, was observed within the BSA at the Emergency Source of Water Supply Connection (Las Virgenes Connection) site. No additional special-status species were observed during the field visit. The location of these sightings is shown in Appendix A, Figure 6.

3.5.5.1 Arroyo Chub

The arroyo chub (*Gila orcuttii*) is designated as a California SSC (CDFW 2018b). The following information is summarized from *California Fish Species of Special Concern, 3rd Edition* (Moyle et al. 2015). Malibu Creek is within the native range of arroyo chub, but the species' status in other nearby creeks within the BSA is unknown. This species typically prefers slow-moving water, muddy or sandy substrates, and water deeper than 1.3 feet, but may also be found in pools with gravel, cobble, or boulders. Preferred stream gradients are 2.5 percent or less, and water temperature from 50 to 82.4 °F. Spawning primarily occurs in June and July, but will generally occur from February through August. After hatching, juveniles spend their first 3-4 months of life living in areas of still water, with vegetation or other submerged cover as shelter.

Malibu Creek is known to be within the native range of arroyo chub (CDFW 2019), and it is possible that the species may be present in other creeks in the area. While some individual sites within the BSA may be periodically influenced by tides and sometimes composed of brackish water, during summer conditions when sandbars are closed, the water in any extant lagoons may be mostly freshwater, and arroyo chubs that may be present upstream could conceivably move downstream into the BSAs. Therefore, considering the proximity of known occurrences and presence of suitable habitat, but also considering disturbance from human activity and adjacent development, there is a moderate potential for arroyo chub to occur within the BSA where freshwater stream habitat occurs. Specifically, there is moderate potential for the species to occur within the BSAs of the Corral Canyon Creek, Las Flores Canyon Creek, Escondido Creek, PCH & Topanga Beach Drive (Segment 2), Topanga Canyon Creek, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), and Topanga County Beach Staging Area sites.

3.5.5.2 Southern California Legless Lizard

The Southern California legless lizard (*Anniella stebbinsi*) is designated as a California SSC (CDFW 2018b). The following information is summarized from *California Amphibian and Reptile Species of Special Concern* (Thomson et. al 2016), *California Herps* (Nafis 2018), and *Amphibian and Reptile Species of Special Concern in California* (Jennings and Hayes 1994). Southern California legless lizard is generally found south of the Transverse Range, extending to Northwestern Baja California, and disjunct populations also occur in the Tehachapi and Piute Mountains in Kern County. These legless lizards are found in a variety of habitats and prefer soils with a high moisture content. They primarily live underground in sandy or loose, loamy soils under sparse vegetation, in cool areas where they can burrow. They breed between early spring and July, and are live-bearing with a 4-month gestation period. Sexual maturity is reached in 2 to 3 years, and the known maximum life span in captivity is 6 years.

Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats. The nearest recent occurrence of southern California legless lizard was documented at Point Dume in 2017 (CDFW 2019), within the geographic extent of the project sites' distributions. Therefore, considering the proximity of recent observations, presence of suitable habitat in the BSA, and general human use and disturbance in the BSA, there is a moderate potential for southern California legless lizard to occur where suitable habitat may be present within the BSA. Specifically, there is moderate potential for the species to occur within the BSAs of the Big Rock Bypass Improvements site, Carbon Canyon Road & Carbon Mesa Road Waterline Improvements site, Creek Crossings (Topanga Canyon, Pena Canyon, Las Flores Canyon, Coal [Carbon] Canyon, Escondido, Corral Canyon, and Zuma creeks), Emergency Source of Water Supply Connection (Las Virgenes Connection) site, Fernwood Tank site, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) sites, PCH & Topanga Beach Drive Waterline Improvements sites, Las Tunas County Beach Staging Area, Topanga County Beach Staging Area, Topanga Field Yard Staging Area, Applefield Lane Vacant Lot Staging Area, Owen Tank Site Staging Area, and Point Dume Tank Site Staging Area.

3.5.5.3 Coastal Whiptail (syn. San Diegan Tiger Whiptail)

Coastal whiptail (*Aspidoscelis tigris stejnegeri*) is designated as a California SSC (CDFW 2018b). The following information is summarized from *California Amphibian and Reptile Species of Special Concern* (Thomson et. al 2016), *California Herps* (Nafis 2018), and *Amphibian and Reptile Species of Special Concern in California* (Jennings and Hayes 1994). Coastal whiptails are slim-bodied lizards with long slender tails. They are found in deserts and semiarid areas with sparse vegetation and open areas, although they also seek cover in dense vegetation. They are also found in woodland and riparian areas. The substrate of the areas they inhabit may be firm soil, sandy, or rocky. Breeding typically begins in May and egg hatching lasts May to August.

Multiple recent occurrences of coastal whiptail were documented in the Santa Monica Mountains during the 2000s (CDFW 2019). Suitable habitat is present within the BSA in scrub, chaparral, woodland, and riparian habitats. Therefore, considering the proximity of recent observations, presence of suitable habitat within the BSAs, and general human use and disturbance within the BSAs, coastal whiptail has a moderate potential to occur within the BSA. Specifically, there is moderate potential for the species to occur within BSAs of the Big Rock Bypass Improvements site, Carbon Canyon Road & Carbon Mesa Road Waterline Improvements site, Creek Crossing sites (Topanga Canyon, Pena Canyon, Las Flores Canyon, Coal [Carbon] Canyon, Escondido, Corral Canyon, and Zuma creeks), Emergency Source of Water Supply Connection (Las Virgenes Connection) site, Fernwood Tank site, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) sites, PCH & Topanga Beach Drive Waterline Improvements sites, Topanga County Beach Staging Area, Topanga Field Yard Staging Area, Applefield Lane Vacant Lot Staging Area, Owen Tank Site Staging Area, and Point Dume Tank Site Staging Area.

3.5.5.4 Southwestern Pond Turtle (Western Pond Turtle)

Southwestern pond turtle (*Actinemys pallida [=Emys marmorata*]) is designated as a California SSC (CDFW 2018b). The following information is summarized from *California Amphibian and Reptile Species of Special Concern* (Thomson et. al 2016), *California Herps* (Nafis 2018), and *Amphibian and Reptile Species of Special Concern in California* (Jennings and Hayes 1994). This aquatic turtle is found in ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation, and below 6,000 feet of elevation. The species requires permanent or nearly permanent water with components such as logs, large rocks, cattail mats, or exposed banks for basking. and requires suitable upland habitat (usually sandy banks or grassy open fields) within approximately 0.3 mile from water for nest-building and egg-laying. Pond turtles can tolerate brackish water and sometimes salinities of seawater. Pond turtles are capable of aestivating (hibernating) underwater in mud for long periods of time and typically will do so during the winter in northern areas.

The nearest recent occurrences of southwestern pond turtle were reported in Triunfo, Las Virgenes, Malibu, and Topanga creeks in the 1980s through 2000s (CDFW 2019), and the species generally is known to occur in streams of the Santa Monica Mountains (Nafis 2018; Dagit et al. 2015). Suitable aquatic and upland nesting habitat is present within the BSA. Wetland habitats within the BSA could provide freshwater feeding areas, with exposed basking opportunities, and adjacent upland habitat at some sites may be suitable for nesting. Therefore, considering the proximity of recent observations and presence of suitable habitat, there is a high potential for southwestern pond turtle to occur where freshwater stream habitat occurs. Specifically, there is high potential for the species to occur within the BSAs of the Corral Canyon Creek, Las Flores Canyon Creek, Escondido Creek, PCH & Topanga Beach Drive (Segment 2), Topanga Canyon Creek, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), and Topanga County Beach Staging Area sites.

3.5.5.5 Coast Horned Lizard (syn. Blainville's Horned Lizard)

Coast horned lizard (syn. Blainville's horned lizard) (*Phrynosoma blainvillii*) is designated as a California SSC (CDFW 2018b.]. The following information is summarized from *California Amphibian and Reptile Species of Special Concern* (Thomson et. al 2016), *California Herps* (Nafis 2018), and *Amphibian and Reptile Species of Special Concern in California* (Jennings and Hayes 1994). Coast horned lizards are found in a wide variety of habitats, including chaparral, cismontane woodland, coastal bluff scrub, coastal scrub, desert wash, pinon and juniper woodlands, riparian scrub, riparian woodland, and valley and foothill grassland. They are most common in lowlands along sandy washes with scattered, low vegetation and use open areas for sunning. They use bushes for cover, patches of loose soil for burial, and require an abundant supply of ants and other insects for food. Females lay eggs from May to June, and eggs hatch from August to September.

The species generally is known to occur in the Santa Monica Mountains (Nafis 2018), and the nearest recent observations were recorded in the Latigo Canyon and Topanga Canyon areas in the 1990s (CDFW 2019). Suitable habitat is present within the BSA in scrub, chaparral, woodland, and riparian habitats. Therefore, considering the proximity of recent observations, the presence of suitable habitat, and general human use and disturbance within the BSAs, there is a moderate potential for coast horned lizard to occur within the BSA. Specifically, there is moderate potential for the species to occur within the BSAs of the Big Rock Bypass Improvements site, Carbon Canyon Road & Carbon Mesa Road Waterline Improvements site, Creek Crossing sites (Topanga Canyon, Pena Canyon, Las Flores Canyon, Coal [Carbon Canyon], Escondido, Corral Canyon, and Zuma creeks), Emergency Source of Water Supply Connection (Las Virgenes Connection) site, Fernwood Tank site, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) sites, PCH & Topanga Beach Drive Waterline Improvements sites, Topanga County Beach Staging Area, Topanga Field Yard Staging Area, Applefield Lane Vacant Lot Staging Area, Owen Tank Site Staging Area, and Point Dume Tank Site Staging Area.

3.5.5.6 Western Mastiff Bat

Western mastiff bat (*Eumops perotis californicus*) is designated as a California SCC (CDFW 2018b). The following information is summarized from *Mammalian Species of Special Concern in California* (Williams 1986), *Terrestrial Mammal Species of Special Concern in California* (Bolster 1998), *Bat and Bridges Technical Bulletin: Hitch Hikers Guide to Bat Roosts* (Erickson et al. 2002), and *California Bat Mitigation Techniques, Solutions, and Effectiveness* (H.T. Harvey & Associates et al. 2004). Western mastiff bat is the largest species of bat in California. It does not hibernate and is likely active all winter. The species does not migrate long distances, and local populations may either move short distances or remain in an area year-round. These bats primarily consume moths, but also will eat other insects. Western mastiff bat is a colonial species, forming small colonies usually composed of less than 100 individuals. Mating occurs in the spring, and young are typically born in early- to mid-September, but timing can vary locally and can occur in the summer. The species occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roost location selection is determined by available crevices in cliff faces, high buildings, trees, and tunnels to roost in, and the species might use bridges. Roosts are typically found at least 20 feet above the ground because the species must free-fall for a few feet to begin flight.

The nearest records of occurrence for western mastiff bat are approximately 4 to 5 miles north of the BSA, from Malibu Creek State Park in 2004, Topanga State Park in 2003, and Peter Strauss Ranch in 2004 (CDFW 2019). Suitable foraging habitat is present within the BSA in woodland, scrub, and chaparral habitats. Although no tall, rocky faces with large crevices were observed during field surveys, potentially suitable roosting habitat occurs within the BSA at high buildings, large trees (if crevices are present), and possibly at bridges. Therefore, considering the proximity of previous observations, presence of potentially suitable foraging and roosting habitat within the BSA, and general human use and disturbance within the BSAs, western mastiff bat has a moderate potential to occur within the BSAs. Specifically, there is moderate potential for the species to occur within BSAs of the Big Rock Bypass Improvements site, Carbon Canyon Road & Carbon Mesa Road Waterline Improvements site, Sunset Mesa Tank Site, Coastline Drive, the Creek Crossing sites (Topanga Canyon, Pena Canyon, Las Flores Canyon, Coal [Carbon Canyon], Escondido, Corral Canyon, and Zuma creeks), Emergency Source of Water Supply Connection (Las Virgenes Connection) site, Fernwood Tank site, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) sites, PCH & Topanga Beach Drive Waterline Improvements sites, Topanga County Beach Staging Area, Topanga Field Yard

Staging Area, Applefield Lane Vacant Lot Staging Area, Owen Tank Site Staging Area, and Point Dume Tank Site Staging Area.

3.5.5.7 Western Red Bat

Western red bat (*Lasiurus blossevillii*) is designated as a California SSC (CDFW 2018b). The following information is summarized from *Mammalian Species of Special Concern in California* (Williams 1986), *Terrestrial Mammal Species of Special Concern in California* (Bolster 1998), *Bat and Bridges Technical Bulletin: Hitch Hikers Guide to Bat Roosts* (Erickson et al. 2002), and *California Bat Mitigation Techniques, Solutions, and Effectiveness* (H.T. Harvey & Associates et al. 2004). Western red bat is a medium-sized bat species that is found throughout California, but has few records in southern California. It forages for insects among trees, including native species, nonnative species, and fruit trees, often in areas with low human use, but also has been observed foraging in and near suburban areas. The species may migrate in cold areas, but can emerge from hibernation during warm days to feed. Mating occurs in later summer or early fall, although females become present in the spring, young are generally born in the summer, and young can fly in approximately 3 to 6 weeks. Western red bat roosts in foliage of trees and shrubs, mostly in edge habitats adjacent to streams and open fields, and the species is not known to roost under bridges. Roosts are usually 2 to 40 feet above the ground and can occur at elevations from sea level up through mixed conifer forests.

The nearest records of occurrence are approximately 3 to 5 miles north of the BSA, at Paramount Ranch, Peter Strauss Ranch, and the Stunt Ranch Reserve in 2004 (CDFW 2019). Suitable foraging habitat is present within the BSA in open areas, and suitable roosting habitat is present where large trees and/or shrubs occur within relatively open scrub and chaparral habitats and at the edges of riparian habitats. Therefore, considering the proximity of recent observations, the presence of suitable foraging and roosting habitat within the BSA, and general human use and disturbance in the BSAs, there is a moderate potential for western red bat to occur within the BSAs. Specifically, there is moderate potential for the species to occur within the BSAs of the Big Rock Bypass Improvements site, Carbon Canyon Road & Carbon Mesa Road Waterline Improvements site, Creek Crossing sites (Topanga Canyon, Pena Canyon, Las Flores Canyon, Coal [Carbon Canyon], Corral Canyon, and Zuma creeks), Emergency Source of Water Supply Connection (Las Virgenes Connection) site, Fernwood Tank site, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) sites, PCH & Topanga Beach Drive Waterline Improvements sites, Topanga Field Yard Staging Area, Applefield Lane Vacant Lot Staging Area, Owen Tank Site Staging Area, and Point Dume Tank Site Staging Area.

3.5.5.8 San Diego Desert Woodrat

San Diego desert woodrat (*Neotoma lepida intermedia*) is designated as a California SSC (CDFW 2018b). The following information is summarized from information available in *California Wildlife Habitat Relationships System – Life History Account for Desert Woodrat* (CDFW 2008), *Morphological and Molecular Analysis of a Contact Zone in the Neotoma Fuscipes Species Complex* (Matocq 2012), and *Santa Monica Mountains National Recreation Area – Small Mammals* (National Park Service 2015). San Diego desert woodrat is found in coastal scrub habitats of Southern California from San Diego County to San Luis Obispo County. Another species of woodrat is also found in this area: big-eared woodrat (*Neotoma macrotis*, formerly a sub-species of dusky-footed woodrat [*Neotoma fuscipes macrotis*]). Both woodrat species build lodges of sticks, preferring areas with moderate to dense canopies. Desert woodrats are particularly abundant in rock outcrops and rocky cliffs and slopes, but both species are also found on steep embankments and hillsides. Desert woodrats depend upon plants, including succulents, for water. Woodrats reproduce quickly, with females maturing at approximately 2 to 3 months of age. Reproduction can occur from October through May, depending upon the habitat, and young are weaned in approximately a month.

The nearest record of occurrence of desert woodrat is from Pepperdine University campus in 1995 (CDFW 2019). San Diego desert woodrat is presumed to be present within the BSA; a woodrat nest (of an unidentified species) was observed within the BSA at the Emergency Source of Water Supply Connection (Las Virgenes Connection) site, and, based upon the ranges of woodrat species (CDFW 2008), could have been built by San Diego desert woodrat or by dusky-footed woodrat (*Neotoma fuscipes*), which is also native to the Santa Monica Mountains. Suitable coastal scrub habitat is also present within the BSAs of the Carbon Canyon Road & Carbon Mesa Road Waterline Improvements site, Creek Crossing sites (Topanga Canyon, Pena Canyon, Las Flores Canyon, Coal (Carbon) Canyon), Escondido, Corral Canyon, and Zuma creeks), PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) sites, PCH & Topanga Beach Drive Waterline Improvements sites, Big Rock Bypass Improvements site, Applefield Lane Vacant Lot Staging Area, Topanga Field Yard Staging Area, Owen Tank Staging Area, and Topanga County Beach Staging Area.

3.6 Nesting Birds

Nesting habitat for common bird species occurs throughout the BSA. Although the 2018 field visits were conducted during the nesting season, the field surveys were generally focused on vegetation mapping and broad-scale wildlife suitability, and not on searching for active nests. A pair of dark-eyed juncos (*Junco hyemalis oreganus*), which is a common breeding species in coastal lowland areas below the Santa Monica Mountains, was behaving territorially in the Zuma Creek BSA and probably nesting locally. In addition, special-status species that may nest within the BSA include western snowy plover and white-tailed kite.

3.7 Jurisdictional Resources

ICF biologist Kristen Klinefelter and regulatory specialist Meris Guerrero conducted the jurisdictional waters and wetland delineation on November 8, 2018, with a supplemental delineation performed by Ms. Klinefelter on November 6, 2019. A total of 15 linear stream features encompassing 1.67 acres (2,802 linear feet) of non-wetland waters and one feature encompassing 0.05 acre of wetland waters subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CCC were delineated within the BSA. In addition, 15 linear streambed features encompassing 2.55 acres (2,968 linear feet) of unvegetated streambed and six features encompassing 0.65 acre of riparian vegetation subject to the jurisdiction of the CDFW were delineated within the BSA. The complete results of the jurisdictional delineation are provided under a separate cover.

Chapter 4
Recommendations

4.1 Focused Surveys

Several species were determined to have potential for occurrence within the BSA and therefore justify, based upon their status, further focused survey efforts to determine their presence or absence.

4.1.1 Special-Status Plants

Because of the suitability of the habitat for Lyon's pentachaeta, Santa Monica dudleya, Braunton's milk vetch, Agoura Hills dudleya, San Fernando Valley spineflower, Ventura marsh milk-vetch, salt marsh bird's-beak, coastal dunes milk-vetch, and 19 non-listed special-status plant species (including red sand-verbena and southern California black walnut, both of which were observed to be present) within the BSA, a focused survey to determine the presence or absence of sensitive plant species is recommended. Surveys should be conducted during the appropriate time of year for correct identification of the species (generally April to October).

Surveys for Lyon's pentachaeta, Santa Monica dudleya, Braunton's milk vetch, Agoura Hills dudleya, and San Fernando Valley spineflower will be conducted in areas of chaparral, grassland, and coastal scrub habitats, including at disturbed areas within the project's limits of disturbance, while surveys for Ventura marsh milk-vetch, salt marsh bird's-beak, and coastal dunes milk-vetch will focus on coastal dunes and coastal saltmarshes. Surveys for Coulter's saltbush, Malibu Baccharis, Brewer's calandrinia, Catalina mariposa-lily, Plummer's mariposa-lily, Lewis' evening-primrose, western dichondra, mesa horkelia, decumbent goldenbush, southern California black walnut, fragrant pitcher sage, ocellated Humboldt lily, white-veined monardella, chaparral ragwort, and California screw moss will be conducted within areas of coastal scrub, chaparral, woodland, and nonnative grassland habitat within the project's limits of disturbance. Surveys for red sand-verbena, Lewis' evening-primrose, southwestern spiny rush, south coast branching phacelia, and woolly seablite will be conducted within areas of coastal dunes and coastal lagoons. Surveys for non-listed species will generally occur between March and June, which overlaps all blooming periods for these species, with a couple outliers on the earlier side or later side of the window.

4.1.2 Special-Status Animals

Based upon the evaluation of potential for special-status animal species to occur within the BSA, no focused animal surveys are recommended at this time.

Pre-construction nesting bird surveys of the BSA are recommended to avoid and minimize impacts to all nesting birds, including sensitive and listed species, in the immediate vicinity of project disturbance. These are described in greater detail in Section 4.3, *Avoidance and Minimization*, below.

General preconstruction surveys of the limits of disturbance are recommended to avoid and minimize impacts to all terrestrial special-status mammal and reptile species with potential to occur within the project area, and it is recommended to have a biological monitor present during vegetation removal and initial ground disturbance activities to direct when work activities should be halted to allow for any observed special-status animals to leave the project area of their own volition or for rescue and relocation, as needed.

Dewatering is not expected to occur as part of any of these improvements. However, if dewatering is ultimately required during construction activities, preconstruction surveys of aquatic habitats are recommended to determine presence or absence of special-status fish, amphibians, and aquatic reptiles. Should special-status aquatic species be found in an area that requires dewatering, consultation with the appropriate regulatory agency(ies) will be needed to minimize impacts, and a biological monitor may be required during the activity.

4.2 FESA/CESA Consultation

Based on the studies that have been conducted for this project in the field and through literature reviews, the following state and/or federally listed species have a moderate or high potential to occur within the BSA: Lyon's pentachaeta (state and federally listed as endangered, moderate potential to occur), Santa Monica dudleya (federally listed as threatened, moderate potential to occur), Braunton's milk-vetch (federally listed as endangered, moderate potential to occur), tidewater goby (federally listed as endangered, high potential to occur), southern California steelhead (federally listed as endangered, high potential to occur), and western snowy plover (federally listed as threatened, high potential to occur). Although focused surveys are recommended to determine if they are within the BSAs, several site visits were conducted in 2018 during the appropriate blooming season for these three plant species, and they were not observed within any of the project sites. Should these three species, or any other listed plant species, be found on-site or in any BSA during focused surveys, consultation will occur with CDFW and/or USFWS, as needed, to determine if an incidental take permit is required or if plants can be avoided.

The three wildlife species may occur within the BSA and even in the project area, but all are expected to be avoided. Where construction is needed at water bodies, it is proposed that foot crews walk into the dry creeks and/or that scaffolding be used to construct areas from above. No wet construction is anticipated, and, at this time, mechanical equipment is not proposed to be placed into any water bodies. Should snowy plovers be nesting in the vicinity of any sites, it is expected that construction would be delayed until after the nest has reached completion so as to avoid project-related impacts. None of the project sites or BSAs are located on open sand, and where open sand is present within the BSAs, it is generally in proximity to housing or other development. In addition, Snowy Plovers only recently began nesting on the Los Angeles County mainland again in 2017, after having been extirpated as breeders for nearly 70 years. They are not expected to nest in close proximity to any of the project sites, but in the event that this does happen, construction would be delayed or modified accordingly to avoid impacts. Consultation with USFWS is not expected to be required for wildlife species.

Critical habitat for tidewater goby is located in the Topanga Canyon Creek project site, and critical habitat for tidewater goby, southern California steelhead, and/or western snowy plover is located in the BSAs for Topanga Canyon Creek, the Topanga County Beach Staging Area, and the Zuma Beach Staging Area. Because there will be no construction on the beach and or wet construction (only foot crews when creeks are dry or crews working on scaffolds from above), no impacts or adverse modifications to critical habitat are expected, and therefore consultation with USFWS for impacts to critical habitat would not be necessary.

4.3 Avoidance and Minimization

The following avoidance and minimization measures are recommended in addition to the focused surveys described above in order to avoid or minimize project-related impacts.

Avoidance and Minimization Measure BIO-1

Prior to clearing or construction, highly visible barriers (e.g., orange construction fencing) will be installed around areas adjacent to the project limit of disturbance to designate environmentally sensitive areas (ESAs) to be protected. No project activity of any type will be permitted within these ESAs. In addition, heavy equipment, including motor vehicles, will not be allowed to operate within the ESAs. All construction equipment will be operated in a manner so as to prevent accidental damage to ESAs. No structure of any kind or incidental storage of equipment or supplies will be allowed within these protected zones. Silt fence barriers will be installed at the ESA boundary to prevent accidental deposition of cut or fill material in areas where vegetation is immediately adjacent to planned grading activities.

Avoidance and Minimization Measure BIO-2

Herbicides and insecticides that are not approved as safe to use around water will not be used, nor will rodenticides.

Avoidance and Minimization Measure BIO-3

To avoid attracting predators of special-status species, the project site will be kept as clean of debris as possible. All food-related trash items will be enclosed in sealed containers and regularly removed from the site(s).

Avoidance and Minimization Measure BIO-4

If construction commences during the bird breeding season (March 1–June 30), an experienced avian biologist will conduct a preconstruction survey for nesting birds within 3 days prior to construction activities. The survey will occur within all suitable nesting habitat within the project impact area and at a buffer deemed suitable by the biologist. It is assumed that areas along PCH will receive a smaller survey buffer than areas where there is less ambient disturbance. If nesting birds are found, a qualified biologist will establish an avoidance area as appropriate around the nest until it has been determined that young have fledged or nesting activities have ceased. The project site will need to be resurveyed if there is a lapse in construction activities for more than 7 days during the nesting season.

It is recommended that a permitted biologist perform nesting surveys for snowy plover as needed for disturbance near or at beach areas. Should white-tailed kite, a fully protected species, be found nesting within 500 feet of any project site, consultation with CDFW may be needed to avoid project-related impacts, and it may be necessary to delay construction until after the nest has gone to completion. Take of fully protected species is not allowed under any circumstances other than collection for necessary scientific research or relocation of birds for the protection of livestock.

In areas where vegetation trimming is required during the construction phase, the avian biologist will conduct a preconstruction survey for nesting birds in the targeted vegetation within 3 days prior to trimming, preferably on the same day. This action is required even if there has been no lapse in construction activities in an area, so as to avoid direct take of active but acclimated nests that may be present.

Avoidance and Minimization Measure BIO-5

So as to reduce unnecessary sound or disturbance to wildlife, vehicles or equipment that are not actively being used will not be left to idle unnecessarily.

Avoidance and Minimization Measure BIO-6

To the extent feasible, nighttime construction will not occur. When nighttime construction cannot be avoided, any required external light sources will be directed at the ground or directly at active construction and will have baffles or other mechanisms to reduce the amount of visible light that may disturb nearby nesting, foraging, or migrating wildlife.

Avoidance and Minimization Measure BIO-7

No pets will be allowed in or adjacent to the project site.

Avoidance and Minimization Measure BIO-8

Prior to site mobilization, all construction equipment and any vehicles that will be driven or parked off pavement in areas containing invasive weeds will be thoroughly washed to remove invasive weed seeds as possible from the tire tracks, undercarriages, and elsewhere where seeds may accumulate. In addition, any invasive plants that are removed from any of the project sites will be properly contained and disposed of so as to avoid their additional spread.

Avoidance and Minimization Measure BIO-9

A water truck will be kept onsite and used as needed for dust containment. To the extent possible, the spread of fugitive dust will be avoided.

Avoidance and Minimization Measure BIO-10

Prior to construction, a certified arborist will investigate and determine if any trees that may be trimmed, removed, or otherwise affected on any site qualify as protected under the Malibu LCP, the SMM LCP, or the Los Angeles County Code of Ordinances.

Avoidance and Minimization Measure BIO-11

The Los Angeles County Department of Public Works requires compliance with the permit conditions stated within the Coastal Development Permit. The Los Angeles County Department of Public Works will seek a Coastal Development Permit under the Malibu LCP for the removal of or adverse impacts to any native oaks, southern California black walnut, California sycamore, white alder, or toyon, as protected under the Native Tree Protection Ordinance, that have at least one trunk measuring at least 6 inches in diameter or a combination of any two trunks measuring a total of at least 8 inches in diameter, measured at 4.5 feet above natural grade. Under this ordinance, removed trees or trees left in a worse state than prior to construction will be replaced at a ratio of at least 10:1 either onsite or offsite, and the applicant will submit a native tree replacement planting program outlining planting locations and tree sizes, as well as details for monitoring success, including annual monitoring and reporting for at least 10 years. All planted trees will be planted less than one year old, and oaks will be grown from local acorns collected from the site vicinity. If the 10:1 replacement ratio cannot be met, an in-lieu fee commensurate to the type, size, and age of the affected tree(s) will be required instead. Additional requisite measures and post-construction requirements would be included as permit conditions of approval and would include 1) protective fencing around root zones (no construction, grading, staging, or storage allowed); 2) only hand-held tools used on any approved development inside the fenced areas, and development must not damage root systems; 3) a qualified biologist or arborist will monitor protected trees in or adjacent to construction; and 4) if the protective fence is compromised, work will be suspended until the fence is repaired or replaced. The only exemptions to the permit requirement include native trees that have been destroyed or damaged beyond recovery by a natural disaster, native trees that are at risk of falling, cannot be stabilized, and pose an imminent public health and safety risk, and native trees that were planted for ornamental reasons and not as part of a LCP or Coastal Act requirement.

The Los Angeles County Department of Public Works will seek an Oak Tree Permit under the Los Angeles County Code of Ordinances before cutting, destroying, removing, relocating, damaging, or encroaching within the protected zone (defined as the dripline +5 feet or 15 feet from the trunk, whichever is greater) of all oak trees in unincorporated Los Angeles County that are at least 8 inches in diameter or that have a combination of any two trunks measuring a total of at least 12 inches in diameter at 4.5 feet above natural grade, as well as any tree that has been planted as a replacement tree pursuant to this ordinance. The permit application must contain a detailed oak tree report evaluating structure, health, impacts, and mitigation for every potentially impacted oak tree onsite. Under this ordinance, removed trees will be replaced at a ratio of at least 2:1, and all trees will be at least a 15-gallon specimen and measure at least 1 inch in diameter measured 1 foot above the base. Replacement trees must be maintained, monitored, and replaced for a minimum of 2 years after planting, and a plan must be put in place to protect the tree(s) once planted. Exemptions to the permit include construction of subdivisions approved prior to the effective date of the ordinance; oaks that are considered a public health or safety hazard; oaks that have been irretrievably damaged or destroyed by a natural disaster; maintenance necessary to protect or maintain electricity, communications, or other public utilities; tree maintenance limited to medium pruning of branches 2 inches in diameter or smaller; trees planted, grown, and/or held for sale by a licensed nursery; and trees in an existing road ROW for which pruning, removal, or relocation is necessary for safety reasons or for road damage.

The Los Angeles County Department of Public Works will seek a CDP-OT before cutting, destroying, removing, relocating, damaging, or encroaching within the protected zone (defined as the dripline +5 feet or 15 feet from the trunk, whichever is greater) all oak trees within the SMM LCP that are at least 6 inches in diameter or that have a combination of any two trunks measuring a total of at least 8 inches in diameter at 4.5 feet above natural grade, or that are replacement trees planted under this ordinance. General application requirements are virtually identical to the Los Angeles County oak tree ordinance. However, under the CDP-OT, mitigation for every affected oak tree will be as follows: the removal of oak trees will be replaced at a ratio of 10:1, an encroachment of more than 30 percent into the protected zone of an oak will be mitigated at a 10:1 ratio, encroachment that extends within 3 feet of the trunk will be mitigated at a 10:1 ratio, trimming branches over 11 inches in diameter will be mitigated at a 5:1 ratio, a 10–30 encroachment into the protected zone will be mitigated at a 5:1 ratio, and less than 10 percent encroachment into the protected zone will only require monitoring. Each replacement tree must be the same species as that it is intended to replace, at least a 1-gallon-sized specimen, measure at least 1 inch in diameter 1 foot above the base, and have an acorn taken from the Santa Monica Mountains planted within its watering zone. Replacement trees must be maintained, monitored, and replaced for a minimum of 7 years after planting. Where feasible, replacement trees will be grown from acorns collected in Los Angeles or Ventura Counties and planted in the same general area of the subject property as the tree they are replacing. If not feasible to plant onsite, trees must be planted in a protected area within the Santa Monica Mountains and, where feasible, will be in the same watershed as the affected trees; if it is not possible to plant in the same watershed, an additional two trees will be added to the mitigation ratio for each affected tree. Trees with less than a 30 percent encroachment into the protected zone will be monitored and reported on annually for a minimum of 10 years, during which time if the subject trees die or deteriorate in health as a result of the project, they must be replaced at a 10:1 ratio under the same conditions as those described above. Finally, a plan must be submitted and implemented for the protection of all oak trees on the subject property both during and after development. Exemptions to the permit include where there is an existing and unexpired CDP and oak tree permits approved prior to the effective date of the LCP; oaks that are considered a public health or safety hazard within 200 feet of an existing structure or on open land threatening public property or utilities; oaks that have been irretrievably damaged or destroyed by a natural disaster; maintenance necessary to protect or maintain electricity, communications, or other public utilities; tree maintenance limited to medium pruning of branches 2 inches in diameter or smaller; trees planted, grown, and/or held for sale by a licensed nursery; and trees in an existing road ROW for which pruning, removal, or relocation is necessary for safety reasons or for road damage.

Avoidance and Minimization Measure BIO-12

Spoils and rubble will not be deposited outside the identified limits of construction and material waste generated by the project will be disposed of offsite.

Avoidance and Minimization Measure BIO-13

All equipment will be adequately maintained to prevent the leaking of oil, fuel, or other hydraulic fluids into nearby creek crossings or other areas where it could accidentally contaminate waterways. Heavy equipment will be examined for leaks each day before work begins and, in the case of a leak, their use will not be allowed until any leak-related issues are fixed. All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other toxic substances will occur in designated staging areas.

Avoidance and Minimization Measure BIO-14

A Storm Water Pollution Prevention Plan will be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential to affect water quality. The plan will identify the sources of pollutants that may affect the quality of stormwater and include relevant Best Management Practices (BMPs) to control pollutants, such as sediment control, catch basin inlet protection, construction materials management, and non-stormwater BMPs.

Avoidance and Minimization Measure BIO-15

The areas of disturbance and constructed slopes will be protected with temporary and/or permanent erosion controls, including fiber rolls, silt fencing, soil binders, rock slope protection, and/or revegetation with an erosion control seed mix.

Avoidance and Minimization Measure BIO-16

When in or near natural habitat areas, all personnel involved in the onsite project construction will be required to participate in a preconstruction training program to understand the mitigation obligations on the project.

Avoidance and Minimization Measure BIO-17

No equipment or vehicles will be operated or placed within the limits of jurisdictional waters or associated riparian vegetation. In areas where a foot crew is required to be present within jurisdictional waters for pipeline repairs, removals, or replacements, all tools, materials, and associated mechanical equipment will be packed out and removed on a daily basis when the crew leaves the site. No construction-related materials will be left within jurisdictional limits or associated riparian vegetation overnight.

Avoidance and Minimization Measure BIO-18

Equipment maintenance, lighting, and staging will occur only in designated areas, and will not block or impede movement through wildlife corridors.

Chapter 5
References

Bolster, B. C., editor. 1998. *Terrestrial Mammal Species of Special Concern in California*. Draft Final Report prepared by P. V. Brylski, P. W. Collins, E. D. Pierson, W. E. Rainey, and T. E. Kucera. Report submitted to California Department of Fish and Game Wildlife Management Division, Nongame Bird and Mammal Conservation Program for Contract No. FG3146WM.

Calflora. 2018. Calflora. Website. Available: http://www.calflora.org/. Accessed: June 2018.

California Coastal Commission (CCC). 2017. Summary of LCP Program Activity in FY 16-17. Available: https://documents.coastal.ca.gov/assets/rflg/FY16_17_LCPStatusSummaryChart.pdf.

California Department of Fish and Wildlife (CDFW). 2008. Desert Woodrat Species Account. California Wildlife Habitat Relationships System. California Department of Fish and Wildlife, California Interagency Wildlife Task Group.

_____. 2018a. *Special Vascular Plants, Bryophytes, and Lichens List*. August. Sacramento, CA: California Department of Fish and Wildlife.

_____. 2018b. *Special Animals List*. August. Sacramento, CA: California Department of Fish and Wildlife.

_____. 2019. California Natural Diversity Database (CNDDB). Element Reports for the Point Dume, Malibu Beach, Topanga, Point Mugu, Camarillo, Newbury Park, Thousand Oaks, Calabasas, Canoga Park, Van Nuys, Beverly Hills, and Venice 7.5-minute Quadrangle Maps. Wildlife Habitat Data Analysis Branch, Habitat Conservation Division. Sacramento, CA: California Department of Fish and Game. Accessed: June 2018, updated November 2019.

California Native Plant Society (CNPS). 2019. *Inventory of Rare and Endangered Plants* (online edition, v8-03 0.39). California Native Plant Society, Rare Plant Program. Available: http://rareplants.cnps.org/. Accessed: June 2018, updated November 2019.

City of Malibu. 2002a. Local Coastal Program LUP. Adopted by the CCC on September 13, 2002, pursuant to the provisions of PRC Section 30166.5, and updated including Ord. 430, passed January 22, 2018. Available: http://www.qcode.us/codes/malibu-coastal/.

_____. 2002b. *Local Coastal Program LIP*. Adopted September 13, 2002, and updated including Ord. 430, passed January 22, 2018. Available: http://www.qcode.us/codes/malibu-coastal/.

Cornell Lab of Ornithology. 2015. Snowy Plover. *All About Birds*. Available: https://www.allaboutbirds.org/guide/Snowy_Plover/overview/

County of Los Angeles Department of Regional Planning. 2014*. Santa Monica Mountains Local Coastal Program – A Component of the Santa Monica Mountains Local Coastal Program*. Adopted August 26, 2014.

_____. 2015. *Los Angeles County General Plan*. Adopted October 6, 2015.

_____. 2018a. *Santa Monica Mountains LUP: A Component of the Santa Monica Mountains Local Coastal Program*. Adopted 2014, Amended February 2018.

_____. 2018b. *Santa Monica Mountains LIP: A Component of the Santa Monica Mountains Local Coastal Program*. Adopted 2014, Amended February 2018.

Dagit, R., S. Albers, C. Stevens. 2015. *Trancas Lagoon Restoration Feasibility Study 2013–2015.* Resource Conservation District of the Santa Monica Mountains, Topanga, CA. December 2015.

Dellith, C. 2018a. Personal communication regarding the status of least Bell's vireo and coastal California gnatcatcher in the project vicinity. U.S. Fish and Wildlife Service, Senior Fish and Wildlife Biologist. August 3, 2018.

_____. 2018b. Personal communication regarding the status of California red-legged frog in the project vicinity. U.S. Fish and Wildlife Service, Senior Fish and Wildlife Biologist. September 18.

eBird. 2019. eBird: An online database of bird distribution and abundance. eBird, Ithaca, New York. Available: http://www.ebird.org/.

Erickson, Gregg A., et al. 2002. Bat and Bridges Technical Bulletin (*Hitchhiker Guide to Bat Roosts*), California Department of Transportation, Sacramento, CA.

Garrett, K. 2018. Personal communication regarding the status of least Bell's vireo and coastal California gnatcatcher in the project vicinity. Natural History Museum of Los Angeles County, Ornithology Collections Manager. April 23.

Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California.* California Department of Fish and Game, Nongame-Heritage Program. Updated: 1992.

H.T. Harvey & Associates. 2004. *California Bat Mitigation Techniques, Solutions, and Effectiveness.* Prepared for California Department of Transportation and California State University Sacramento Foundation. Project Number 2394-01. December 29.

Jennings, M. R. and M. P. Hayes. 1994. *Amphibians and Reptiles of Special Concern in California*. California Department of Fish and Game.

Kus, B., S. L. Hopp, R. R. Johnson, and B. T. Brown. 2010. Bell's Vireo (*Vireo bellii*), version 2.0. In *The Birds of North America* (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY. Available: https://doi.org/10.2173/bna.35/.

Matocq, M.D. 2002. *Morphological and Molecular Analysis of a Contact Zone in the Neotoma Fuscipes Species Complex*. Journal of Mammalogy 83(3):866–883.

Moyle, P. B., R. M. Quiñones, J. V. Katz, and J. Weaver. 2015. *Fish Species of Special Concern in California*. Sacramento: California Department of Fish and Wildlife. Available: www.wildlife.ca.gov.

Mulder, J. 2017. Personal communication regarding the status of tidewater goby and arroyo chub in the project vicinity. ICF, Senior Manager. April 12.

Nafis, G. 2018. California Herps - A Guide to the Amphibians and Reptiles of California. Available: http://www.californiaherps.com/.

National Marine Fisheries Service (NMFS). 1996. Endangered and Threatened Species: Proposed Endangered Status for Five ESUs of Steelhead and Proposed Threatened Status for Five ESUs of Steelhead in Washington, Oregon, Idaho, and California; Proposed Rule. *Federal Register* 61(155):41541–41561. National Oceanic and Atmospheric Administration.

_____. 2005. Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California; Final Rule. *Federal Register* 70(170): 52488–52627. National Oceanic and Atmospheric Administration.

_____. 2006. Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead. *Federal Register* 71(3):834–862.

_____. 2012. *Southern California Steelhead Recovery Plan*. Southwest Region, Protected Resources Division, Long Beach, CA.

_____. 2016. *5-Year Review: Summary and Evaluation of Southern California Coast Steelhead Distinct Population Segment*. National Marine Fisheries Service. West Coast Region. California Coastal Office. Long Beach, CA.

_____. 2019. California Species List Tools database – KMZ of NMFS Resources in California. National Marine Fisheries Service West Coast Region. Available: http://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html. Accessed: June 2018, updated November 2019.

National Park Service. 2019. *Mammals*. Available: https://www.nps.gov/samo/learn/nature/mammals.htm.

National Parks Traveler (NPT). 2019. *Woolsey Fire A Major Setback For California Red-legged Frogs*. Available: https://www.nationalparkstraveler.org/2019/06/woolsey-fire-major-setback-california-red-legged-frogs/.

Pacific Fishery Management Council (PFMC). 1998. Appendix D, *Description and Identification of Essential Fish Habitat for the Coastal Pelagic Species Fishery Management Plan*. December.

_____. 2005. Amendment 18 (Bycatch Mitigation Program) and Amendment 19 (Essential Fish Habitat) to the *Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery.* Pacific Fishery Management Council. Portland, OR. November.

_____. 2007. Appendix F, *U.S. West Coast Highly Migratory Species: Life History Accounts and Essential Fish Habitat Descriptions*. U.S. West Coast Highly Migratory Species Plan Development Team, Pacific Fishery Management Council. June.

Sawyer, J. O., T. Keeler-Wolf, J. M. Evens. 2009. *A Manual of California Vegetation*. Second edition. Sacramento, CA: California Native Plant Society. Available: http://vegetation.cnps.org/.

Sutter, M. 2018. *Rangewide Tidewater Goby Occupancy Survey Using Environmental DNA*. A Thesis Presented to the Faculty of Humboldt State University in Partial Fulfillment of the Requirements for the Degree Master of Science in Natural Resources: Fisheries.

Thomson, R. C., A. N. Wright, H. B. Shaffer. 2016. *California Amphibian and Reptile Species of Special Concern*. Oakland, CA: University of California Press.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA/NRCS). 2018. Web Soil Survey. Available: http://websoilsurvey.nrcs.usda.gov/app/. Accessed: June 2018.

U.S. Fish and Wildlife Service (USFWS). 1986. Determination of Endangered Status for the Least Bell's Vireo. *Federal Register* 51(85):16474–16481.

_____. 1993. Determination of Threatened Status for the Pacific Coast Population of the Western Snowy Plover. *Federal Register* 58(42):12864–12874.

_____. 1994. Determination of Endangered Status for the Tidewater Goby. *Federal Register* 59(24):5494–5499.

_____. 1995. Final Rule Determining Endangered Status for the Southwestern Willow Flycatcher. *Federal Register* 60(38):10694–10715.

_____. 1996. Determination of Threatened Status for the California Red-Legged Frog. *Federal Register* 61(101):25813–25833.

_____. 1998. *Draft Recovery Plan for the Least Bell's Vireo.* U.S. Fish and Wildlife Service, Portland, Oregon. 139 pp.

_____. 2002a. *Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*).* U.S. Fish and Wildlife Service, Portland, Oregon. viii + 173 pp.

_____. 2002b. *Southwestern Willow Flycatcher Recovery Plan*. Albuquerque, New Mexico. i–ix + 210 pp., Appendices A–O.

_____. 2005a. *Recovery Plan for the Tidewater Goby (*Eucyclogobius newberryi). U.S. Fish and Wildlife Service, Portland, OR. vi + 199 pp.

_____. 2005b. Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog.

_____. 2006a. *5-Year Review Short Form Summary for the Pacific Coast Population of Western Snowy Plover (*Charadrius alexandrinus nivosus*).* U.S. Fish and Wildlife Service, Arcata, CA. 5 pp.

_____. 2006b. *California Least Tern (*Sternula antillarum browni*) 5-Year Review: Summary and Evaluation*. U.S. Fish and Wildlife Service, Carlsbad, CA. 33 pp.

_____. 2007. *Tidewater Goby (*Eucyclogobius newberryi*) 5-Year Review: Summary and Evaluation*. U.S. Fish and Wildlife Service, Ventura, CA. 50 pp.

_____. 2012. Revised Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover; Final Rule. *Federal Register* 77(118): 36727–36869.

_____. 2013. Designation of Critical Habitat for Tidewater Goby. *Federal Register* 78(25): 8745–8819.

_____. 2016. Endangered and Threatened Wildlife and Plants; Threatened Species Status for *Chorizanthe parryi* var. *fernandina* (San Fernando Valley Spineflower); Proposed Rule. *Federal Register* 81(179): 63454–63466.

_____. 2017. Ventura Fish and Wildlife Office News Room: Rare, tiny shorebird nests on Los Angeles county beaches for first time in nearly 70 years. Available: https://www.fws.gov/ventura/newsroom/release.cfm?item=410/.

_____. 2018. Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule to List *Chorizanthe parryi* var. *fernandina* (San Fernando Valley Spineflower); Proposed Rule. *Federal Register* 83(51): 11453–11474.

_____. 2019. Information for Planning and Consultation (IPaC) database. Available: https://ecos.fws.gov/ipac/. Accessed: April 2018. Official species list obtained October 2018, updated November 2019.

U.S. Geological Survey (USGS). 2015a. *Topanga, California, 7.5-minute Topographic Map*. Color, scale 1:24,000.

_____. 2015b. Malibu Beach, California, 7.5-minute Topographic Map. Color, scale 1:24,000.

_____. 2015c. Point Dume, California, 7.5-minute Topographic Map. Color, scale 1:24,000.

_____. 2015d. Triunfo Pass, California, 7.5-minute Topographic Map. Color, scale 1:24,000.

White, C. M., N. J. Clum, T. J. Cade, and W. Grainger Hunt. 2002. Peregrine Falcon (Falco peregrinus), in *The Birds of North America* (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/perfal.

Williams, D. F. 1986. *Mammalian Species of Special Concern in California*. Prepared for State of California, The Resources Agency, Department of Fish and Game.

Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White, eds. 1988–1990. *California's Wildlife. Vol. I–III.* California Department of Fish and Game, Sacramento, CA. Updated electronically in 2005.

Appendix A
Figures

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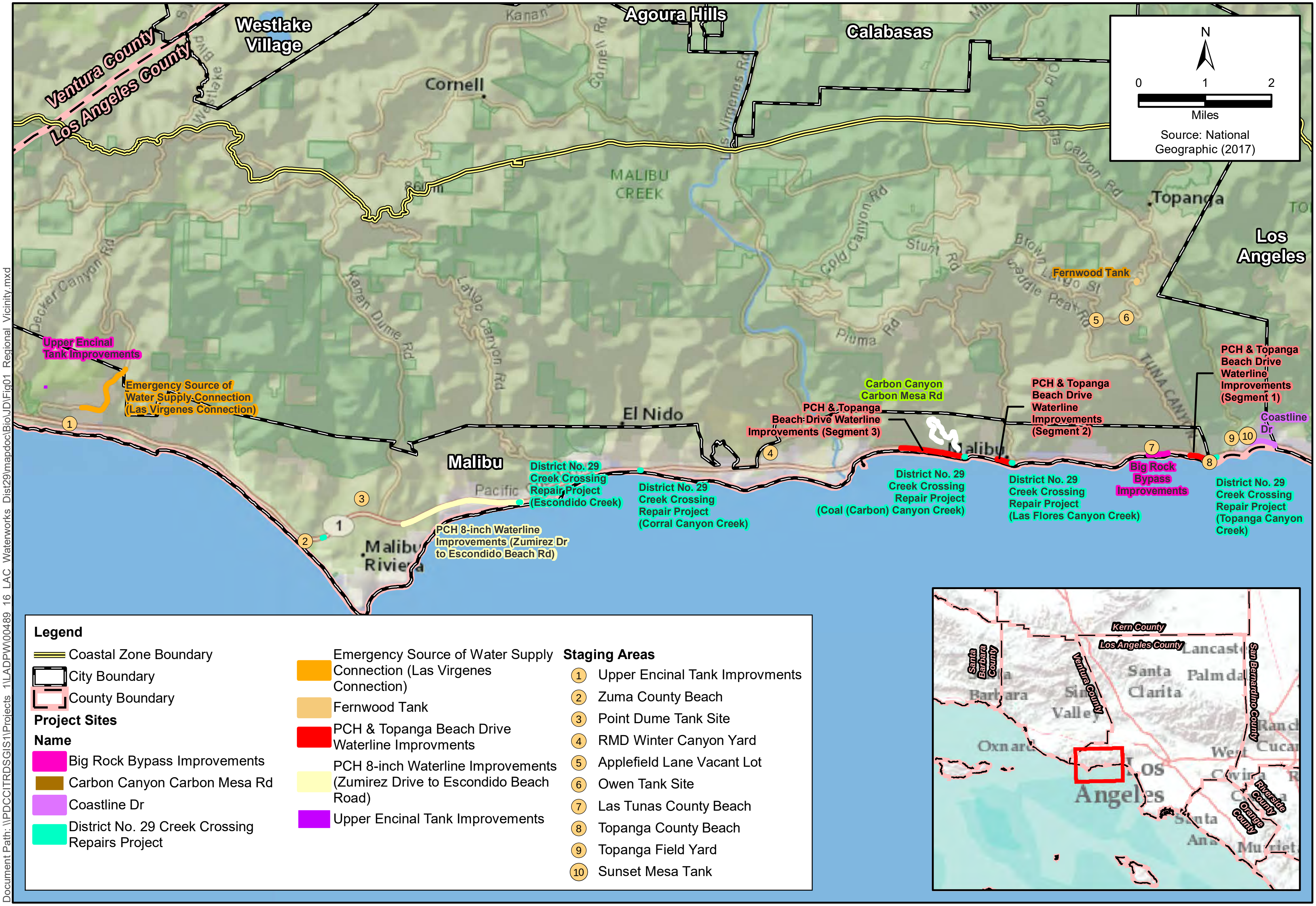

Figure 1
Regional Vicinity
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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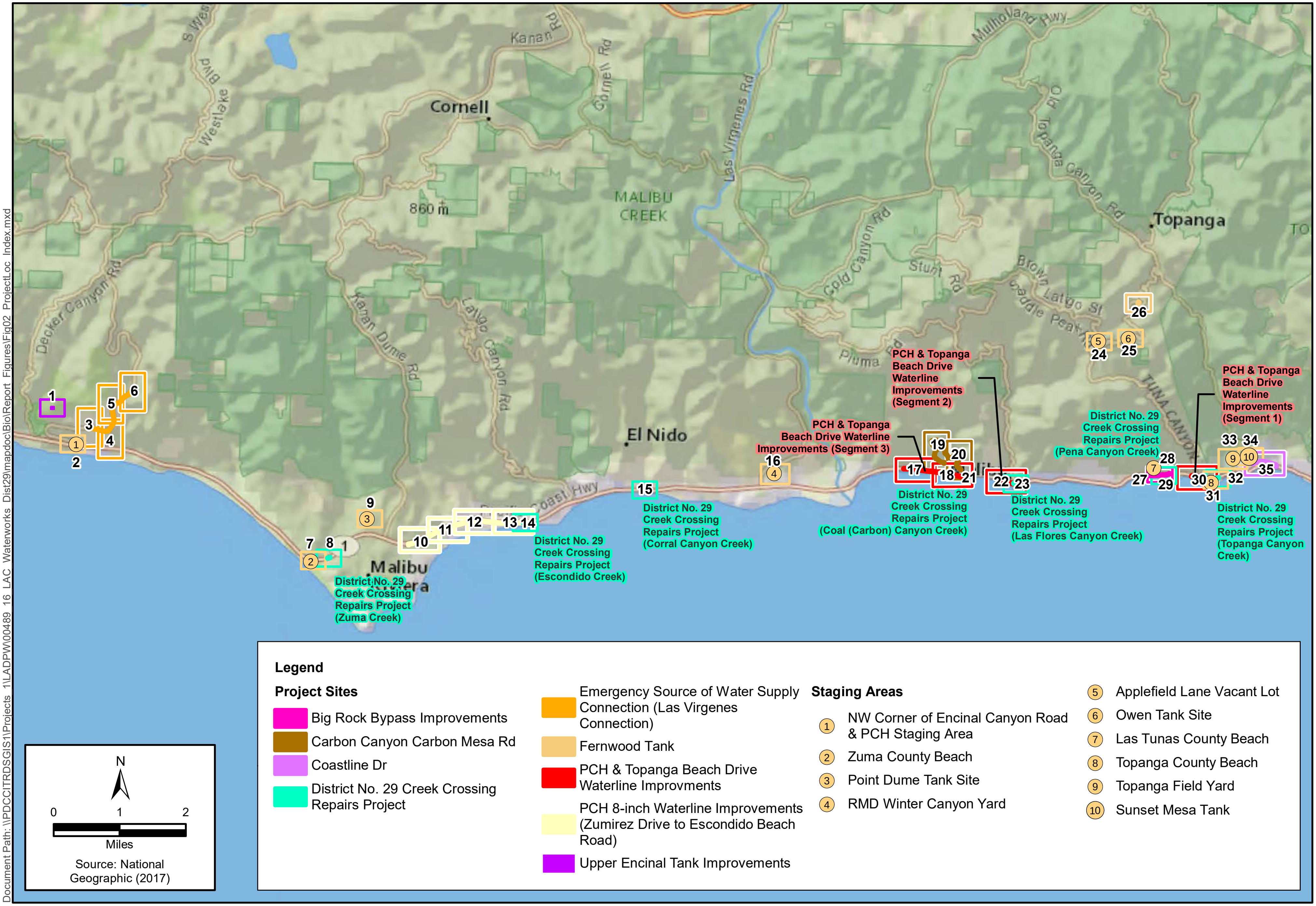

Figure 2 – Project Location Index Sheet

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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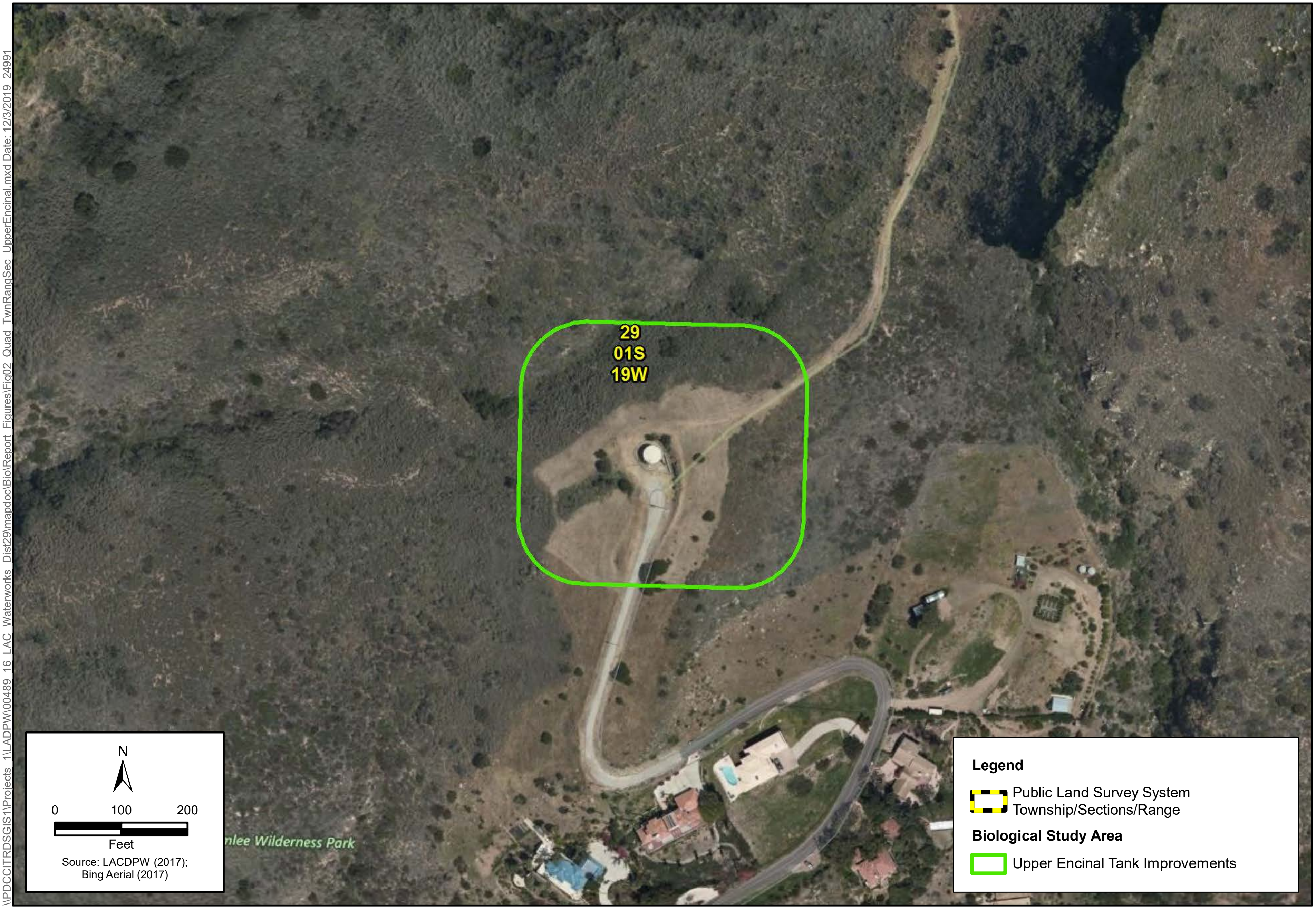

Figure 2 - Project Location
Upper Encinal Tank Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 2 - Project Location
NW Corner of Encinal Canyon Road & PCH Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

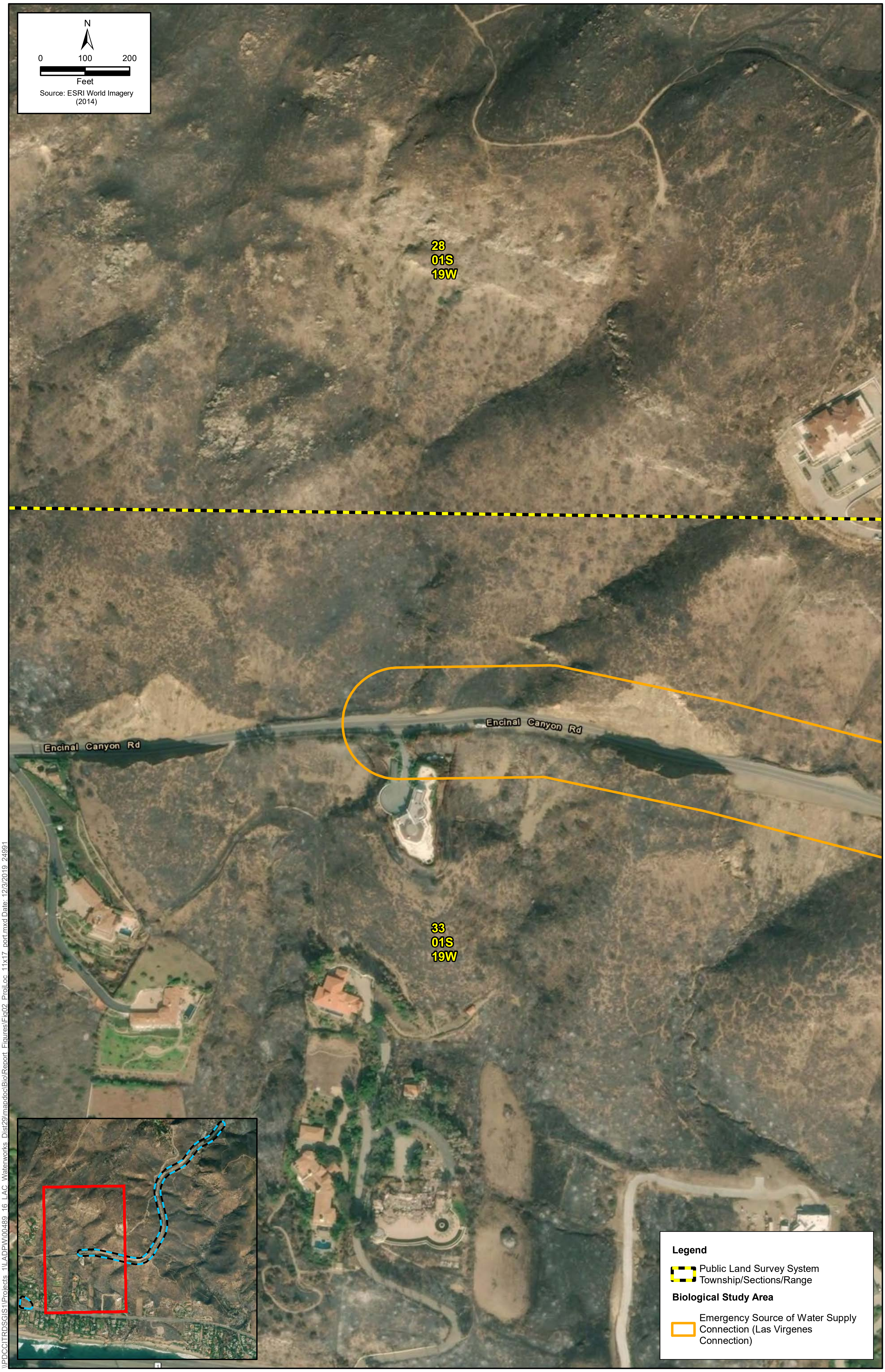

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Figure 2 - Project Location
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

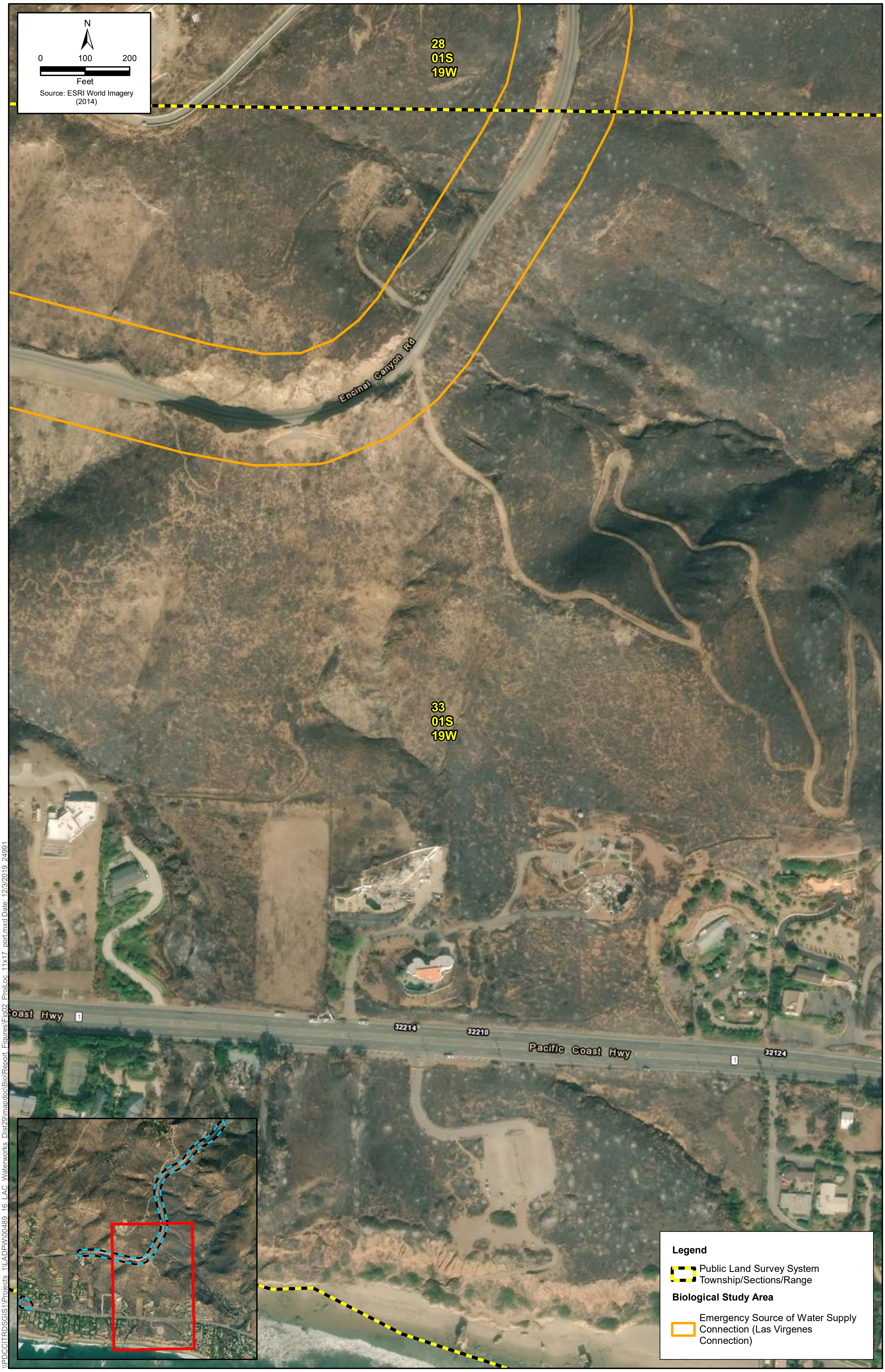

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Figure 2 - Project Location
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
Emergency Source of Water Supply Connection (Las Virgenes Connection)
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 2 - Project Location
Zuma County Beach Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 2 - Project Location
District No. 29 Creek Crossing Repairs Project (Zuma Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
Point Dume Tank Site Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Legend

▨ Public Land Survey System Township/Sections/Range

Biological Study Area

☐ PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)

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Figure 2 - Project Location
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017);
Bing Aerial (2017)

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Figure 2 - Project Location
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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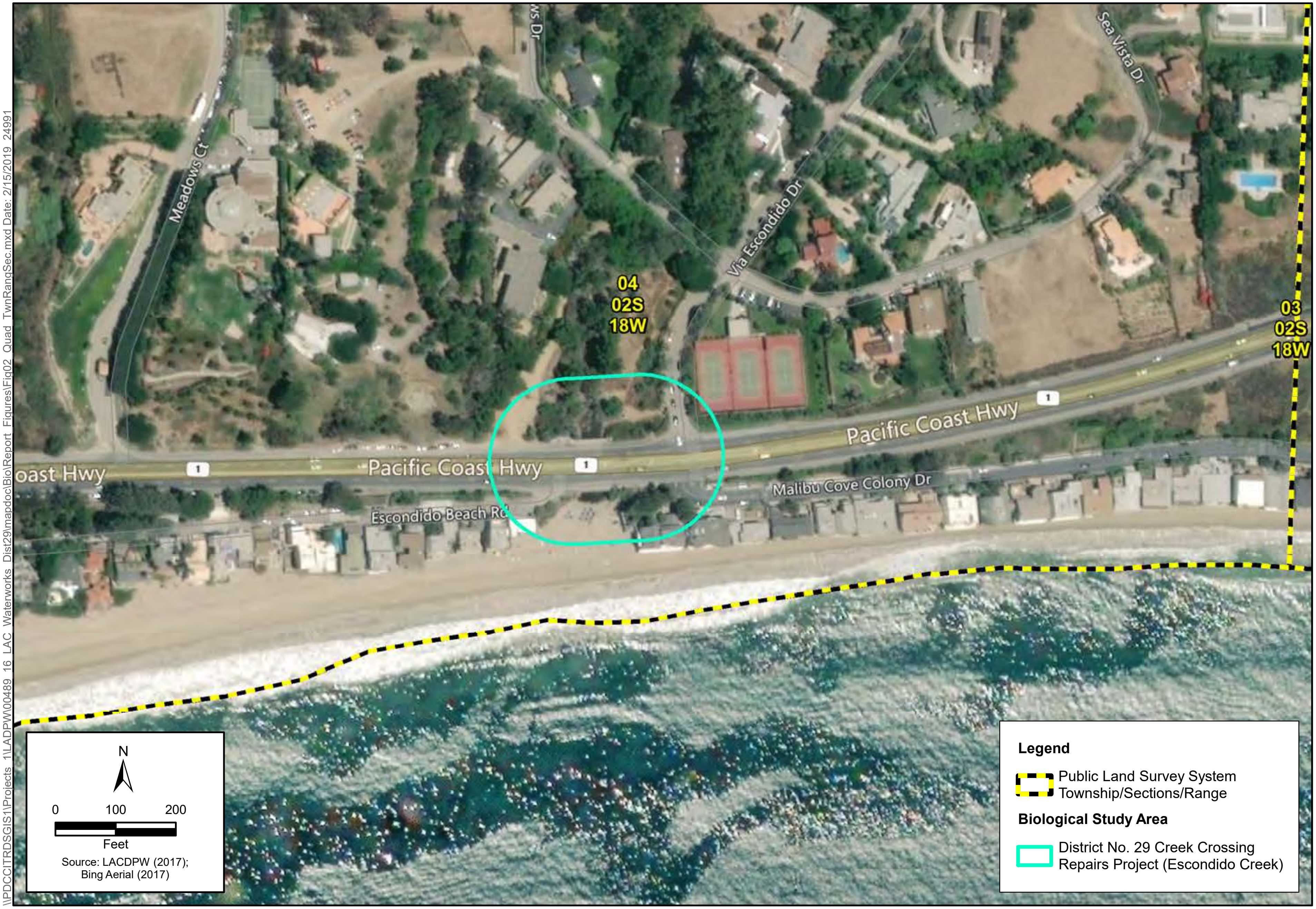

Source: LACDPW (2017); Bing Aerial (2017)

Figure 2 - Project Location
District No. 29 Creek Crossing Repairs Project (Escondido Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

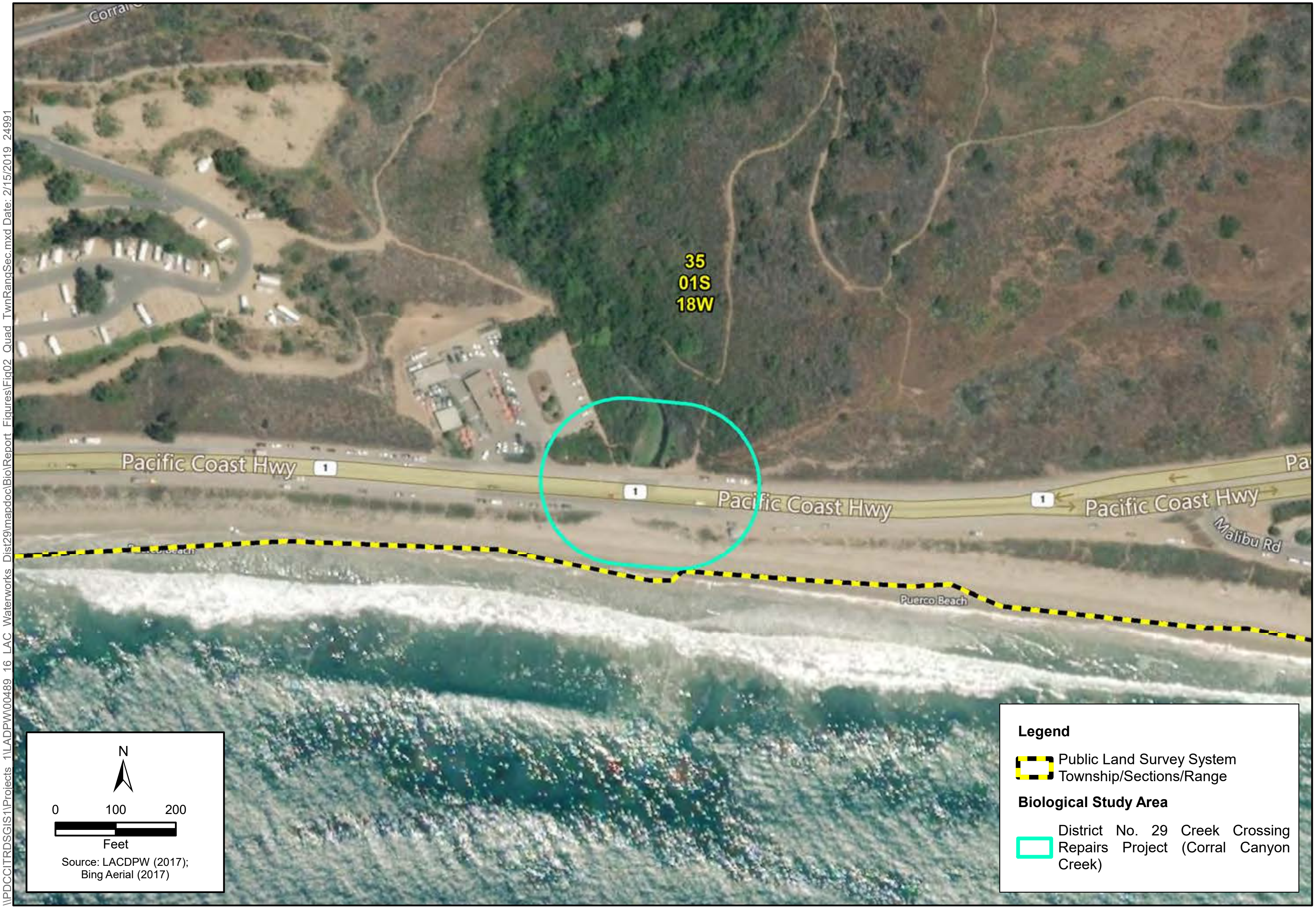

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Figure 2 - Project Location
District No. 29 Creek Crossing Repairs Project (Corral Canyon Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
RMD Winter Canyon Yard Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
PCH West of Carbon Canyon Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
PCH West of Carbon Canyon Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

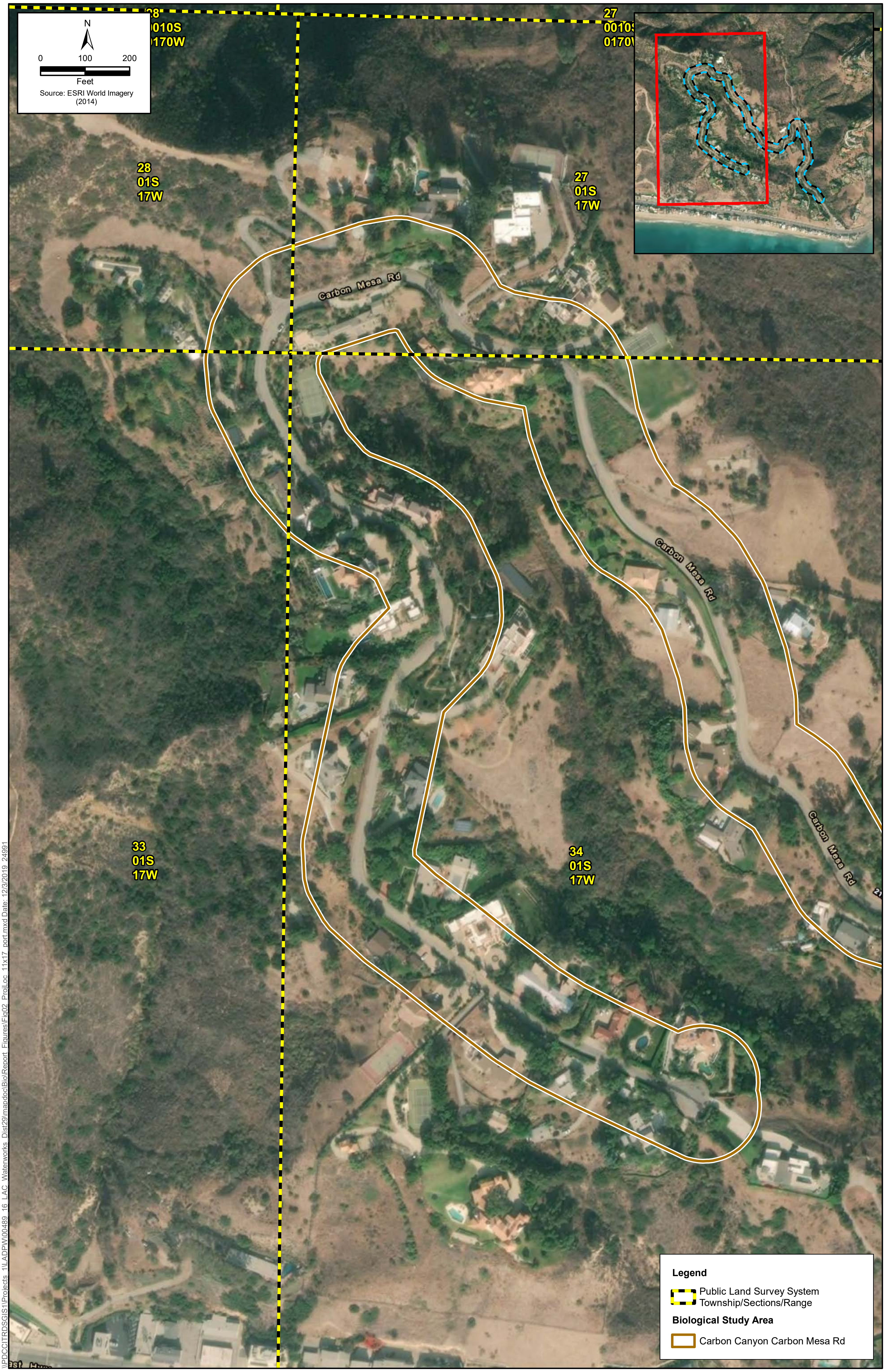

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Figure 2 - Project Location
Carbon Canyon Carbon Mesa Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

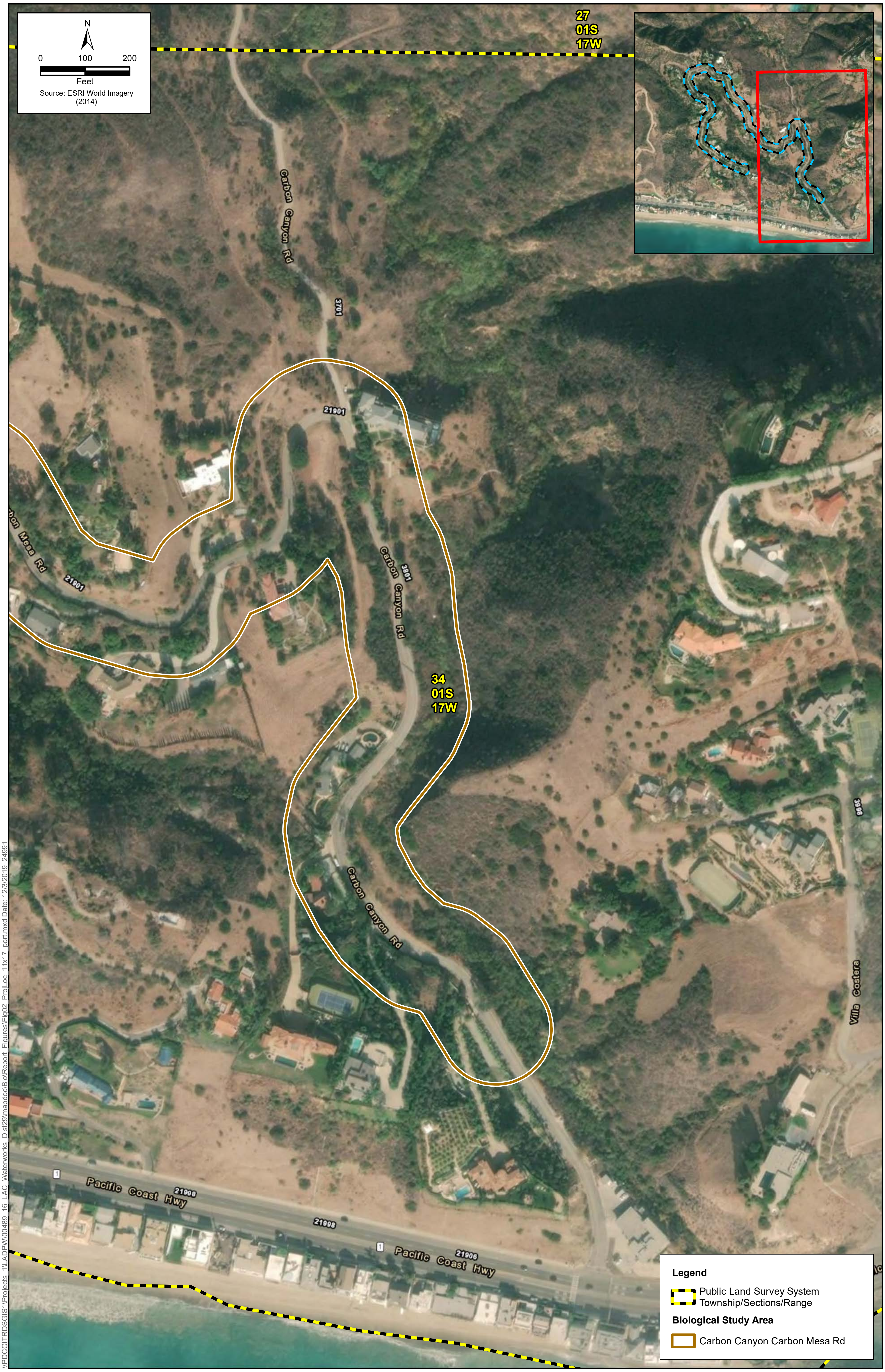

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Figure 2 - Project Location
Carbon Canyon Carbon Mesa Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 2 - Project Location
District No. 29 Creek Crossing Repairs Project (Coal (Carbon) Canyon Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
PCH West of Rambla Pacifico St Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 2 - Project Location
District No. 29 Creek Crossing Repair Project (Las Flores Canyon Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
Applefield Lane Vacant Lot Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 2 - Project Location
Owen Tank Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017);
Bing Aerial (2017)

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Figure 2 - Project Location
Fernwood Tank Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
Big Rock Bypass Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 2 - Project Location

District No. 29 Creek Crossing Repair Project (Pena Canyon Creek) Project Site

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

Figure 2 - Project Location
Las Tunas County Beach Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
PCH West of Topanga Beach Dr Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 2 - Project Location
Topanga County Beach Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
District No. 29 Creek Crossing Repair Project (Topanga Canyon Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017);
Bing Aerial (2017)

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Figure 2 - Project Location
Topanga Field Yard Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017);
Bing Aerial (2017)

Figure 2 - Project Location
Sunset Mesa Tank Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 2 - Project Location
Coastline Dr Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

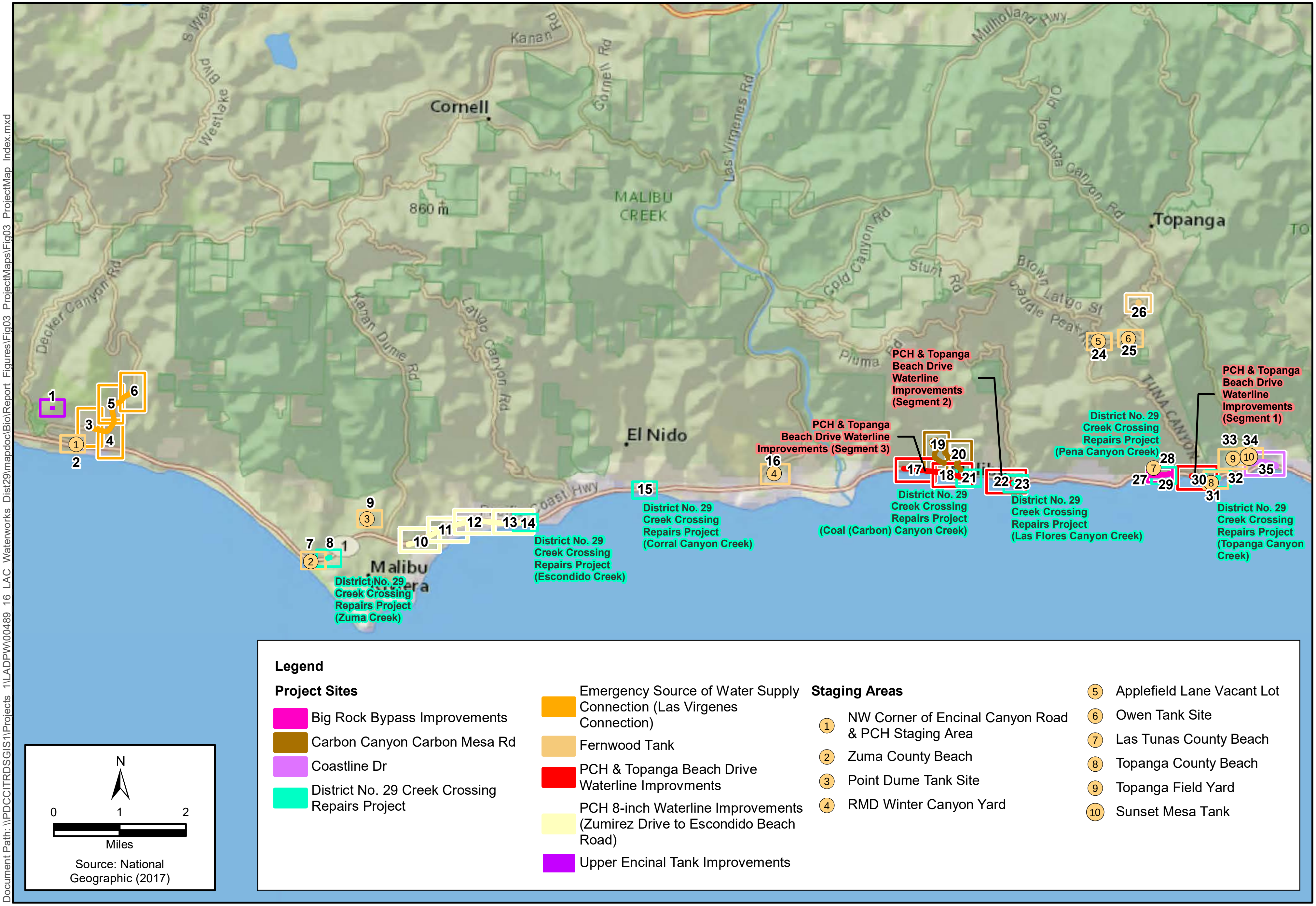

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Figure 3 – Project Map Index Sheet

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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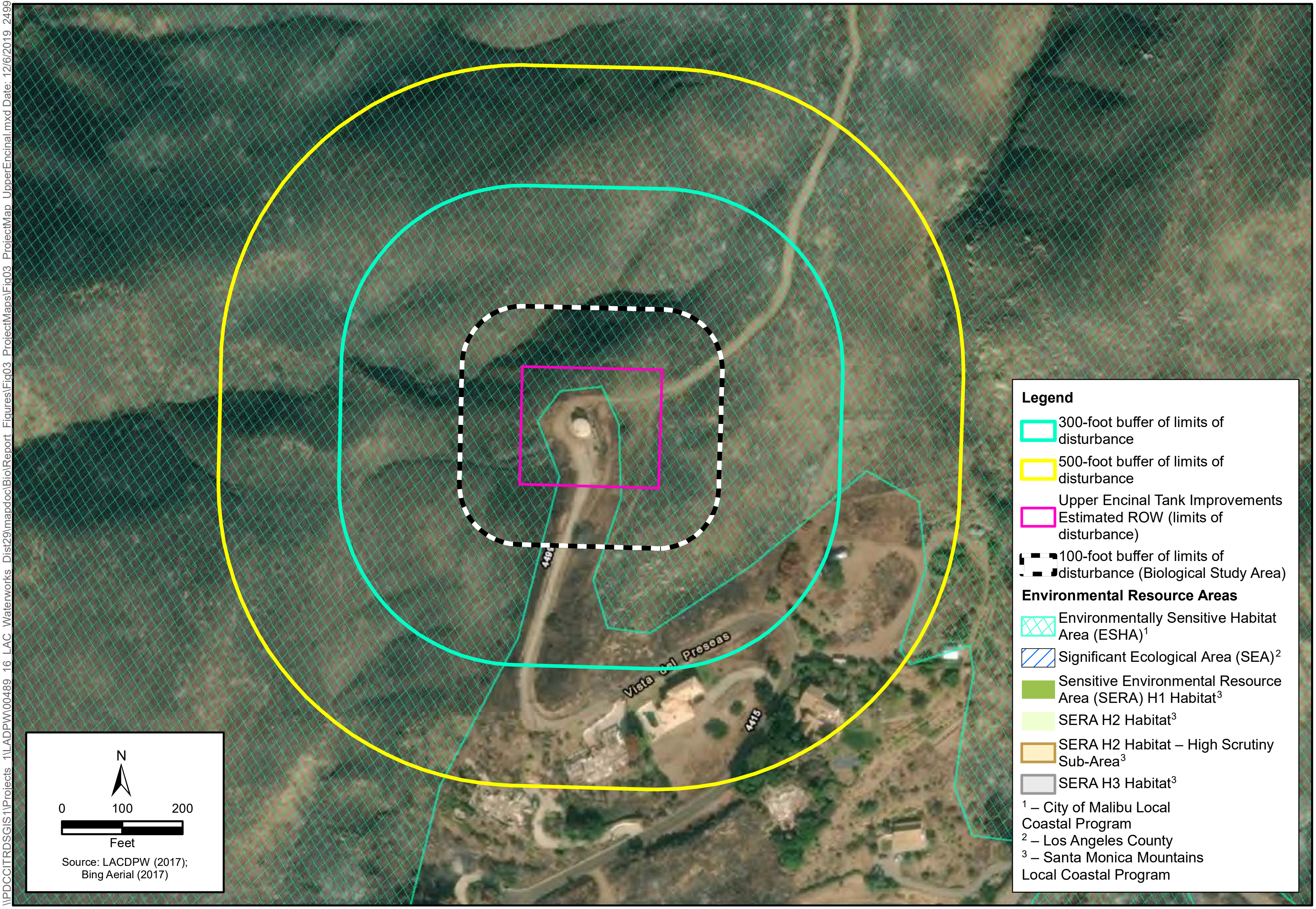

Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map

Upper Encinal Tank Improvements Project Site

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

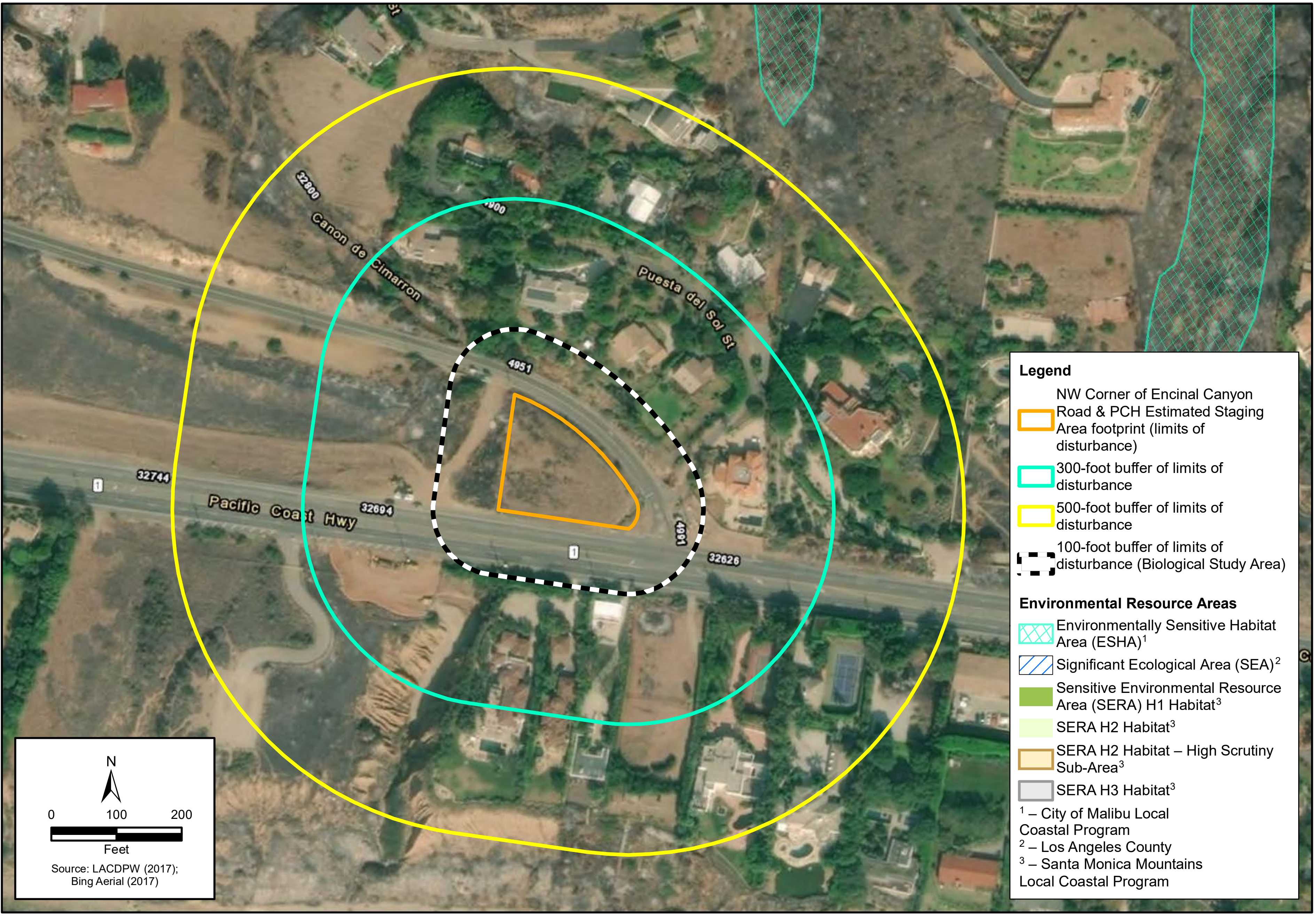

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Figure 3 – Project Map
NW Corner of Encinal Canyon Road & PCH Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

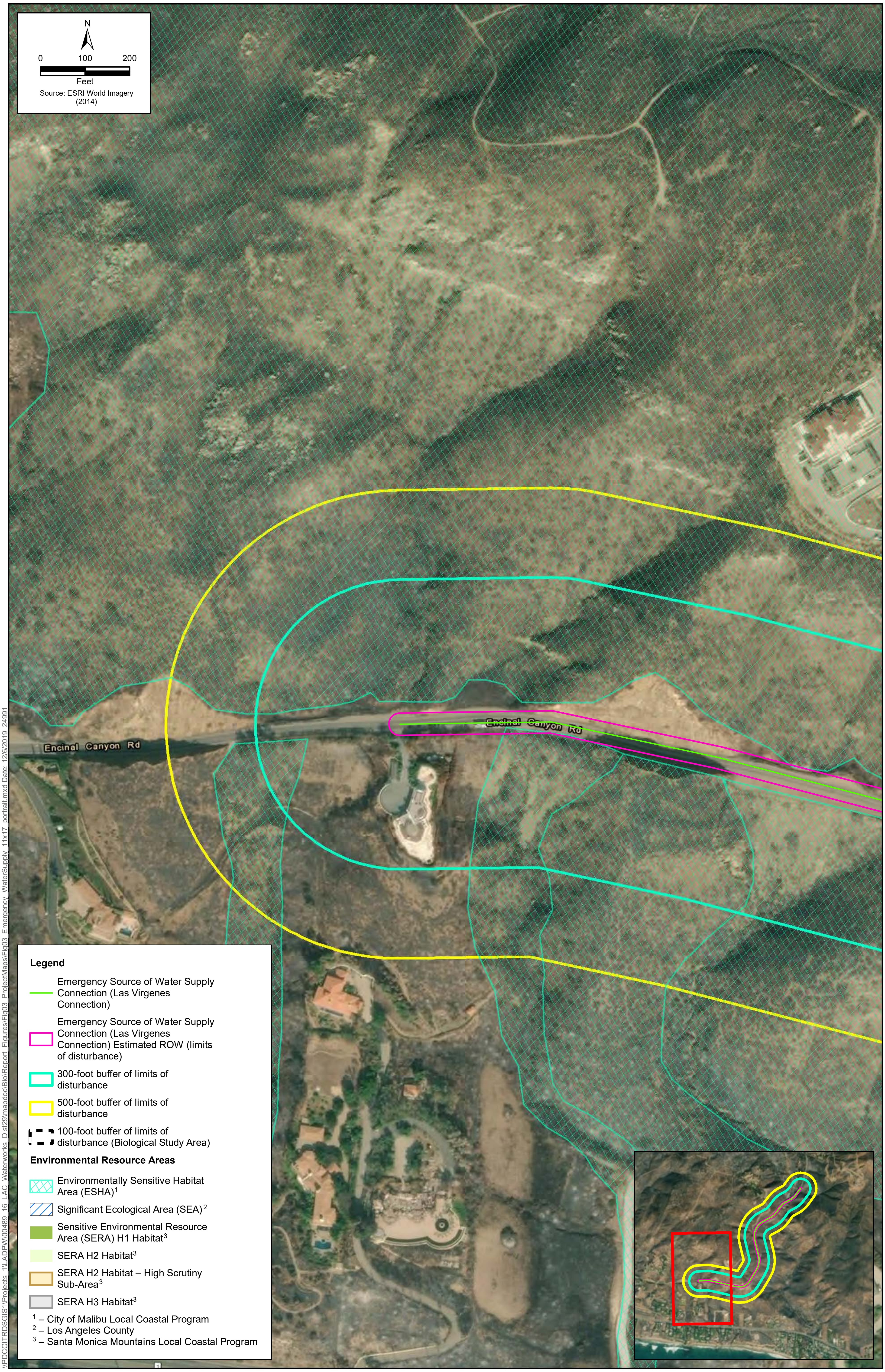

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Figure 3 - Project Map

Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

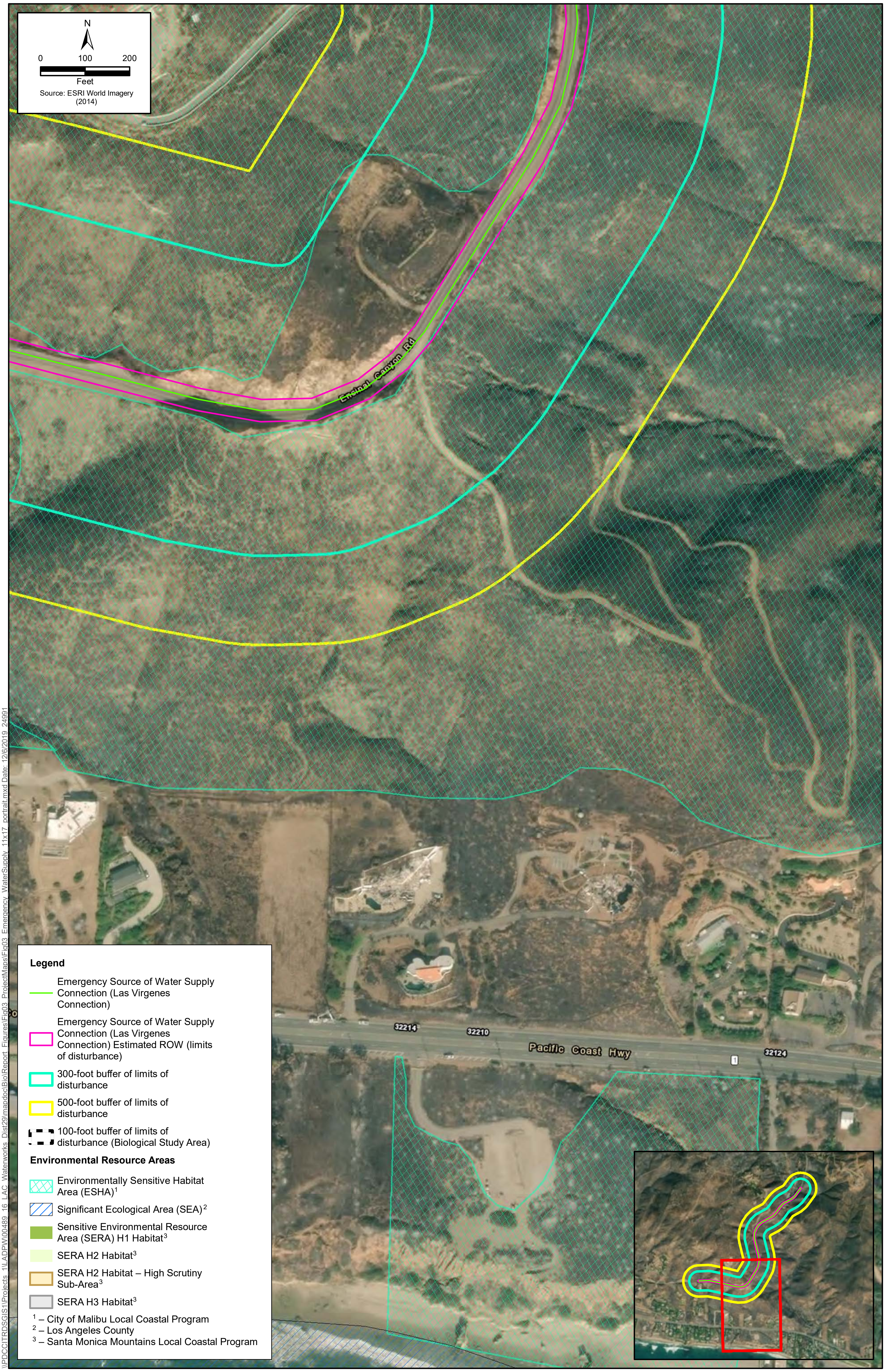

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Figure 3 - Project Map
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

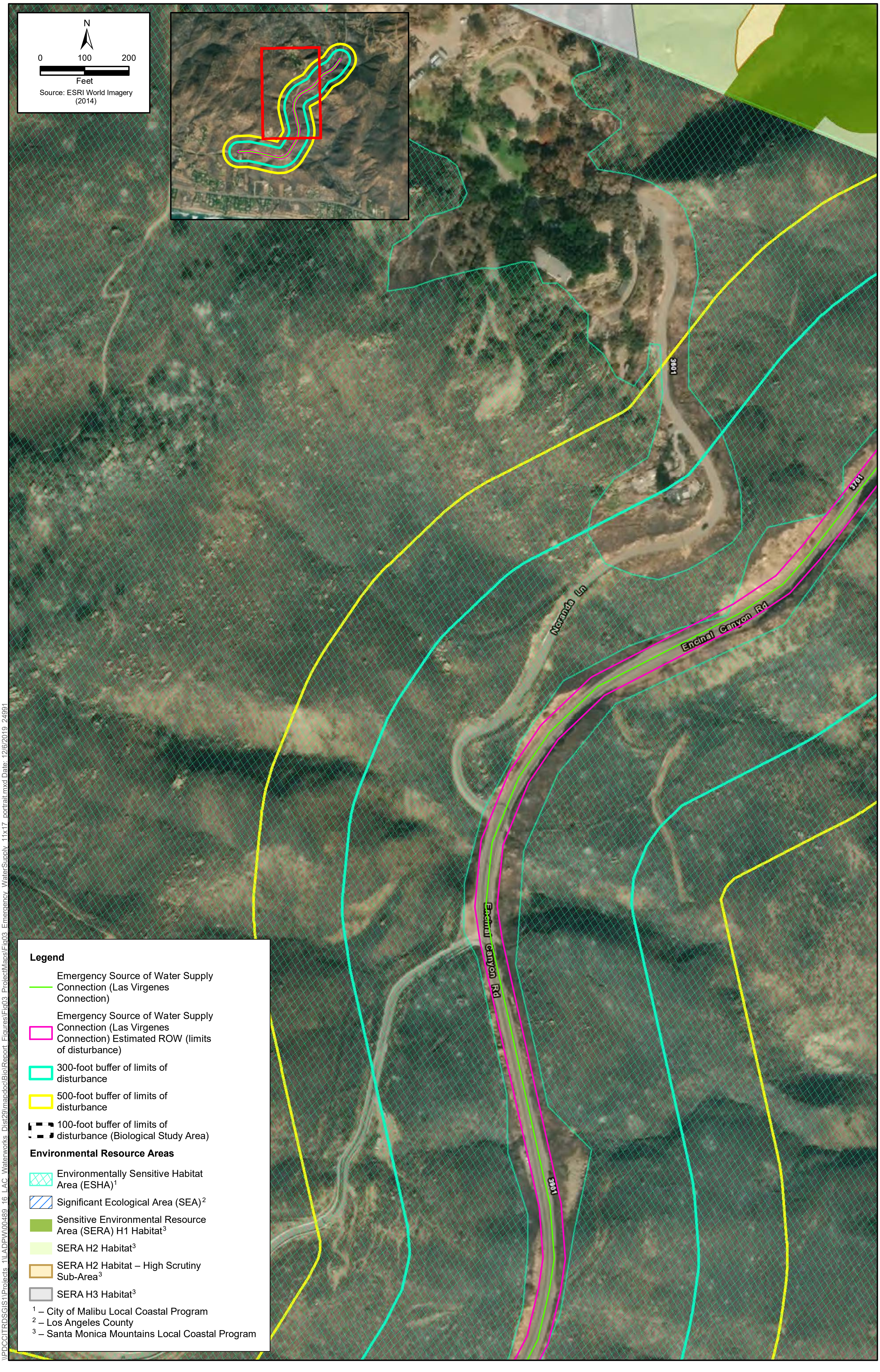

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Figure 3 - Project Map
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

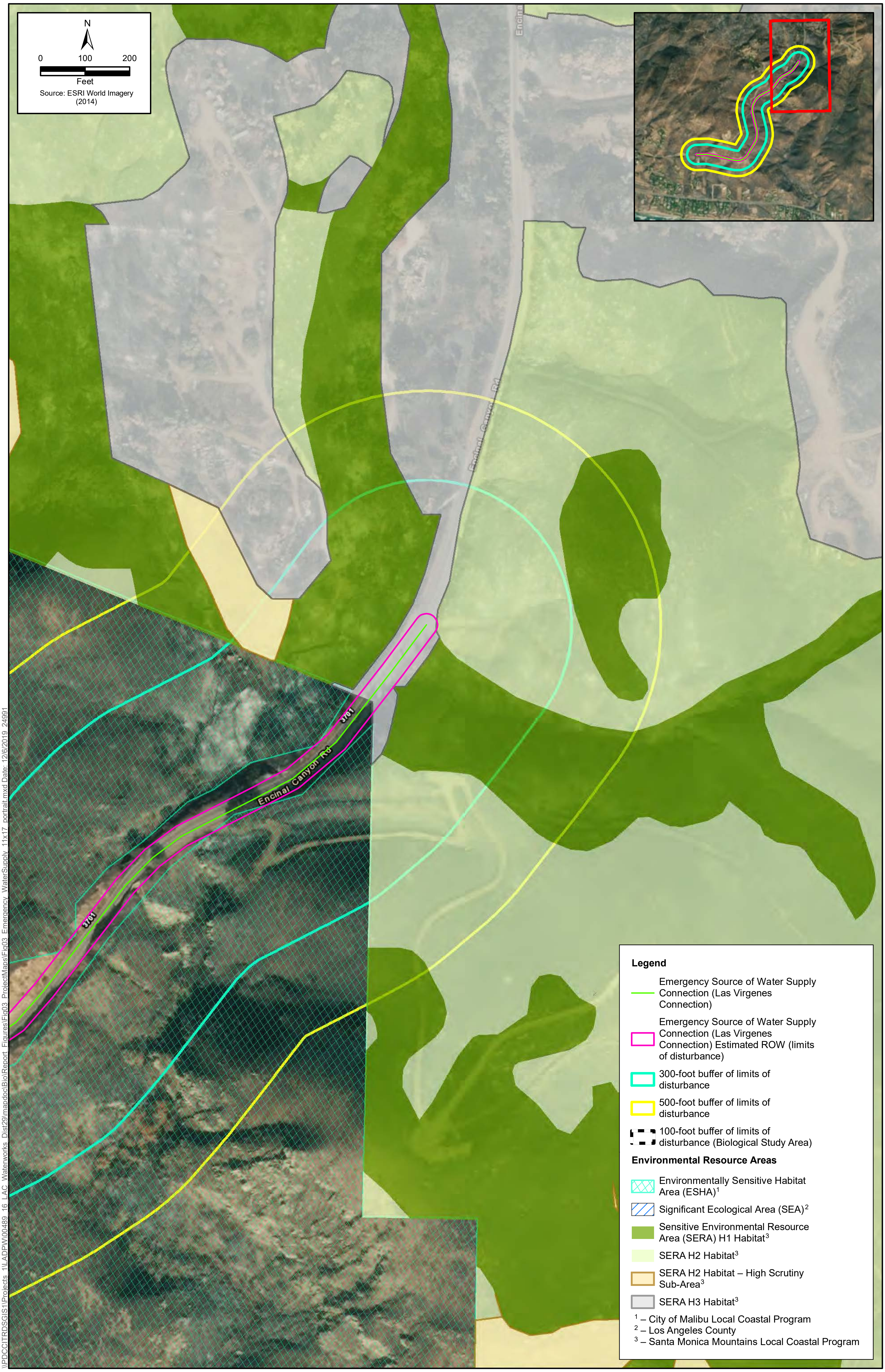

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Figure 3 - Project Map
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

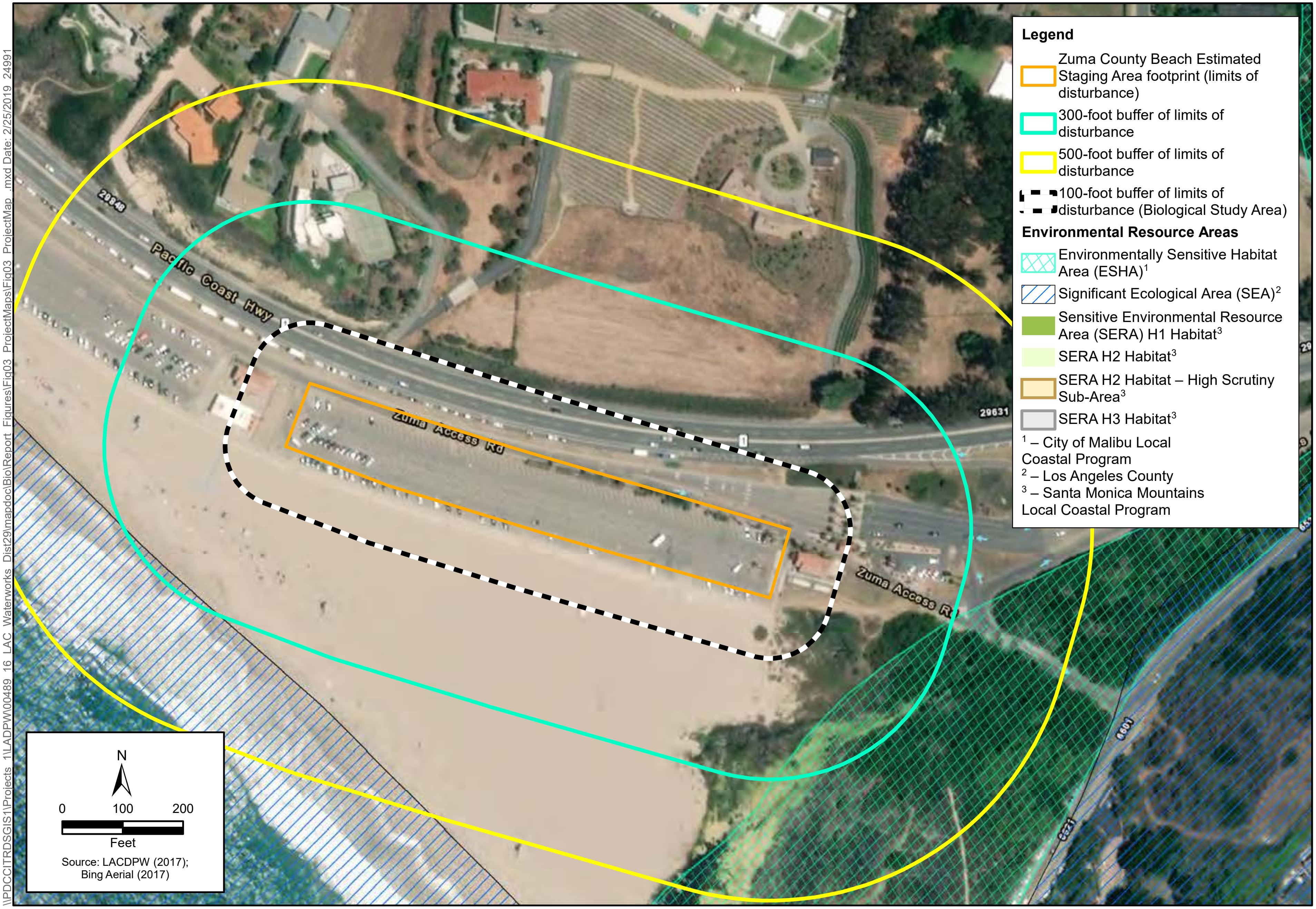

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Figure 3 – Project Map
Zuma County Beach Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

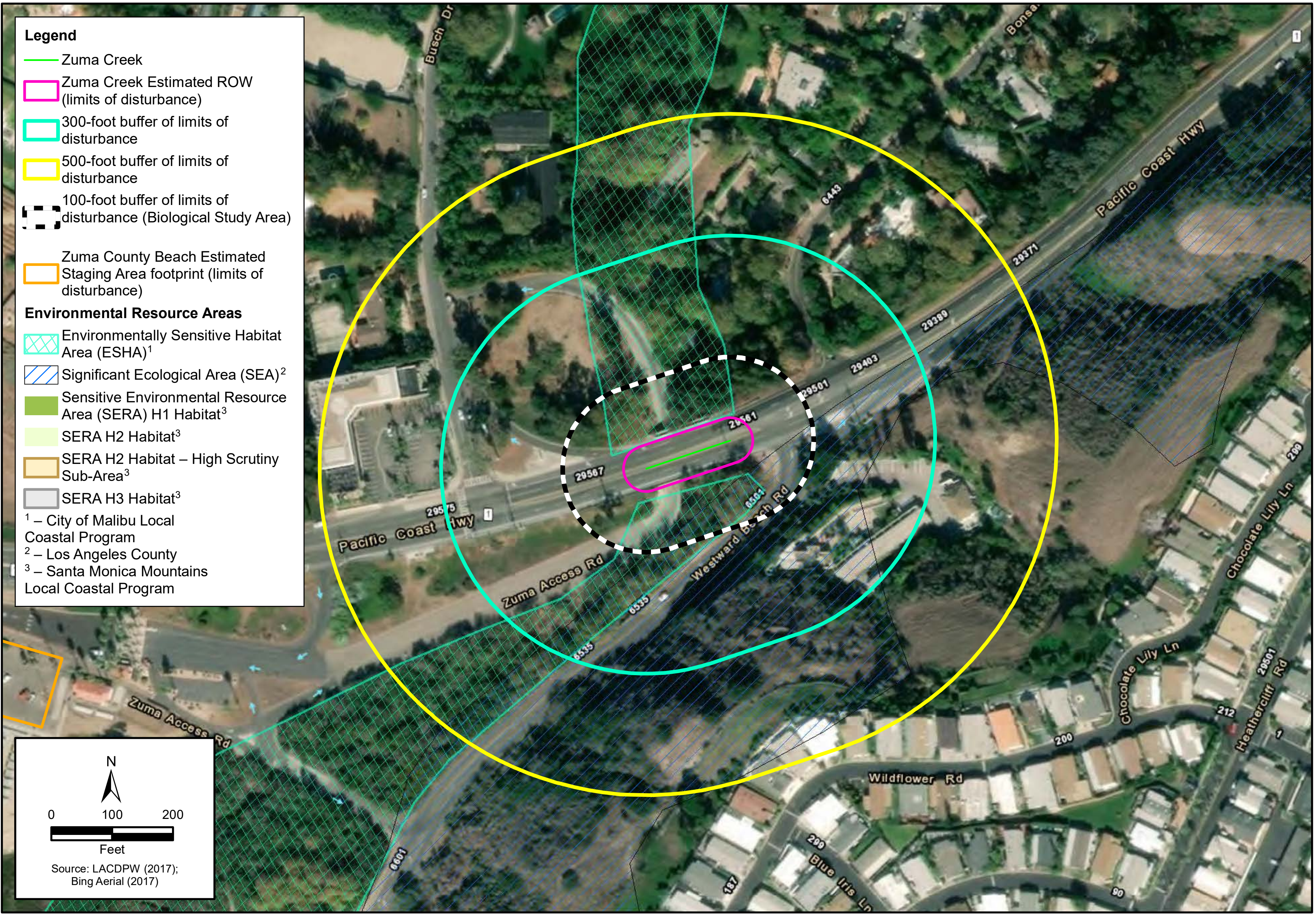

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Figure 3 – Project Map

District No. 29 Creek Crossing Rep airs Project - Zuma Creek Project Site

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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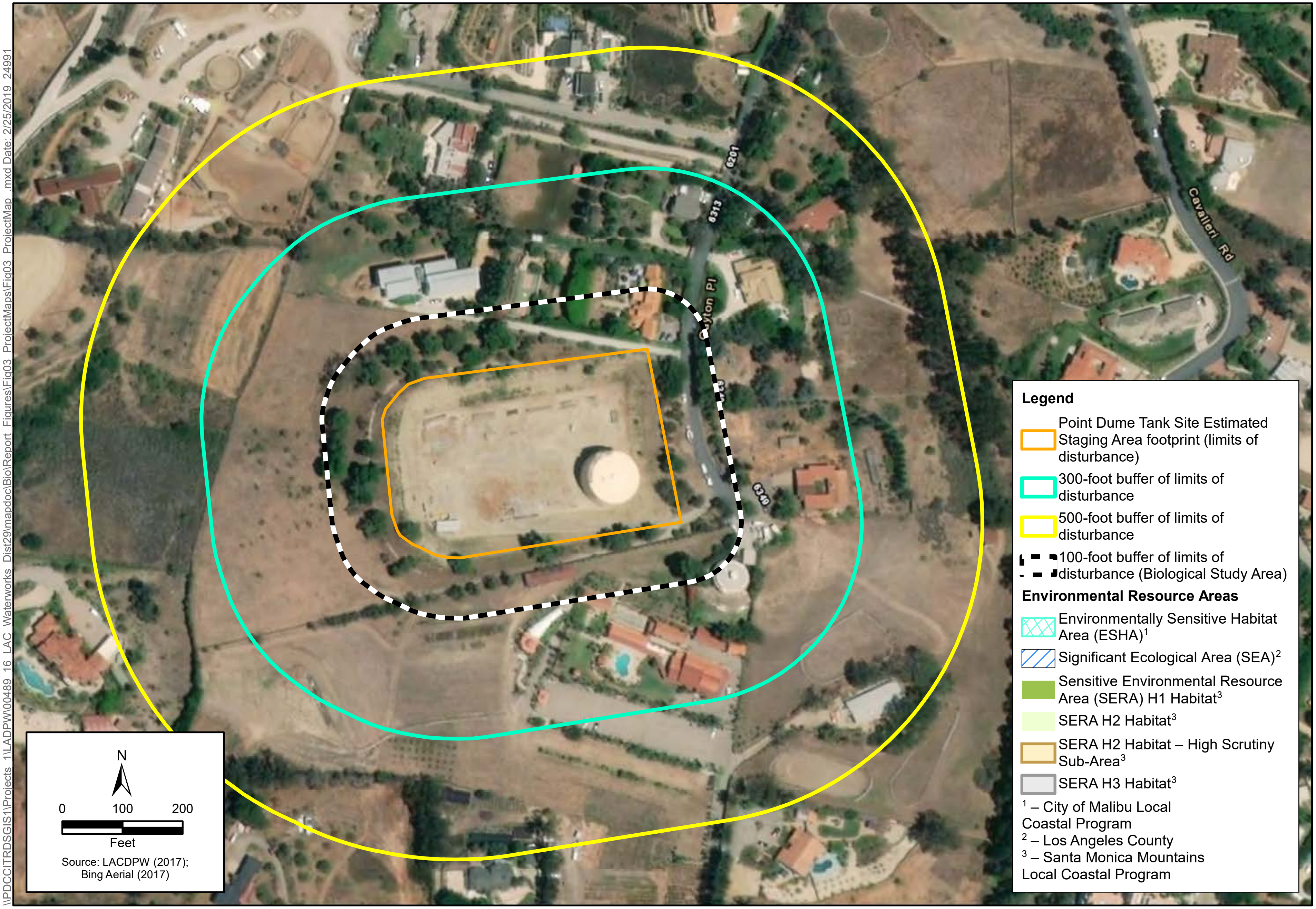
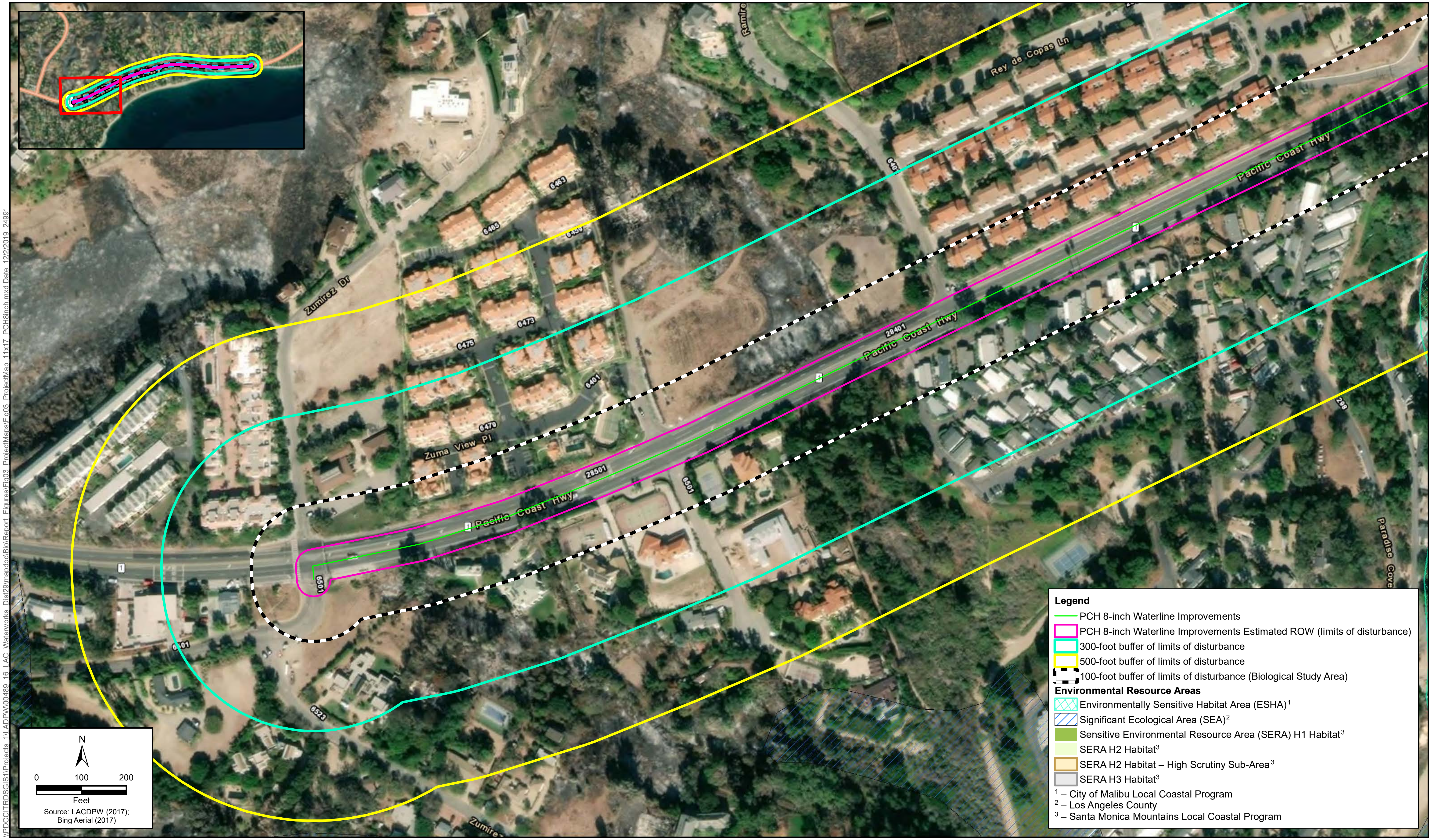


Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map
Point Dume Tank Site Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

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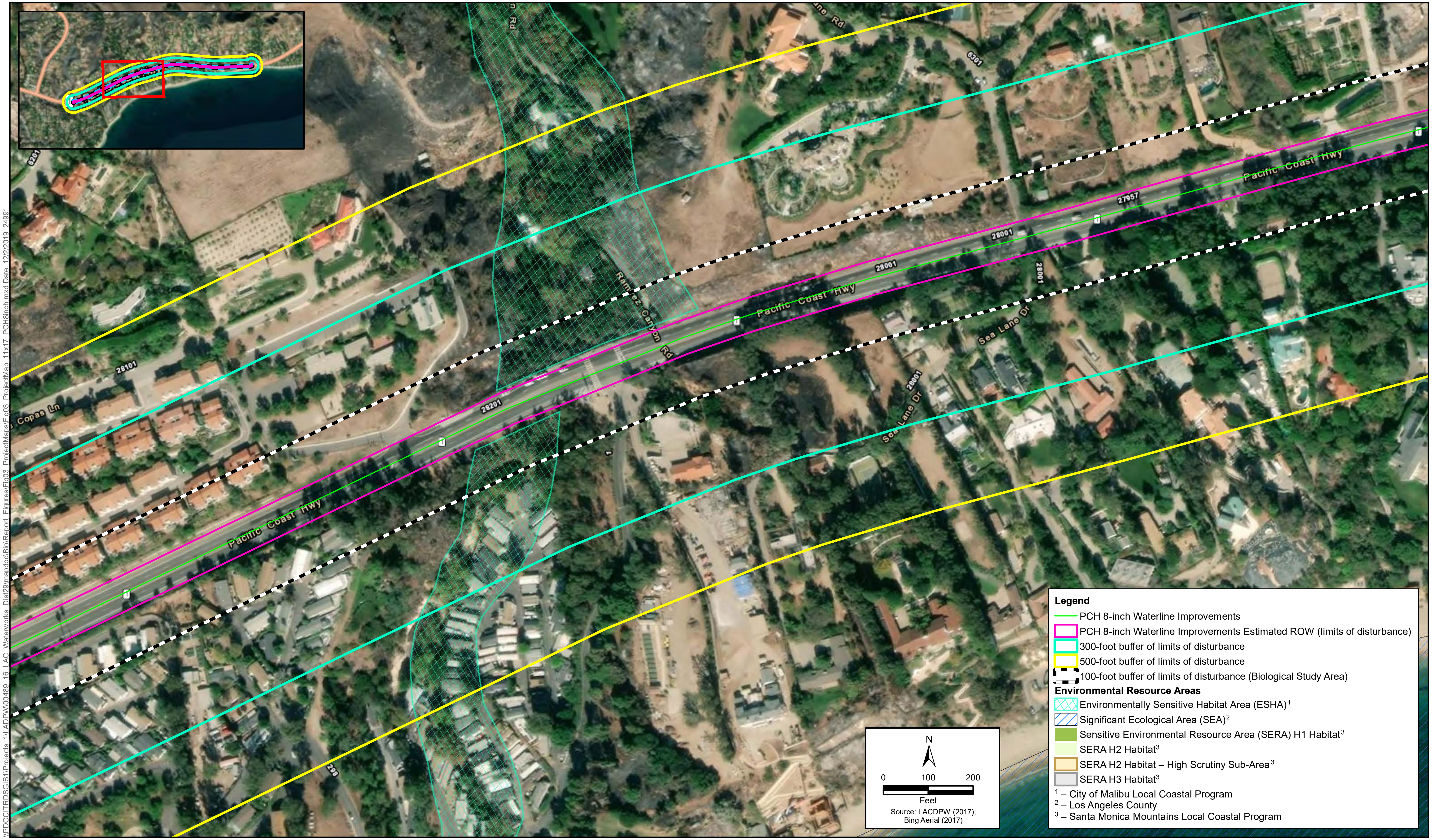
Figure 3 - Project Map
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

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Figure 3 - Project Map
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

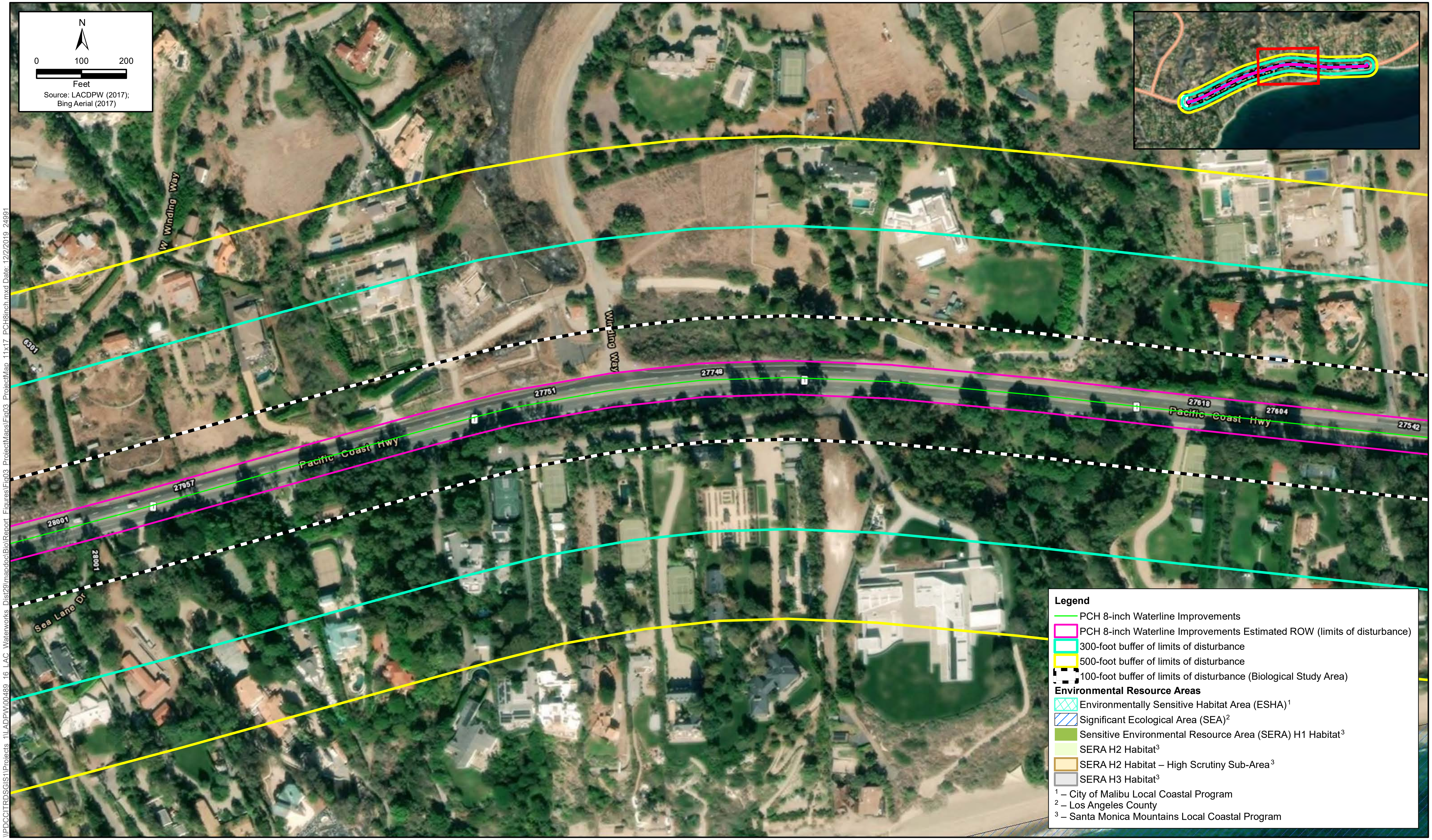

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Figure 3 - Project Map
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

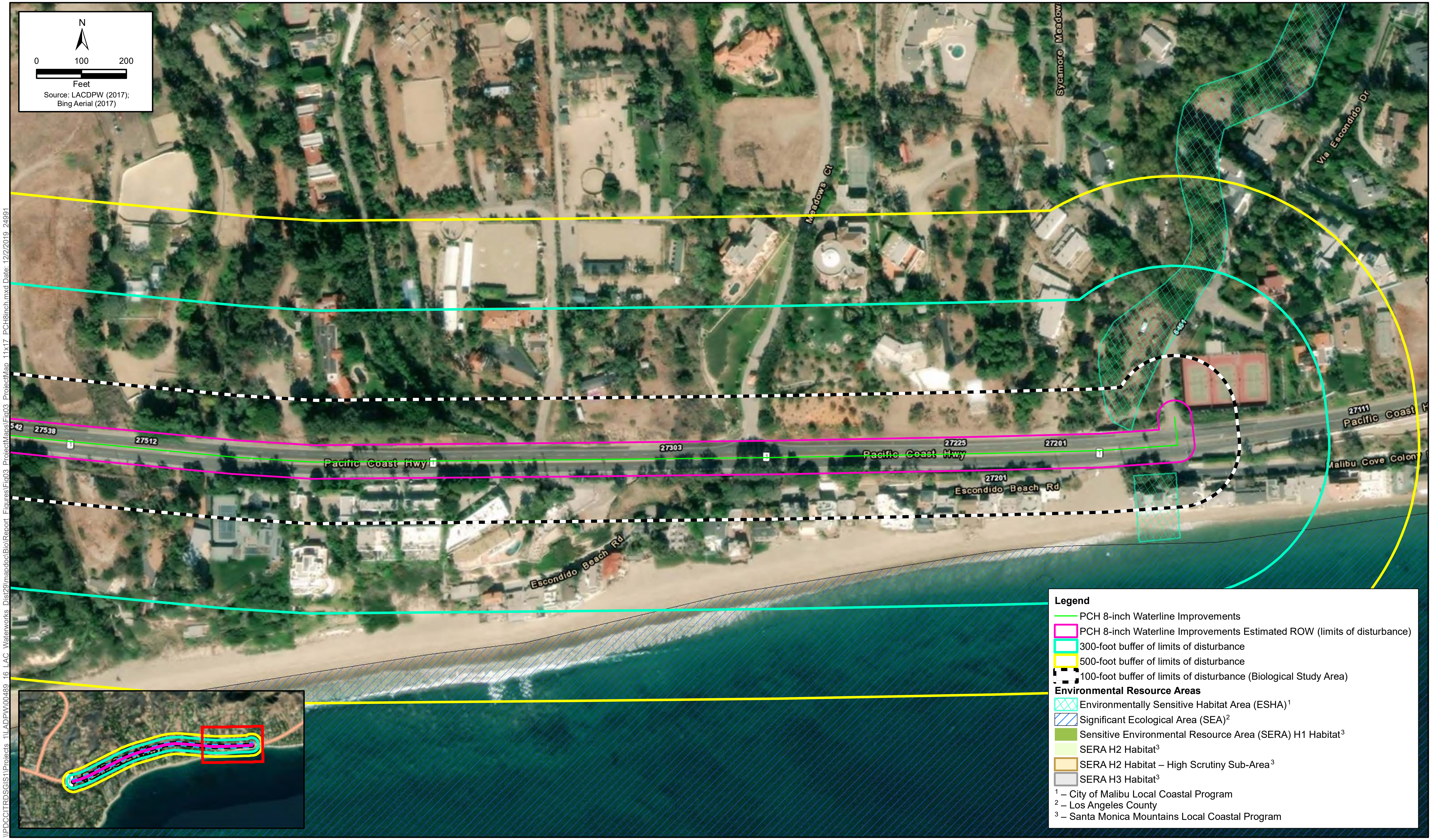

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Figure 3 - Project Map
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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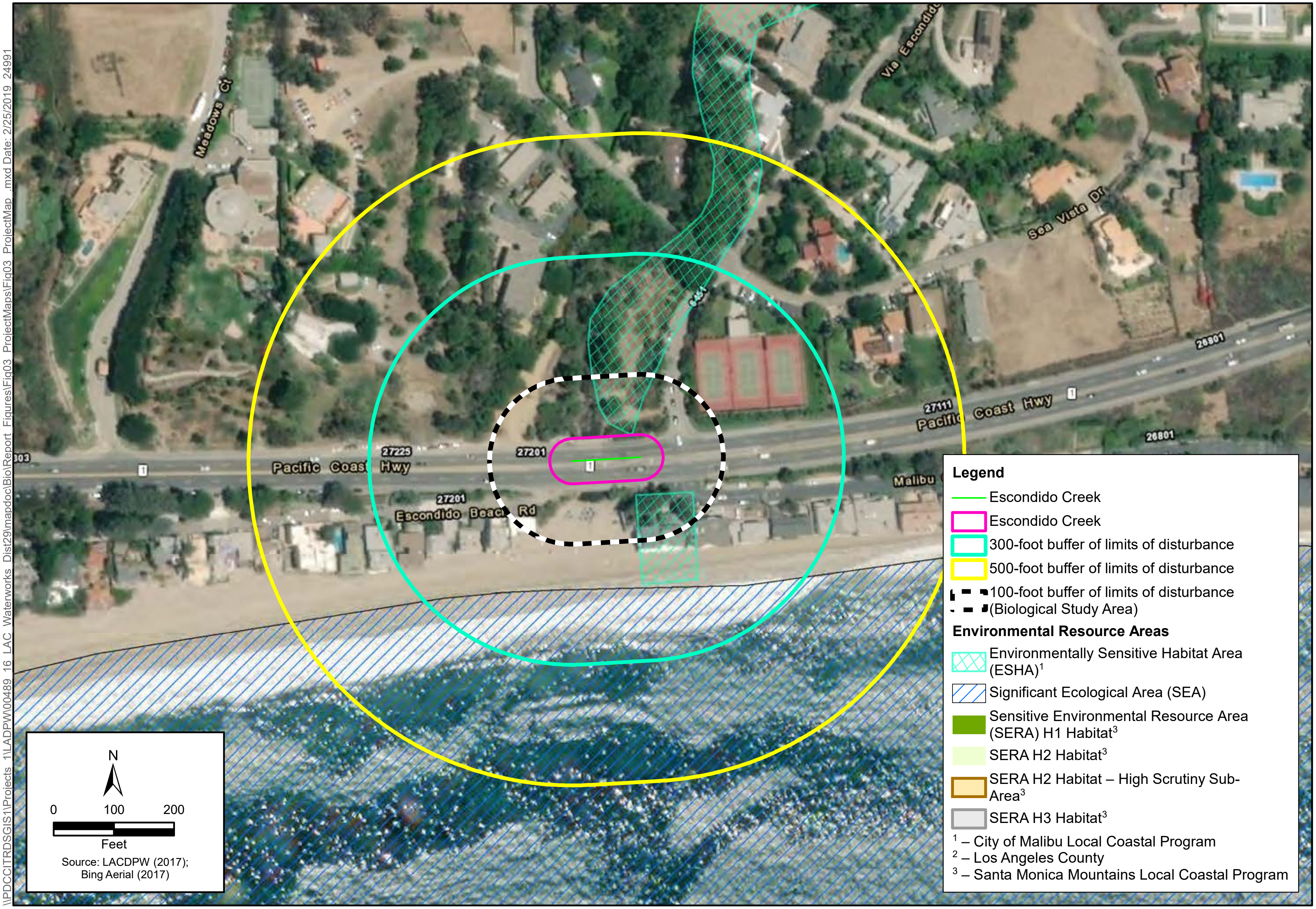

Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map

District No. 29 Creek Crossing Repair Project - Escondido Creek Project Site

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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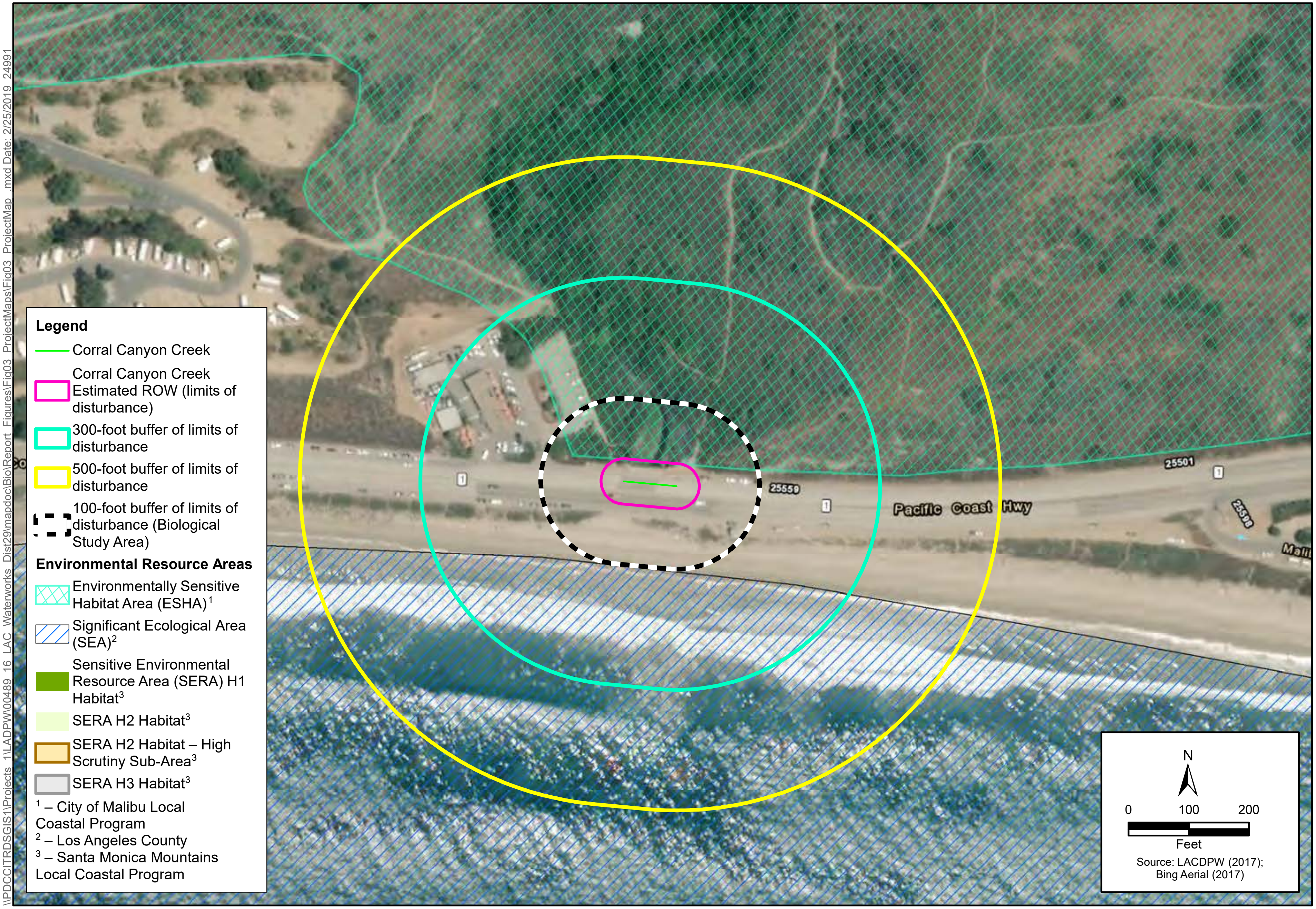

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 3 – Project Map
District No. 29 Creek Crossing Repair Project - Corral Canyon Creek Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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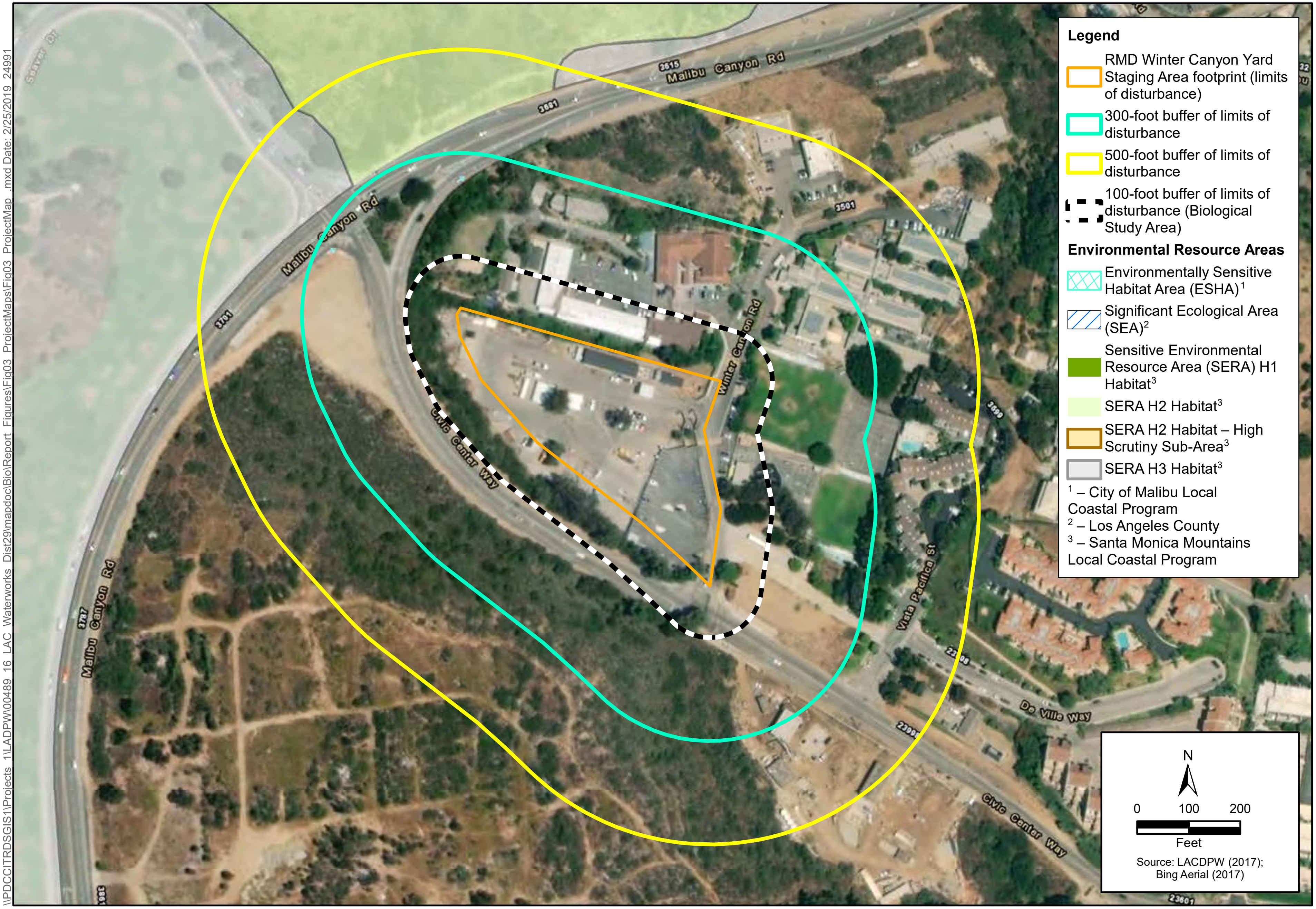
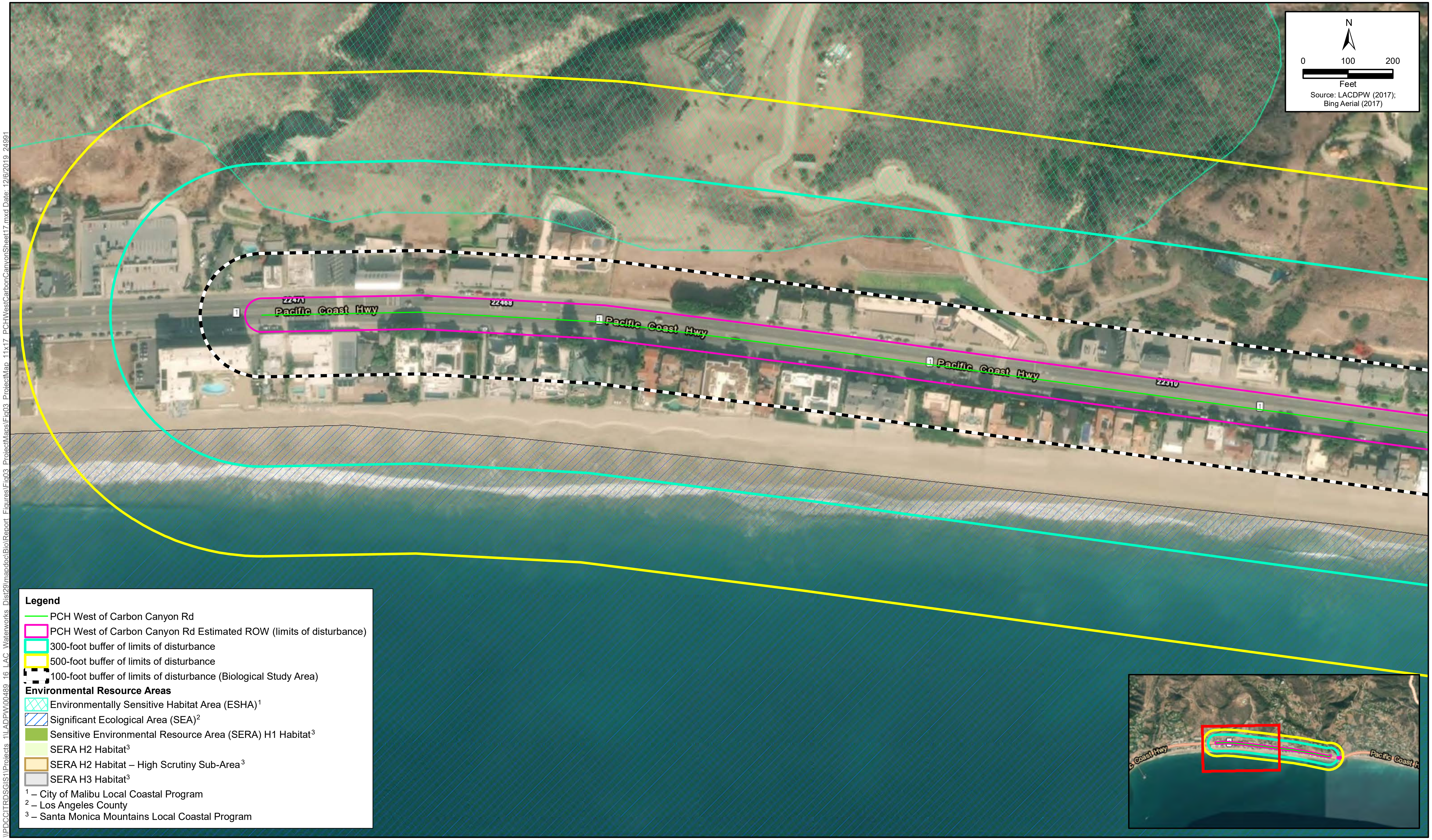


Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map

RMD Winter Canyon Yard Estimated Staging Area

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

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Figure 3 - Project Map
PCH West of Carbon Canyon Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 3 - Project Map
PCH West of Carbon Canyon Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

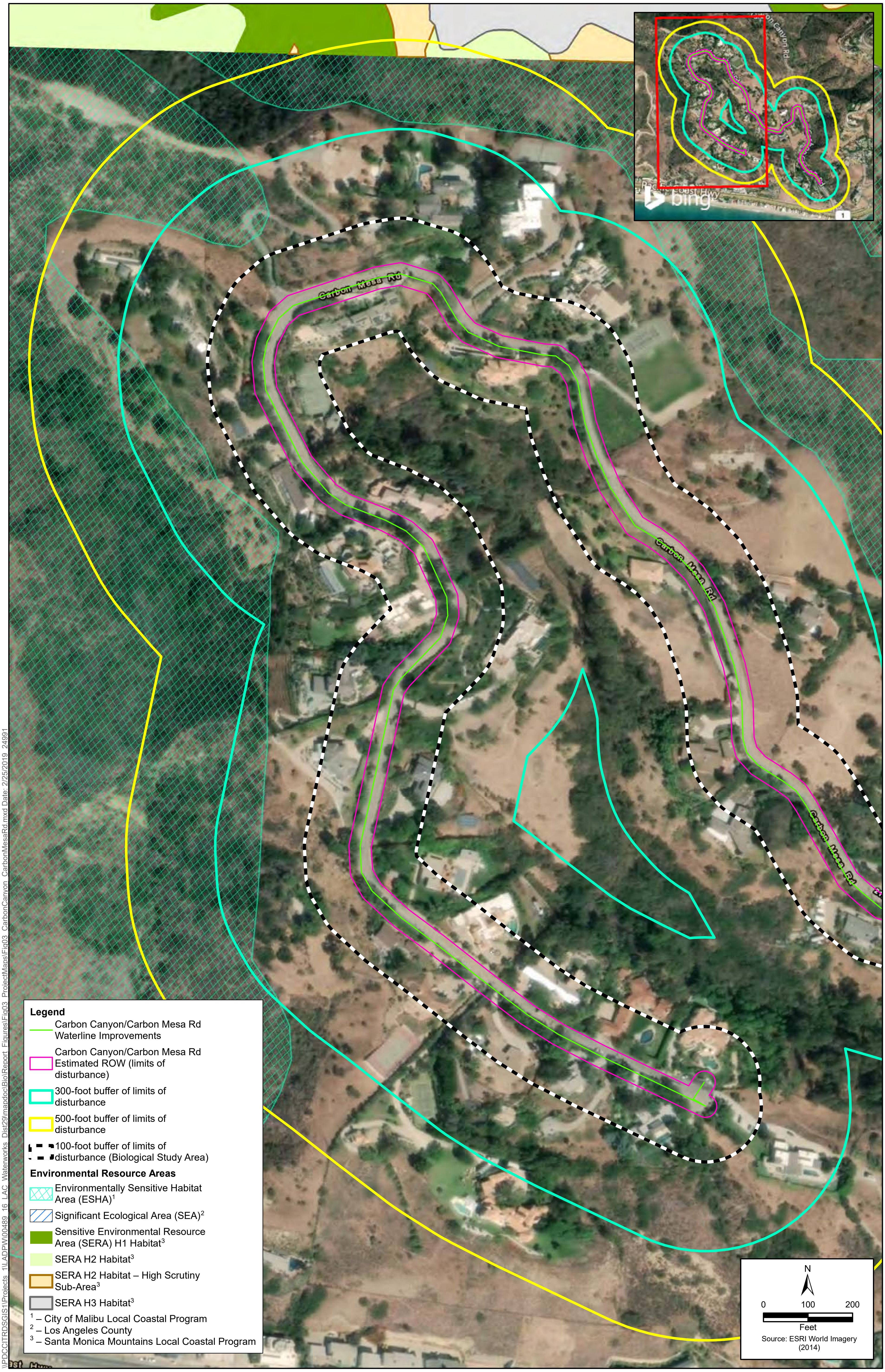

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Figure 3 – Project Map
Carbon Canyon Road and Carbon Mesa Road Waterline Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: ESRI World Imagery (2014)

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Figure 3 – Project Map
Carbon Canyon Road and Carbon Mesa Road Waterline Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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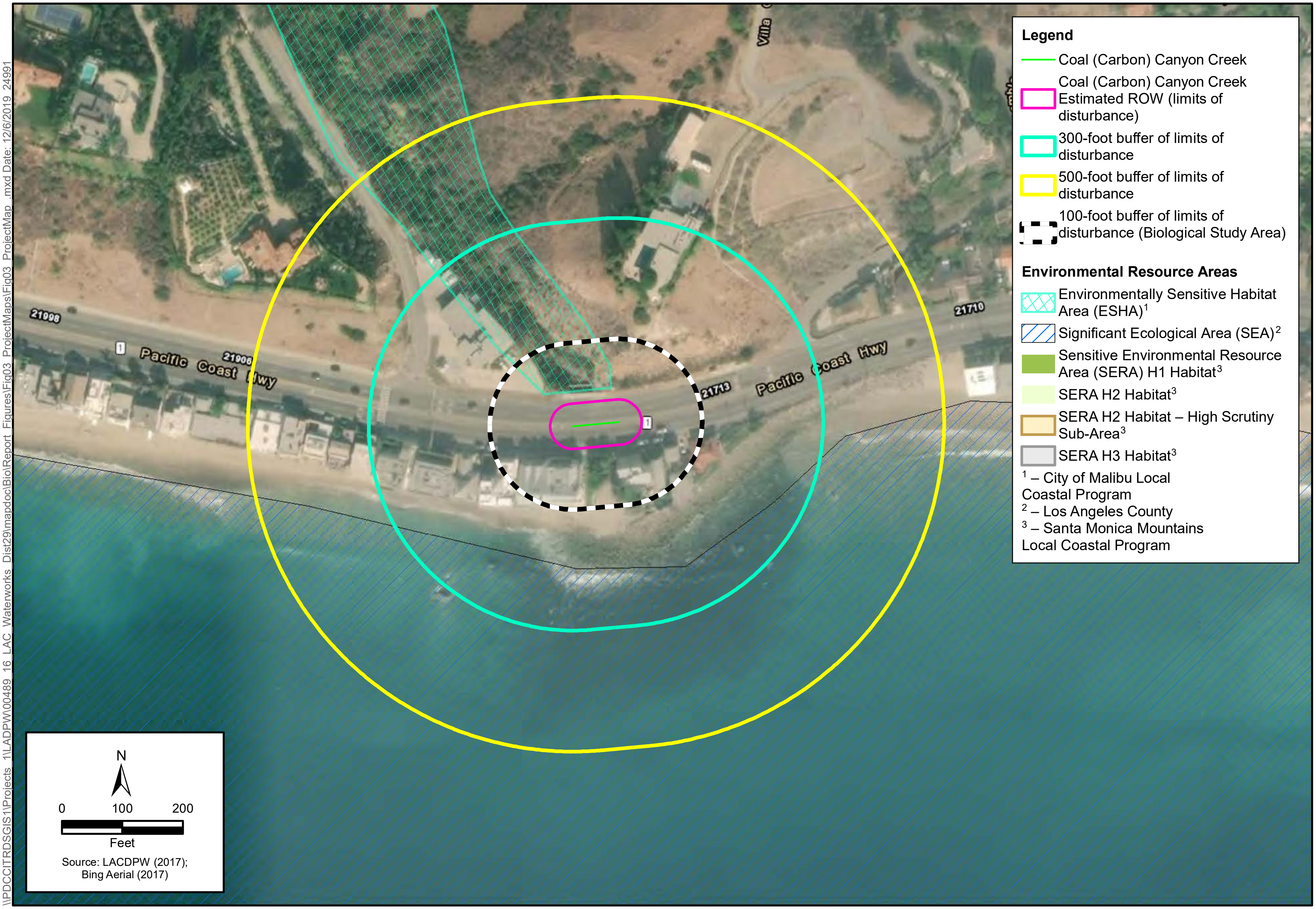

Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map

District No. 29 Creek Crossing Repairs Project - Coal (Carbon) Canyon Creek Project Site

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 3 - Project Map
PCH West of Rambla Pacifico St Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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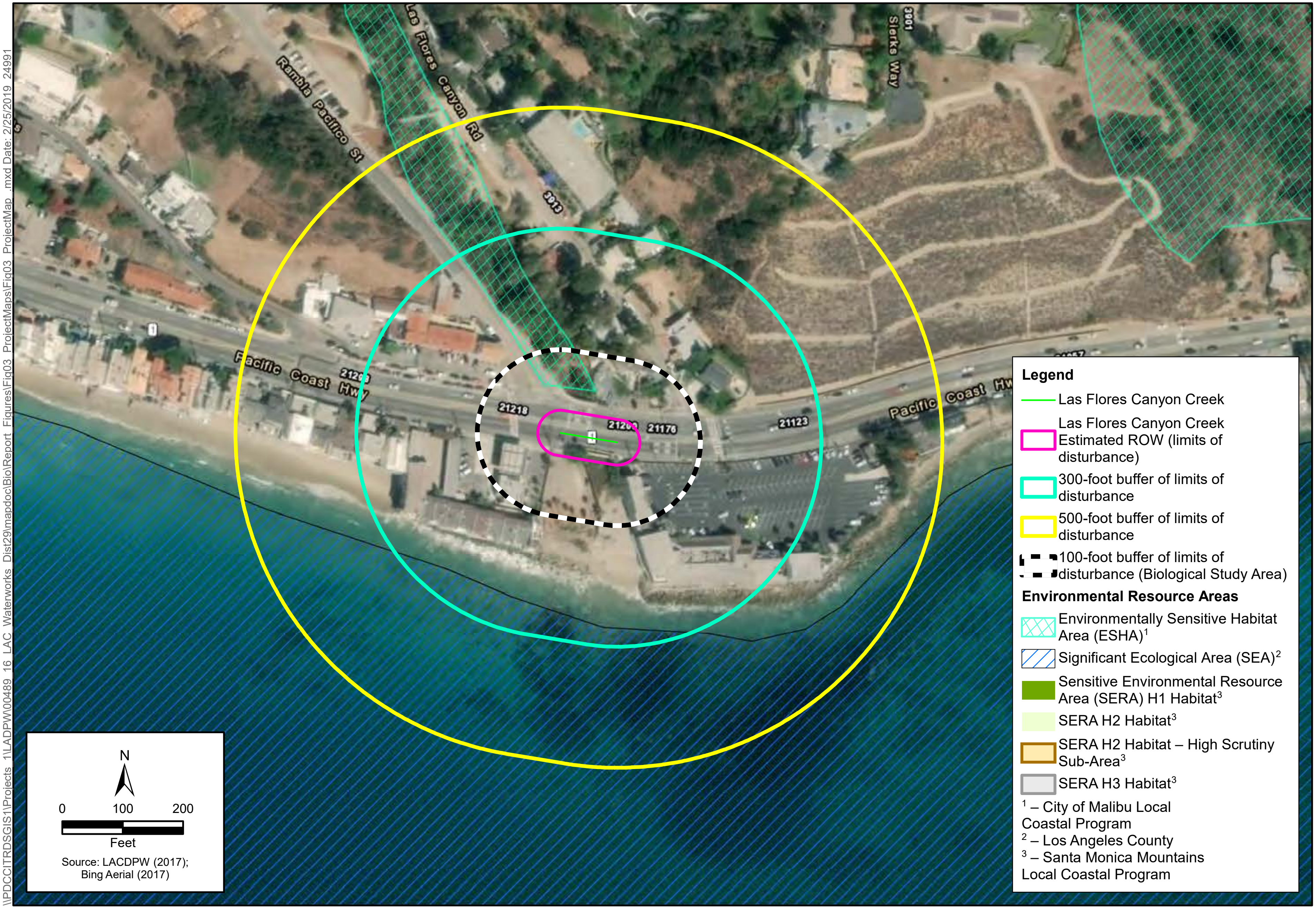

Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map
District No. 29 Creek Crossing Repair Project - Las Flores Canyon Creek Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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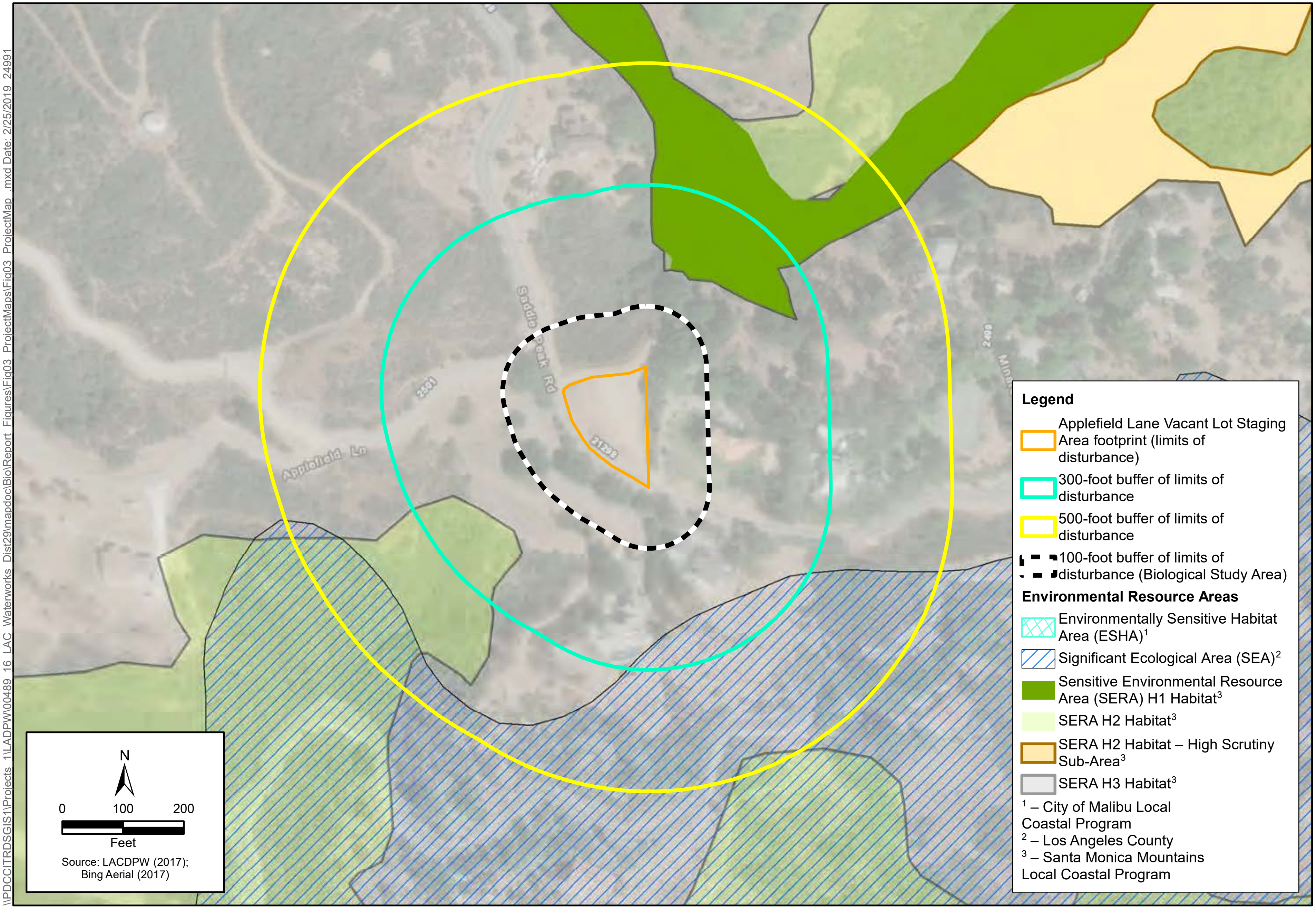

Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map
Applefield Lane Vacant Lot Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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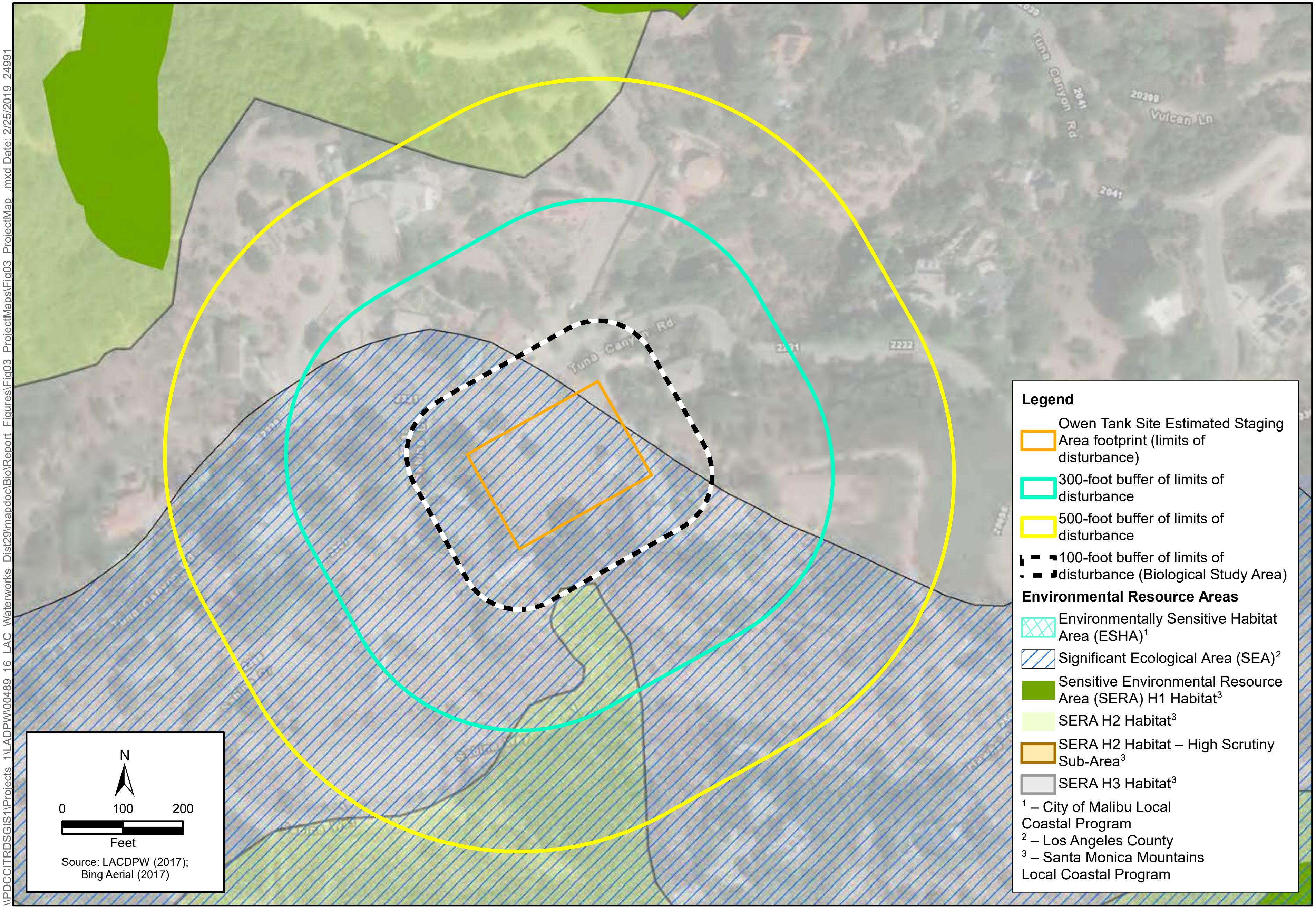

Figure 3 – Project Map
Owen Tank Site Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

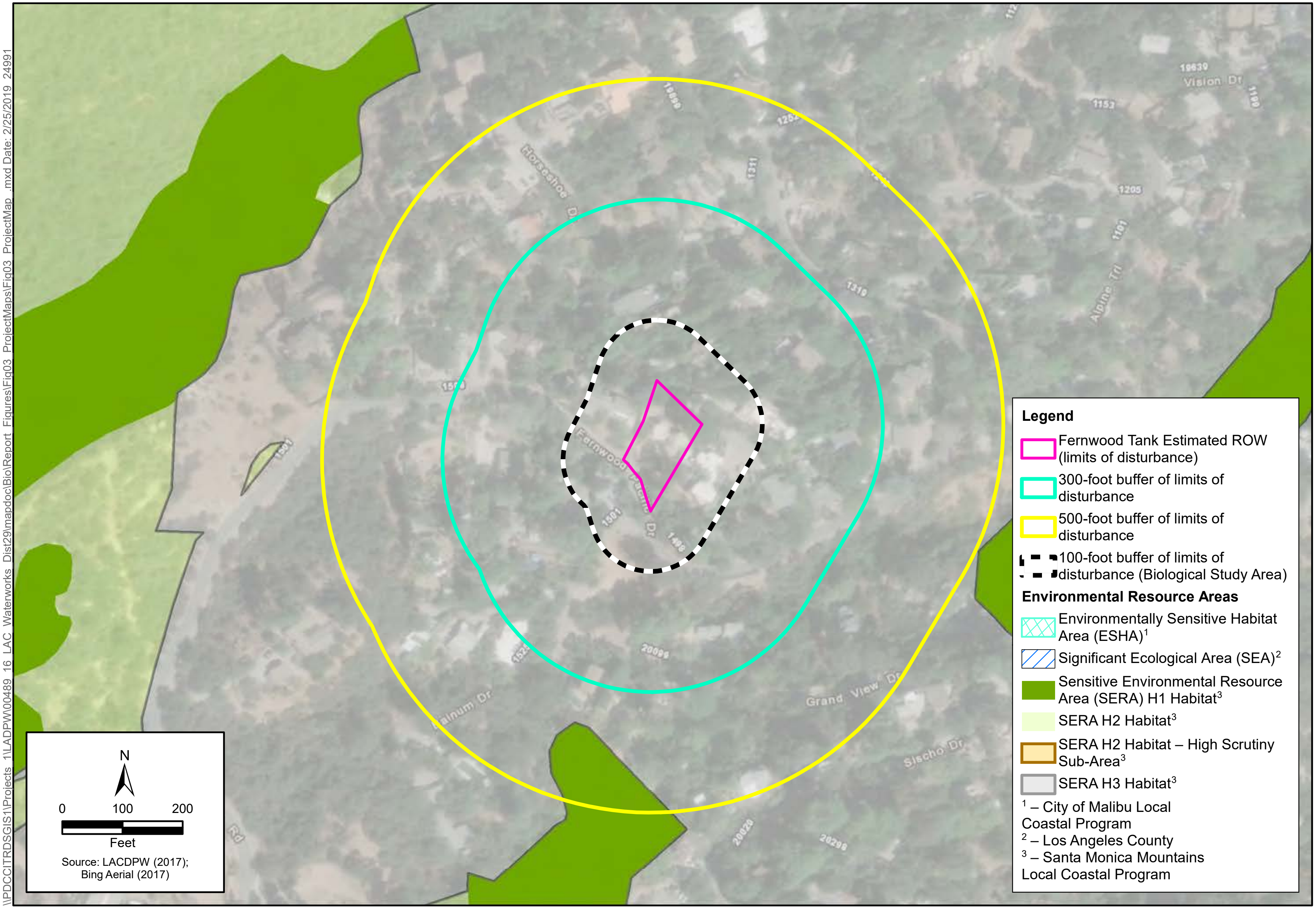

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Figure 3 – Project Map
Fernwood Tank Improvement Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

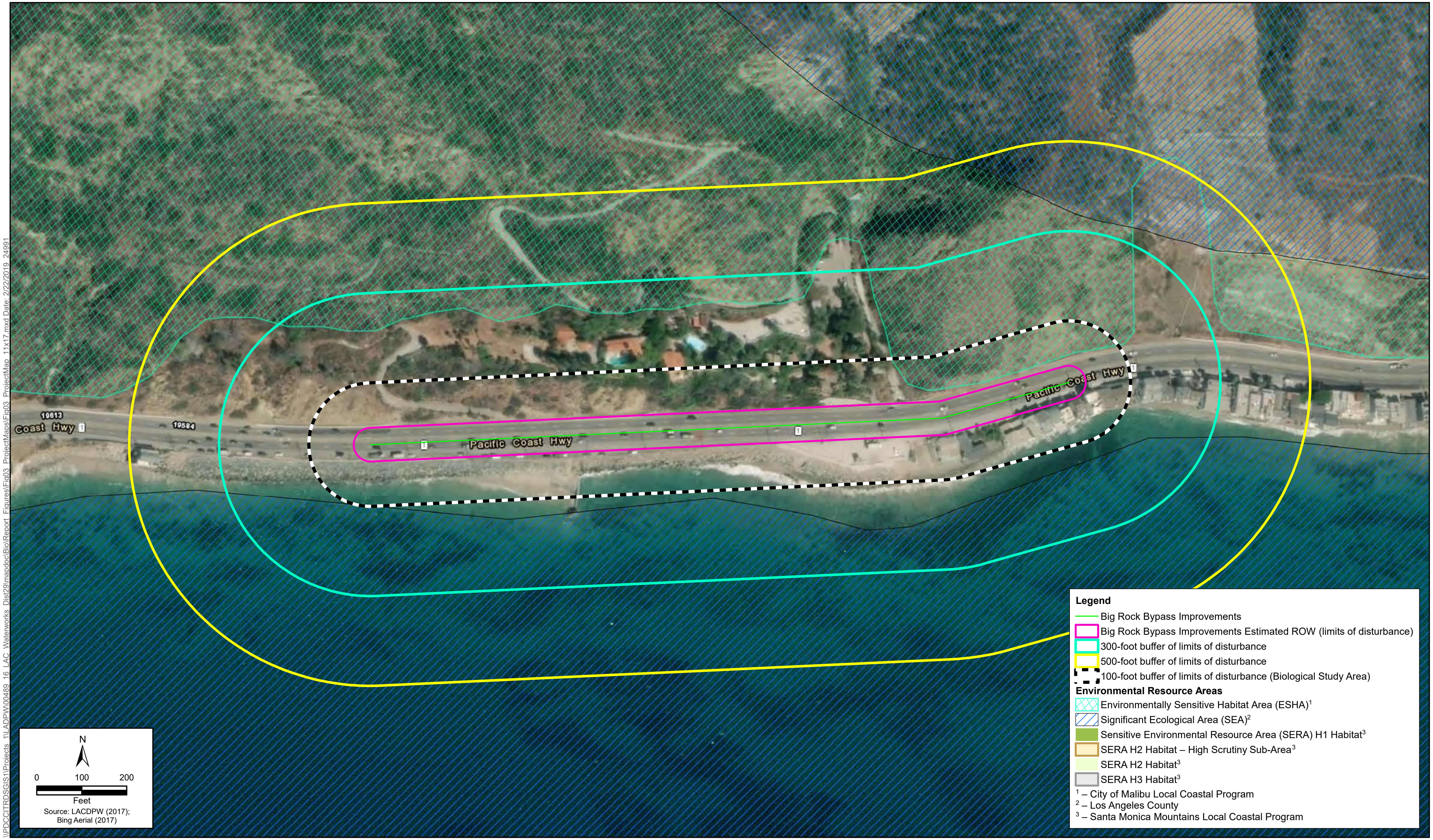

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Figure 3 - Project Map
Big Rock Bypass Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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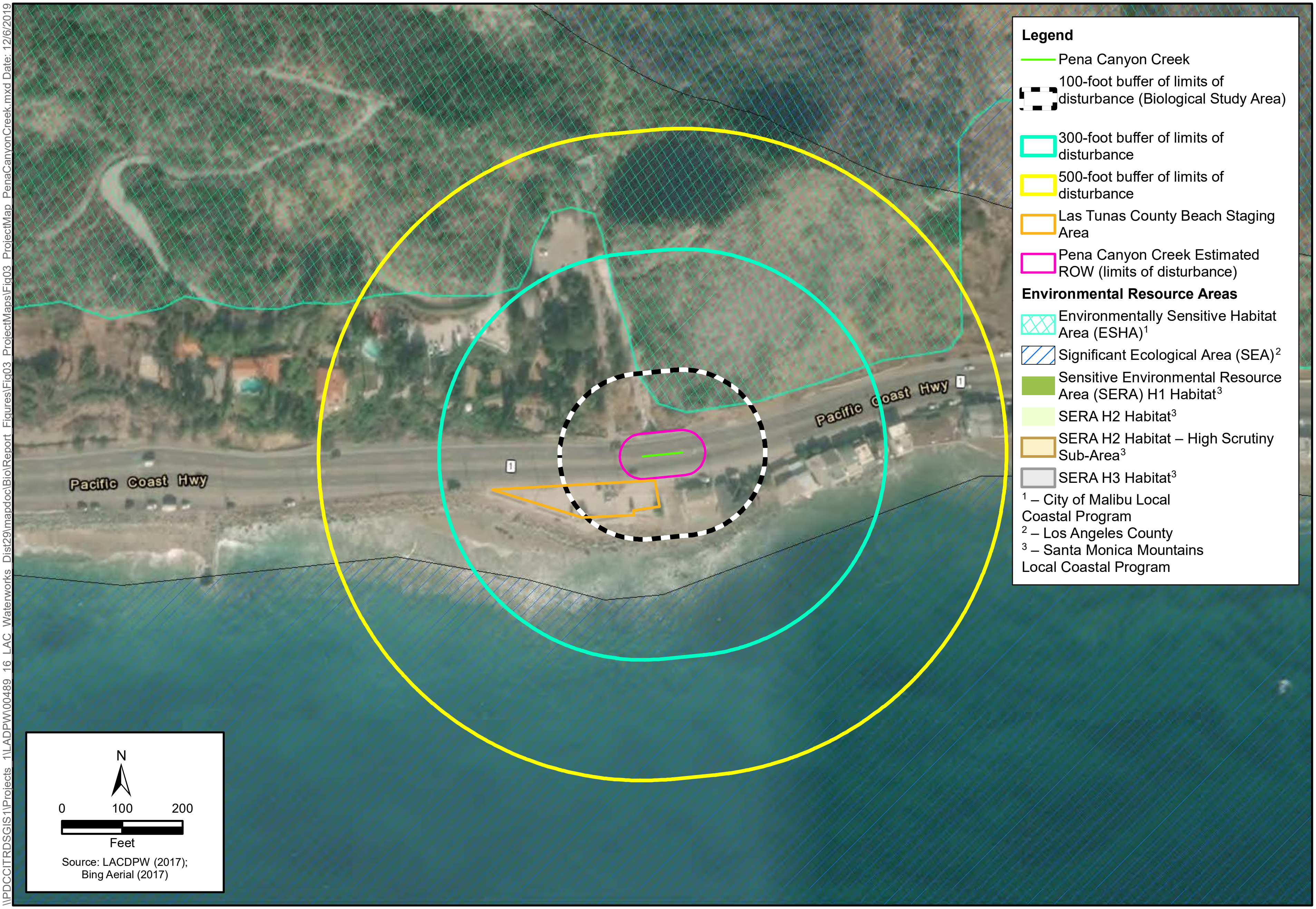

Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map
District No. 29 Creek Crossing Rep airs Project - Pena Canyon Creek Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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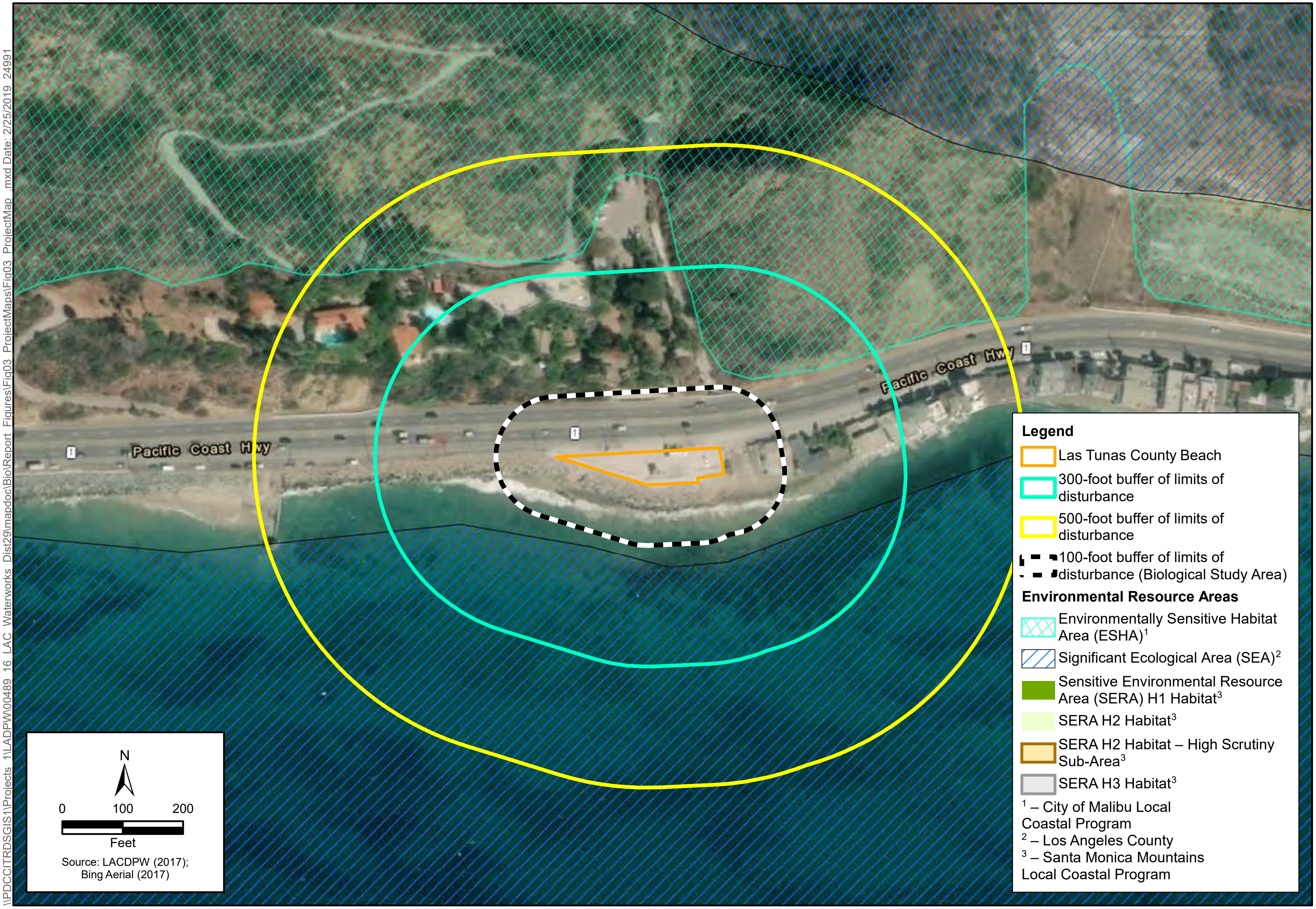
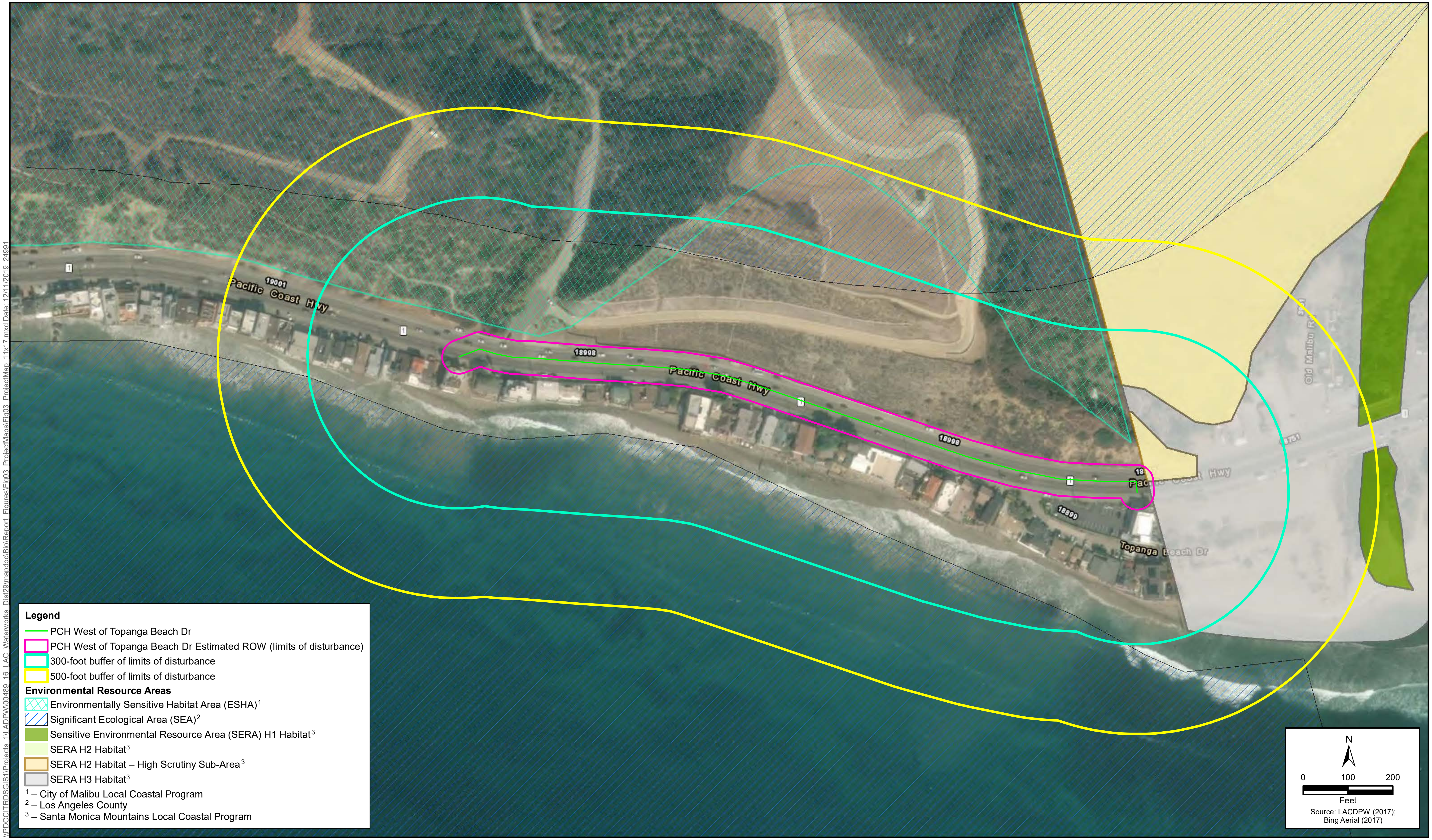


Figure 3 – Project Map
Las Tunas County Beach Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

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Figure 3 - Project Map
PCH West of Topanga Beach Dr Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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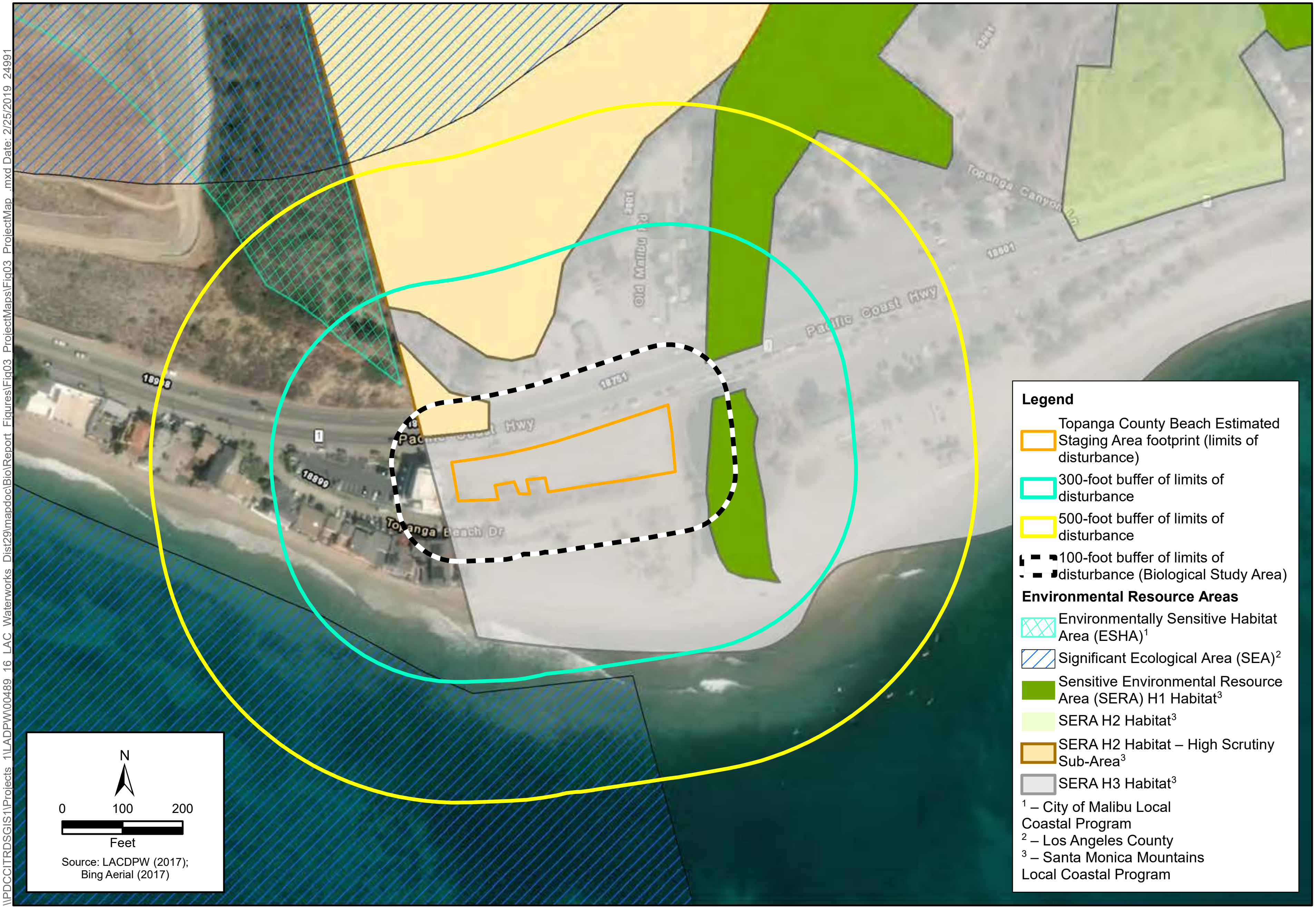

Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map
Topanga County Beach Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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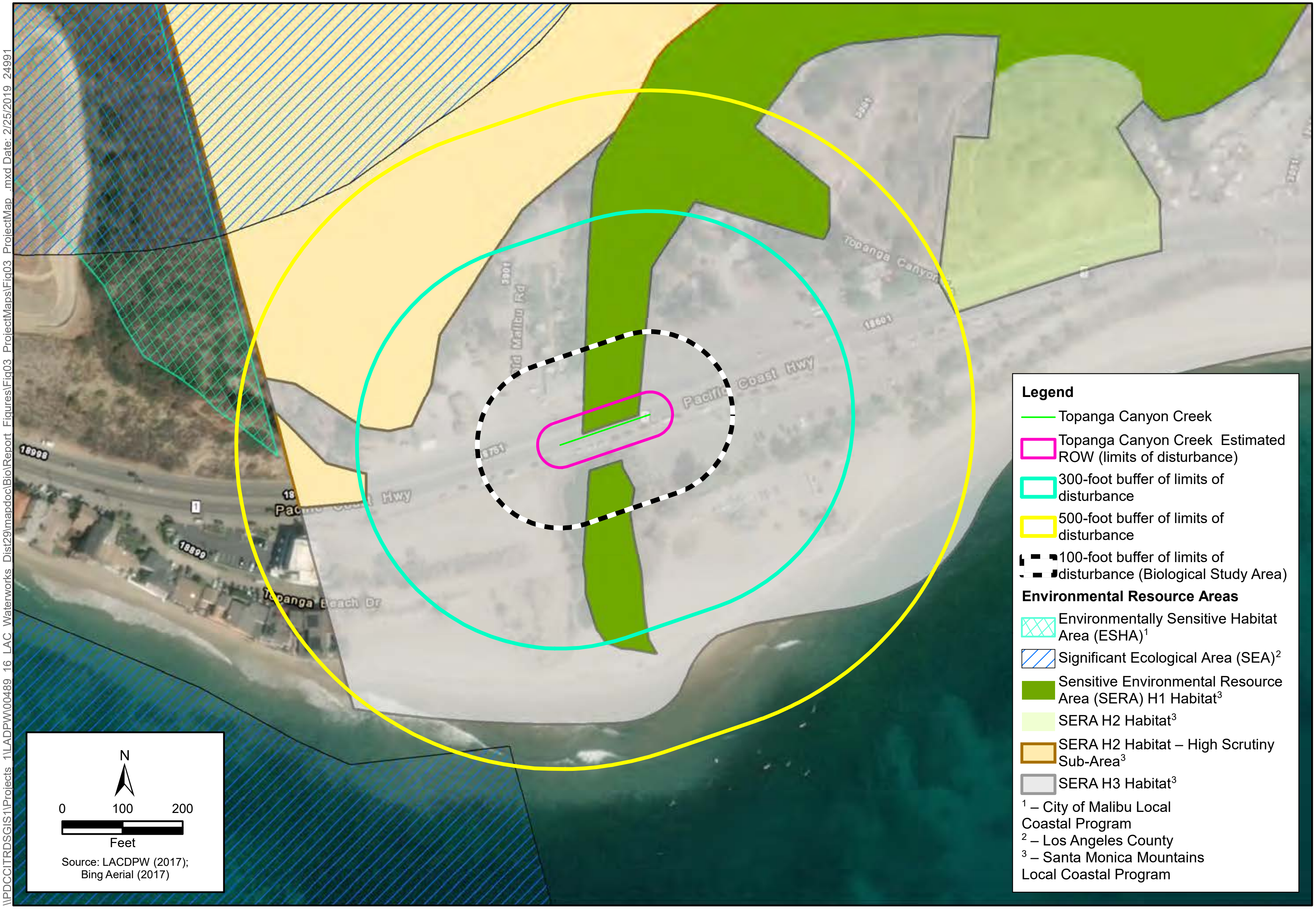

Figure 3 – Project Map
District No. 29 Creek Crossing Repair Project - Topanga Canyon Creek Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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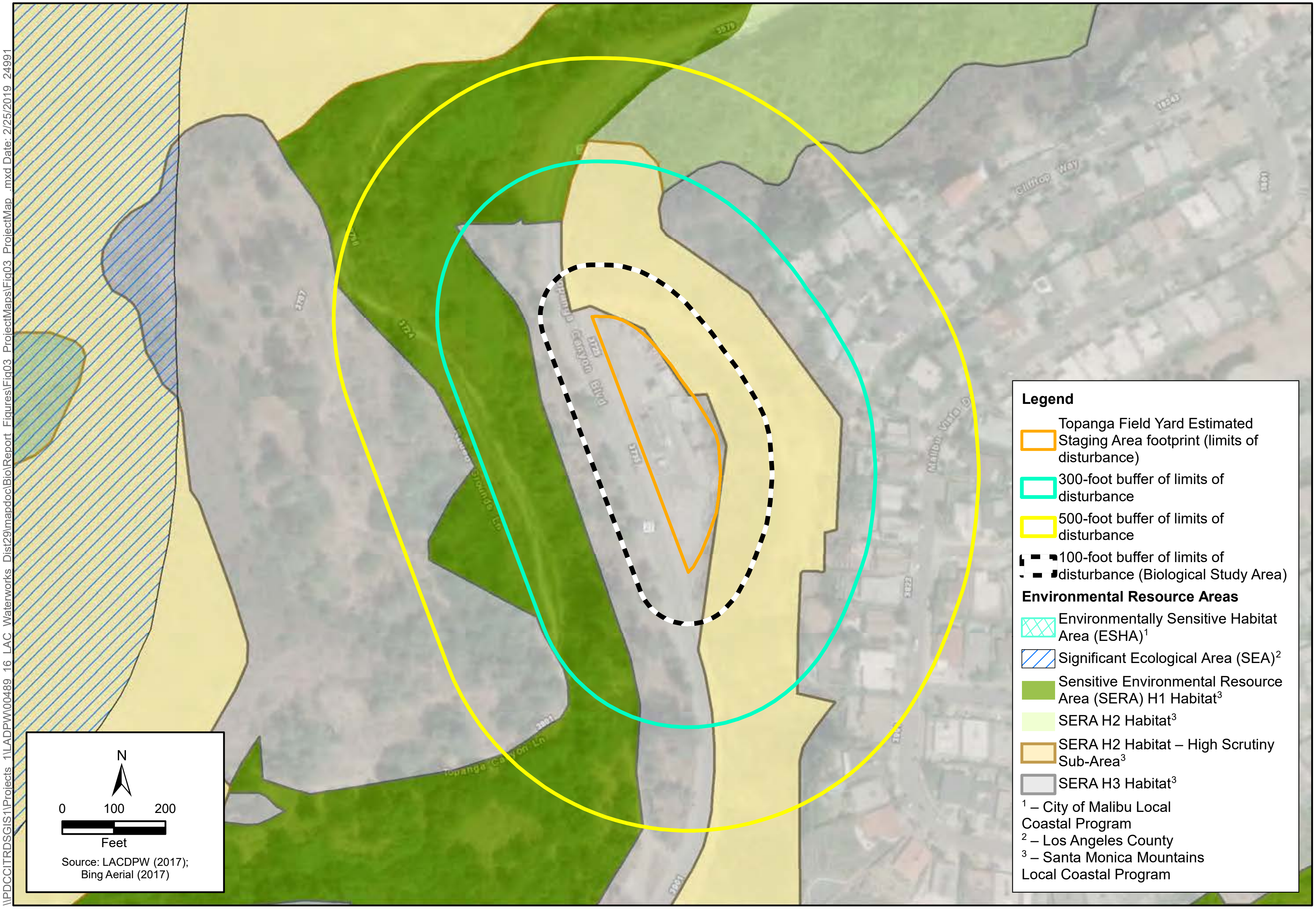

Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map

Topanga Field Yard Estimated Staging Area

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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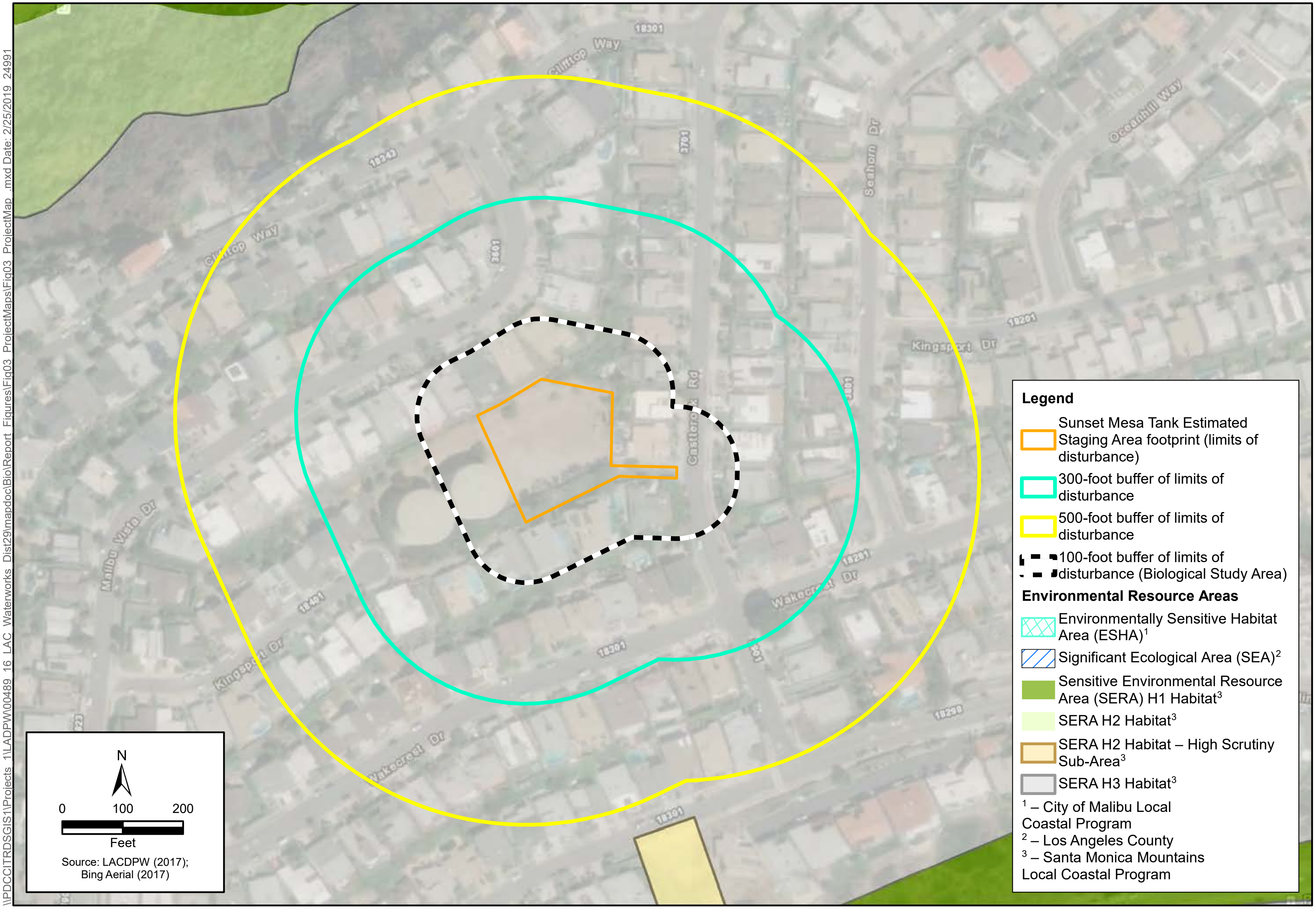

Source: LACDPW (2017); Bing Aerial (2017)

Figure 3 – Project Map

Sunset Mesa Tank Staging Area

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

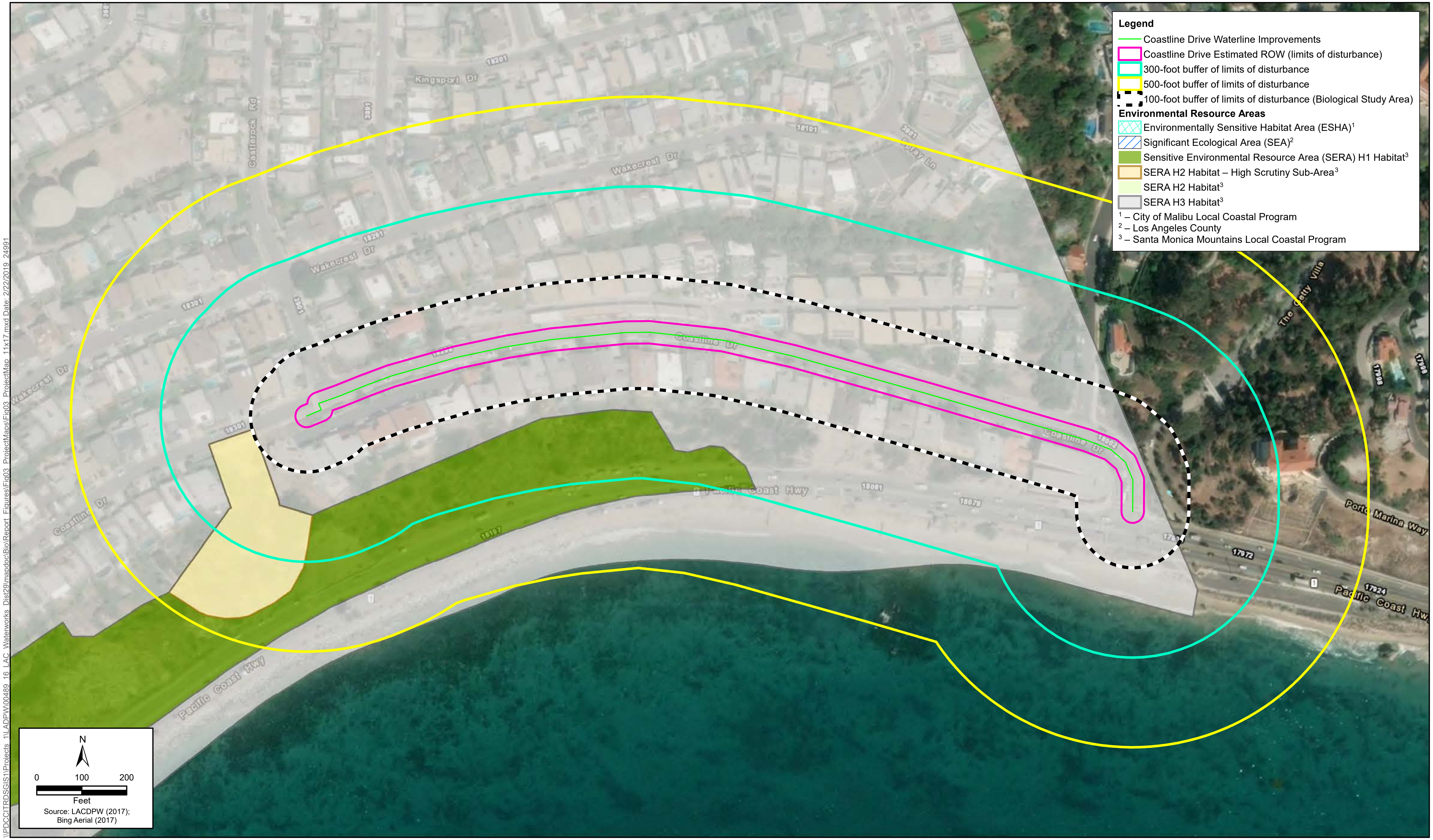

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Figure 3 - Project Map
Coastline Drive 12-Inch Waterline Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

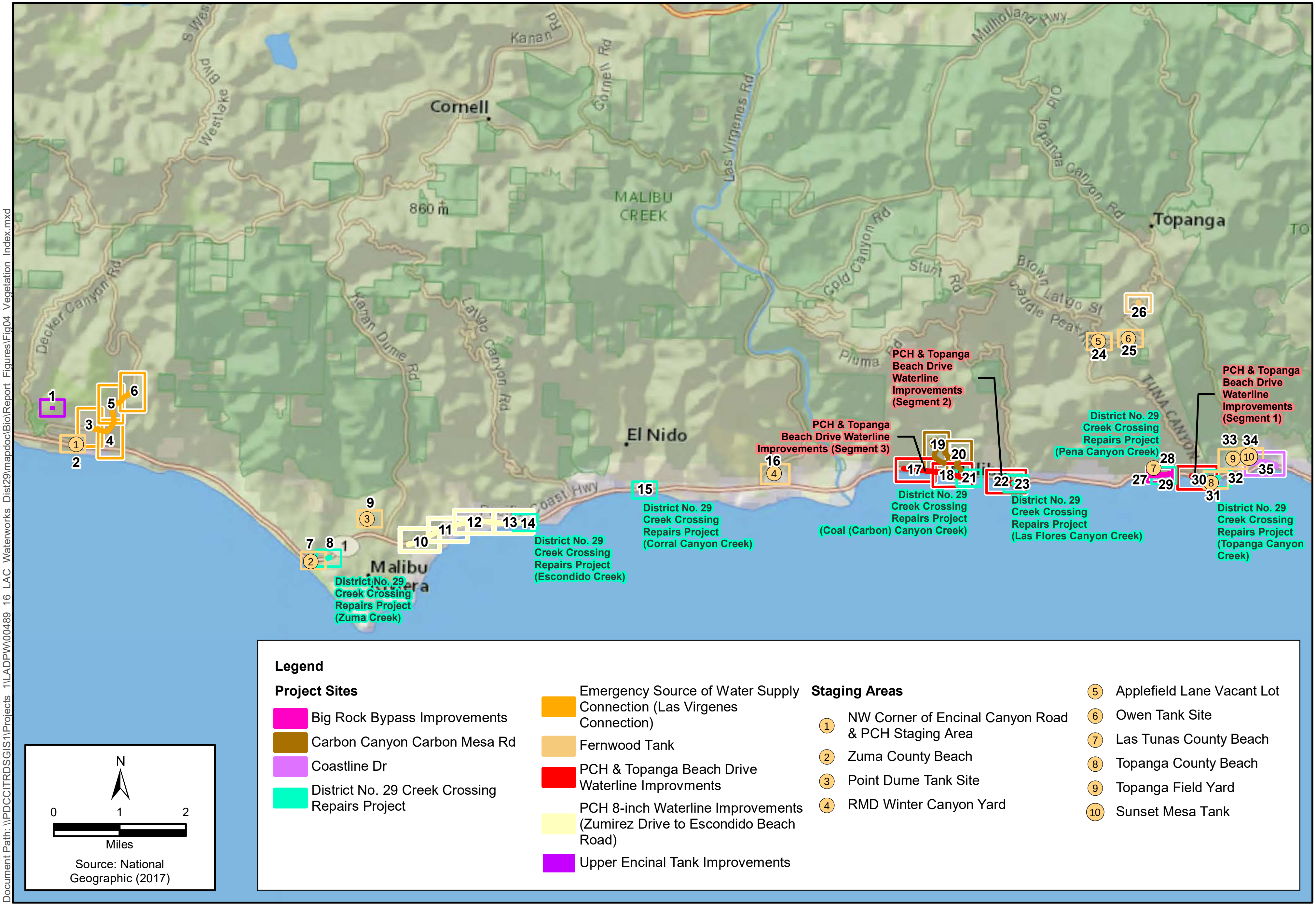

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Figure 4 - Vegetation Map
Index Sheet
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 4 - Vegetation Map
Upper Encinal Tank Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017);
Bing Aerial (2017)

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Figure 4 - Vegetation Map
NW Corner of Encinal Canyon Road & PCH Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

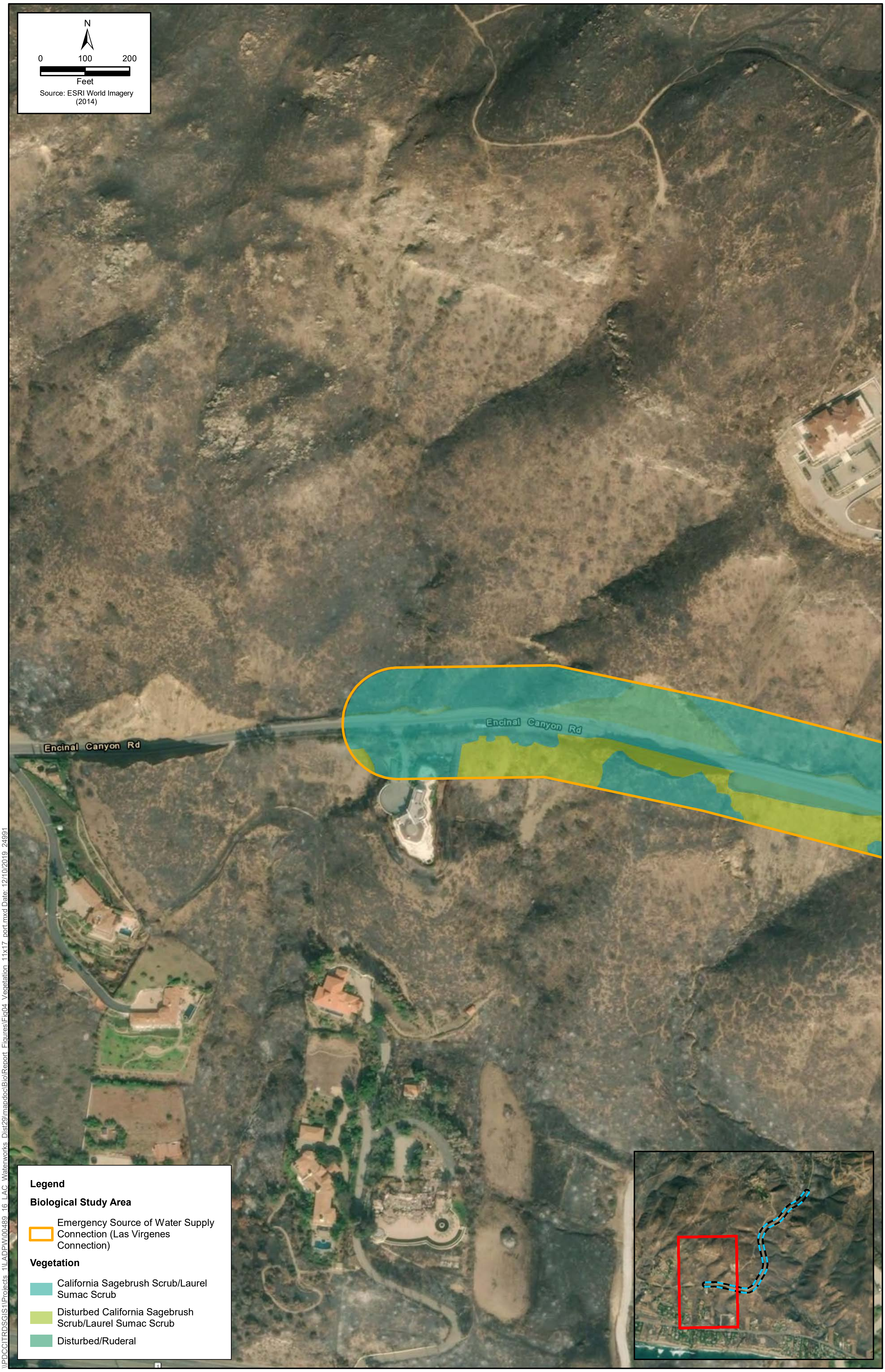

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Figure 4 - Vegetation Map
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

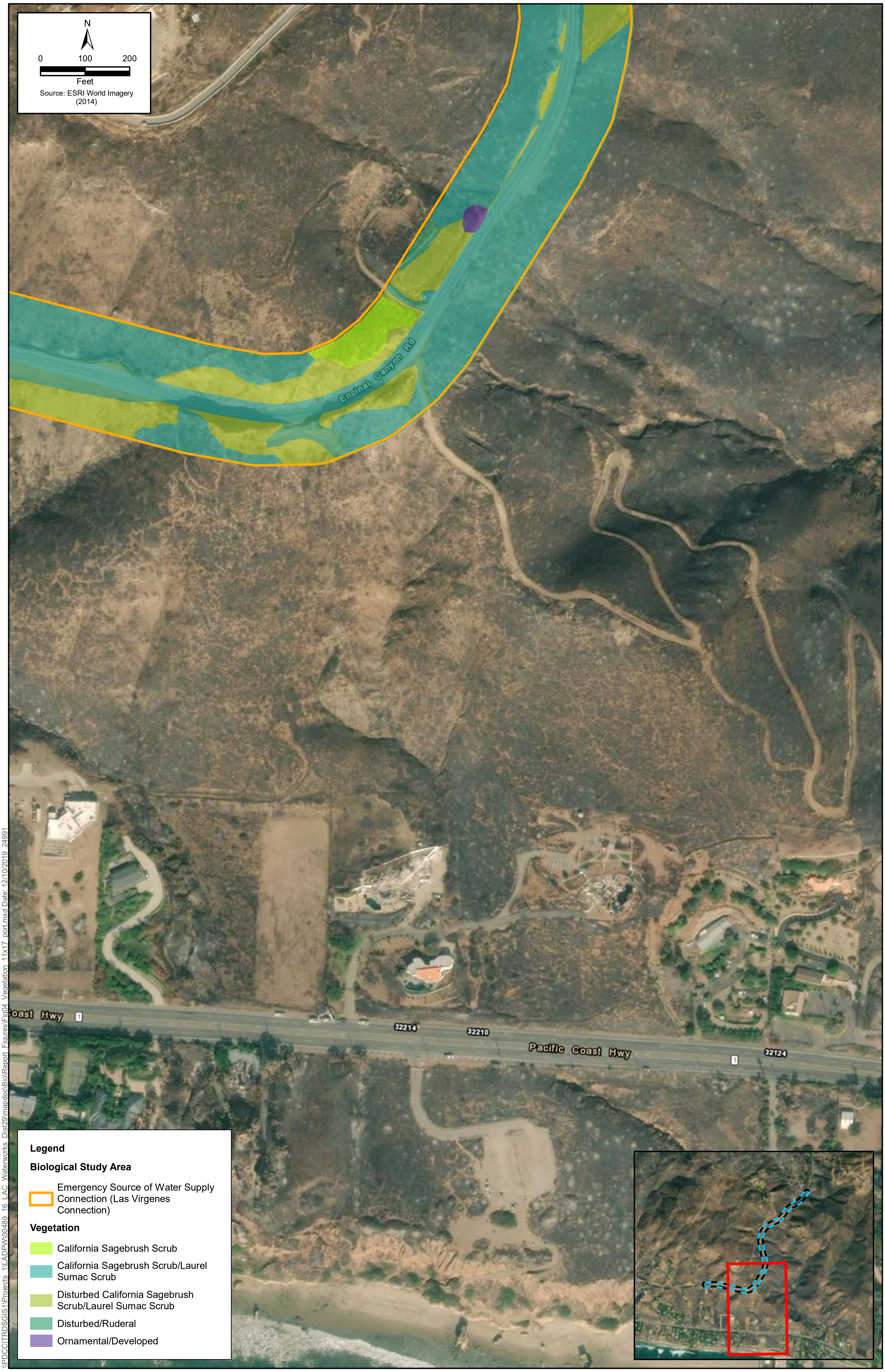

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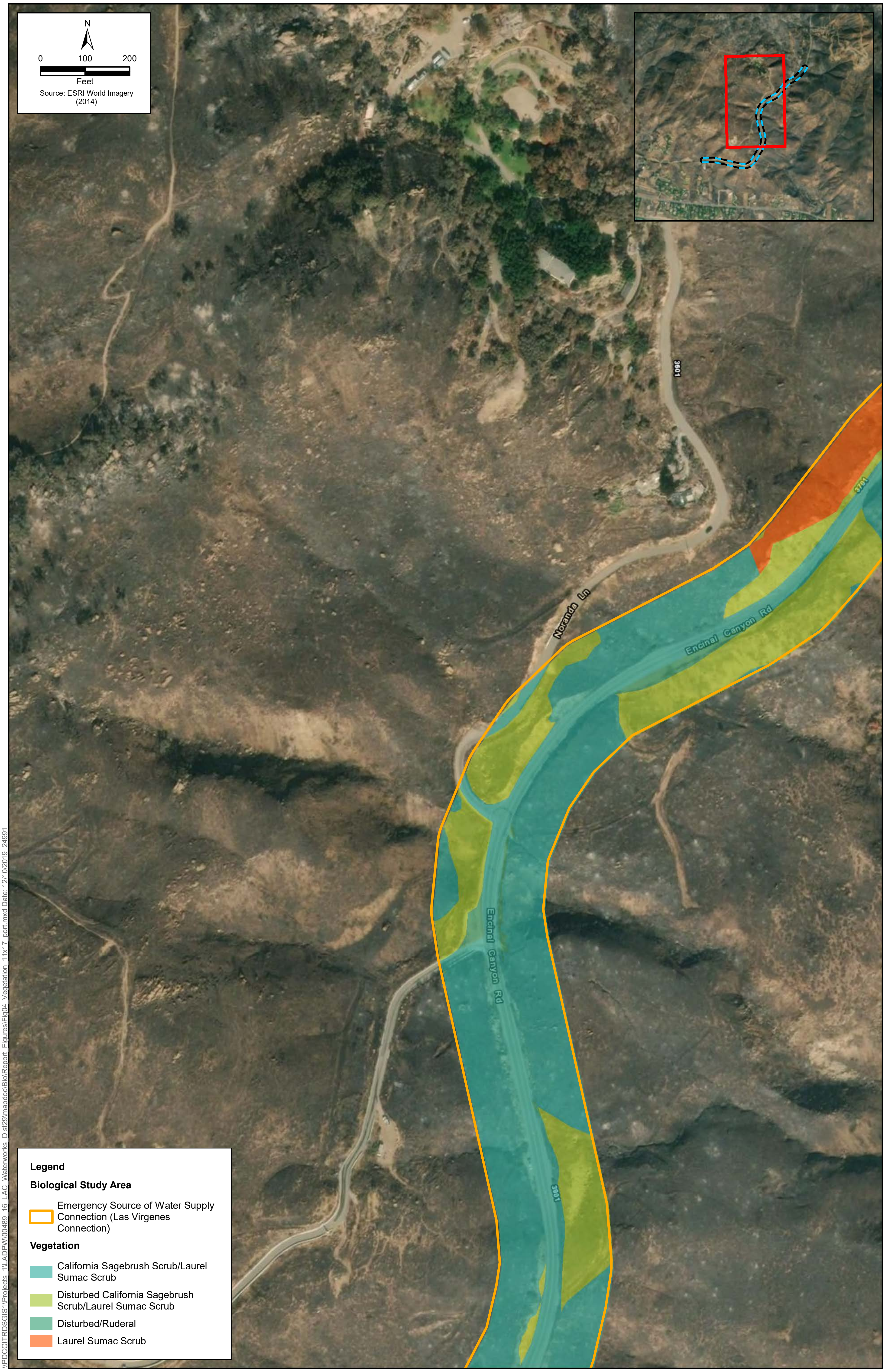
Figure 4 - Vegetation Map
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: ESRI World Imagery (2014)

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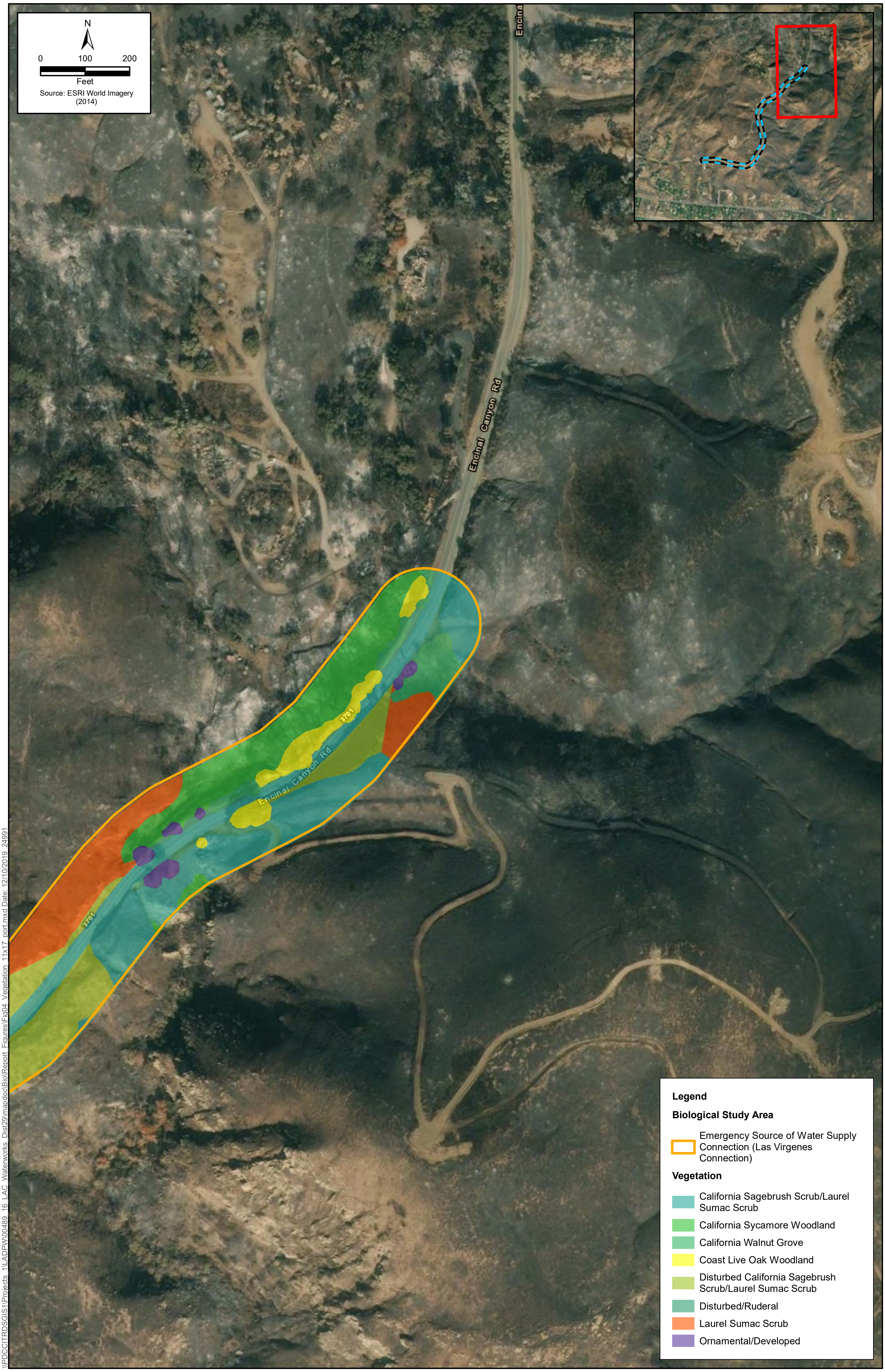
Figure 4 - Vegetation Map
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\Report Figures\Fig04 Vegetation 11x17 port.mxd Date: 12/10/2019 24991

Figure 4 - Vegetation Map
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\BioReport Figures\Fig04 Vegetation letter land updated.mxd Date: 11/22/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 4 - Vegetation Map
Zuma County Beach Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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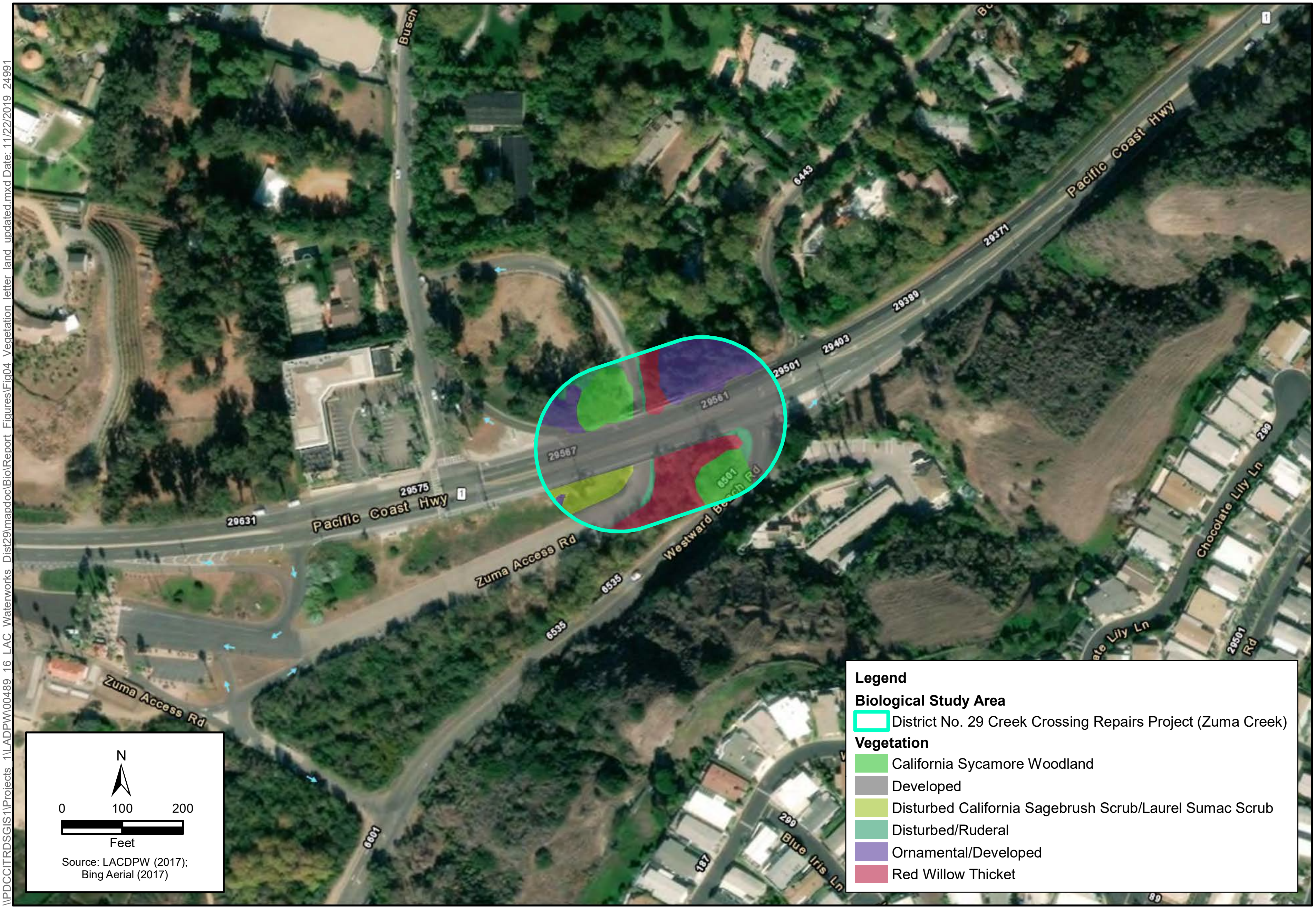

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 4 - Vegetation Map

District No. 29 Creek Crossing Repairs Project - Zuma Creek Project Site

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 4 - Vegetation Map
Point Dume Tank Site Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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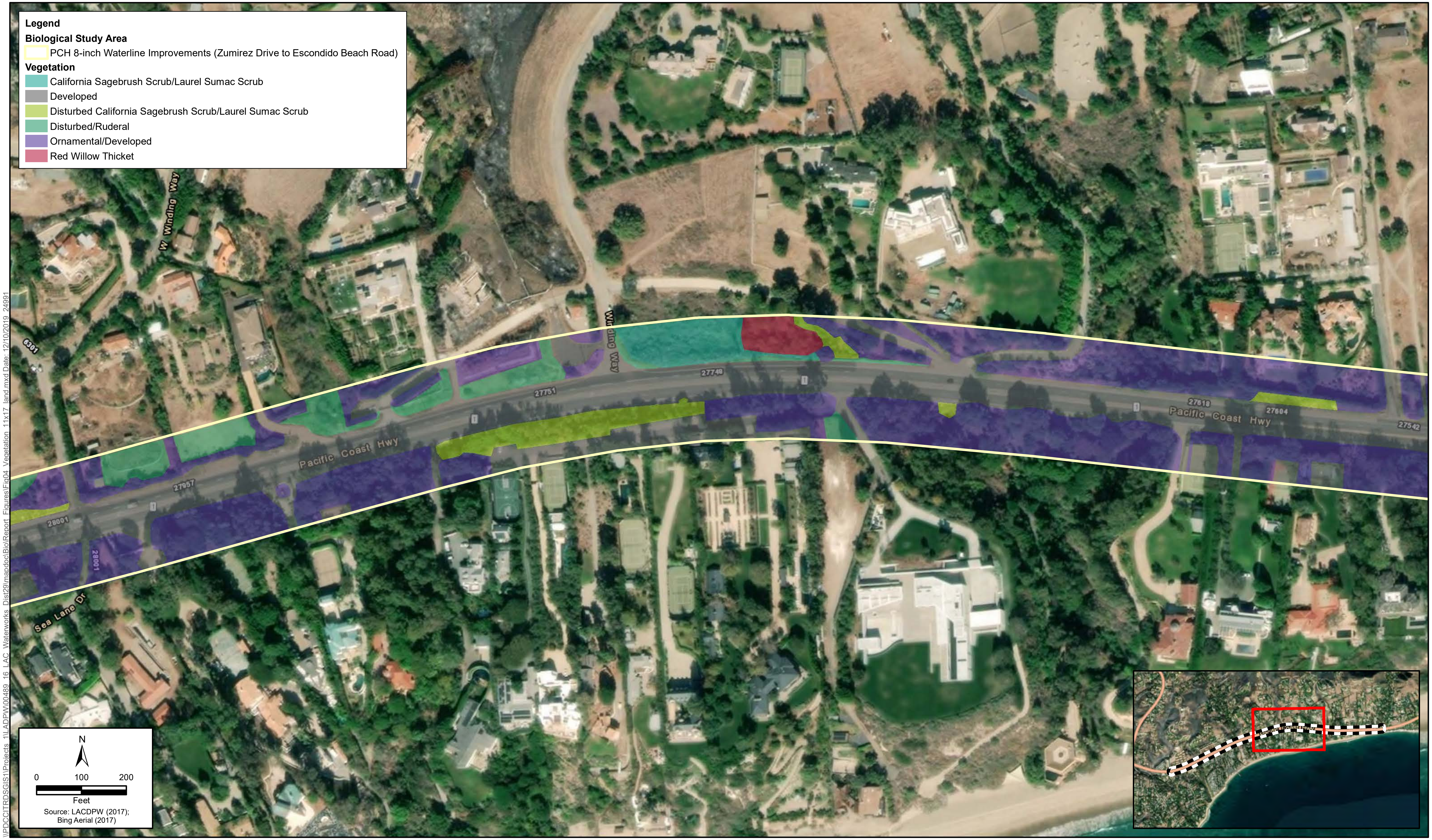
Figure 4 - Vegetation Map
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

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Figure 4 - Vegetation Map
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 4 - Vegetation Map
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 4 - Vegetation Map

District No. 29 Creek Crossing Repairs Project - Escondido Creek Project Site

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 4 - Vegetation Map
District No. 29 Creek Crossing Repairs Project - Corral Canyon Creek Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
RMD Winter Canyon Yard Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
PCH West of Carbon Canyon Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
PCH West of Carbon Canyon Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
Carbon Canyon Road and Carbon Mesa Road Waterline Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

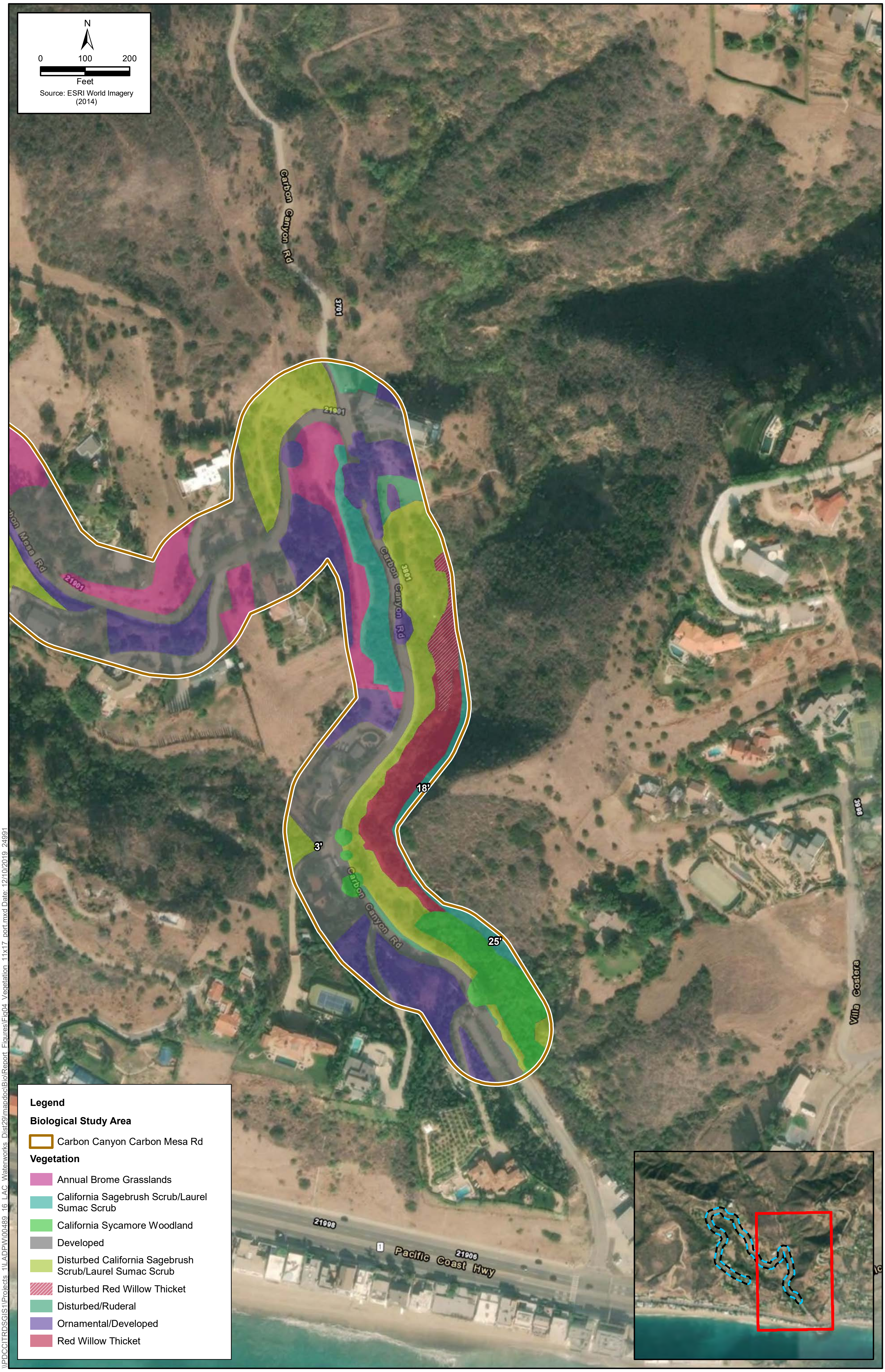

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Figure 4 - Vegetation Map
Carbon Canyon Road and Carbon Mesa Road Waterline Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 4 - Vegetation Map
District No. 29 Creek Crossing Repairs Project - Coal (Carbon) Canyon Creek Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
PCH West of Rambla Pacifico St Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map

District No. 29 Creek Crossing Repairs Project - Las Flores Canyon Creek Project Site

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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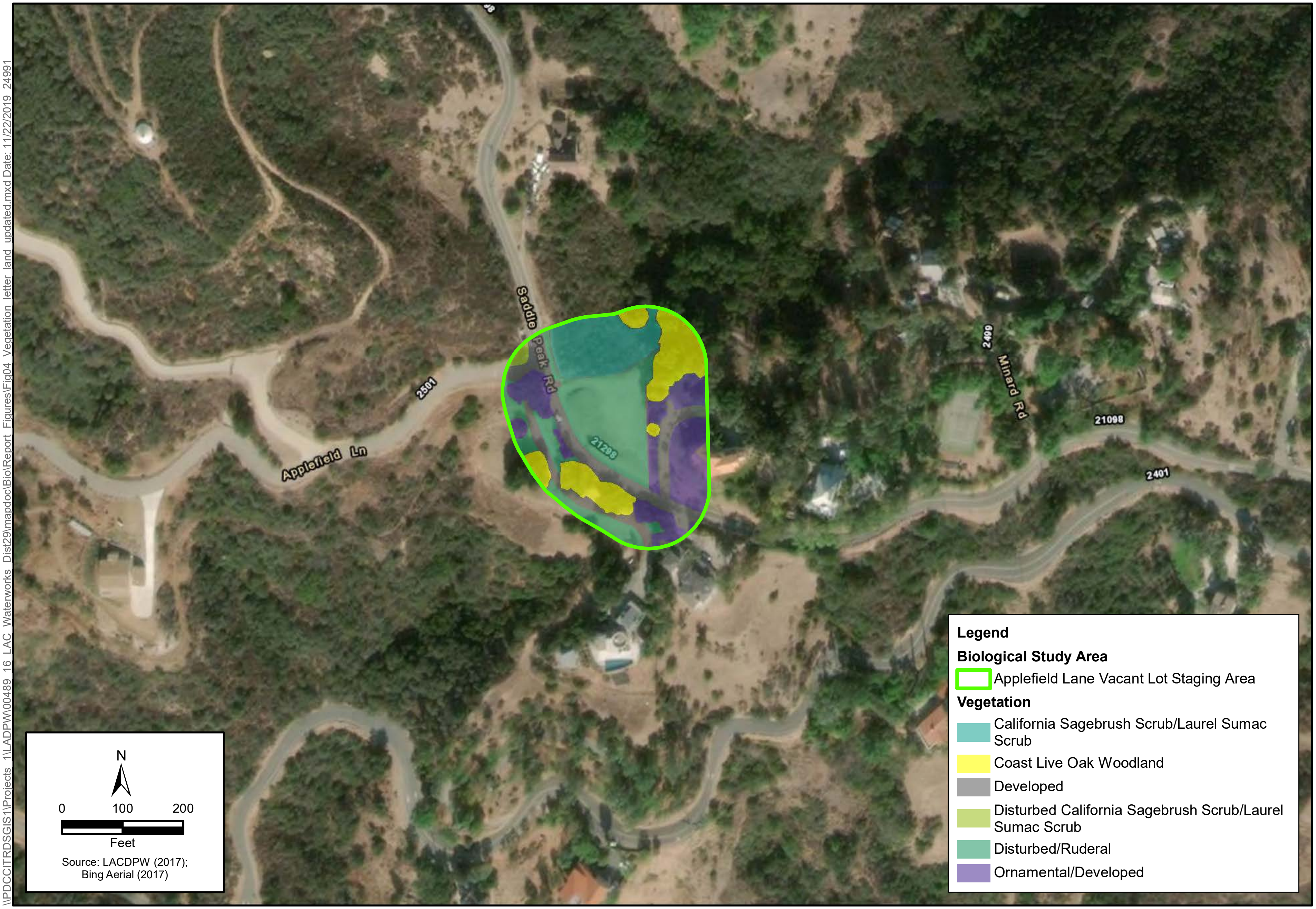

Source: LACDPW (2017); Bing Aerial (2017)

Figure 4 - Vegetation Map
Applefield Lane Vacant Lot Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
Owen Tank Site Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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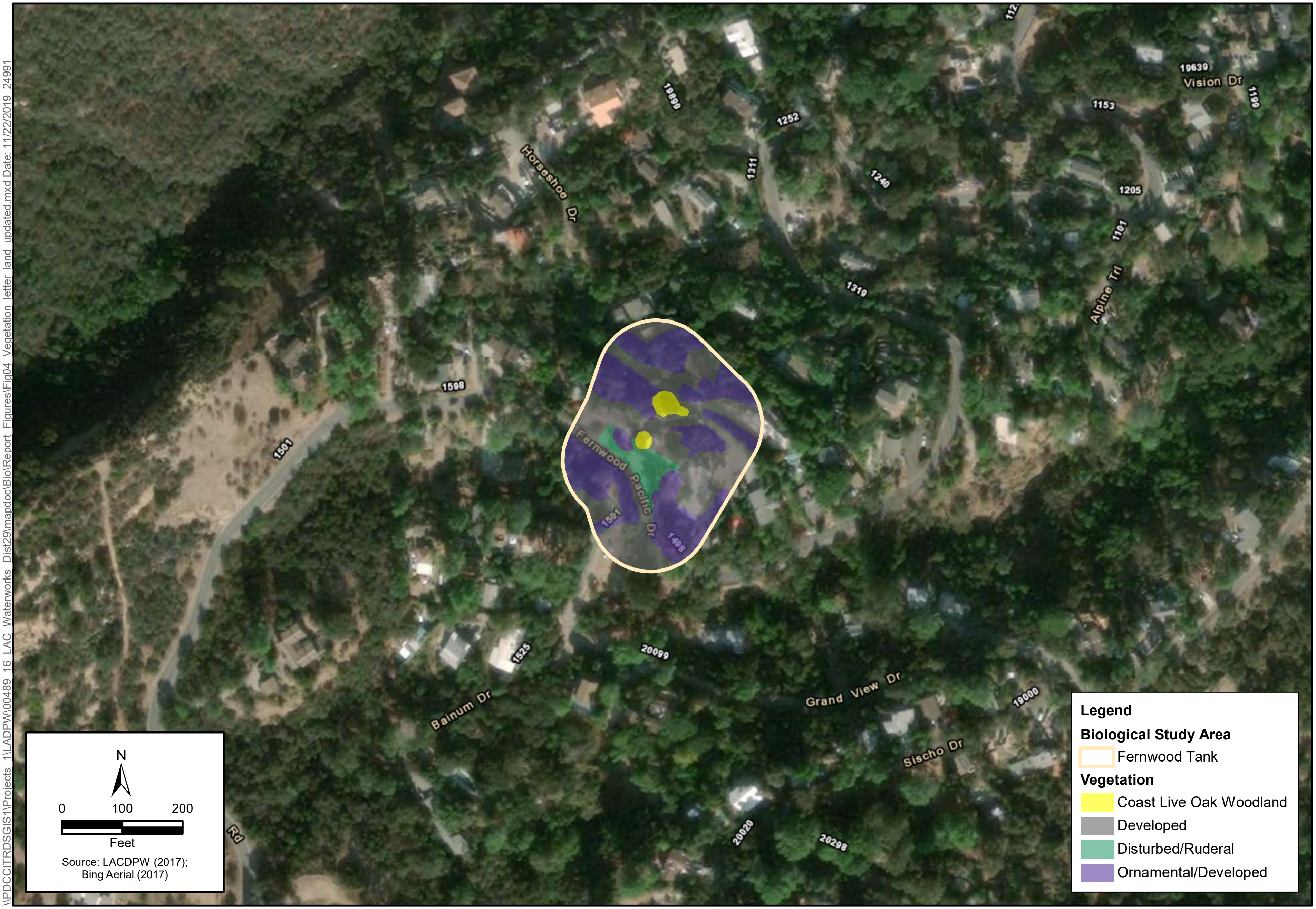

Source: LACDPW (2017);
Bing Aerial (2017)

Figure 4 - Vegetation Map
Fernwood Tank Improvement Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

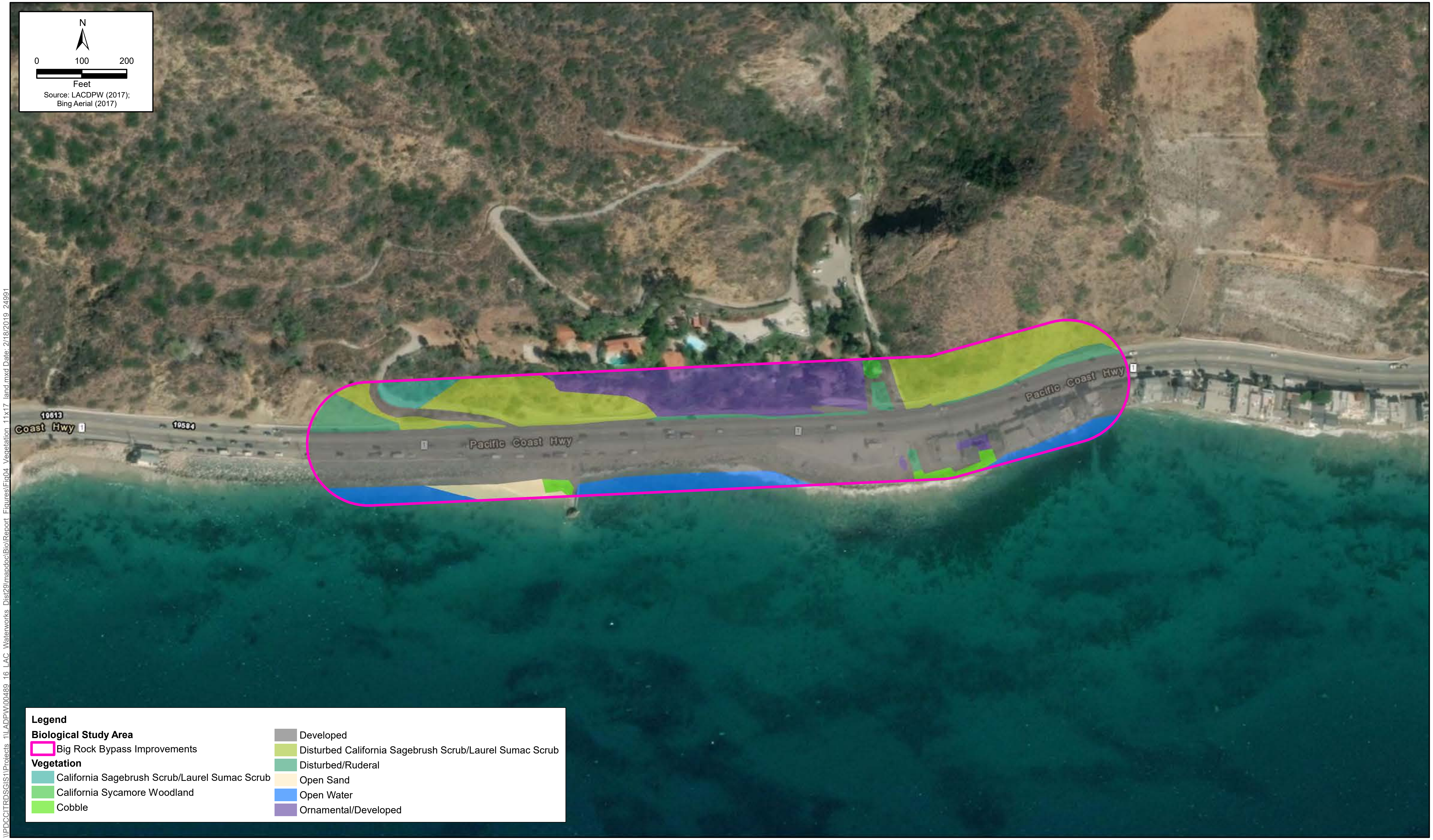

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Figure 4 - Vegetation Map
Big Rock Bypass Improvements Project Site
Project Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 4 - Vegetation Map
District No. 29 Creek Crossing Repairs Project - Pena Canyon Creek Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 4 - Vegetation Map
Las Tunas County Beach Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
PCH West of Topanga Beach Dr Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 4 - Vegetation Map
Topanga County Beach Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
District No. 29 Creek Crossing Repairs Project - Topanga Canyon Creek Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
Topanga Field Yard Estimated Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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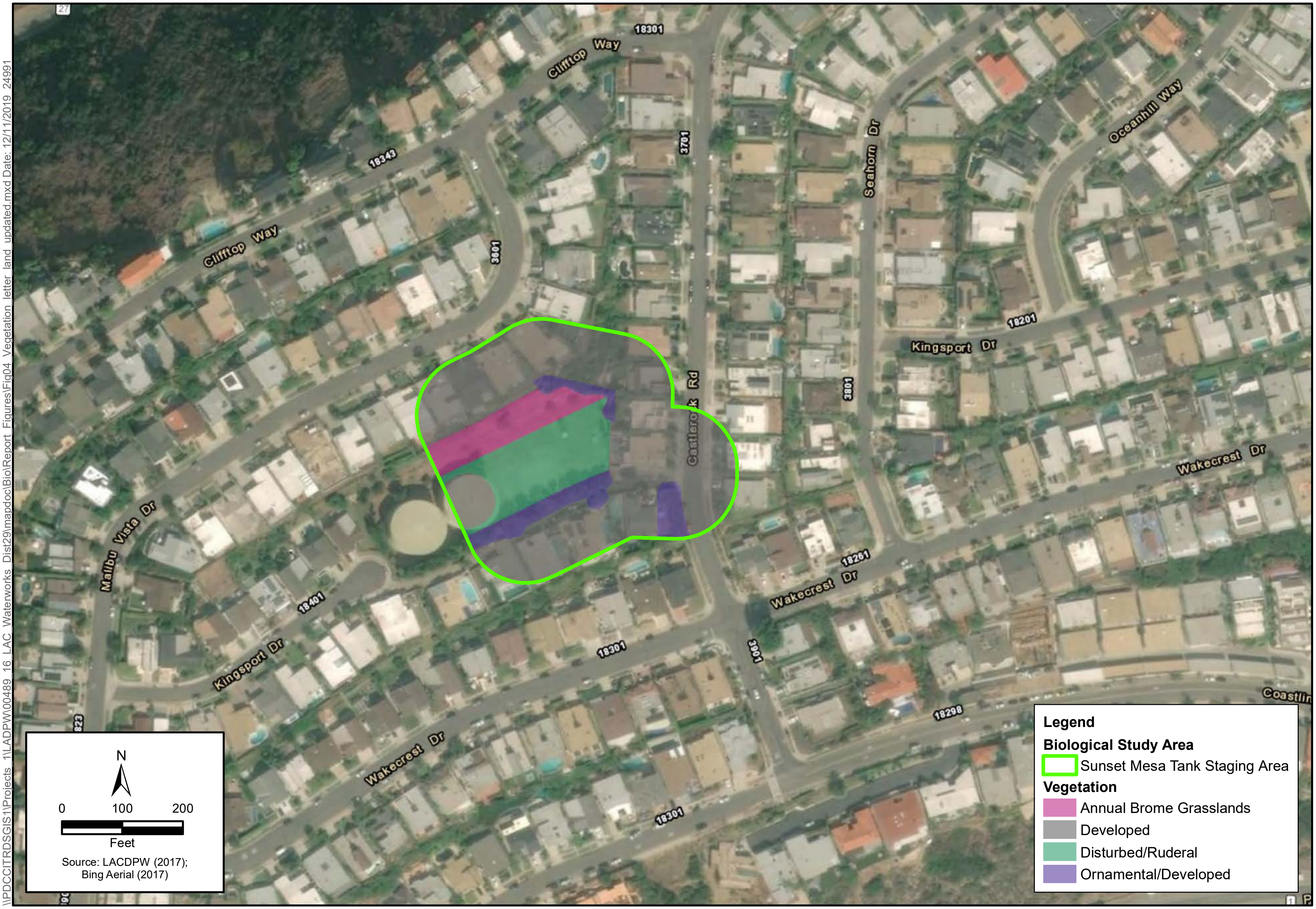

Source: LACDPW (2017);
Bing Aerial (2017)

Figure 4 - Vegetation Map
Sunset Mesa Tank Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 4 - Vegetation Map
Coastline Drive 12-Inch Waterline Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

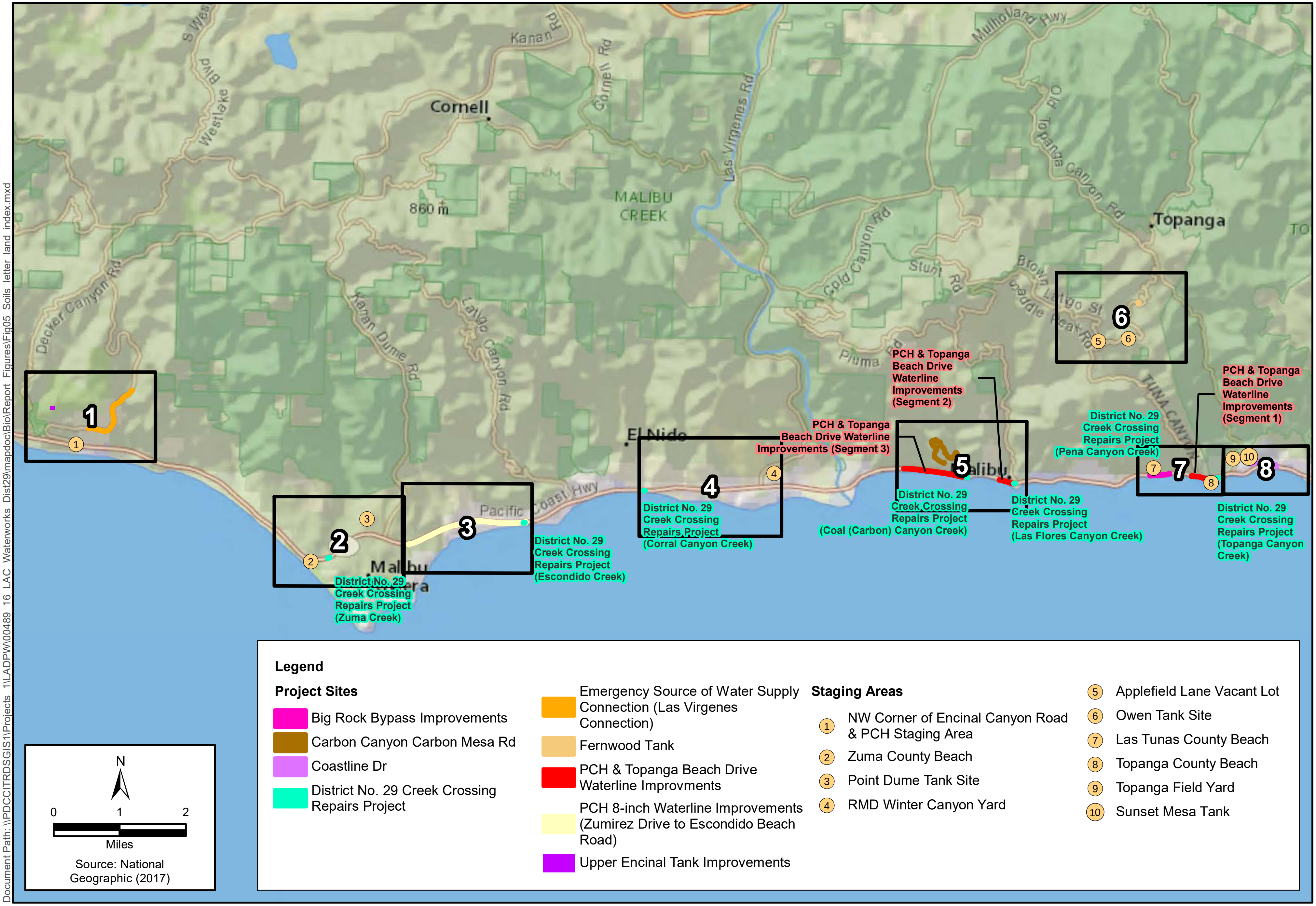

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Figure 5 - Soils Map
Index Sheet
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 5 - Soils Map
Emergency Source of Water Supply Connection (Las Virgenes Connection) and Upper Encinal Tank Improvements Project Sites and NW Corner of Encinal Canyon Road & PCH Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source:
ESRI Streetmap (2017)

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Figure 5 - Soils Map
District No. 29 Creek Crossing Repairs Project (Pena Canyon Creek) Project Site and Point Dume and Zuma County Beach Staging Areas
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 5 - Soils Map
District No. 29 Creek Crossing Repairs Project (Escondido Creek) and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Sites
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 5 - Soils Map
District No. 29 Creek Crossing Repairs Project (Corral Canyon Creek) Project Site and RMD Winter Canyon Yard Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 5 - Soils Map

Carbon Canyon Carbon Mesa Rd, District No. 29 Creek Crossing Repairs Project (Coal (Carbon) Canyon Creek and Las Flores Canyon Creek), PCH West of Carbon Canyon Rd, and PCH West of Rambla Pacifico St Project Sites

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

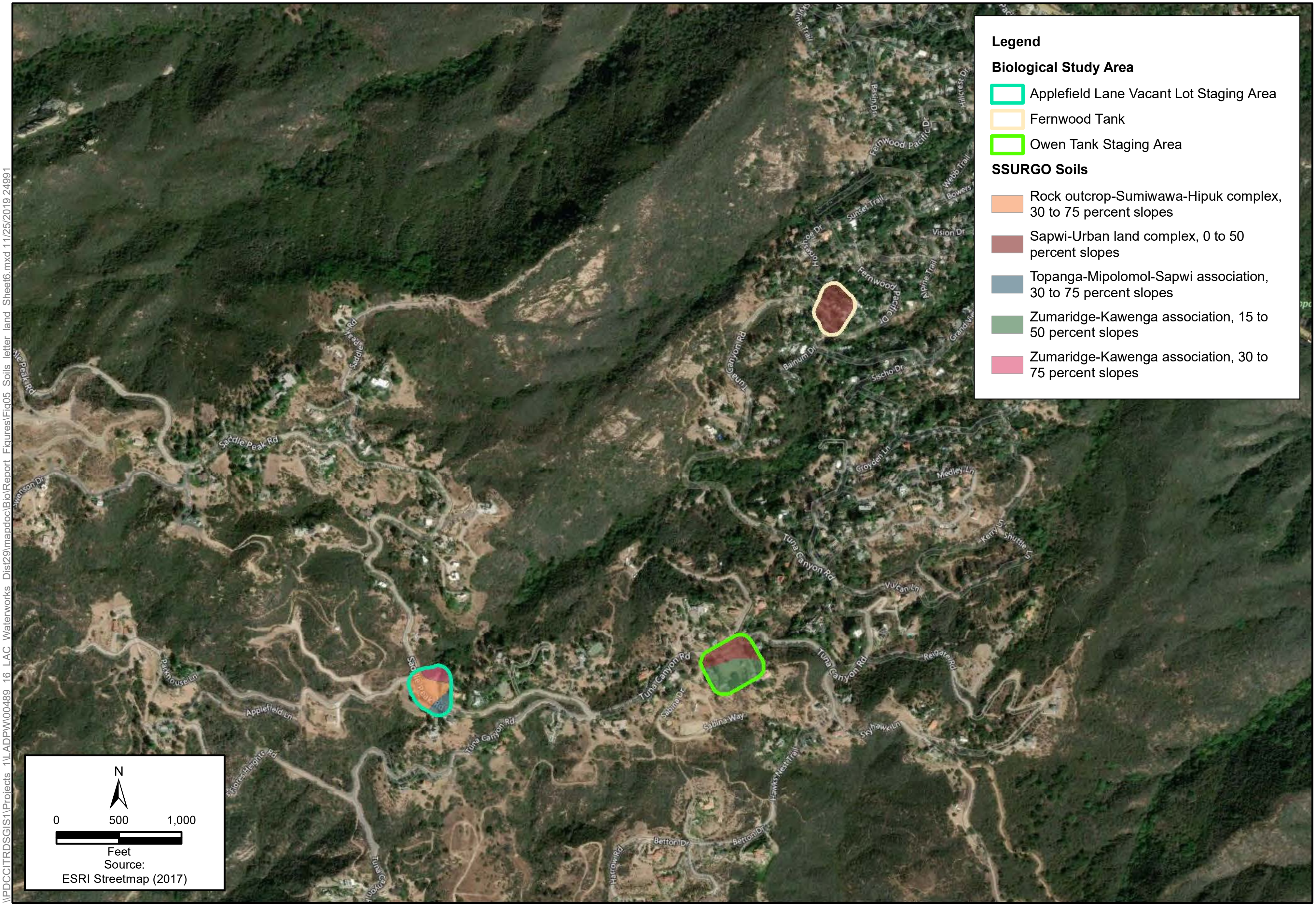

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Figure 5 - Soils Map
Fernwood Tank, Applefield Lane Vacant Lot and Owen Tank Staging Areas
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

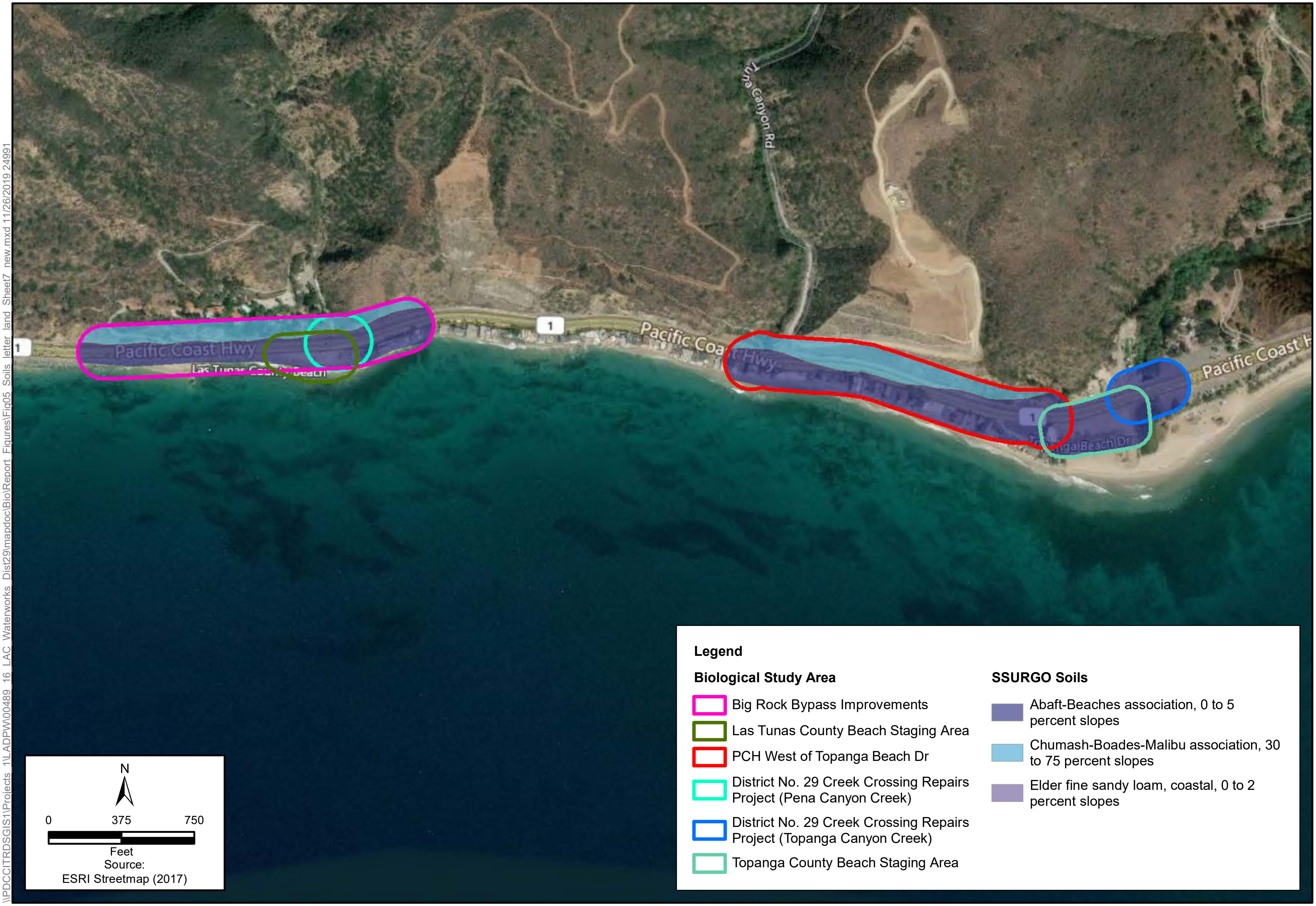

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Figure 5 - Soils Map

Big Rock Bypass Improvements, PCH West of Topanga Beach Dr, District No. 29 Creek Crossing Repairs Project (Pena Canyon Creek and Topanga Canyon Creek), Las Tunas and Topanga County Beach Staging Areas

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source:
ESRI Streetmap (2017)

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Figure 5 - Soils Map
Coastline Dr Project Site and Sunset Mesa Tank and Topanga Field Yard Staging Areas
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

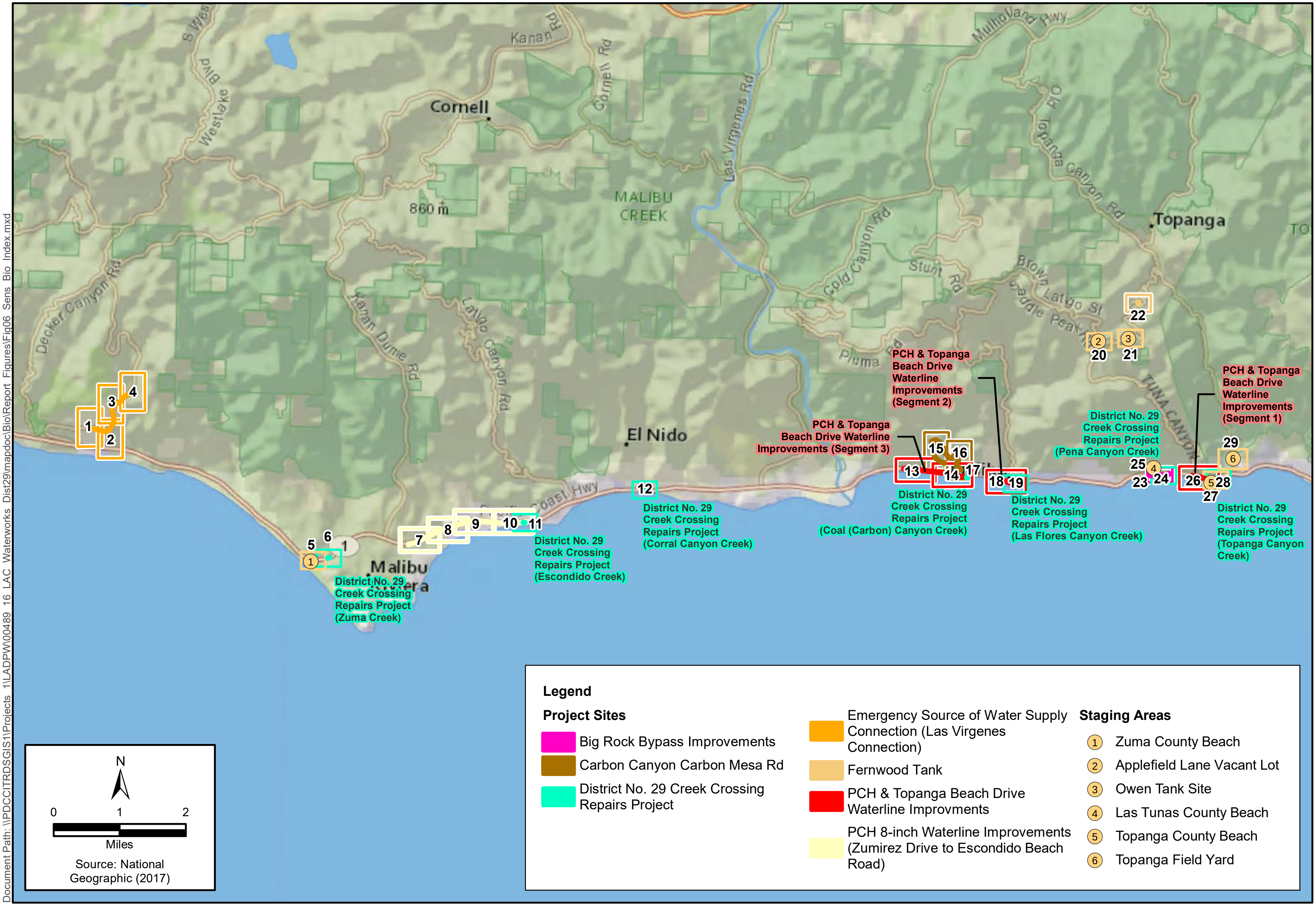

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Figure 6 – Sensitive Biological Resources Index Sheet
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 6 - Sensitive Biological Resources
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 6 - Sensitive Biological Resources
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 6 - Sensitive Biological Resources
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

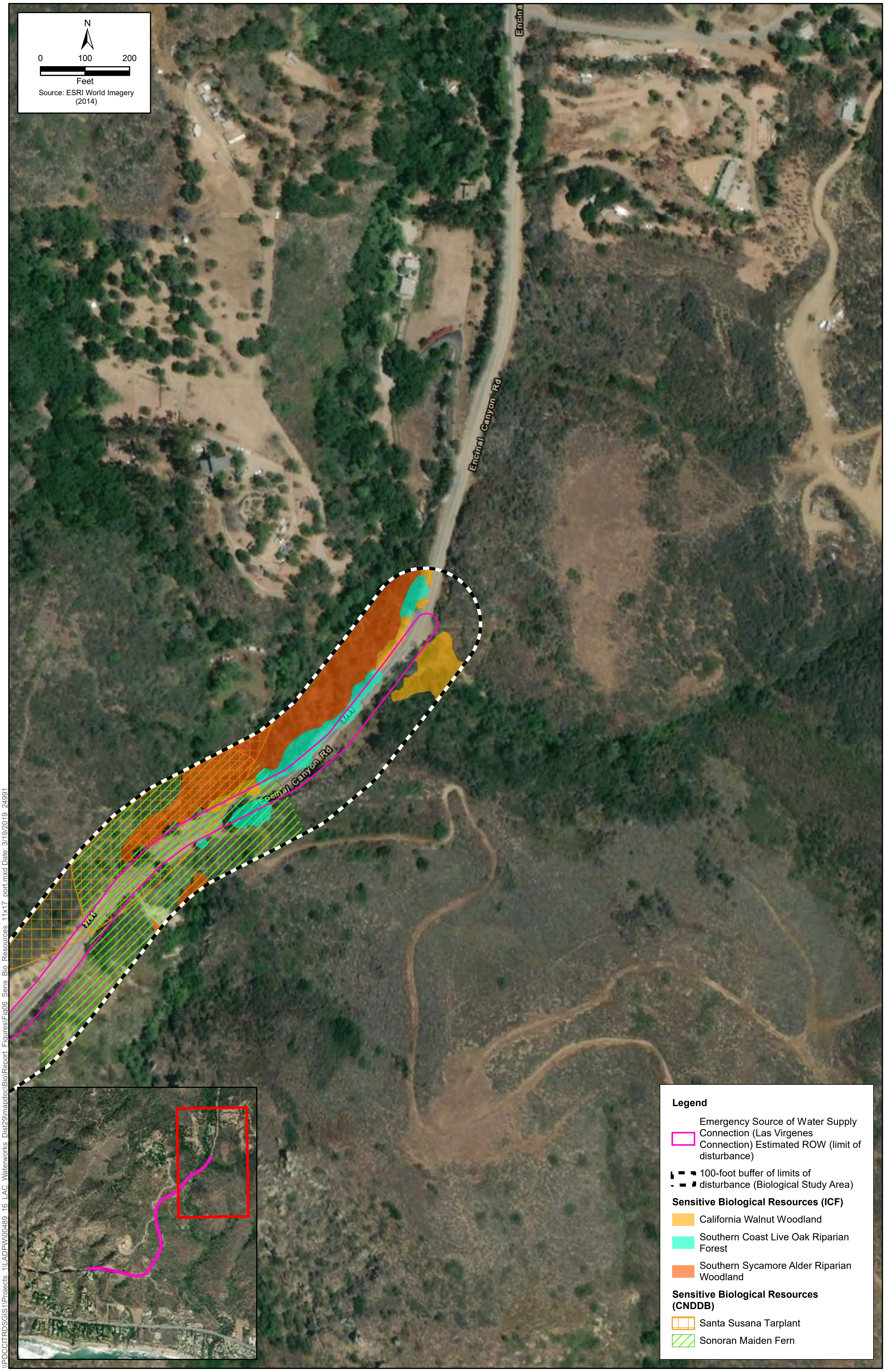

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Figure 6 - Sensitive Biological Resources
Emergency Source of Water Supply Connection (Las Virgenes Connection) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017);
Bing Aerial (2017)

Figure 6 - Sensitive Biological Resources
Zuma County Beach Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

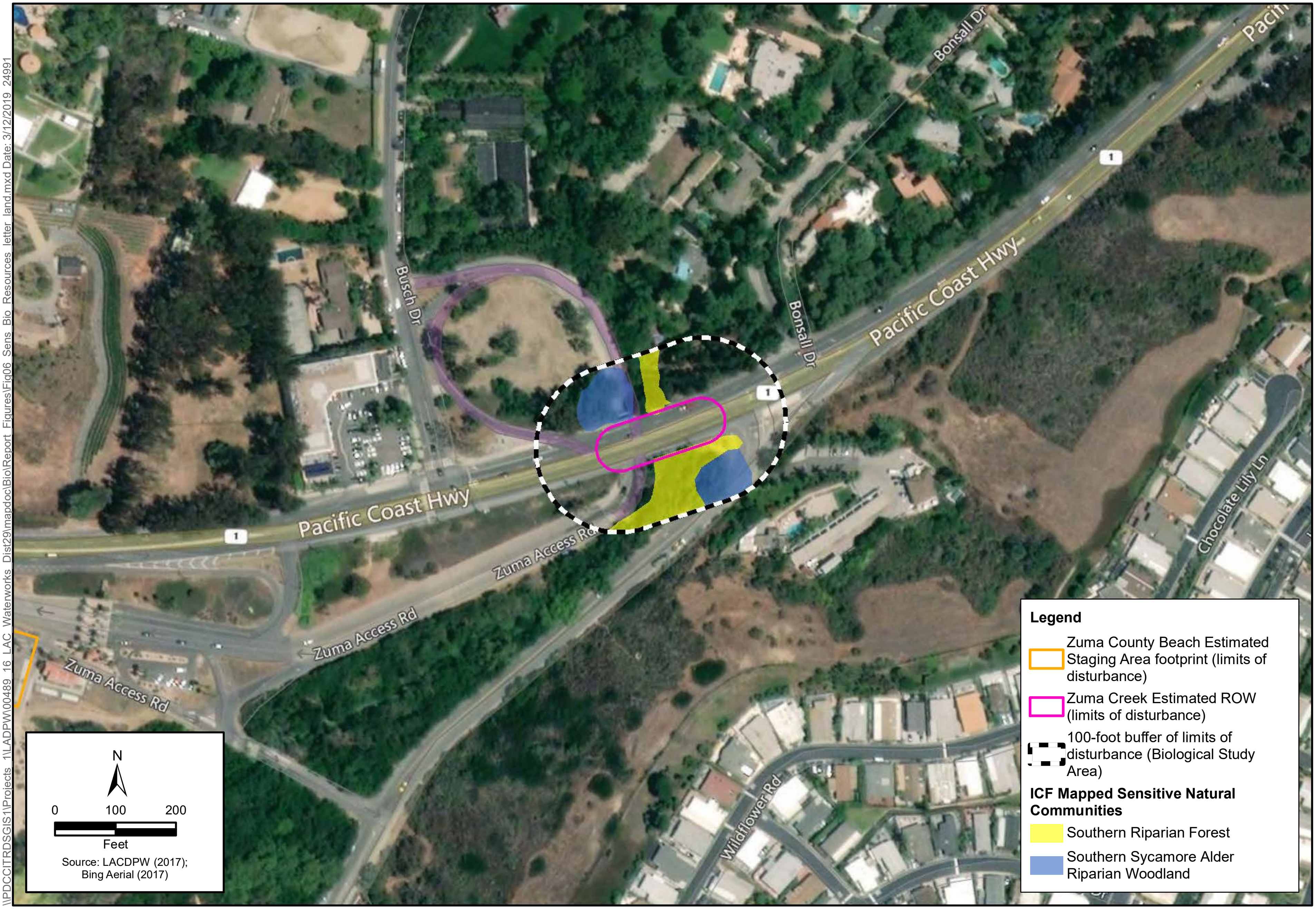

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Figure 6 - Sensitive Biological Resources
District No. 29 Creek Crossing Repairs Project (Zuma Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Figure 6 - Sensitive Biological Resources
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 6 - Sensitive Biological Resources
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Legend

▭ PCH 8-inch Waterline Improvements Estimated ROW (limit of disturbance)

▭ 100-foot buffer of limits of disturbance (Biological Study Area)

Sensitive Biological Resources (ICF)

🟨 Southern Riparian Forest

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Figure 6 - Sensitive Biological Resources
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 6 - Sensitive Biological Resources
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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Figure 6 - Sensitive Biological Resources
District No. 29 Creek Crossing Repairs Project (Escondido Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sensitive Biological Resources
District No. 29 Creek Crossing Repairs Project (Corral Canyon Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

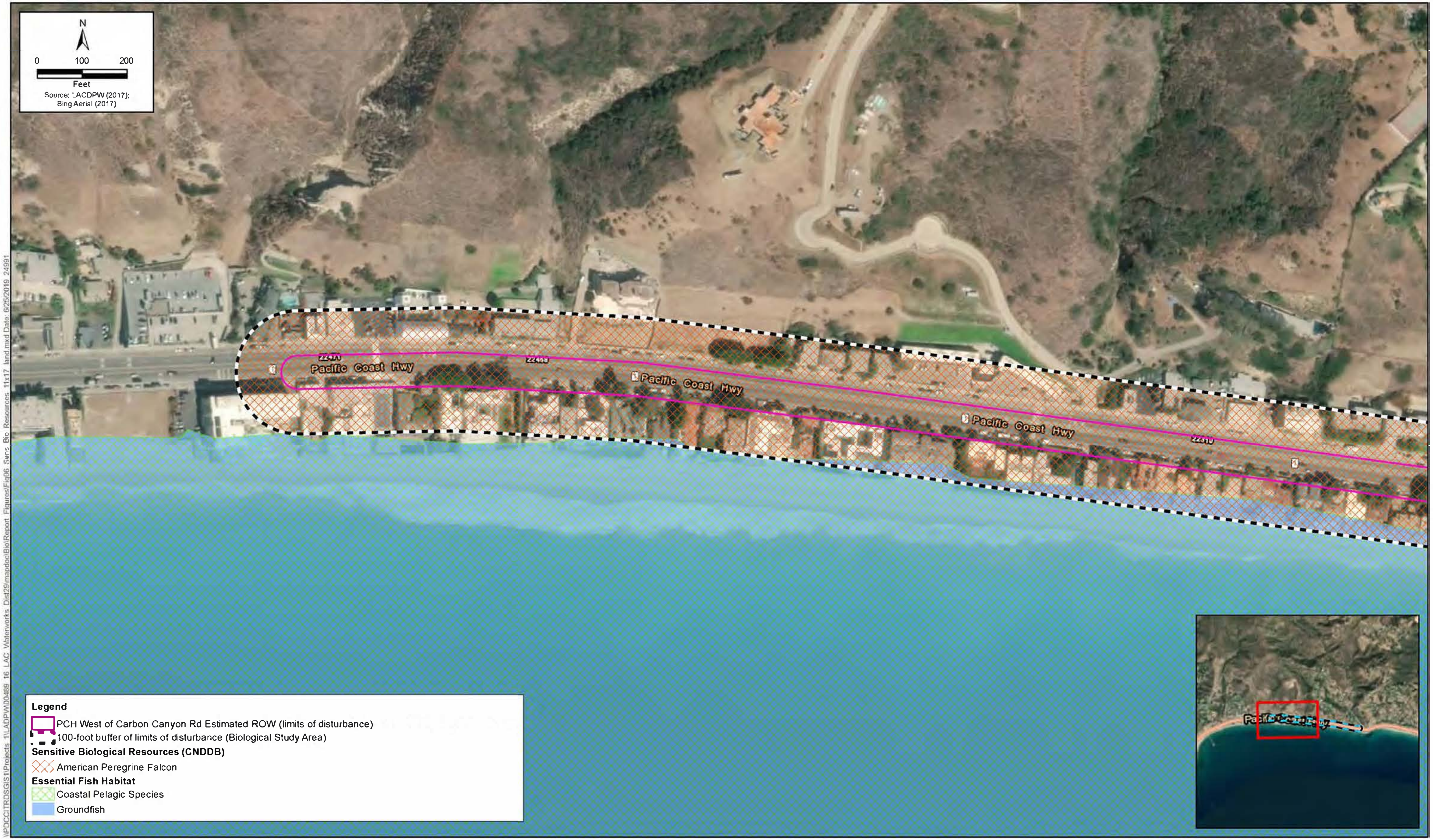

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Figure 6 - Sensitive Biological Resources
PCH West of Carbon Canyon Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

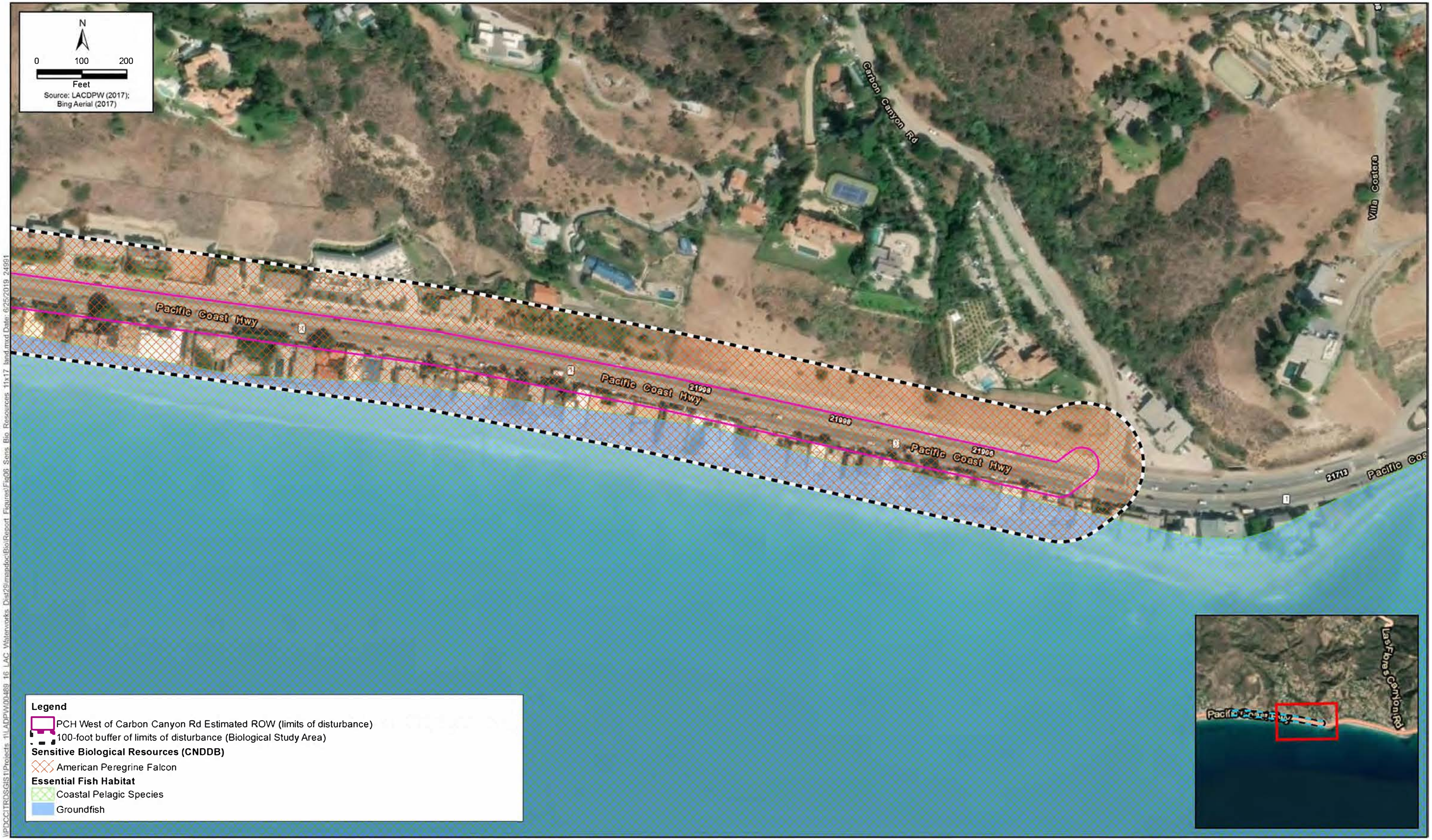

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Figure 6 - Sensitive Biological Resources
PCH West of Carbon Canyon Rd Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 6 - Sensitive Biological Resources
Carbon Canyon Carbon Mesa Rd Project Site Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

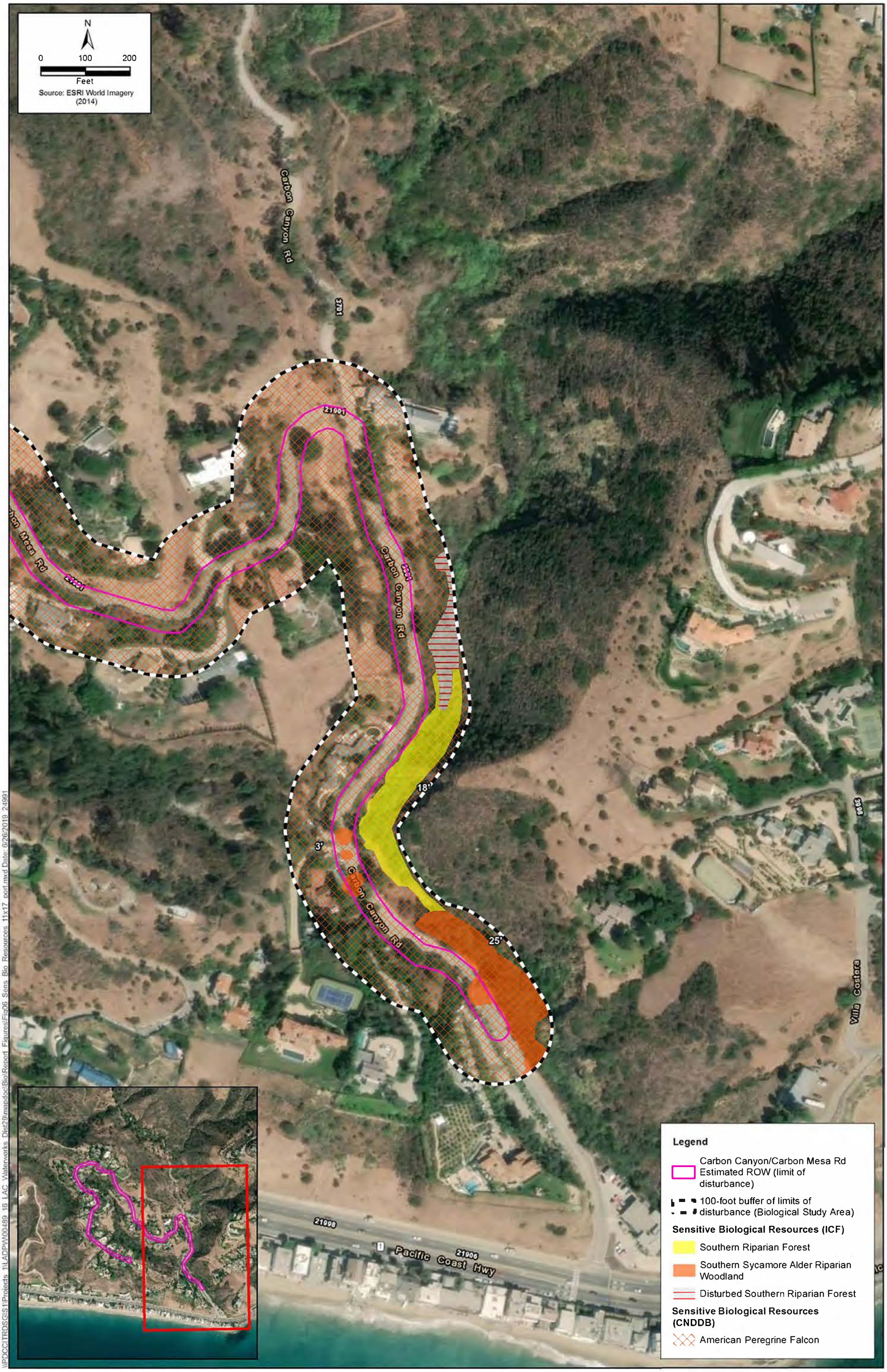

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Figure 6 - Sensitive Biological Resources
Carbon Canyon Carbon Mesa Rd Project Site Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 6 - Sensitive Biological Resources
District No. 29 Creek Crossing Repairs Project (Coal (Carbon) Canyon Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 6 - Sensitive Biological Resources
PCH West of Rambla Pacifico St Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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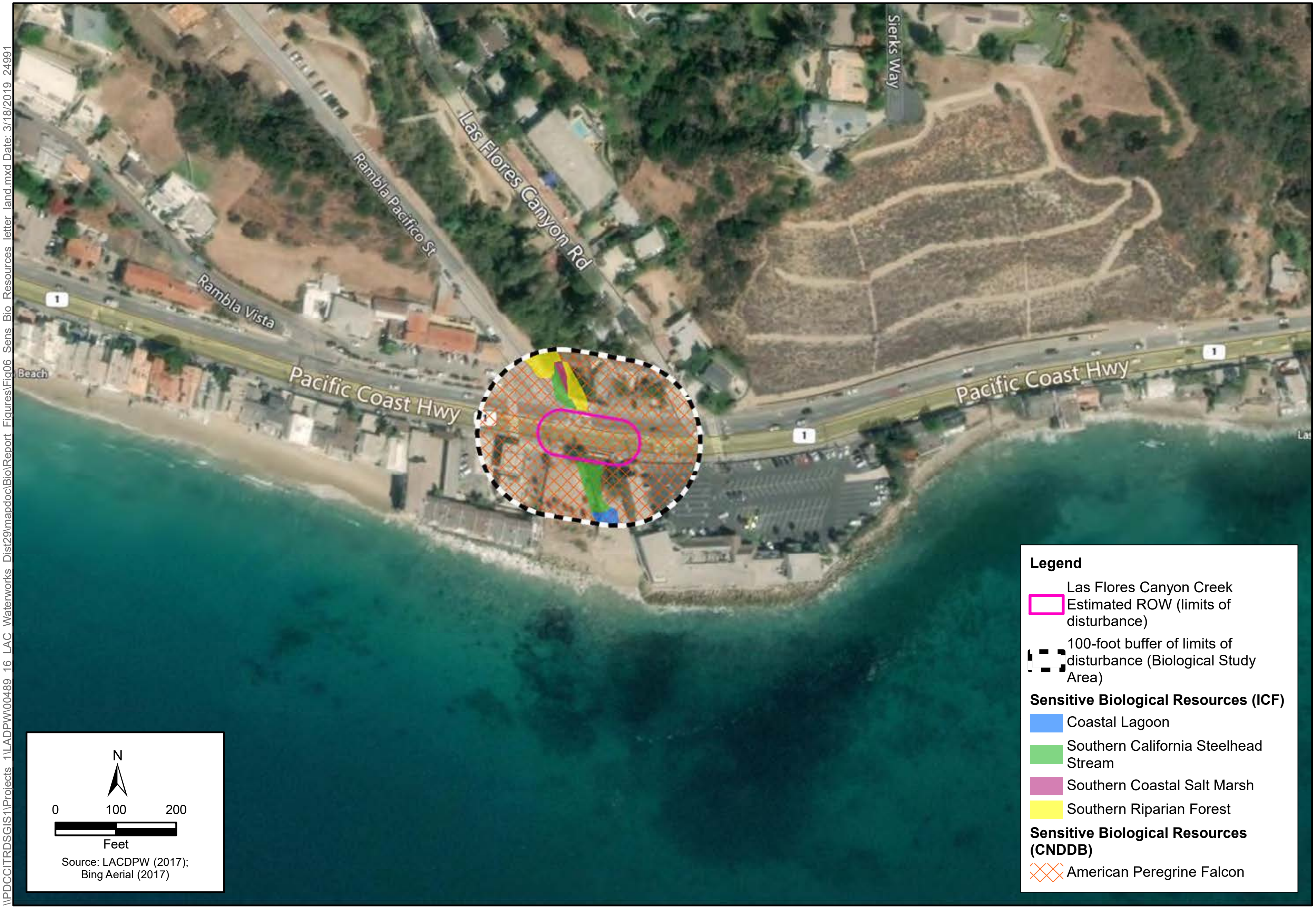

Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sensitive Biological Resources
District No. 29 Creek Crossing Repairs Project (Las Flores Canyon Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

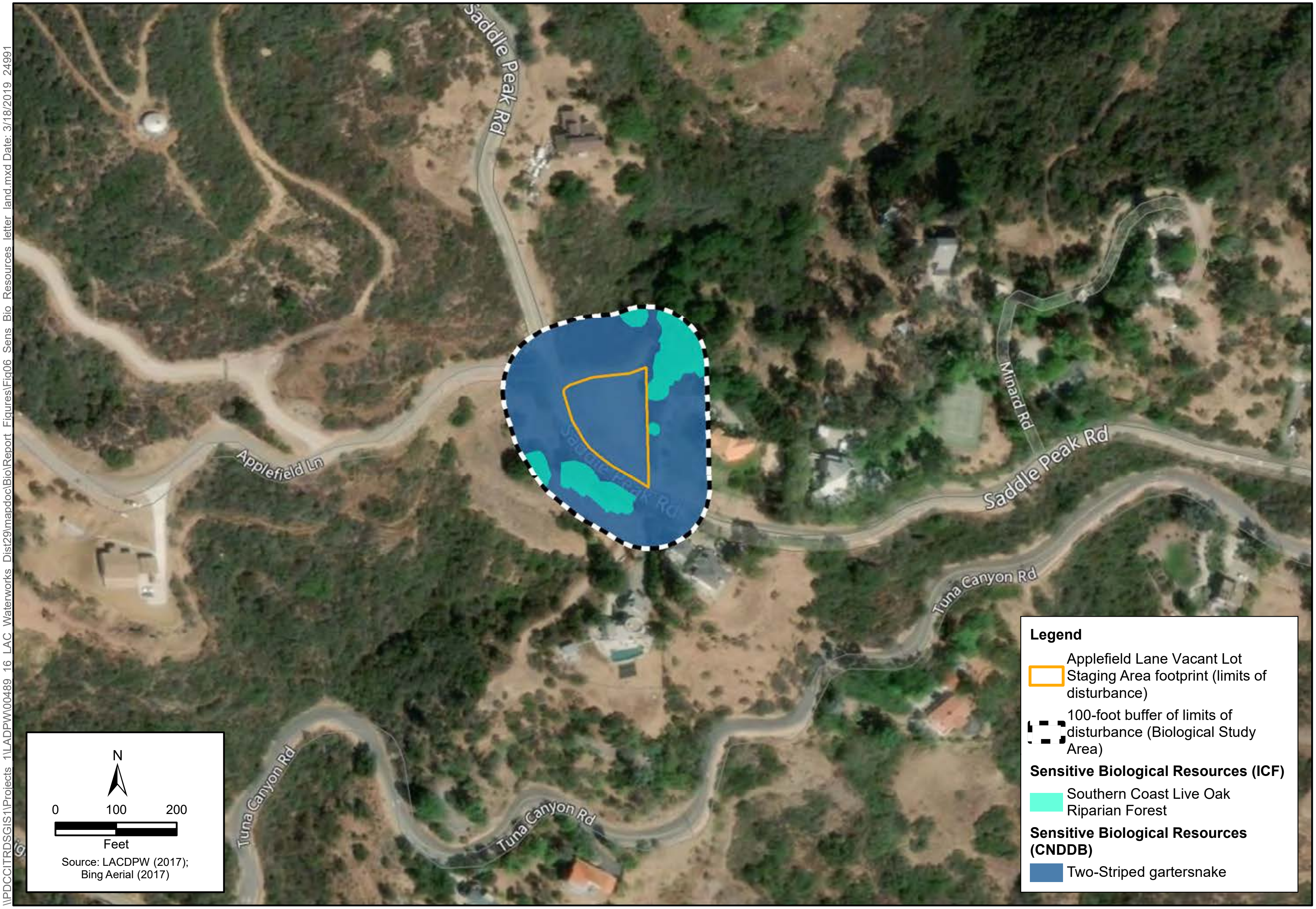

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Figure 6 - Sensitive Biological Resources
Applefield Lane Vacant Lot Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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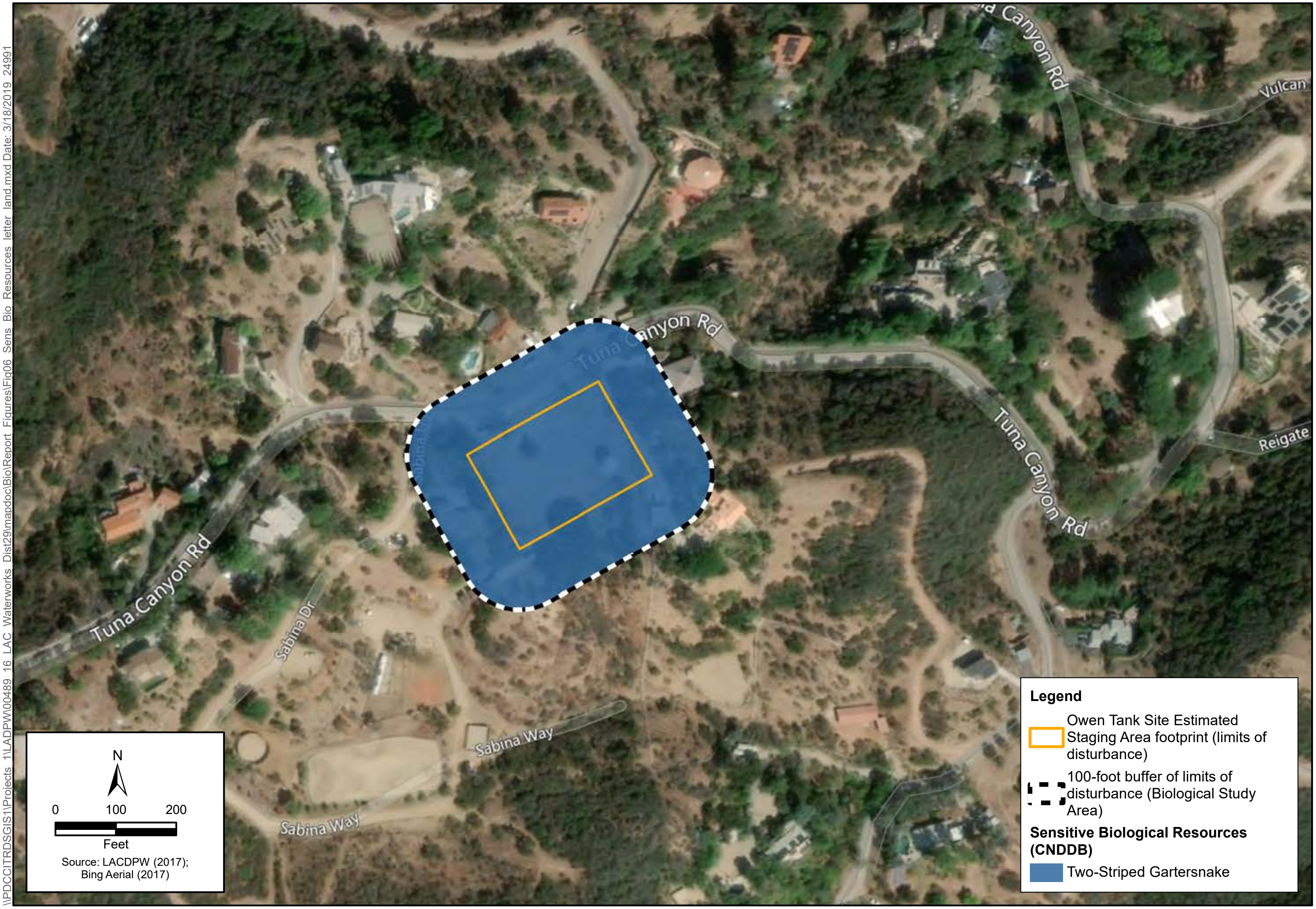

Figure 6 - Sensitive Biological Resources
Owen Tank Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

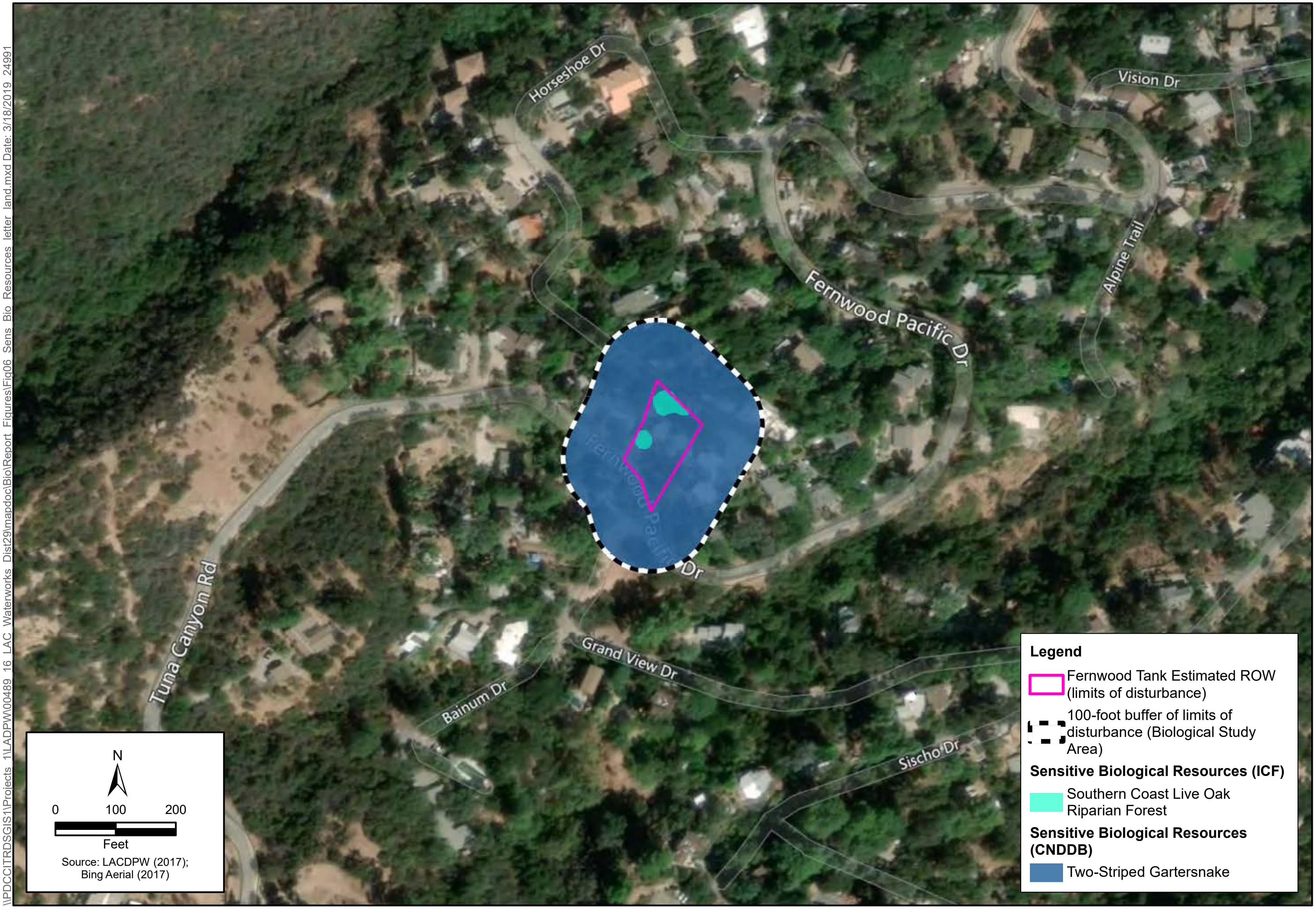

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Figure 6 - Sensitive Biological Resources
Fernwood Tank Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

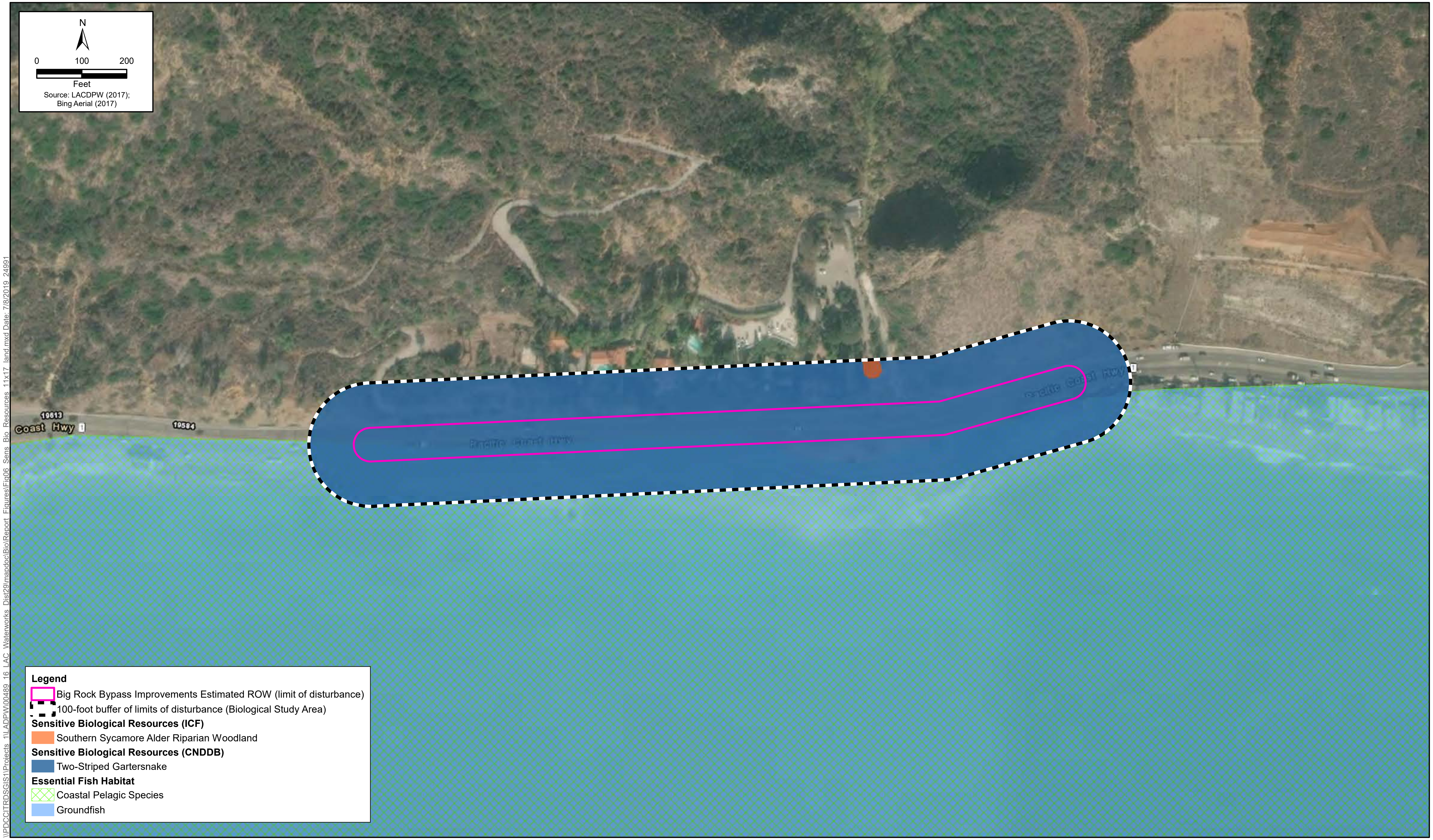

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Figure 6 - Sensitive Biological Resources
Big Rock Bypass Improvements Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sensitive Biological Resources
District No. 29 Creek Crossing Repair Project (Pena Canyon Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017);
Bing Aerial (2017)

Figure 6 - Sensitive Biological Resources
Las Tunas County Beach Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

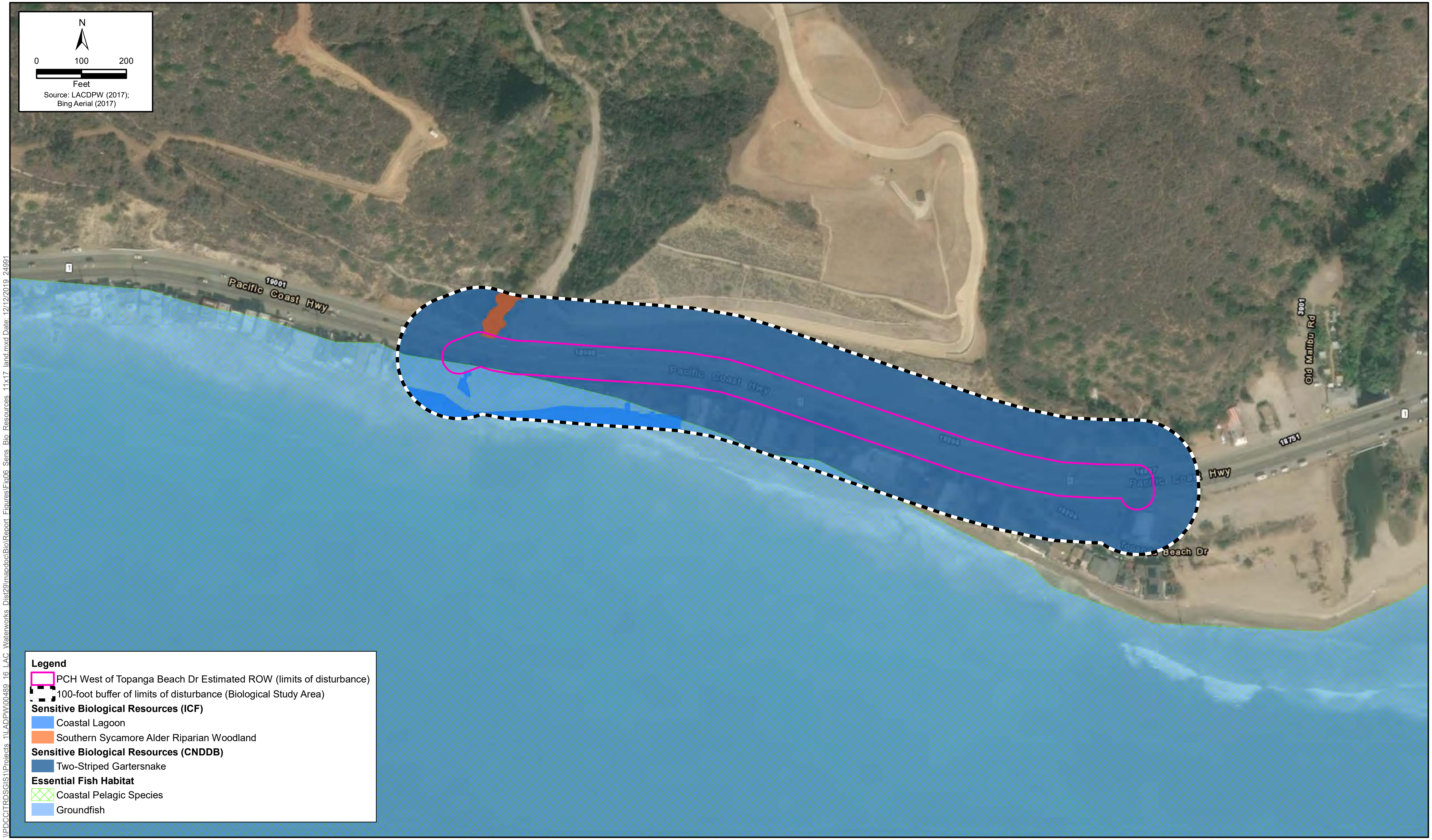

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Figure 6 - Sensitive Biological Resources
PCH West of Topanga Beach Dr Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

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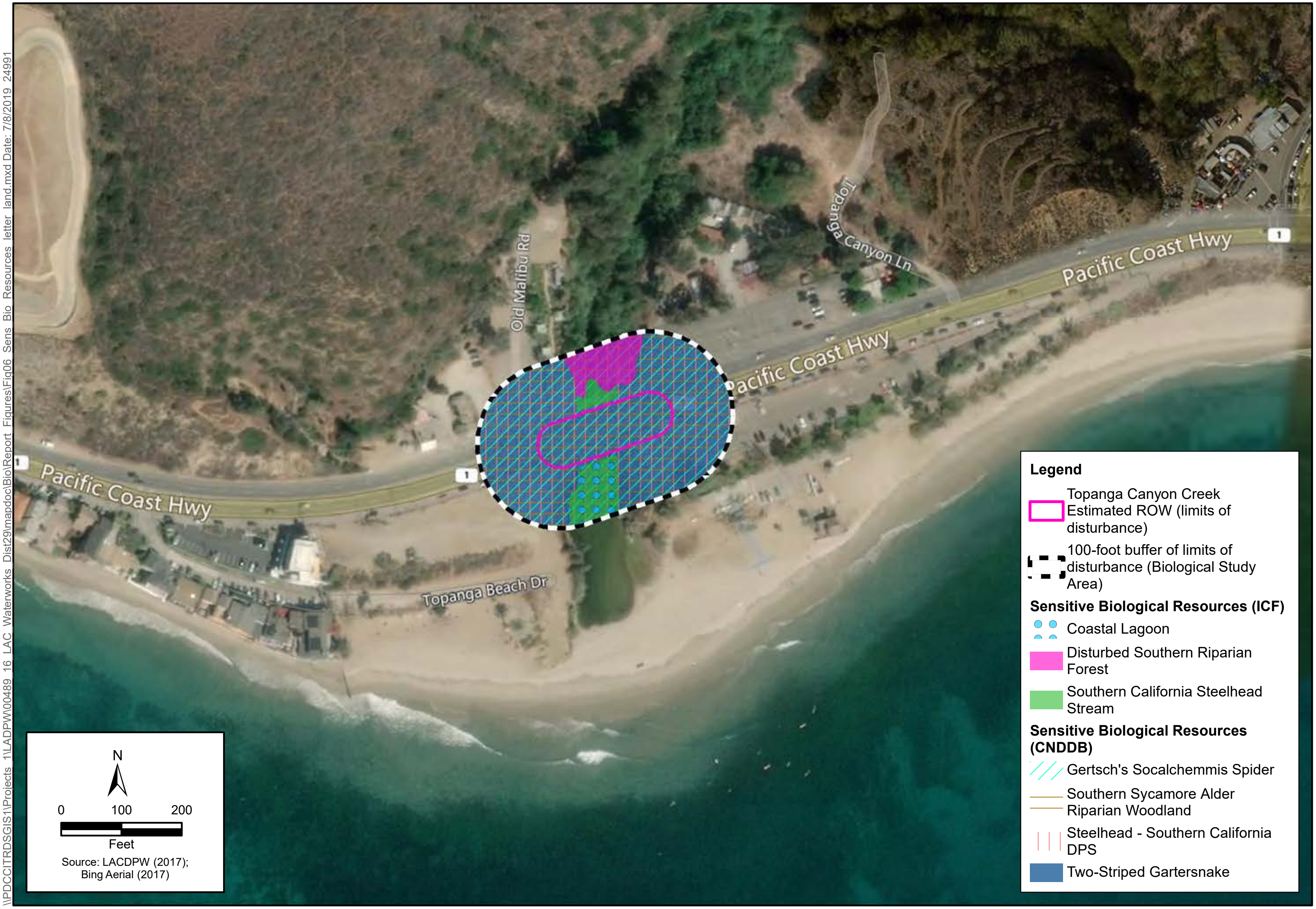
Figure 6 - Sensitive Biological Resources
Topanga County Beach Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017);
Bing Aerial (2017)

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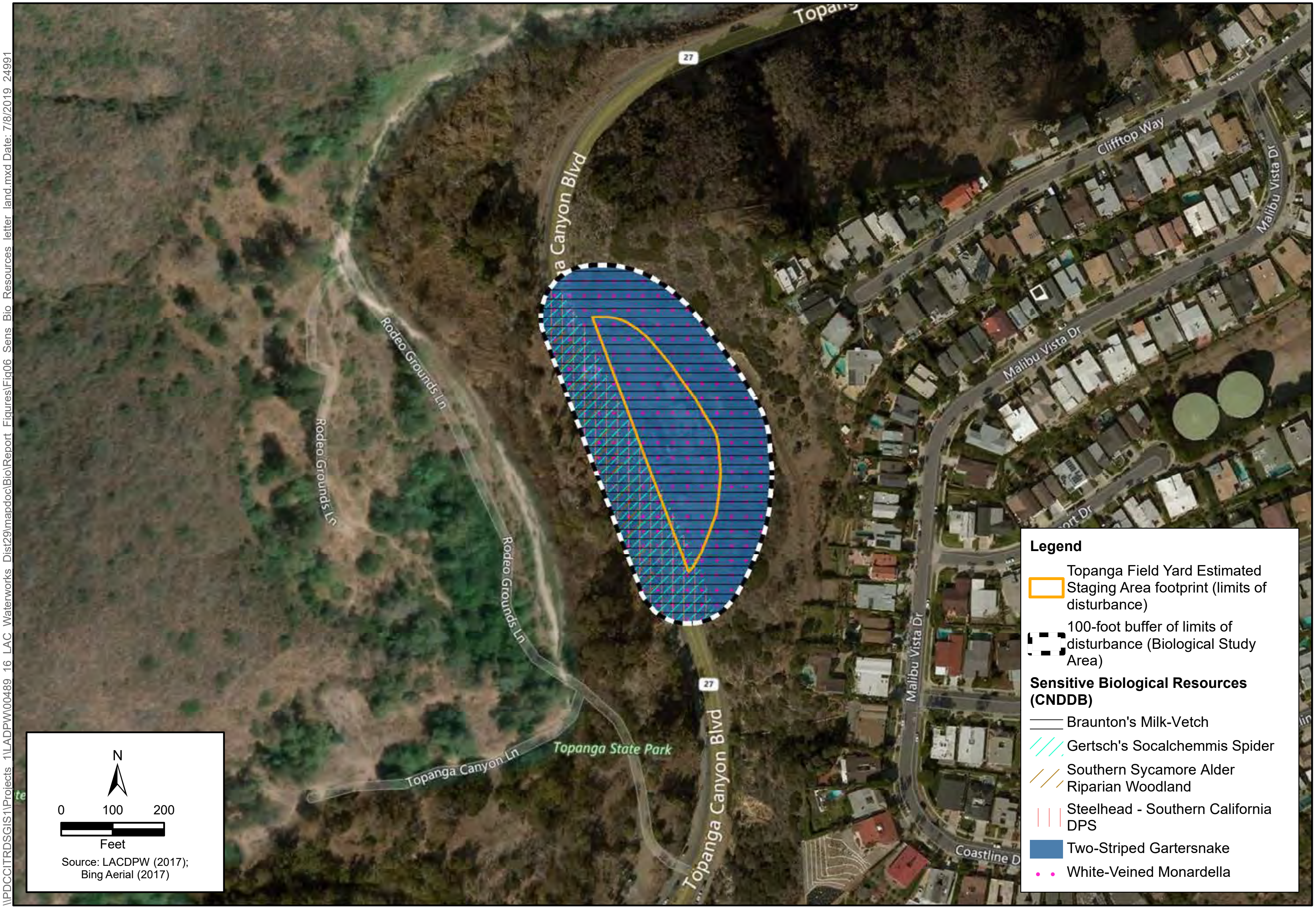
Figure 6 - Sensitive Biological Resources
District No. 29 Creek Crossing Repairs Project (Topanga Canyon Creek) Project Site
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

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Figure 6 - Sensitive Biological Resources
Topanga Field Yard Staging Area
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Appendix B
Site Photos

Appendix B - Photo log

	Photograph # 1 Project: Emergency Source of Water Supply Connection (Las Virgenes Connection) Photo Date: May 2, 2018 Direction: West Comment: California Sagebrush Scrub is located in a small, discrete patch on the slope on the left (south) side of the dirt access road in the background of this photo. This is the only location in the project where this community was mapped. Note that this entire BSA burned in the Woolsey Fire of 2018.
	Photograph # 2 Project: Emergency Source of Water Supply Connection (Las Virgenes Connection) Photo Date: May 2, 2018 Direction: Southwest Comment: California Sagebrush Scrub/Laurel Sumac Scrub is located along most of Encinal Canyon Road. This community was primarily mapped in the far western Biological Study Areas (BSAs). Note that this entire BSA burned in the Woolsey Fire of 2018.
	Photograph # 3 Staging Area: Topanga Field Yard Photo Date: April 25, 2018 Direction: Southeast Comment: Laurel Sumac Scrub is located on the slopes behind the Topanga Field Yard, in the background of this photo. This community was generally scarce and was only mapped in a few discrete patches across all BSAs.

	Photograph # 4 Project: District No. 29 Creek Crossing Repair Project (Escondido Creek) Photo Date: April 23, 2018 Direction: North Comment: Fourwing Saltbush Scrub is located in a very small, discrete patch in Escondido Creek north of Pacific Coast Highway (PCH). Individual saltbush plants are visible in this photo on both sides of the creek (the pale green shrubs).
	Photograph # 5 Project: Carbon Canyon Road & Carbon Mesa Road Waterline Improvements Photo Date: April 25, 2018 Direction: South Comment: California Sycamore Woodland is present in several BSAs. In this photo, the tall sycamores can be seen on both sides of Carbon Canyon Road at the start of the curve.
	Photograph # 6 Project: PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Photo Date: June 1, 2018 Direction: Northeast Comment: California Walnut Grove is most abundant on the far northern end of the Emergency Source of Water Supply Connection (Las Virgenes Connection), but also grows alongside PCH at this location.

Photograph # 7

Project: Emergency Source of Water Supply Connection (Las Virgenes Connection)

Photo Date: May 2, 2018

Direction: Northeast

Comment: Coast Live Oak Woodland is located in several BSAs but is most abundant in this one, where it can be found near the northern end of this BSA. Note that this entire BSA burned in the Woolsey Fire of 2018.

Photograph # 8

Project: District No. 29 Creek Crossing Repair Project (Las Flores Creek)

Photo Date: April 25, 2018

Direction: Northwest

Comment: Las Flores Creek is dominated by Red Willow Thicket vegetation.

Photograph # 9

Project: District No. 29 Creek Crossing Repair Project (Corral Canyon Creek)

Photo Date: May 2, 2018

Direction: North

Comment: The banks of Corral Canyon Creek at this location are dominated by the Saltgrass/Cattail Marsh vegetation community. Note that this entire BSA burned in the Woolsey Fire of 2018.

	Photograph # 10 Staging Area: Zuma Beach Photo Date: May 2, 2018 Direction: North/Northeast Comment: This photo is dominated by a patch of dune mat at Zuma Beach, the only location where this community was mapped. Plants in this photo include beach bur and red sand verbena.
	Photograph # 11 Project: Carbon Canyon Road & Carbon Mesa Road Waterline Improvements Photo Date: April 25, 2018 Direction: South Comment: Annual Brome Grasslands are most abundant along the sides of Carbon Canyon Road in between houses.
	Photograph # 12 Staging Area: RMD Winter Canyon Yard Photo Date: April 25, 2018 Direction: East/Northeast Comment: The RMD Winter Canyon Yard BSA is nearly entirely Ornamental/Developed. These areas are abundant throughout the entire project area.

	Photograph # 13 Staging Area: Zuma Beach (BSA) Photo Date: May 2, 2018 Direction: Southeast Comment: Open Sand is on Zuma Beach. This area is also designated as critical habitat for western snowy plover (federal threatened).
	Photograph # 14 Project: District No. 29 Creek Crossing Repair Project (Topanga Canyon Creek) Photo Date: April 23, 2018 Direction: South Comment: Facing south from the Topanga Canyon Creek footprint into Open Water lagoon habitat. This area is also designated as critical habitat for both steelhead (federal threatened) and tidewater goby (federal endangered.
	Photograph # 15 Project: District No. 29 Creek Crossing Repair Project (Pena Canyon Creek) Photo Date: April 23, 2018 Direction: North Comment: Facing upstream into Pena Canyon Creek over Cobble habitat at the creek mouth.

Appendix C
Species Observed

Table C-1. Wildlife Species Observed within the Biological Study Areas

Scientific Name	Common Name	Special Status
Fish		
Gambusia affinis	Western Mosquitofish	
Reptiles		
Elgaria multicarinata webbii	San Diego Alligator Lizard	
Sceloporus occidentalis	Western Fence Lizard	
Uta stansburiana elegans	Western Side-blotched Lizard	
Birds		
Anas platyrhynchos	Mallard	
Callipepla californica	California Quail	
Pelecanus occidentalis	Brown Pelican	
Egretta thula	Snowy Egret	
Cathartes aura	Turkey Vulture	
Accipiter cooperii	Cooper's Hawk	
Buteo jamaicensis	Red-tailed Hawk	
Charadrius vociferus	Killdeer	
Numenius phaeopus	Whimbrel	
Larus delawarensis	Ring-billed Gull	
Larus occidentalis	Western Gull	
Larus californicus	California Gull	
Thalasseus maximus	Royal Tern	
Thalasseus elegans	Elegant Tern	
Rynchops niger	Black Skimmer	CSC
**Columba livia*	Rock Pigeon	
Patagioenas fasciata	Band-tailed Pigeon	
Zenaida macroura	Mourning Dove	
Aeronautes saxatalis	White-throated Swift	
Calypte anna	Anna's Hummingbird	
Calypte costae	Costa's Hummingbird	
Selasphorus sasin	Allen's Hummingbird	
Melanerpes formicivorus	Acorn Woodpecker	
Picoides nuttallii	Nuttall's Woodpecker	
Colaptes auratus	Northern Flicker	
**Aratingus nenday*	Nanday Parakeet	
Empidonax difficilis	Pacific-slope Flycatcher	
Sayornis nigricans	Black Phoebe	
Myiarchus cinerascens	Ash-throated Flycatcher	
Tyrannus vociferans	Cassin's Kingbird	
Vireo cassinii	Cassin’s Vireo	
Vireo huttoni	Hutton's Vireo	
Vireo gilvus	Warbling Vireo	

Scientific Name	**Common Name**	**Special Status**
Aphelocoma californica	California Scrub-Jay	
Corvus brachyrhynchos	American Crow	
Stelgidopteryx serripennis	Northern Rough-winged Swallow	
Petrochelidon pyrrhonota	Cliff Swallow	
Baeolophus inornatus	Oak Titmouse	
Psaltriparus minimus	Bushtit	
Salpinctes obsoletus	Rock Wren	
Catherpes mexicanus	Canyon Wren	
Troglodytes aedon	House Wren	
Thryomanes bewickii	Bewick's Wren	
Polioptila caerulea	Blue-gray Gnatcatcher	
Regulus calendula	Ruby-crowned Kinglet	
Chamaea fasciata	Wrentit	
Toxostoma redivivum	California Thrasher	
Mimus polyglottos	Northern Mockingbird	
**Sturnus vulgaris*	European Starling	
Oreothypis celata	Orange-crowned Warbler	
Geothlypis trichas	Common Yellowthroat	
Setophaga coronata	Yellow-rumped Warbler	
Pipilo maculatus	Spotted Towhee	
Aimophila ruficeps canescens	Southern California Rufous-crowned Sparrow	
Melozone crissalis	California Towhee	
Passerella iliaca	Fox Sparrow	
Melospiza melodia	Song Sparrow	
Melospiza lincolnii	Lincoln’s Sparrow	
Zonotrichia leucophrys	White-crowned Sparrow	
Junco hyemalis	Dark-eyed Junco	
Pheucticus melanocephalus	Black-headed Grosbeak	
Passerina amoena	Lazuli Bunting	
Agelaius phoeniceus	Red-winged Blackbird	
**Molothrus ater*	Brown-headed Cowbird	
Icterus cucullatus	Hooded Oriole	
Haemorhous mexicanus	House Finch	
Carduelis psaltria	Lesser Goldfinch	
Mammals		
Ostospermophilus beecheyi	California Ground Squirrel	
Odocoileus hemionus	Southern Mule Deer	

*= Non-native or invasive species

Special Status:

Federal: FE = Endangered, FT = Threatened

State: SE = Endangered, ST =Threatened, CSC = California Species of Special Concern, CFP = California Fully Protected Species

Table C-2. Plant Species Observed within the Biological Study Areas

Scientific Name	**Common Name**	**Special Status**
Agavaceae	*Agave Family*	
Hesperoyucca whipplei	our lord's candle	
Anacardiaceae	*Sumac Family*	
Malosma laurina	laurel sumac	
Rhus integrifolia	lemonade berry	
*Schinus molle**	Peruvian pepper tree	
*Schinus terebenthifolius**	Brazillian pepper tree	
Toxicodendron diversilobum	poison oak	
Apiaceae	*Carrot Family*	
*Foeniculum vulgare**	fennel	
Arecaceae	*Palm Family*	
*Phoenix canariensis**	date palm	
*Washingtonia robusta**	Mexican fan palm	
Asteraceace	*Sun Flower Family*	
Artemisia californica	California sagebrush	
Baccharis pilularis	coyote brush	
Baccharis salicifolia	mule fat	
Carduus pycnocephalus	Italian thistle	
*Chrysanthemum coronarium**	chrysanthemum	
*Cotula coronopifolia**	African brass-buttons	
Corethrogyne filaginifolia	California aster	
Encelia californica	California encelia	
Eriophyllum confertiflorum	golden yarrow	
Helianthus annuus	common sunflower	
Heterotheca grandifolia	telegraph weed	
Jaumea carnosa	fleshy jaumea	
Venegasia carpesioides	canyon sunflower	
Xanthium strumarium	cocklebur	
Bignoniaceae	*Trumpet Creeper Family*	
*Jacaranda sp.**	jacaranda	
*Tecomaria capensis**	cape honeysuckle	
Brassicaceae	*Mustard Family*	
*Hirschfeldia incana**	summer mustard	
*Sisymbrium irio**	London rocket	
Cactaceae	*Cactus Family*	
Opuntia littoralis	coastal prickly pear	
Chenopodiaceae	*Goosefoot Family*	
Atriplex canescens	four-wing saltbush	
*Salsola tragus**	Russian thistle	

Scientific Name	**Common Name**	**Special Status**
Cucurbitaceae	*Cucumber Family*	
Marah macrocarpus	wild cucumber	
Cyperaceae	*Sedge Family*	
*Cyperus esculentus**	umbrella sedge	
Eleocharis palustris	common spike rush	
Schoenoplectus sp.	tule	
Euphorbiaceae	*Spurge Family*	
Croton setigerus	doveweed	
*Ricinus communis**	castor bean	
Fabaceae	*Pea Family*	
Acacia sp.*	acacia	
Acmispon americanus	American bird's foot trefoil	
Acmispon glaber	deer weed	
Fagaceae	*Oak Family*	
Quercus agrifolia	coast live oak	LCP
Quercus berberidifolia	California scrub oak	
Geraniaceae	*Geranium Family*	
*Erodium botrys**	long-beaked filaree	
*Erodium cicutarium**	red-stemmed filaree	
Juglandiaceae	*Walnut Family*	
Juglans californica var. *californica*	southern California black walnut	LCP
Lamiaceae	*Mint Family*	
Salvia apiana	white sage	
Salvia mellifera	black sage	
Nyctaginaceae	*Four O'clock Family*	
Abronia maritima	red sand verbena	CNPS 1B.1
Abronia umbellatum	beach sand verbena	
Bougainvillea sp.*	bougainvillea	
Mirabalis laevis	California wishbone bush	
Malvaceae	*Mallow Family*	
Malva parviflora	cheeseweed	
Malvella leprosa	alkali mallow	
Myrtaceae	*Myrtle Family*	
Eucalyptus sp.*	eucalyptus	
Melaleuca sp.*	bottle brush tree	
Oleaceae	*Olive Family*	
Fraxinus sp.*	ash	
Ligustrum sp.*	privet	
*Olea europa**	olive	
Pinaceae	*Pine Family*	
Pinus sp.*	pine	

Scientific Name	**Common Name**	**Special Status**
Platanaceae	*Plain Tree Family*	
Platanus racemosa	western sycamore	LCP
Plantaginaceae	*Plantain Family*	
Keckiella cordifolia	heart-leaved bush-penstemon	
*Veronica anagalis-aquatica**	great water speedwell	
Poaceae	*Grass Family*	
Arundo donax	giant reed	
Avena sp.*	wild oats	
*Brachypodium distachyon**	purple false brome	
*Bromus diandrus**	rip-gut brome	
*Bromus madritensis**	red brome	
*Cortaderia selloana**	pampas grass	
Cynodon dactylon	Bermuda grass	
Distichlis spicata	saltgrass	
Leymus condensatus	giant wild rye	
Paspalum sp.	crowngrass	
*Pennisetum setaceum**	fountain grass	
*Schismus barbatus**	Mediterranean schismus	
*Stipa miliaceum**	smilograss	
Stipa pulchra	purple needlegrass	
Polygonaceae	*Buckwheat Family*	
Eriogonum elongatum	longstem buckwheat	
Eriogonum fasciculatum	California buckwheat	
Rhamnaceae	*Buckthorn Family*	
Ceanothus leucodermis	lilac ceanothus	
Ceanothus sp.	ceanothus	
Frangula californica	coffeeberry	
Rosaceae	*Rose Family*	
Cercocarpus betuloides	mountain mahogany	
Heteromeles arbutifolia	toyon	LCP
Prunus ilicifolia	holly-leaved cherry	
Rubus ursinus	California blackberry	
Salicaceae	*Willow Family*	
Salix exigua	sand bar willow	
Salix laevigata	red willow	
Salix lasiolepis	arroyo willow	
Scrophulariaceae	*Figwort Family*	
Myoporum sp.*	myoporum	
Solanaceae	*Nightshade Family*	
*Nicotiana glauca**	tree tobacco	

Scientific Name	Common Name	Special Status
Typhaceae	*Cattail Family*	
Typha domingensis	cattail	

Legend

*= Non-native or invasive species

Special Status:

LCP	City of Malibu Local Coastal Plan, protected under Native Tree Protection Ordinance

California Native Plant Society (CNPS)

1A	Plants presumed extirpated in California and either rare or extinct elsewhere
1B	Plants rare, threatened, or endangered in California and elsewhere
1B.1	Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
1B.2	Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
1B.3	Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)
2A	Plants presumed extirpated in California, but common elsewhere
2B	Plants rare, threatened, or endangered in California, but more common elsewhere
3	Review List: Plants about which more information is needed
4	Watch List: Plants of limited distribution

Appendix D

Summary of Sensitive and Listed Species Potential to Occur Evaluation Results

Table D-1. Sensitive and Listed Species Potentials to Occur within the Biological Study Areas

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Invertebrates					
Bombus crotchii	crotch bumble bee	-/SCE/-	Generally inhabits grasslands and scrublands and nests underground. In the winter this species probably inhabits soft, disturbed soil or winters under leaf litter or other loose debris. Utilizes plants in the genera *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.	Limited marginal habitat is present within the BSA. Much of the BSA was burned in 2018, leaving highly-disturbed patches of native vegetation punctuated by dense weeds.	Low potential to occur at marginal habitat within BSA.
Branchinecta lynchi	Vernal pool fairy shrimp	FT/-/-	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains. Inhabit astatic, small rain-filled pools. Usually in clear-water sandstone-depression pools and grassed swales, earth slump, or basalt-flow depression pools.	No suitable habitat present.	Not expected to occur. There is no vernal pool habitat present within BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Euphilotes battoides allyni	El Segundo blue butterfly	FE/-/-	Restricted to remnant coastal dune habitat in Southern California. Host plant is Eriogonum parvifolium; larvae feed only on the flowers and seeds; used by adults as major nectar source.	No suitable habitat present. Open sand habitat within the BSA was not observed to have Sea cliff buckwheat (Eriogonum parvifolium).	Not expected to occur. The nearest record of occurrence is from approximately 9 miles south west at El Segundo Dunes in 2005. The open sand habitat within the BSA does not contain the host plant of El Segundo blue butterfly (Eriogonum parvifolium).
Euphydryas editha quino	quino checkerspot butterfly	FE/-/-	Sunny openings within chaparral and coastal sage shrublands in parts of Riverside and San Diego counties. Hills and mesas near the coast. Need high densities of food plants (Plantago erecta, P. insualris, and Orthocarpus purpurescens).	Outside known range of species distribution.	Not expected to occur. Outside of known range.
Haliotis cracherodii	black abalone	FE/-/-	Occurs in mid to low rocky intertidal areas.	No suitable habitat present.	Not expected to occur. There is no rocky intertidal habitat present within BSA.
Haliotis sorenseni	white abalone	FE/-/-	Found subtidally on rocky pinnacles and deep reefs in Southern California; especially those off the Channel Islands. Occurs at depths of at least 80 feet to over 200 feet.	No suitable habitat present.	Not expected to occur. There is no subtidal habitat present within BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Streptocephalus woottoni	Riverside fairy shrimp	FE/-/-	Endemic to western Riverside, Orange, and San Diego Counties in areas of tectonic swales/earth slump basins in grassland and coastal sage scrub. Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season.	Outside known range of species distribution.	Not expected to occur. Outside of known range.
Birds					
Agelaius tricolor	tricolored blackbird (Nesting colony)	-/ST/SSC	Inhabits freshwater marsh, swamp, and wetland areas. Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate (e.g. cattails), and foraging areas with insect prey within a few kilometers of the colony.	Open-water habitats with cattails are present within the BSA at estuaries; however the small extents of open water and cattails are not suitable for supporting tricolored blackbird.	Not expected to occur. Available habitat is too small in extent to support foraging and nesting within the BSA. Additionally, the BSA is outside of the typical distribution range for this species.
Aquila chrysaetos	golden eagle (Nesting & wintering)	-/-/CFP	Rolling foothills, mountain areas, sage-juniper flats, and desert habitats. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	There is no nesting habitat present within the BSA. Marginal foraging habitat is present within the BSA as sites at the base of the Santa Monica Mountains.	Low potential to occur at marginal foraging habitat within BSA. Golden eagles occur in the Santa Monica Mountains; however, the species typically stays inland and is rarely found on the immediate coast.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Athene cunicularia	burrowing owl (burrow sites & some wintering sites)	-/-/SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Marginally suitable habitat is present within the BSA in grassland and scrub habitats; however, the BSA is outside the known and predicted ranges for burrowing owl (CDFW 2019).	Not expected to occur. The most consistently used areas for this species are in the Playa del Rey area near Ballona Creek and at Naval Air Station Point Mugu (eBird 2019). The BSA is outside the known and predicted ranges for burrowing owl (CDFW 2019).
Brachyramphus marmoratus	marbled murrelet	FT/SE/-	Breeds in coastal forests from Alaska through northern California, nesting primarily in redwood-dominated forests in California. Winters offshore or along the coast to Santa Barbara County and is rare south to Baja California.	No suitable nesting habitat present and out of range for breeding birds. May occur very rarely in winter.	Not expected to occur. There are a very small number of records of this species over the last several decades along the Los Angeles County coast, but realistically this species is not expected to occur in this area.
Buteo swainsoni	Swainson's hawk (Nesting)	-/ST/-	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	No suitable habitat present.	Not expected to occur. This species is an occasional migrant along the coast, but there is no suitable breeding habitat present within BSA. This species no longer breeds in Los Angeles County outside of the Antelope Valley on the western end of the Mojave Desert.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Charadrius nivosus ssp. nivosus	western snowy plover (Nesting)	FT/-/SSC	Sandy beaches, salt ponds levees, and shores of large alkali lakes. Needs sandy, gravelly, or friable soils for nesting. Forages in areas of sandy beach above and below the high-tide line, with occasional surf-cast wrack supporting small invertebrates, and generally barren to sparsely vegetated terrain.	Sandy beach habitats are present within BSA; however, they are heavily disturbed by adjacent residences and/or recreational use. Thus, they are generally not suitable for snowy plover nesting. The sandy beach habitats within the BSA may support marginal foraging habitat for snowy plover, with marginal breeding habitat at Malibu State Beach.	Low potential to nest within BSA; high potential for foraging within the BSA. This species is a regular non-breeding inhabitant of Malibu-area beaches. More recently, snowy plovers began nesting for the first time in 70 years in very small numbers in Los Angeles County in spring 2017, including two nests on Malibu State Beach. This species has continued to nest on Malibu State Beach in 2018, with a fenced enclosure surrounding the nest(s) for protection. It may be present year-round, albeit in small numbers during the breeding season.
Coturnicops noveboracensis	yellow rail	-/-/SSC	Summer resident in Eastern Sierra Nevada in Mono County. Found in freshwater marshlands. Requires densly vegetated marshes for breeding, and may inhabit wet meadows and coastal tidal marshes in winter.	No suitable breeding habitat present; not known to breed in Southern California. Small areas of alkaline/emergent wetlands along lagoons within the BSA may provide marginal wintering habitat, although the species is rarely observed in Southern California.	Not expected to occur. This species is a rare vagrant anywhere in southern California and is not expected within the BSA. The only record for Los Angeles County is from 1998 at Manhattan Beach (CBRC 2018, CDFW 2019).

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Elanus leucurus	white-tailed kite (Nesting)	-/-/CFP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging, close to isolated, dense-topped trees for nesting and perching.	Small portions of the BSA may provide suitable nesting habitat where riparian woodland habitats are present in proximity to suitable foraging habitat, such as within the BSA of the Zuma Creek, Emergency Source of Water Supply Connection (Las Virgenes Connection), PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Carbon Canyon Road & Carbon Mesa Road, PCH & Topanga Beach Drive Segment 1, Big Rock Bypass Improvement, and Pena Canyon Creek sites.	Moderate potential to occur/nest within the BSA. Suitable foraging and nesting habitat is present with the BSA. This species was documented to fledge at least three young at Malibu Lagoon in 2013, but is not known to have nested at this location since, although adults were still recorded until 2016; a lack of records anywhere in Malibu since 2016 would suggest that the pair that was previously living in Malibu is no longer present (eBird 2019). Therefore, there is a moderate potential for white-tailed kite to occur or nest within the BSA.
Empidonax traillii extimus	Southwestern willow flycatcher (Nesting)	FE/SE/-	Occurs in riparian woodlands in Southern California. Generally flycatchers nest in areas with willows, tamarisk, or both. Nesting usually occurs along major drainages. Patches or small areas of riparian vegetation are usually unsuitable for nest placement (e.g. vegetation is too short, too sparse, or patch is too small).	No suitable breeding habitat present; patches of riparian woodland are likely too small to support nesting. Riparian habitats within the BSA could be used by flycatcher for foraging, migrating, and dispersing.	Not expected to nest within the BSA. Low potential to occur in marginal foraging habitat (not nesting) in patches of riparian woodland within BSA. This species is recorded in casual numbers (i.e. may or may not be found annually) in the Malibu area, strictly during migration, most often at Malibu Lagoon (CDFW 2019).

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Falco peregrinus anatum	American peregrine falcon (Nesting)	FD/SD/CFP	Nests near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Suitable nesting habitat may be present where steep canyons, creek banks, or structures occur within the BSA.	Moderate potential to occur within the BSA at creek banks, ledges, or structures. This species is commonly found along cliffy coastlines. It is known to occur in the Santa Monica Mountains regional area (CDFW 2019). Not expected to nest within the BSA due to lack of suitable habitat.
Laterallus jamaicensis coturniculus	California black rail	-/ST/CFP	Inhabits freshwater marshes, wet meadows, and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat. Usually nests in pickleweed.	Suitable nesting habitat is not present within the BSA. Wetland habitats within the BSA do not consists of extensive enough marsh habitat to support California black rail.	Not expected to occur within the BSA. There is no suitable habitat present within BSA. The nearest recorded occurrences are in the Oxnard and Santa Monica areas from the 1920s and 1930s (CDFW 2019).
Passerculus sandwichensis beldingi	Belding's savannah sparrow	-/SE/-	Inhabits coastal salt marshes, from Santa Barbara south through San Diego County. Nests in Salicornia, on and about margins of tidal flats.	Suitable nesting habitat is not present within the BSA. Wetland habitats within the BSA do not consists of extensive enough marsh habitat to support Belding's savannah sparrow.	Not expected to occur within the BSA. There is no suitable habitat present within BSA. The nearest recorded occurrence of an extant breeding population is at the Ballona Wetlands in 2001 (CDFW 2019).

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Pelecanus occidentalis californicus	California brown pelican (Nesting colony & communal roosts)	FD/SD/CFP	Colonial nester on Anacapa and Santa Barbara Islands. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Roosts communally. Marine forager.	Suitable nesting and foraging habitat is not present within the BSA, but limited roosting habitat is present.	Not expected to nest or roost communally within the BSA.
Polioptila californica californica	coastal California gnatcatcher	FT/-/SSC	Obligate, permanent resident of coastal sage scrub below 2,500 feet elevation in Southern California. Low, coastal sage scrub in arid washes, on mesas, and slopes. Not all areas classified as coastal sage scrub are occupied.	Coastal sage scrub habitat is present within portions of the BSA. Most of the coastal sage scrub-chaparral habitat is disturbed.	Not expected to occur within the BSA. Although coastal sage scrub habitat is present within the BSA, the species is known to be generally absent from the coastal side of the Santa Monica Mountains (Garrett pers. comm. 2018, Dellith pers. comm. 2018).
Rallus obsoletus levipes (formerly Rallus longirostris levipes)	light-footed Ridgway's rail (formerly light-footed clapper rail)	FE/SE/CFP	Found in salt marshes traversed by tidal sloughs, where cordgrass and pickleweed are the dominant vegetation. Requires dense growth of either pickleweed or cordgrass for nesting or escape cover.	Suitable nesting habitat is not present within the BSA. Wetland habitats within the BSA do not consists of extensive enough marsh habitat to support Ridgway's rail.	Not expected to occur within the BSA. There is no suitable habitat present within BSA. While one lone bird was present at Malibu Legacy Park in fall 2017, the otherwise nearest recorded occurrences are in the Mugu Lagoon marshes and at Ballona Freshwater Marsh (eBird 2019).

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Riparia riparia	bank swallow (Nesting)	-/ST/-	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks and/or cliffs with fine-textured and/or sandy soils near streams, rivers, lakes, or the ocean to dig nesting hole.	Marginal nesting habitat may be present within the BSA where creeks pass through steep canyons.	Not expected to occur. Marginal nesting habitat may be present within the BSA; however, the species is not known to nest in Southern California and nearby historic colonies have been extirpated (CDFW 2019).
Sternula antillarum browni	California least tern (Nesting colony)	FE/SE/CFP	Nests along the coast from San Francisco Bay south to Northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas.	Marginal nesting habitat may be present within the BSA where open sand is present.	Not expected to occur. Marginal nesting habitat may be present within the BSA; however, the species is not known to nest along the Malibu coastline and does not forage more than a few miles from colonies (USFWS 2006b, CDFW 2019).
Vireo bellii pusillus	least Bell's vireo (Nesting)	FE/SE/-	Summer resident of Southern California in low riparian habitat in the vicinity of water or in dry river bottoms, below 2,000 feet. Nests are placed along margins of bushes or on twigs projecting into pathways, usually in willow, baccharis, or mesquite.	Marginal breeding habitat present where riparian vegetation consists of willows and baccharis. Riparian habitats within the BSA could be used by vireo for foraging, migrating, and dispersing.	Low potential to occur in marginal foraging habitat (not nesting) within BSA. Nearest recent observation was in 2017 along the northern half of the Santa Monica Mountains (eBird 2019). Generally very rare on the coastal slope of the Santa Monica Mountains (Garrett pers. comm. 2018, Dellith pers. comm. 2018).

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Reptiles & Amphibians					
Anaxyrus californicus	arroyo toad	FE/-/SSC	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in the drier parts of the range.	Marginal habitat may be present in small drainages within the BSA; however, the species' known range does not include the coastal side of the Santa Monica Mountains.	Not expected to occur. Marginal habitat in small drainages is present within the BSA; however, the BSA is outside of the species known range, and the nearest documented occurrence is from the San Fernando Valley (CDFW 2019).
Anniella stebbinsi	southern California legless lizard	-/-/SSC	Generally found south of the Transverse Range, extending to the Northwestern Baja California. Occurs in sandy or loose, loamy soils under sparse vegetation. Disjunct populations occur in the Tehachapi and Piute Mountains in Kern County. Found in a variety of habitats; generally in moist, loose soils. Prefer soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrence of southern California legless lizard was documented at Point Dume in 2017, within the geographic extent of the project sites' distribution (CDFW 2019).

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Anniella sp. 1	California legless lizard	-/-/SSC	**Note - this element record represents California records of Anniella not yet assigned to the new species within the Anniella pulchra complex.** Contra Costa County south to San Diego, within a variety to open habitats. Found in a variety of habitats, generally in moist, loose soil. Prefer soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats. This sub-species of legless lizard is no longer recognized (SSAR 2017). See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur within the BSA. Nearest recent occurrences of Anniella sp. documented in Westlake in 2009 (CDFW 2019); however, this sub-species is no longer recognized in the area. See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).
Anniella pulchra pulchra	silvery legless lizard	-/-/SSC	**Note - this is a subspecies of California legless lizard entered in unprocessed CNDDB data, and CNDDB treats it as Anniella sp. 1.** Found in chaparral, coastal dunes, or coastal scrub habitats with sandy or loose loamy soils, usually under sparse vegetation. Soil moisture is essential. Species prefers soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats. This sub-species of legless lizard is no longer recognized (SSAR 2017). See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur within the BSA. Nearest recent occurrences of Anniella sp. were documented in Westlake in 2009 (CDFW 2019); however, this sub-species is no longer recognized in the area. See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).
Aspidoscelis tigris stejnegeri	coastal whiptail (syn. San Diegan tiger whiptail)	-/-/SSC	Found in deserts and semiarid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. Ground may be firm soil, sandy, or rocky.	Suitable habitat present within the BSA in coastal sage scrub, chaparral, woodland, and riparian habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Multiple recent occurrence of coastal whiptail were documented in the Santa Monica Mountains during the 2000s (CDFW 2019).

Scientific Name	**Common Name**	**Listing Status**[1]	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Caretta caretta	North Pacific loggerhead sea turtle	FE/-/-	Pelagic species that rarely comes to land. Nests on beaches in Mexico, Brazil, Japan, South Africa, Oman, Australia, and the southeastern United States.	No suitable habitat present.	Not expected to occur. No suitable habitat present.
Chelonia mydas	East Pacific green sea turtle	FT/-/-	Marine species that rarely comes to land. Nesting sites in the Eastern Pacific include Panama, Costa Rica, Nicaragua, Guatemala, El Salvador, Michoacan, Chiapas, and Baja California. Can be found in shallow waters of lagoons, bays, estuaries, mangroves, eelgrass and seaweed beds. Uncommon to the California coast.	No suitable habitat present.	Not expected to occur. No suitable habitat present.
Dermochelys coriacea	leatherback sea turtle	FE/-/-	Marine, pelagic species that rarely comes to land. Primary nesting beaches are in the Pacific are Mexico, Costa Rica, and Indonesia. In the United States, nesting occurs on beaches in Florida and Georgia.	No suitable habitat present.	Not expected to occur. No suitable habitat present.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Emys marmorata (syn. *Actinemys pallida)*	western pond turtle (syn. southwestern pond turtle)	-/-/SSC	Aquatic turtle found in ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation, below 6,000 feet elevation. Requires basking sites and suitable upland habitat (usually sandy banks or grassy open fields) up to 0.3 mile from water for egg-laying.	Suitable aquatic and upland nesting habitat is present within the BSA. Wetland habitats within the BSA could provide freshwater feeding areas, with exposed basking opportunities, and adjacent upland habitat for nesting.	High potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of southwestern pond turtle were in Triunfo, Las Virgenes, Malibu, and Topanga creeks in the 1980s through 2000s (CDFW 2019), and the species generally is known to occur in streams of the Santa Monica Mountains (Nafis 2018, RCD of the Santa Monica Mountains 2015).
Lepidochelys olivacea	Olive Ridley sea turtle	FE/-/- (breeding populations on the Pacific Coast of Mexico); Threatened (all other populations)	Marine species that is found out to sea and in protected, relatively shallow bays and lagoons, and in shallow water between reefs and the shore. Nesting occurs from Costa Rica to Baja California.	No suitable habitat present.	Not expected to occur. No suitable habitat present.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Phrynosoma blainvillii	coast horned lizard (syn. Blainville's horned lizard)	-/-/SSC	Frequents a wide variety of habitats, including chaparral, cismontane woodland, coastal bluff scrub, coastal scrub, desert wash, pinon and juniper woodlands, riparian scrub, riparian woodland, and valley and foothill grassland. Most common in lowlands along sandy washes with scattered low bushes. Uses open areas for sunning, bushes for cover, patches of loose soil for burial, and requires an abundant supply of ants and other insects.	Suitable habitat present within the BSA in coastal sage scrub, chaparral, woodland, and riparian habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of horned lizard were in Latigo Canyon, Topanga Canyon areas in the 1990s (CDFW 2019), and the species generally is known to occur in the Santa Monica Mountains (Nafis 2018). If present, this species is most likely to occur at the more inland sites where coastal sage scrub and chaparral are present.

Scientific Name	**Common Name**	**Listing Status**[1]	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Rana draytonii	California red-legged frog	FT/-/SSC	Lowlands and foothills in or near permanent sources of deep water (2 feet or greater) with dense, shrubby, or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat (such as existing burrows or downed tree debris).	Suitable habitat may occur within the BSA where semi-permanent to permanent water is present, such as in perennial or intermittent streams. California red-legged frogs do not tolerate elevated salinity, such as may occur in the small coastal lagoons and alkaline wetlands along the Malibu coastline.	Low potential to occur where suitable habitat may be present within the BSA. There is a known population in upper Las Virgenes Creek (CDFW 2019), and the species has been reintroduced to portions of the Santa Monica Mountains, but it is not likely to occur within the lowest reaches of coastal streams within the BSA at this time (Dellith pers. comm. 2018). In addition, during the Woolsey Fire of 2018, most of the local reintroduced populations were severely affected or extirpated by mudslides and fire. Therefore, there is a low potential for California red-legged frog to occur within the BSA.
Spea hammondii	western spadefoot	-/-/SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	No suitable habitat present within the BSA.	Not expected to occur. No suitable habitat present.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Thamnophis hammondii	two-striped gartersnake	-/-/SSC	Found in coastal California from the vicinity of Salinas to northwest Baja California, from sea level to about 7,000 feet of elevation. Highly aquatic, found in or near permanent fresh water, often along streams with rocky beds and riparian growth.	Suitable habitat may occur within the BSA where permanent water is present in perennial streams. Two-striped gartersnake do not tolerate elevated salinity, such as may occur in the small coastal lagoons and alkaline wetlands along the Malibu coastline.	Low potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of two-striped gartersnake were in Triunfo Creek in 1998 and in Sycamore Canyon in 2009 (CDFW 2019). The species is known to occur in the Santa Monica Mountains (Nafis 2018).
Fish					
Acipenser medirostris	green sturgeon - Southern DPS	FT/-/SSC	Most marine species of sturgeon, mostly found north of Point Conception. Spawns in the Sacramento, Klamath, and Trinity rivers. Spawns at water temperatures between 8-14°C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	No suitable habitat present and outside known range of species.	Not expected to occur. No suitable habitat present, and outside known range of species.
Eucyclogobius newberryi	tidewater goby	FE/-/SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches. The species needs fairly still, but not stagnant water and high oxygen levels.	Suitable habitat is present within the BSA where PCH crosses Malibu Lagoon/Malibu Creek and Topanga Creek, and may also be present at other perennial, brackish waters within the BSA.	High potential to occur. This species was reintroduced to Malibu Lagoon in the 1990s (CDFW 2019) and now occurs in both Malibu Lagoon/Creek and Topanga Creek (USFWS 2013). It is unknown if tidewater goby are present within the BSA at other locations at this time.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Gila orcuttii	arroyo chub	-/-/SSC	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mohave, and San Diego river basins. Found in slow-water stream sections with mud or sandy bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	Suitable habitat is present within the BSA where PCH crosses Malibu Lagoon/Malibu Creek, and may also be present at other perennial, fresh waters within the BSA.	High potential to occur. Arroyo chub are known to occur in Malibu Creek (CDFW 2019) and may occur in other coastal streams within the geographic area of the Project. When sandbars block saltwater from entering lagoons and upstream areas may be dominated by freshwater, conditions may exist for this species to occur within the BSA. This species would not be expected when sandbars are open and water in the BSA is presumably brackish.
Oncorhynchus mykiss irideus pop. 10	steelhead - Southern California DPS	FE/-/-	Can be found in streams that have connectivity to the ocean. Federally listed populations occur from the Santa Maria River south to southern extent of the species' range (San Mateo Creek in San Diego County). Southern steelhead likely have greater physiological tolerances to warmer water more variable conditions than their northern counterparts.	Suitable habitat is present within the BSA where the BSA crosses Topanga Creek, and may also be present at other small coastal streams within the BSA depending upon hydrologic and water quality conditions.	High potential to occur. Within the BSA, steelhead are known to occur in Topanga Creek. They also occur nearby in Malibu Creek (CDFW 2019, NMFS 2016). When sandbars are open, adults or smolts may enter or exit through estuaries, and if sandbars are closed, smolts, juveniles, and/or resident adults may also be present in lagoons or lower creek reaches.

Scientific Name	**Common Name**	**Listing Status**[1]	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Mammals					
Antrozous pallidus	pallid bat	-/-/SSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Pallid bats are known to use bridges for roosting. Very sensitive to disturbance of roosting sites.	Suitable foraging habitat is present within the BSA where dry shrublands, such as chaparral habitat, and woodlands occur. Suitable roosting habitat, such as bridges, is present within the BSA.	Low potential to occur. The nearest records of occurrence are from the Simi Hills in 2004, and historically from Encino Park in 1951 and near Culver City in 1932 (CDFW 2019). Suitable foraging habitat is present within the BSA. Pallid bats are known to use bridges for roosting (Caltrans 2016); therefore, suitable roosting habitat is present within the BSA. However, roosting pallid bats are very sensitive to disturbance and habitats in the vicinity of the BSA are generally disturbed by road and residential activities. Thus, the species has a low potential to occur within the BSA.
Arctocephalus townsendi	Guadalupe fur seal	FT/ST/CFP	Guadalupe fur seals breed along the eastern coast of Guadalupe Island, and have been observed in the southern California Channel Islands.	No suitable habitat present and outside known range of species.	Not expected to occur. No suitable habitat present and outside known range of species.
Balaenoptera musculus	blue whale	FE/-/-	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.
Balaenoptera physalus	fin whale	FE/-/-	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.
Balaenoptera borealis	sei whale	FE/-/-	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Euderma maculatum	spotted bat	-/-/SSC	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting, and rarely uses bridges.	Suitable foraging habitat is present within the BSA at lagoons and creeks. Marginally suitable roosting habitat is present within the BSA at bridges.	Low potential to occur. Suitable foraging habitat is present within or adjacent to the BSA at coastal lagoons and creek crossings. The nearest record of occurrence is from Malibu Creek State Park in 2003, approximately 4 miles north of the BSA (CDFW 2019). Marginally suitable roosting habitat is present within the BSA at bridges. Thus, the species has a low potential to occur within the BSA.
Eubalaena japonica	North Pacific right whale	FE/-/-	Marine pelagic species.	No suitable habitat present	Not expected to occur. No suitable habitat present.
Eumops perotis californicus	western mastiff bat	-/-/SSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces, high buildings, trees, and tunnels, and might use bridges.	Suitable foraging habitat is present within the BSA in woodland, coastal scrub, and chaparral habitats. Potentially suitable roosting habitat occurs within the BSA at bridges, high buildings, or large trees.	Moderate potential to occur. Suitable foraging habitat and roosting habitat is present within the BSA. The nearest records of occurrence are approximately 4 to 5 miles north of the BSA, from Malibu Creek State Park in 2004, Topanga State Park in 2003, and Peter Strauss Ranch in 2004 (CDFW 2019). Thus, western mastiff bat has a moderate potential to occur within the BSA.

Scientific Name	**Common Name**	**Listing Status[1]**	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Lasiurus blossevillii	western red bat	-/-/SSC	Roosts primarily in trees, 2–40 feet above ground, from sea level up through mixed conifer forests. Not known to roost in bridges. Prefers habitat edges and mosaics, with trees that are protected from above and open below, with open areas for foraging.	Suitable foraging habitat is present within the BSA in relatively open coastal scrub and chaparral habitats. Suitable roosting habitat occurs within the BSA where large trees occur.	Moderate potential to occur. Suitable foraging habitat and roosting habitat is present within the BSA. The nearest records of occurrence are approximately 3 to 5 miles north of the BSA, at Paramount Ranch, Peter Strauss Ranch, and the Stunt Ranch Reserve in 2004 (CDFW 2019). Thus, western red bat has a moderate potential to occur within the BSA.
Macrotus californicus	California leaf-nosed bat	/-/SSC	Found in desert riparian, desert wash, desert scrub, desert succulent scrub, alkali scrub, and palm oasis habitats. Needs rocky, rugged terrain with mines or caves for roosting. Rarely roosts in bridges.	No suitable foraging habitat present. Marginally suitable roosting habitat present at bridges. Species only known from desert habitats of Southern California.	Not expected to occur. Marginally suitable roosting habitat is present at bridges; however, the BSA is outside of the known range of the species, and no suitable foraging habitat is present or known to occur in the vicinity. Thus, California leaf-nosed bat is not expected to occur within the BSA.
Megaptera novaeangliae	humpback whale	FE/-/-	Marine pelagic species.	No suitable habitat present	Not expected to occur. No suitable habitat present.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Microtus californicus stephensi	south coast marsh vole	-/-/SSC	Found in tidal marshes in Los Angeles, Orange, and southern Ventura counties.	Potentially suitable tidal marsh habitats are present within the BSA.	Low potential to occur. Potentially suitable tidal marsh habitats (alkaline wetlands) are present within the BSA; however their small extents and generally disturbed nature due to recreational, nearby residential, and/or road usage activities reduces their potential to be used by south coast marsh vole. The nearest record of occurrence is approximately 9 miles southwest of the BSA at the Ballona Wetlands from 2004 (CDFW 2019). Thus, the south coast marsh vole has a low potential to occur within the BSA.
Neotoma lepida intermedia	San Diego desert woodrat	-/-/SSC	Found in coastal scrub of Southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. Particularly abundant in rock outcrops and in rocky cliffs and slopes.	Suitable coastal scrub habitat is present within the BSA.	Present. San Diego desert woodrat nest was observed within the BSA and suitable coastal scrub habitat occurs within the BSA. The nearest record of occurrence is from Pepperdine University campus in 1995 (CDFW 2019).
Orcinus orca	Southern resident killer whale	FE/-/-	Marine pelagic species.	No suitable habitat present	Not expected to occur. No suitable habitat present.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Perognathus longimembris brevinasus	Los Angeles pocket mouse	-/-/SSC	Found in lower elevation grasslands and coastal sage communities in and around the Los Angeles Basin. Open ground with fine, sandy soils. May not dig extensive burrows, hiding under weeds and dead leaves instead.	Suitable coastal scrub habitat is present within the BSA.	Low potential to occur. There are no recent records of Los Angeles pocket mouse in the vicinity of the project; the nearest historical record is from the San Fernando Valley in 1903 (CDFW 2019).
Perognathus longimembris pacificus	Pacific pocket mouse	FE/-/SSC	Inhabits the narrow coastal plains from the Mexican border north to El Segundo, Los Angeles County. Seems to prefer soils of fine alluvial sands near the ocean.	Suitable habitat present within the BSA; however, outside the known range of the species.	Not expected to occur. Outside known range of species.
Physeter macrocephalus	sperm whale	FE/-/-	Marine pelagic species.	No suitable habitat present	Not expected to occur. No suitable habitat present.
Sorex ornatus salicornicus	southern California saltmarsh shrew	-/-/SSC	Found in coastal marshes in Los Angeles, Orange, and Ventura counties. Requires dense vegetation and woody debris for cover.	Potentially suitable tidal marsh habitats are present within the BSA.	Low potential to occur. Potentially suitable tidal marsh habitats (alkaline wetlands) are present within the BSA; however their small extents and generally disturbed nature due to recreational, nearby residential, and/or road usage activities reduces their potential to be used by southern California saltmarsh shrew. The nearest record of occurrence is approximately 9 miles southwest of the BSA at the Ballona Wetlands from 1991 (CDFW 2019). Thus, the species has a low potential to occur within the BSA.

Scientific Name	**Common Name**	**Listing Status^1**	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Taxidea taxus	American badger	-/-/SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Marginally suitable habitat is present within the BSA in chaparral, scrub, woodland, and/or grassland habitats; however, no large burrows were observed within the BSA.	Low potential to occur. The nearest recent records of badger were observed within the Santa Monica Mountains National Recreation Area north of Malibu along Kanan-Dume Road, within the geographic extent of the project. Marginally suitable habitat is present within the BSA. However, no large burrows were observed within the BSA; thus, there is a low potential for badger to use the area for foraging and denning.
Plants					
Abronia maritima	red sand-verbena	-/-/4.2	Perennial herb. Occurs in coastal dunes. 0-328 feet. Blooms February-November.	Open sand habitat is present within the BSA, and some dune habitat is also present.	Present within the BSA at the Zuma Creek Staging Area. There are multiple occurrences of red sand-verbena along the Malibu coastline from the early 1900s through 2013, including at Zuma Beach (Calflora 2018).
Arenaria paludicola	Marsh sandwort	FE/SE/1B/1	Perennial stoloniferous herb. Occurs in marshes and swamps. Found growing up through dense mats of Typha, Juncus, Scirpus, etc. in freshwater marsh with sandy soil. 10-558 feet. Blooms May-August.	Freshwater marsh habitat is not present within the BSA.	Not expected to occur. There is no freshwater marsh habitat present within the BSA. Nearest historical occurrence was recorded in Cienega area in 1900 (Calflora 2018, CDFW 2019). Thus, there marsh sandwort is not expected to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Asplenium vespertinum	western spleenwort	-/-/4.2	Perennial rhizomatous herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, in rocky areas. 262-3,281 feet. Blooms February-June.	Coastal scrub habitats are present in portions of the BSA.	Low potential to occur. Most of the coastal scrub habitats within the BSA are disturbed and dominated by nonnative species. The nearest record of occurrence is from Lake Sherwood near Westlake Village in 1963 (Calflora 2018). Thus, there is a low potential for western spleenwort to occur within the BSA.
Astragalus brauntonii	Braunton's milk-vetch	FE/-/1B.1	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in recent burns or disturbed areas; usually on sandstone with carbonate layers. Soil specialist; requires shallow soils to defeat pocket gophers and open areas, preferably on hilltops, saddles, or bowls between hills. 10-2,100 feet. Blooms January-August.	Chaparral, coastal scrub, and nonnative grassland habitats are present in portions of the BSA.	Moderate potential to occur in disturbed areas of suitable habitat. There are chaparral, coastal scrub, and nonnative grassland habitats within the BSA. In addition, recent local occurrences have been documented at Zuma Ridge in 2007, at upper Zuma Canyon near 2002, and at Malibu Lagoon in the 1980s (Calflora 2018, CDFW 2019). Thus, there is a moderate potential for Braunton's milk-vetch to occur within the BSA. It may be more likely to occur in areas burned by the 2018 Woolsey Fire for the next several years.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Astragalus pycnostachyus var. lanosissimus	Ventura Marsh milk-vetch	FE/SE/1B.1	Perennial herb. Occurs in marshes, swamps, coastal dunes, and coastal scrub habitats. Found within reach of high tide or protected by barrier beaches; more rarely found near seeps on sandy bluffs. 3-115 feet. Blooms June-October.	Marsh, coastal dune, and coastal scrub habitats within reach of high tide are present within the BSA.	Low potential to occur. Most of the marsh and coastal scrub habitats within the BSA are disturbed and/or dominated by nonnative species. Nearest historical occurrences were recorded near Santa Monica in the late 1800s and early 1900s (Calflora 2018). Thus, there is a low potential for Ventura Marsh milk-vetch to occur within the BSA.
Astragalus tener var. titi	coastal dunes milk-vetch	FE/SE/1B.1	Annual herb. Occurs in coastal bluff scrub, coastal dunes, and coastal prairie habitats. Found in moist, sandy depressions of bluffs or dunes along and near the Pacific Ocean; one site was found on a clay terrace. 3-148 feet. Blooms March-May.	Coastal dune habitat is present within the BSA.	Low potential to occur. The coastal dune habitats within the BSA are highly disturbed. Nearest historical occurrence was in Santa Monica in 1930 (Calflora 2018). Thus, there is a low potential for coastal dunes milk-vetch to occur within the BSA.
Atriplex coulteri	Coulter's saltbush	-/-/1B.2	Perennial herb. Occurs in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland habitats. Found on ocean bluffs and ridgetops, as well as in low places in alkaline or clay soils. 6-1,509 feet. Blooms March-October.	Coastal dune, coastal scrub, and nonnative grassland habitats are present within the BSA.	Moderate potential to occur. There are coastal dune, coastal scrub, and nonnative grassland habitats within the BSA. In addition, recent local occurrences have been documented at Malibu Bluffs in 2009 and at Point Dume in 1991 (CDFW 2019, Calflora 2018). Thus, there is a moderate potential for Coulter's saltbush to occur within the BSA.

Scientific Name	Common Name	Listing Status¹	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Atriplex pacifica	south coast saltscale	-/-/1B.2	Annual herb. Occurs in coastal scrub, coastal bluff scrub, playas, and coastal dunes habitats. Found in alkali soils. 3-1,312 feet. Blooms March-October.	Coastal scrub and coastal dune habitats are present within the BSA.	Low potential to occur within the BSA. The coastal dune and coastal scrub habitats within the BSA are highly disturbed. Nearest historical occurrence was in Santa Monica Mountains in 1881 (Calflora 2018). Thus, there is a low potential for Coulter's saltbush to occur within the BSA.
Atriplex parishii	Parish's brittlescale	-/-/1B.1	Annual herb. Occurs in vernal pools, chenopod scrub, and playas habitats. Usually found on drying alkali flats with fine soils. 16-4,659 feet. Blooms June-October.	No suitable habitat present within the BSA.	Not expected to occur within the BSA. There are no vernal pools, chenopod scrub, or playas habitats present within the BSA. Additionally, the Calflora lists Parish's brittlescale as occurring in the Beverly Hills quad; however, there are no records for the species there (Calflora 2018). The CNDDB has an undated record of the species collected near Santa Monica (CDFW 2019). Thus, Parish's brittlescale is not expected to occur within the BSA.
Atriplex serenana var. davidsonii	Davidson's saltscale	-/-/1B.2	Annual herb. Occurs in coastal bluff scrub and coastal scrub habitats. Found in alkaline soil. 33-656 feet. Blooms April-October.	Coastal scrub habitats are present within the BSA.	Low potential to occur within the BSA. The coastal scrub habitats within the BSA are highly disturbed. Nearest recorded occurrence was in Malibu/Las Virgenes Canyon in 1974 (Calflora 2018). Thus, there is a low potential for Davidson's saltscale to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Baccharis malibuensis	Malibu baccharis	-/-/1B.1	Perennial deciduous shrub. Occurs in coastal scrub, chaparral, cismontane woodland, and riparian woodland habitats. Found in Conejo volcanic substrates, often on exposed roadcuts. Sometimes occupies oak woodland habitat. 492-1,050 feet. Blooms August.	Coastal scrub, chaparral, and riparian woodland habitats occur within the BSA; however, Conejo volcanic substrates may not be present, as indicated by existing soil map units (USDA/NRCS 2018).	Moderate potential to occur within the BSA. There are coastal scrub, chaparral, and riparian woodland habitats within the BSA and some volcanic and igneous soils in the BSA. The coastal scrub, chaparral, and riparian woodland habitats within the BSA are highly disturbed, but Conejo volcanic substrates may not be present (USDA/NRCS 2018). In addition, a relatively recent local occurrence was documented in Solstice Canyon Park in 2000 (Calflora 2018). Thus, there is a moderate potential for Malibu baccharis to occur within the BSA.
Calandrinia breweri	Brewer's calandrinia	-/-/4.2	Annual herb. Occurs in chaparral and coastal scrub habitats, in sandy or loamy soils, and at disturbed sites and burns.33-4,003 feet. Blooms March-June, and occasionally as early as January.	Chaparral and coastal scrub habitats with sandy or loamy soils, and disturbed sites occur within the BSA.	Moderate potential to occur within the BSA. There are chaparral and coastal scrub habitats with and sandy loamy soils within the BSA. In addition, multiple local occurrences have been documented in the Santa Monica Mountains and along the Malibu Coastline from the early 1900s through 2005 (Calflora 2018). Thus, there is a moderate potential for Brewer's calandrinia to occur within the BSA.

Scientific Name	**Common Name**	**Listing Status**[1]	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Calochortus catalinae	Catalina mariposa-lily	-/-/4.2	Perennial bulbiferous herb. Occurs in valley and foothill grassland, chaparral, coastal scrub, and cismontane woodland habitats. Found in heavy soils, open slopes, openings in brush. 49-2,297 feet. Blooms March-June, occasionally as early as February.	Chaparral, coastal scrub, and nonnative grassland habitats with sandy or loamy soils, and disturbed sites occur within the BSA.	Moderate potential to occur within the BSA. There are coastal dune, coastal scrub, and nonnative grassland habitats within the BSA In addition, many occurrences have been documented in the Santa Monica Mountains and along the Malibu coastline from the early 1900s through 2010 (Calflora 2018). Thus, there is a moderate potential for Catalina mariposa-lily to occur within the BSA.
Calochortus clavatus var. clavatus	club-haired mariposa lily	-/-/4.3	Perennial bulbiferous herb. Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats, usually in serpentinite, clay, or rocky soils. 246-4,265 feet. Blooms (March)May-June.	Chaparral, coastal scrub, and nonnative grassland habitats occur within the BSA. Serpentinite or clay soils are not mapped within the BSA (USDA/NRCS 2018).	Low potential to occur within the BSA. There are chaparral, coastal scrub, and nonnative grassland habitats within the BSA. In addition, multiple occurrences have been documented in the Santa Monica Mountains and Malibu Coastline from the early 1920s through 1980s (Calflora 2018). Thus, there is a low potential for club-haired mariposa lily to occur within the BSA.

Scientific Name	**Common Name**	**Listing Status[1]**	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Calochortus clavatus var. gracilis	slender mariposa-lily	-/-/1B.2	Perennial bulbiferous herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in shaded foothill canyons; often on grassy slopes within other habitat. 689-5,955 feet. Blooms March-June, occasionally to November.	Chaparral, coastal scrub, and nonnative grassland habitats occur within the BSA, including areas with shaded canyon and/or grassy slopes.	Low potential to occur within the BSA. Most of the coastal scrub, grassland, and chaparral habitats within the BSA are highly disturbed. Only recently documented occurrences along the Santa Monica Mountains were from 2010 and 2017 along Topanga Canyon Boulevard at Garapito Creek, on the northern side of the Santa Monica Mountains (Calflora 2018). Thus, there is a low potential for slender mariposa lily to occur within the BSA.
Calochortus plummerae	Plummer's mariposa-lily	-/-/4.2	Perennial bulbiferous herb. Occurs in coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest. Found at rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire. 197-8,202 feet. Blooms May-July.	Chaparral, coastal scrub, and nonnative grassland habitats occur within the BSA, including areas of rocky and sandy sites with granitic or alluvial soils (USDA/NRCS 2018).	Moderate potential to occur within the BSA. There are chaparral, coastal scrub, and nonnative grassland habitats within the BSA. In addition, multiple occurrences have been documented in the Santa Monica Mountains from the late 1800s through 2015 (Calflora 2018). The nearest recent record of occurrence was observed near Zuma Creek in 2010 (CDFW 2019). Thus, there is a moderate potential for Plummer's mariposa lily to occur within the BSA. It may be more likely to occur in areas burned by the 2018 Woolsey Fire for the next several years.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Camissoniopsis lewisii	Lewis' evening-primrose	-/-/3	Annual herb. Occurs in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland habitats, in sandy or clay soils. 0-984 feet. Blooms March-May, and occasionally as late as June.	Coastal dune, coastal scrub, nonnative grassland, and woodland habitats, with sandy soils, occur within the BSA.	Moderate potential to occur within the BSA. There are coastal dune, coastal scrub, and nonnative grassland habitats within the BSA. There are several historical occurrences recorded at Point Dume from the 1950s (Calflora 2018). Thus, there is a moderate potential for Lewis' evening-primrose to occur within the BSA.
Centromadia parryi ssp. australis	southern tarplant	-/-/1B.1	Annual herb. Occurs in marshes and swamps (at margins), valley and foothill grassland, and vernal pools. Often found in disturbed sites near the coast at marsh edges; also in alkaline soils, sometimes with saltgrass. Sometimes found on vernal pool margins. 0-3,199 feet. Blooms May-November.	Marsh (alkaline wetland) and nonnative grassland habitats occur within the BSA.	Low potential to occur within the BSA. The alkaline wetland and native grassland habitats within the BSA are highly disturbed. The nearest historical occurrences were recorded at UCLA, Del Rey, and Ballona areas from the early 1900s to 1950s (Calflora 2018). Thus, there is a low potential for southern tarplant to occur within the BSA.
Cercocarpus betuloides var. blancheae	island mountain-mahogany	-/-/4.3	Perennial evergreen shrub. Occurs in closed-cone coniferous forest and chaparral habitats. 98-1,969 feet. Blooms February-May.	Chaparral habitats occur within the BSA.	Low potential to occur within the BSA. The chaparral habitats within the BSA are highly disturbed. A few occurrences were recorded in the Santa Monica Mountains from the early 1900s to early 2000s (Calflora 2018). Thus, there is a low potential for island mountain mahogany to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Chaenactis glabriuscula var. orcuttiana	Orcutt's pincushion	-/-/1B.1	Annual herb. Occurs in coastal bluff scrub and coastal dunes. Found in sandy sites. 10-262 feet. Blooms January-August.	Coastal dune habitat is present within the BSA.	Low potential to occur within the BSA. The coastal dune habitat within the BSA is highly disturbed. An historical occurrence was recorded in 1898 near the present-day location of Leo Carillo State Beach, and multiple records exist through 2015 at the Ballona Wetlands (Calflora 2018). Thus, there is a low potential for Orcutt's pincushion to occur within the BSA.
Chenopodium littoreum	coastal goosefoot	-/-/1B.2	Annual herb. Found in coastal dunes. 33-98 feet. Blooms April - August.	Coastal dune habitat is present within the BSA.	Not expected to occur within the BSA. There is coastal dune habitat present within the BSA; however, the nearest historical record was near Playa Del Rey in 1904 (CDFW 2019). Thus, coastal goosefoot is not expected to occur within the BSA.
Chloropyron maritimum ssp. maritimum	salt marsh bird's-beak	FE/SE/1B.2	Annual herb (hemiparasitic). Occurs in marshes, swamps, and coastal dune habitats. Limited to the higher zones of salt marsh habitat. 0-10 meters. Blooms May-October(November)	Coastal dune and salt marsh habitats are present within the BSA.	Low potential to occur within the BSA. The coastal dune and salt marsh present within the BSA are highly disturbed. The nearest occurrences were recorded at Ballona Harbor in 1901 and Point Mugu Lagoon in the 1980s (Calflora 2018). Thus, there is low potential for salt marsh bird's-beak to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	FPT/SE/1B.2	Annual herb. Occurs in coastal scrub and valley and foothill grassland habitats. Found in sandy soils. 49-3,330 feet. Blooms April-July.	Coastal scrub and nonnative grassland habitats with sandy soils are present within the BSA.	Low potential to occur within the BSA. The coastal scrub and nonnative grassland habitats present within the BSA are highly disturbed. The nearest occurrences were recorded at Ballona Harbor in 1901 and at upper Las Virgenes Canyon from 1999 to 2014 (Calflora 2018). Thus, there is low potential for San Fernando Valley spineflower to occur within the BSA.
Chorizanthe parryi var. parryi	Parry's spineflower	-/-/1B.1	Annual herb. Occurs in coastal scrub, chaparral, cismontane woodland, and valley and foothill grassland habitats. Found on dry slopes and flats; sometimes at interface of 2 vegetation types, such as chaparral and oak woodland. Found in dry, sandy soils. 738-4,003 feet. Blooms April-June.	Coastal scrub, chaparral, woodland, and nonnative grassland habitats with sandy soils are present within the BSA.	Low potential to occur within the BSA. Most of the coastal scrub, chaparral, woodland and nonnative grassland habitats present within the BSA are highly disturbed. The nearest historical occurrence was recorded at Latigo Canyon in 1957 (Calflora 2018). Thus, there is low potential for Parry's spineflower to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Convolvulus simulans	small-flowered morning-glory	-/-/4.2	Crustose lichen (terricolous). Occurs in chaparral (openings) habitats, on soil, small mammal pellets, dead twigs, and on Selaginella spp. 197-2,165 feet.	Chaparral habitats occur within the BSA.	Low potential to occur within the BSA. Chaparral habitats occur within the BSA; however, the nearest records of occurrence are from the Agoura Hills area north of Highway 101, and there are no records in the Santa Monica Mountains (Calflora 2018). Thus, there is a low potential for small-flowered morning-glory to occur within the BSA.
Deinandra minthornii	Santa Susana tarplant	-/SR/1B.2	Perennial deciduous shrub. Occurs in chaparral and coastal scrub habitats. Found on sandstone outcrops and crevices, in shrubland. 919-2,313 feet. Blooms July-November.	Chaparral and coastal scrub habitats occur within the BSA, and sandstone rock outcrops are mapped within the BSA (USDA/NRCS 2018).	Low potential to occur within the BSA. Chaparral and coastal scrub habitats, occur within the BSA, but these habitats are highly disturbed. There are a few records of occurrence from the southern Santa Monica Mountains from 1978 to 2010 (Calflora 2018, CDFW 2010). However, the area within the BSA that is mapped as sandstone rock outcrops soil map unit (USDA/NRCS 2018) was observed during field surveys to be vegetated with disturbed ruderal. Thus, there is a low potential for Santa Susana tarplant to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Deinandra paniculata	paniculate tarplant	-/-/4.2	Annual herb. Occurs in coastal scrub, valley and foothill grassland, and vernal pools habitats, in usually vernally mesic, sometimes sandy soils. 82-3,084 feet. Blooms April-November, occasionally as early as March.	Coastal scrub and nonnative grassland habitats with sandy soils occur within the BSA.	Low potential to occur within the BSA. Most chaparral and coastal scrub habitats within the BSA are highly disturbed. The nearest record of occurrence was from Santa Monica from 1973 (Calflora 2018). Thus, there is a low potential for paniculate tarplant to occur within the BSA.
Delphinium parryi ssp. blochmaniae	dune larkspur	-/-/1B.2	Perennial herb. Occurs in chaparral and coastal dunes (maritime) habitats, on rocky areas and dunes. 59-1,001 feet. Blooms April-June.	Chaparral and coastal dune habitats, with rocky areas or dunes, are present within the BSA.	Low potential to occur within the BSA. Most chaparral and coastal dune habitats within the BSA are highly disturbed. The nearest record of occurrence was from near the present-day location of CSU Channel Islands in 1969 (Calflora 2018). Thus, there is a low potential for dune larkspur to occur within the BSA.
Delphinium parryi ssp. purpureum	Mt. Pinos larkspur	-/-/4.3	Perennial herb. Occurs in chaparral, Mojavean desert scrub, and pinyon and juniper woodland habitats. 3,281-8,530 feet. Blooms May-June.	Chaparral habitats are present within the BSA.	Not expected to occur within the BSA. There is chaparral habitat present within the BSA; however, the Calflora lists Mt. Pinos larkspur as occurring in the Thousand Oaks and Newberry Park quads, but there are no records for the species there (Calflora 2018). Thus, Mt. Pinos larkspur is not expected to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Dichondra occidentalis	western dichondra	-/-/4.2	Perennial rhizomatous herb. Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. Found on sandy loam, clay, and rocky soils. 164-1,640 feet. Blooms March-July, occasionally as early as January.	Chaparral, woodland, coastal scrub, and nonnative grassland habitats are present within the BSA, and sandy loam, clay, and/or rocky soils have been mapped within the BSA (USDA/NRCS 2018).	Moderate potential to occur within the BSA. There is chaparral, woodland, coastal scrub, and nonnative grassland is present in the BSA. The nearest record of occurrence was from Tuna Canyon in 1994 (Calflora 2018). Thus, there is a moderate potential for western dichondra to occur within the BSA.
Dithyrea maritima	beach spectaclepod	-/ST/1B.1	Perennial rhizomatous herb. Occurs in coastal dunes and coastal scrub habitats. Found on sea shores, sand dunes, and sandy places near the shore. 10-213 feet. Blooms March-May.	Coastal dune and coastal scrub habitats are present within the BSA, including along the sea shore with sand dunes and sandy areas.	Not expected to occur within the BSA. There are coastal dune and coastal scrub habitats present within the BSA; however, the nearest historical occurrences were from near Santa Monica in the late 1880s and early 1900s (CDFW 2019). Thus, beach spectaclepod is not expected to occur within the BSA.
Dodecahema leptoceras	slender-horned spineflower	FE/SE/1B.1	Annual herb. Found on flood deposited fine sand terraces and washes in Riversidian alluvial fan sage scrub and is also associated with cismontane woodland and chaparral having suitable hydrology and fine sands. It is often associated with cryptogrammic soils. 656-2,493 feet. Blooms April-June.	No suitable habitat. Although woodland and scrub habitat are present, the sandy alluvial washes that this species is associated with are not present within the BSA.	Not expected to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Dudleya blochmaniae ssp. blochmaniae	Blochman's dudleya	-/-/1B.1	Perennial herb. Occurs in coastal scrub, coastal bluff scrub, chaparral, and valley and foothill grassland habitats. Found on open, rocky slopes; often in shallow clays over serpentine or in rocky areas with little soil. 16-1,476 feet. Blooms April-June.	Coastal scrub, chaparral, and nonnative grassland habitats occur in the BSA. Rocky slopes were not observed during field surveys, and clay or serpentine soils were not mapped within the BSA (USDA/NRCS 2018).	Low potential to occur within the BSA. Coastal scrub, chaparral, and nonnative grassland habitats occur within the BSA, and most are highly disturbed. Rocky slopes were not observed during field surveys, and clay or serpentine soils were not mapped within the BSA (USDA/NRCS 2018). The nearest records of occurrence were from Point Dume in 1959, near Malibu Beach in 1948, and Little Sycamore Canyon in 1985 (Calflora 2018). Thus, there is a low potential for Blochman's dudleya to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Dudleya cymosa ssp. agourensis	Agoura Hills dudleya	FT/-/1B.2	Perennial herb. Occurs in chaparral and cismontane woodland in rocky or volcanic soils. 656-1,640 feet. Blooms May-June.	Chaparral and woodland habitats occur within the BSA. Rocky or volcanic soils were not mapped within the BSA (USDA/NRCS 2018).	Low potential to occur within the BSA. Most chaparral and woodland habitats occur within the BSA, but most are highly disturbed. Rocky or volcanic soils were not mapped within the BSA, and most soils present are derived from alluvium, shale, and sandstone (USDA/NRCS 2018). The nearest occurrences of Agoura Hills dudleya were recorded in the northern side of the Santa Monica Mountains near Agoura Hills from 1978 to 2007 (Calflora 2018). Thus, there is a low potential for Agoura Hills dudleya to occur within the BSA.
Dudleya cymosa ssp. marcescens	marcescent dudleya	FT/SR/1B.2	Perennial herb. Occurs in chaparral habitat, on sheer rock surfaces and rocky volcanic cliffs. 476-2,198 feet. Blooms April-July.	Chaparral habitat occurs within the BSA; however, no sheer rock surfaces or rocky volcanic cliffs were observed during field surveys.	Not expected to occur within the BSA. Observations were recorded from the early 1900s through 2006 at four specific locations along the Santa Monica Mountains (Malibu Creek, Topanga Canyon, Seminole Hot Springs, Little Sycamore Canyon) (Calflora 2018). However, no suitable habitat is present within the BSA; thus, marcescent dudleya is not expected to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Dudleya cymosa ssp. ovatifolia	Santa Monica dudleya	FT/-/1B.1	Perennial herb. Occurs in chaparral and coastal habitats. Found in canyons on volcanic or sedimentary substrates; primarily on north-facing slopes. 492-1,099 feet. Blooms March-June.	Chaparral and coastal habitats occur within the BSA, including with sedimentary soils (USDA/NRCS 2018).	Moderate potential to occur within the BSA in suitable habitat. There are chaparral and coastal habitats and north facing slopes within the BSA, including with sedimentary soils (USDA/NRCS 2018). Occurrences have been recorded at various locations in the Santa Monica Mountains from 1948 to 2011, including Malibu Canyon and Topanga Canyon (Calflora 2018). Thus, there is a moderate potential for Santa Monica dudleya to occur within the BSA.
Dudleya multicaulis	many-stemmed dudleya	-/-/1B.2	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland, often in clay soils. 49-2,592 feet. Blooms April-July.	Chaparral, coastal scrub, and nonnative grassland habitats occur within the BSA. No clay soils were mapped within the BSA (USDA/NRCS 2018), and might not occur.	Low potential to occur within the BSA. Most chaparral and coastal habitats within the BSA are highly disturbed. No clay soils were mapped within the BSA (USDA/NRCS 2018), and might not occur. The nearest historical occurrences were recorded near Thousand Oaks from 1958 and in Santa Monica in 1891 (Calflora 2018). Thus, there is a low potential for many-stemmed dudleya to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Dudleya parva	Conejo dudleya	FT/-/1B.2	Perennial herb. Occurs in coastal scrub, valley and foothill grassland, in clay or volcanic soils on rocky slopes and grassy hillsides. 295-1,247 feet. Blooms May-June.	Coastal scrub and nonnative grassland habitats are present within the BSA; however, no clay or volcanic soils were mapped in the BSA and might not occur (USDA/NRCS 2018), and the BSA is outside the known range of the species (CNPS 2019).	Not expected to occur within the BSA. Conejo dudleya is only known to occur north of the Santa Monica Mountains; it does not occur on the Malibu Coast or southern Santa Monica Mountains. Occurrences were recorded near Thousand Oaks and Newberry Park, north of Highway 101, from 1922 through 2001 (Calflora 2018).
Dudleya verityi	Verity's dudleya	FT/-/1B.1	Perennial herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, on volcanic rock outcrops in the Santa Monica Mountains. 197-1,099 feet. Blooms May-June.	Chaparral, coastal scrub, and woodland habitats are present within the BSA; however, no volcanic outcrops were observed during field surveys, and the BSA is outside the known range of the species.	Not expected to occur within the BSA. No suitable habitat present within the BSA. Verity's dudleya is only known to occur in the western-most portion of the Santa Monica Mountains near CSU Channel Islands, where observations were recorded from 1944 through 2016 (Calflora 2018); it does not occur on the Malibu Coast or southern Santa Monica Mountains.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Eriogonum crocatum	Conejo buckwheat	-/SR/1B.2	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats, at rocky sites on Conejo volcanic outcrops. 295-1,903 feet. Blooms April-July.	Chaparral, coastal scrub, and nonnative grassland habitats occur within the BSA; however, no volcanic outcrops were observed during field surveys.	Not expected to occur within the BSA. No suitable habitat present within the BSA. Conejo buckwheat currently only known to occur in the northwestern Santa Monica Mountains (Calflora 2018). An historical occurrence was recorded in the Malibu Hills 1926 (Calflora 2018); however, it not known to occur on the Malibu Coast or southern Santa Monica Mountains at present day. Thus, Conejo buckwheat is not expected to occur within the BSA.
Eryngium aristulatum var. parishii	San Diego button-celery	FE/SE/1B.1	Annual/perennial herb. Occurs in vernal pools, coastal scrub, valley and foothill grassland habitats. Specifically found in San Diego mesa hardpan and claypan vernal pools, and in southern interior basalt flow vernal pools; usually surrounded by scrub. 49-2,887 feet. Blooms April-June.	San Diego mesa hardpan, claypan vernal pools, or southern interior basalt flow vernal pools habitats are not present within the BSA.	Not expected to occur within the BSA. There are no suitable habitats present within the BSA. The nearest historical occurrence was recorded near Wiseburn in the Venice Quad in 1901, but is now extirpated at that site (Calflora 2018). Thus, San Diego button-celery is not expected to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Erysimum suffrutescens	suffrutescent wallflower	-/-/4.2	Perennial herb. Occurs in coastal bluff scrub, chaparral (maritime), coastal dunes, and coastal scrub habitats. 0-492 feet. Blooms January-July, occasionally as late as August.	Chaparral, coastal dune, and coastal scrub habitats are present within the BSA.	Low potential to occur within the BSA. Most chaparral, coastal dune, and coastal scrub habitats within the BSA are highly disturbed. The nearest recent occurrences were recorded at Ballona Wetlands in 1980 and Point Mugu in 2002. Thus, there is a low potential for suffrutescent wallflower to occur within the BSA.
Hordeum intercedens	vernal barley	-/-/3.2	Annual herb. Occurs in coastal dunes, coastal scrub, valley and foothill grassland (saline flats and depressions), and vernal pool habitats. 16-3,281 feet. Blooms March-June.	No suitable saline flats or vernal pool habitats present within the BSA.	Not expected to occur within the BSA. There are no suitable habitats present within the BSA. The nearest occurrence was recorded in 1984 near Glenview, on the northern side of the Santa Monica Mountains (Calflora 2018). Thus, vernal barley is not expected to occur within the BSA.
Horkelia cuneata var. puberula	mesa horkelia	-/-/1B.1	Perennial herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, at sandy or gravelly sites. 49-5,397 feet. Blooms February-July, occasionally to September.	Chaparral, woodland, and coastal scrub habitats, including with sandy or gravelly sites, are present within the BSA.	Moderate potential to occur within the BSA. There are chaparral, woodland, and coastal scrub habitats within the BSA. The nearest occurrences were recorded at Charmlee Wilderness Park in 2008 and Point Dume in 1955 (Calflora 2018). Thus, there is a moderate potential for mesa horkelia to occur within the BSA.

Scientific Name	Common Name	Listing Status¹	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Isocoma menziesii var. decumbens	decumbent goldenbush	-/-/1B.2	Perennial shrub. Occurs in coastal scrub and chaparral habitats. Found in sandy soils; often in disturbed sites. 3-3,002 feet. Blooms April-November.	Coastal scrub and chaparral habitats with sandy soils are present within the BSA.	Moderate potential to occur within the BSA. There is coastal scrub and chaparral habitat in the BSA. The nearest occurrence was recorded at Malibu Colony in 1975 (Calflora 2018). Thus, there is a moderate potential for decumbent goldenbush to occur within the BSA.
Juglans californica var. californica	Southern California black walnut	-/-/4.2	Perennial deciduous tree. Occurs in chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats, in alluvial soils. 164-2,953 feet.	Chaparral, woodland, coastal scrub, and riparian woodland habitats with alluvial soils are present within the BSA.	Present. Walnut woodland habitat (California walnut grove) with Southern California black walnut trees is present within the BSA. There are also areas in the BSA with individual Southern California black walnut trees intermixed within other habitats.
Juncus acutus ssp. leopoldii	southwestern spiny rush	-/-/4.2	Perennial rhizomatous herb. Occurs in coastal dunes (mesic), meadows and seeps (alkaline seeps), and marshes and swamps (coastal salt) habitats. 10-2,953 feet. Blooms May-June, sometimes as early as March.	Coastal dune and coastal marsh/lagoon habitats are present within the BSA.	Moderate potential to occur within the BSA. Coastal dune and coastal lagoon habitats within the BSA are highly disturbed. The nearest historical occurrences were recorded at Point Mugu in 1959 and 1977 and at Pacific Palisades in 1959 (Calflora 2018). Thus, there is a moderate potential for southwestern spiny rush to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	-/-/1B.1	Annual herb. Occurs in coastal salt marshes, playas, and vernal pools habitats. Usually found on alkaline soils in playas, sinks, and grassland areas. 3-4,511 feet. Blooms February-June.	Coastal salt marsh/lagoon habitat is present within the BSA.	Low potential to occur within the BSA. Coastal lagoon habitats within the BSA are highly disturbed. The nearest historical occurrence was recorded along the highway near Malibu in 1933 (Calflora 2018). Thus, there is a low potential for Coulter's goldfields to occur within the BSA.
Lepechinia fragrans	fragrant pitcher sage	-/-/4.2	Perennial shrub. Occurs in chaparral habitat. 66-4,298 feet. Blooms March-October.	Chaparral habitat is present within the BSA.	Moderate potential to occur within the BSA. There is chaparral habitat present within the BSA. There are multiple occurrences recorded from 1930s through 2000s in the Santa Monica Mountains, although the nearest records were from 1931 in Los Alisos Canyon (Calflora 2018). Thus, there is a moderate potential for fragrant pitcher sage to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Lilium humboldtii ssp. ocellatum	ocellated Humboldt lily	-/-/4.2	Perennial bulbiferous herb. Occurs within openings in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland habitats. 98-5,906 feet. Blooms March-July, and occasionally as late as August.	Chaparral, coastal scrub, and woodland habitats are present within the BSA.	Moderate potential to occur within the BSA. There is chaparral, coastal scrub, and woodland habitat present within the BSA. There are multiple occurrences recorded from early 1900s through 2000s in the Santa Monica Mountains, and the most recent and nearest record was from 2009 in lower Solstice Canyon (Calflora 2018). Thus, there is a moderate potential for ocellated Humboldt lily to occur within the BSA.
Malacothamnus davidsonii	Davidson's bush-mallow	-/-/1B.2	Perennial deciduous shrub. Occurs in coastal scrub, riparian woodland, chaparral, and cismontane woodland habitats, in sandy washes. 492-5,003 feet. Blooms June-January.	Coastal scrub, woodland, and chaparral habitats are present within the BSA.	Low potential to occur within the BSA. Chaparral, coastal scrub, and woodland habitats are present within the BSA, although most are highly disturbed. The nearest historical observation was recorded in the San Fernando Valley in 1931 (Calflora 2018). Thus, there is a low potential for Davidson's bush-mallow to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Monardella hypoleuca ssp. hypoleuca	white-veined monardella	-/-/1B.3	Perennial herb. Occurs in chaparral and cismontane woodland habitats, on dry slopes. 164-4,199 feet. Blooms May-August, occasionally as early as April or as late as December.	Chaparral and woodland habitats with dry slopes are present within the BSA.	Moderate potential to occur within the BSA. Chaparral and woodland habitats are present within the BSA. The nearest recent observation was recorded in Santa Ynez Canyon in 2009 and is known historically in Malibu Canyon (1898) and Topanga Canyon (1907) (Calflora 2018). Thus, there is a moderate potential for white-veined monardella to occur within the BSA.
Monardella sinuata ssp. gerryi	Gerry's curly-leaved monardella	-/-/1B.1	Annual herb. Occurs in coastal scrub, in sandy openings. 492-804 feet. Blooms April-June.	Coastal scrub habitat with sandy openings is present within the BSA.	Low potential to occur within the BSA. There are coastal scrub habitats with sandy openings present within the BSA; however, the nearest records for the species are from observations north of Camarillo and Thousand Oaks in 1934, 1976, and 2015 (CDFW 2019). Thus, Gerry's curly-leaved monardella has a low potential to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Monardella sinuata ssp. sinuata	southern curly-leaved monardella	-/-/1B.2	Annual herb. Occurs in chaparral, cismontane woodland, coastal dunes, and coastal scrub (openings) habitats, in sandy soils. 0-984 feet. Blooms April-September.	Chaparral, woodland, coastal dune, and coastal scrub habitats with openings in sandy soil are present within the BSA.	Low potential to occur within the BSA. There are coastal scrub, woodland, coastal dune, and chaparral habitats with sandy openings present within the BSA; however, the nearest records of occurrence are from the Las Posas Hills area, north of Highway 101, in 1975 and 2013 (Calflora 2018). Thus, southern curly-leaved monardella has a low potential to occur within the BSA.
Nama stenocarpa	mud nama	-/-/2B.2	Annual herb. Occurs in marshes and swamps, at lake shores, river banks, and intermittently wet areas. 16-1,640 feet. Blooms January-July.	Wetland and intermittent stream habitats are present within the BSA.	Low potential to occur within the BSA. There are wetland and intermittent stream habitats present within the BSA; however, the nearest historical records of occurrence are from the Santa Monica and Brentwood areas in the late 1800s and early 1900s (Calflora 2018). Thus, mud nama has a low potential to occur within the BSA.
Navarretia fossalis	Spreading navarretia	FT/-/1B.1	Annual herb. Occurs in vernal pools, chenopod scrub, marshes, swamps, and playas habitats. Found in San Diego hardpan and San Diego claypan vernal pools, and in swales, often surrounded by other habitat types. 49-2,789 feet. Blooms April-June.	Vernal pool habitat is not present within the BSA.	Not expected to occur within the BSA because there is no suitable vernal pool habitat present. The nearest records of occurrence for the species are from near Santa Clarita in 2003, and historically from near Inglewood in 1906 (Calflora 2018).

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Navarretia ojaiensis	Ojai navarretia	-/-/1B.1	Annual herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in openings in shrublands or grasslands. 902-2,034 feet. Blooms May-July.	Chaparral, coastal scrub, and nonnative grassland habitats with openings are present within the BSA.	Low potential to occur. Chaparral, coastal scrub, and grassland habitats are present within the BSA, although most of these habitats are highly disturbed. The nearest recent observations were recorded in the Santa Monica Mountains along upper Latigo Canyon Road in 2012, and near Malibu Springs in 2007 (Calflora 2018, CDFW 2019). Thus, Ojai navarretia has a low potential to occur within the BSA.
Navarretia prostrata	prostrate vernal pool navarretia	-/-/1B.1	Annual herb. Occurs in coastal scrub, valley and foothill grassland, vernal pools, and meadows and seeps habitats. Found in in mesic, alkaline sites, including alkaline soils in grassland, or in vernal pools. 10-4,052 feet. Blooms April-July.	No suitable vernal pool or mesic, alkaline grassland habitats are present within the BSA.	Not expected to occur within the BSA because there is no suitable vernal pool or mesic, alkaline habitat present. The nearest historical records of occurrence for the species are from near Inglewood in the early 1900s and from near Manhattan Beach in the 1940s (Calflora 2018, CDFW 2019).
Nolina cismontana	chaparral nolina	-/-/1B.2	Perennial evergreen shrub. Occurs in chaparral and coastal scrub habitats, primarily on sandstone and shale substrates; also known from gabbro. 459-3,609 feet. Blooms May-July, occasionally as early as March.	Chaparral and coastal scrub habitats with sandstone substrates occur within the BSA.	Low potential to occur. Chaparral and coastal scrub habitats are present within the BSA, although most of these habitats are highly disturbed. The nearest observations were recorded north of Thousand Oaks and Agoura Hills (Calflora 2018, CDFW 2019). Thus, chaparral nolina has a low potential to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Orcuttia californica	California Orcutt grass	FE/SE/1B.1	Annual herb. Found in vernal pools. 33-2,165 feet. Blooms April-August.	No vernal pool habitat is present within the BSA.	Not expected to occur within the BSA because no vernal pool habitat is present. Nearest recent record of occurrence was from near Moorpark in 2011, and historically observed near Inglewood in 1946 (Calflora 2018).
Pentachaeta lyonii	Lyon's pentachaeta	FE/SE/1B.1	Annual herb. Occurs in chaparral, valley and foothill grassland, and coastal scrub habitats. Found at edges of clearings in chaparral, usually at the ecotone between grassland and chaparral or edges of firebreaks. 98-2,067 feet. Blooms March-August, occasionally as early as February.	Chaparral, nonnative grassland, and coastal scrub habitats occur within the BSA.	Moderate potential to occur within the BSA. Chaparral, grassland, and coastal scrub habitats are present within the BSA. There are multiple observations of Lyon's pentachaeta across the Santa Monica Mountains from the early 1900s through 2017. The most recent or nearby occurrences were recorded in 2017, approximately 4 miles north of Malibu Beach, in 2015-2016 along upper Malibu Creek, and in 2012 along Kanan-Dune Road (Calflora 2018, CDFW 2019). Thus, Lyon's pentachaeta has a moderate potential to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Phacelia hubbyi	Hubby's phacelia	-/-/4.2	Annual herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats, in gravelly, rocky, and talus soils. 0-3,281 feet. Blooms April-July.	Chaparral, grassland, and coastal scrub habitats with gravelly and rocky soils are present within the BSA.	Low potential to occur within the BSA. Chaparral, grassland, and coastal scrub habitats are present within the BSA, although most of these habitats are highly disturbed. There are multiple observations of Hubby's phacelia across the Santa Monica Mountains from the 1920s through 2016, although the observations from the south side of the range are from the 1920s through 1940s (Calflora 2018). Thus, Hubby's phacelia has a low potential to occur within the BSA.
Phacelia ramosissima var. austrolitoralis	south coast branching phacelia	-/-/3.2	Perennial herb. Occurs in chaparral, coastal dunes, coastal scrub, and marshes and swamps (coastal salt) habitats, in sandy and sometimes rocky soils. 16-984 feet. Blooms March-August.	Chaparral, coastal dune, coastal scrub, and coastal lagoon habitats with sandy soils occur within the BSA	Moderate potential to occur within the BSA. There are chaparral, coastal dune, coastal scrub, and coastal lagoon habitats with sandy soils within the BSA. There are multiple historical occurrences recorded from the 1930s through 1980s across the Malibu Coastline at Point Dume, Carbon Canyon, and Topanga Canyon (Calflora 2018). Thus, south coast branching phacelia has a moderate potential to occur within the BSA.

Scientific Name	Common Name	Listing Status^1	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Phacelia stellaris	Brand's star phacelia	-/-/1B.1	Annual herb. Occurs in coastal dunes and coastal scrub habitats. 3-1,312 feet. Blooms March-June.	Coastal dunes and coastal scrub occur within the BSA.	Low potential to occur within the BSA. Coastal dunes and coastal scrub habitats occur within the BSA, although most of these habitats are highly disturbed. The nearest historical occurrences are from the 1930s and 1940s near Playa Del Rey (Calflora 2018). Thus, Brand's star phacelia has a low potential to occur within the BSA.
Piperia michaelii	Michael's rein orchid	-/-/4.2	Perennial herb. Occurs in coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest habitats. 10-3,002 feet. Blooms April-August.	Coastal scrub and woodland habitats are present within the BSA.	Not expected to occur within the BSA. Coastal scrub and woodland habitats are present within the BSA, although most of these habitats are highly disturbed. The nearest historical occurrences are from the late 1800s and early 1900s near Glendale (Calflora 2018). Thus, there is a low potential for Michael's rein orchid to occur within the BSA.
Potentilla multijuga	Ballona cinquefoil	-/-/1A	Perennial herb. Found in brackish meadows and seeps. 0-7 feet. Blooms June-August.	Alkaline wetland and coastal lagoon habitats are present within the BSA.	Not expected to occur within the BSA. Alkaline wetland and coastal lagoon habitats are present within the BSA, although they are highly disturbed. The nearest historical occurrence was recorded near Ballona Wetlands in the late 1800s (Calflora 2018). Thus, it is not likely that Ballona cinquefoil would occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Pseudognaphalium leucocephalum	white rabbit-tobacco	-/-/2B.2	Perennial herb. Occurs in riparian woodland, cismontane woodland, coastal scrub, and chaparral habitats. Found in sandy and gravelly sites. 100 to 4,035 feet. Blooms (July)August-November(December).	Woodland, coastal scrub, and chaparral habitats with sandy sites are present within the BSA.	Not expected to occur within the BSA. Woodland, coastal scrub, and chaparral habitats with sandy sites are present within the BSA, although they are highly disturbed. The nearest historical occurrences were recorded near Camarillo in the 1950s and near Hollywood in the early 1900s (Calflora 2018). Thus, it is not likely that white rabbit-tobacco would occur within the BSA.
Quercus dumosa	Nuttall's scrub oak	-/-/1B.1	Perennial evergreen shrub. Occurs in closed-cone coniferous forest, chaparral, and coastal scrub habitats. Generally found on sandy soils near the coast; sometimes found on clay loam. 49-2,100 feet. Blooms February-April, occasionally as late as May-August.	Chaparral and coastal scrub habitats with sandy soils are present within the BSA.	Not present within the BSA. Chaparral and coastal scrub habitats with sandy soils are present within the BSA. There are multiple records of Nuttall's scrub oak across the Santa Monica Mountains from the early 1900s through 1990s (Calflora 2018). This species was not observed during field surveys within the BSA.

Scientific Name	**Common Name**	**Listing Status[1]**	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Nasturtium gambelii (Rorippa gambellii)	Gambel's watercress	-/-/1B.1	Perennial rhizomatous herb. Occurs in freshwater and brackish marshes, and at the margins of lakes and along streams, in or just above the waterline. Blooms April-October.	Alkaline wetland and coastal lagoon habitats are present within the BSA.	Not expected to occur within the BSA. Alkaline wetland and coastal lagoon habitats are present within the BSA, although are highly disturbed. The nearest historical occurrences were from Los Angeles near Cienega in the late 1800s and early 1900s (Calflora 2018). Thus, Gambel's watercress is not expected to occur within the BSA.
Senecio aphanactis	chaparral ragwort	-/-/2B.2	Annual herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, sometimes in alkaline soils. 49-2,625 feet. Blooms January-April, and occasionally as late as May.	Chaparral, woodland, and scrub habitats are present within the BSA.	Moderate potential to occur within the BSA. Chaparral, woodland, and coastal scrub habitats are present within the BSA. The nearest observation was recorded at Deer Creek Canyon, east of Point Mugu in 1997 (Calflora 2018). Thus, there is a moderate potential for chaparral ragwort to occur within the BSA.
Sidalcea neomexicana	salt spring checkerbloom	-/-/2B.2	Perennial herb. Occurs in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas habitats, in alkaline and mesic soils. 49-5,020 feet. Blooms March-June.	Chaparral and coastal scrub habitats are present within the BSA.	Low potential to occur. Chaparral and coastal scrub habitats are present within the BSA, although most are highly disturbed. The nearest historical observation was recorded at Santa Monica in 1900 (Calflora 2018). Thus, there is a low potential for salt spring checkerbloom to occur within the BSA.

Scientific Name	**Common Name**	**Listing Status**[1]	**Habitat Requirements**	**Habitat Occurrence within BSA**	**Potential to Occur within BSA & Rationale**
Spermolepis lateriflora	western bristly scaleseed	-/-/2A	Annual herb. Occurs in Sonoran desert scrub habitats on rocky or sandy areas. 1198-2,198 feet. Blooms March-April.	There are no Sonoran desert scrub habitats present within the BSA.	Not expected to occur. There are no Sonoran desert scrub habitats present within the BSA. Additionally, the Calflora lists western bristly scaleseed as occurring in the Topanga quad; however, there are no records for the species there (Calflora 2018). The CNDDB maps an occurrence in Tuna Canyon near Topanga Creek, but the record indicates Tuna Canyon in the Verdugo Mountains, suggesting the record is mapped incorrectly in the Santa Monica Mountains (CNDDB 2018). Thus, western bristly scaleseed is not expected to occur within the BSA.
Suaeda esteroa	estuary seablite	-/-/1B.2	Perennial herb. Occurs in marshes and swamps (coastal salt). 0-16 feet. Blooms (May)July-October(January)	Coastal lagoon and alkaline wetland habitats are present within the BSA.	Low potential to occur within the BSA. Coastal lagoon and alkaline wetland habitats are present within the BSA, although they are highly disturbed. The nearest observations were recorded at Point Mugu from 1948 through 2012 (Calflora 2018, CDFW 2019). Thus, there is a low potential for estuary seablite to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Suaeda taxifolia	woolly seablite	-/-/4.2	Perennial evergreen shrub. Occurs in coastal bluff scrub, coastal dunes, and marshes and swamps (margins of coastal salt) habitats. 0-164 feet. Blooms January-December.	Coastal dunes, coastal lagoon, and alkaline wetland habitats are present within the BSA.	High potential to occur within the BSA. Coastal dunes, coastal lagoon, and alkaline wetland habitats are present within the BSA. There are multiple observations recorded across the Malibu coastline from the 1930s through 1990s, including a 1997 observation at Zuma Beach (Calflora 2018). Thus, there is a high potential for woolly seablite to occur within the BSA.
Symphyotrichum greatae	Greata's aster	-/-/1B.3	Perennial rhizomatous herb. Occurs in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and riparian woodland, in mesic areas. 984-6,594 feet. Blooms June-October.	Chaparral and woodland habitats are present within the BSA, possibly with mesic areas.	Not expected to occur within the BSA. Chaparral and woodland habitats are present within the BSA, possibly with mesic areas; however, the Calflora lists Greata's aster as occurring in the Beverly Hills quad and the nearest occurrence was in Benedicts Canyon, north of Beverly Hills, from an undated collection (Calflora 2018, CDFW 2019). Thus, Greata's aster is not expected to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Texosporium sancti-jacobi	woven-spored lichen	-/-/3	Crustose lichen (terricolous). Occurs in chaparral (openings) habitats, on soil, small mammal pellets, dead twigs, and on Selaginella spp. 197-2,165 feet.	Chaparral habitats are present within the BSA.	Low potential to occur within the BSA. Chaparral habitats are present within the BSA; however, the Calflora lists woven-spored lichen as occurring in the Camarillo quad and the nearest record was from 2003 near CSU Channel Islands in Long Grade Canyon (Calflora 2018, CDFW 2019). Thus, woven-spored lichen has a low potential to occur within the BSA.
Thelypteris puberula var. sonorensis	Sonoran maiden fern	-/-/2B.2	Perennial rhizomatous herb. Occurs in meadows and seeps, along streams or at seepage areas. 164-2,001 feet. Blooms January-September.	Wetland and intermittent stream habitats are present within the BSA.	Low potential to occur within the BSA. Wetland and intermittent stream habitats are present within the BSA. The nearest and most recent observations were recorded at Lachusa Canyon and Encinal Canyon in the 1960s, and in Arroyo Sequit in the 1950s (Calflora 2018, CDFW 2019). Thus, there is a low potential for Sonoran maiden fern to occur within the BSA.

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Occurrence within BSA	Potential to Occur within BSA & Rationale
Tortula californica	California screw moss	-/-/1B.2	Moss. Occurs in chenopod scrub and valley and foothill grassland habitats. Moss grows on sandy soil. 33-4,790 feet.	Nonnative grassland habitats with sandy soil are present within the BSA.	Moderate potential to occur within the BSA. Nonnative grassland habitats with sandy soil are present within the BSA. The nearest recent observation was recorded in Newton Canyon, just east of Zuma Canyon, in 2004, and near Triunfo Pass and upper Arroyo Sequit Creek in 2006 (CDFW 2019). Thus, California screw moss has a moderate potential to occur within the BSA.

[1] Federal Status/State Status/CDFW listing or CNPS Rare Plant Rank:

Federal Status

FE = federally listed as endangered under FESA; FT = federally listed as threatened under FESA; FPT = proposed to be federally listed as threatened under FESA

State Status

SE = State-listed as endangered under CESA; ST = State-listed as threatened under CESA; SR = State-listed as a rare plant under CESA; SCE = candidate to be state-listed as endangered under CESA; CFP = fully protected in California under Code of Regulations; SSC = California species of special concern as designated by CDFW

CNPS Rare Plant Ranks

1A. Presumed extirpated in California and either rare or extinct elsewhere
1B. Rare or Endangered in California and elsewhere
2A. Presumed extirpated in California, but more common elsewhere
2B. Rare or Endangered in California, but more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list
Threat Code extensions and their meanings:
1 – Seriously threatened in California (over 80 percent of occurrences threatened / high degree and immediacy of threat)
2 – Moderately threatened in California (20-80 percent of occurrences threatened / moderate degree and immediacy of threat)
3 – Not very threatened in California (<20 percent of occurrences threatened / low degree and immediacy of threat or no current threats known)

Table D-2
Species Lists and PTO Table: January 2019

Scientific Name	Common Name	Habitat Requirements	Habitat Occurrence within BSA (to be filled in from fieldwork)	Potential to Occur within BSA & Rationale	PTO for filtering	Federal Listing	State Listing	CDFW Status	Rare Plant Rank	Other Listing	Element Code	Occurrences in CNDDB quads search or other source
<u>Animals</u>												
<u>Invertebrates</u>												
Branchinecta lynchi	Vernal pool fairy shrimp	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains. Inhabit astatic, small rain-filled pools. Usually in clear-water sandstone-depression pools and grassed swales, earth slump, or basalt-flow depression pools.	No suitable habitat present.	Not expected to occur. There is no vernal pool habitat present within BSA.	Not expected to occur	Threatened	None	None		IUCN:VU		USFWS IPAC query
Euphilotes battoides allyni	El Segundo blue butterfly	Restricted to remnant coastal dune habitat in Southern California. Host plant is Eriogonum parvifolium; larvae feed only on the flowers and seeds; used by adults as major nectar source.	No suitable habitat present. Open sand habitat within the BSA was not observed to have Sea cliff buckwheat (*Eriogonum parvifolium*).	Not expected to occur. The nearest record of occurrence is from approximately 9 miles south west at El Segundo Dunes in 2005. The open sand habitat within the BSA does not contain the host plant of El Segundo blue butterfly (*Eriogonum parvifolium*).	Not expected to occur	Endangered	None	None		XERCES_CI	IILEPG201B	2
Euphydryas editha quino	quino checkerspot butterfly	Sunny openings within chaparral and coastal sage shrublands in parts of Riverside and San Diego counties. Hills and mesas near the coast. Need high densities of food plants (Plantago erecta, P. insualris, and Orthocarpus purpurescens).	Outside known range of species distribution.	Not expected to occur. Outside of known range.	Not expected to occur	Endangered	None	None		XERCES_CI	IILEPK405L	1
Haliotis cracherodii	black abalone	Occurs in mid to low rocky intertidal areas.	No suitable habitat present.	Not expected to occur. There is no rocky intertidal habitat present within BSA.	Not expected to occur	Endangered	None	None				
Haliotis sorenseni	white abalone	Found subtidally on rocky pinnacles and deep reefs in Southern California; especially those off the Channel Islands. Occurs at depths of at least 80 feet to over 200 feet.	No suitable habitat present.	Not expected to occur. There is no subtidal habitat present within BSA.	Not expected to occur	Endangered	None	None				
Streptocephalus woottoni	Riverside fairy shrimp	Endemic to western Riverside, Orange, and San Diego Counties in areas of tectonic swales/earth slump basins in grassland and coastal sage scrub. Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season.	Outside known range of species distribution.	Not expected to occur. Outside of known range.	Not expected to occur	Endangered	None	None		IUCN_EN	ICBRA07010	3
<u>Birds</u>												
Agelaius tricolor	tricolored blackbird (Nesting colony)	Inhabits freshwater marsh, swamp, and wetland areas. Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate (e.g. cattails), and foraging areas with insect prey within a few kilometers of the colony.	Openwater habitats with cattails are present within the BSA at estuaries; however the small extents of open water and cattails are not suitable for supporting tricolored blackbird.	Not expected to occur. Available habitat is too small in extent to support foraging and nesting within the BSA. Additionally, the BSA is outside of the typical distribution range for this species.	Not expected to occur	None	Candidate End	SSC		BLM_S; IUCN_EN; NABCI_RWL; USFWS_BCC	ABPBXB0020	3
Aquila chrysaetos	golden eagle (Nesting & wintering)	Rolling foothills, mountain areas, sage-juniper flats, and desert habitats. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	There is no nesting habitat present within the BSA. Marginal foraging habitat is present within the BSA as sites at the base of the Santa Monica Mountains.	Low potential to occur at marginal foraging habitat within BSA. Golden eagles occur in the Santa Monica Mountains; however, the species typically stays inland and is rarely found on the immediate coast.	Low potential to occur	None	None	FP; WL		BLM_S; CDF_S; IUCN_LC; USFWS_BCC	ABNKC22010	4
Athene cunicularia	burrowing owl (Burrow sites & some wintering sites)	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Marginally suitable habitat is present within the BSA in grassland and scrub habitats; however, the BSA is outside the known and predicted ranges for burrowing owl (CDFW 2018).	Not expected to to occur. The most consistently used areas for this species are in the Playa del Rey area near Ballona Creek and at Naval Air Station Point Mugu (eBird 2018). The BSA is outside the known and predicted ranges for burrowing owl (CDFW 2018).	Not expected to occur	None	None	SSC		BLM_S; IUCN_LC; USFWS_BCC	ABNSB10010	11
Buteo swainsoni	Swainson's hawk (Nesting)	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areaas such as grasslands, or alfalfa or grain fields supporting rodent populations.	No suitable habitat present.	Not expected to occur. This species is an occasional migrant along the coast, but there is no suitable breeding habitat present within BSA. This species no longer breeds in Los Angeles County outside of the Antelope Valley on the western end of the Mojave Desert.	Not expected to occur	None	Threatened	None		BLM_S; IUCN_LC; USFWS_BCC	ABNKC19070	3

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Charadrius alexandrinus nivosus	western snowy plover (Nesting)	Sandy beaches, salt ponds levees, and shores of large alkali lakes. Needs sandy, gravelly, or friable soils for nesting. Forages in areas of sandy beach above and below the high-tide line, with occasional surf-cast wrack supporting small invertebrates, and generally barren to sparsely vegetated terrain.	Sandy beach habitats are present within BSA; however, they are heavily disturbed by adjacent residences and/or recreational use. Thus, they are generally not suitable for snowy plover nesting. The sandy beach habitats within the BSA may support marginal foraging habitat for snowy plover, with marginal breeding habitat at Malibu State Beach.	Low potential to nest within BSA; high potential to occur within the BSA for foraging. This species is a regular non-breeding inhabitant of Malibu-area beaches. More recently, snowy plovers began nesting for the first time in 70 years in very small numbers in Los Angeles County in spring 2017, including two nests on Malibu State Beach. This species has continued to nest on Malibu State Beach in 2018, with a fenced enclosure surrounding the nest(s) for protection. It may be present year-round, albeit in small numbers during the breeding season, but has a low potential to nest on sandy beach habitat within the BSA.	Low potential to occur	Threatened	None	SSC		NABCI_RWL; USFWS_BCC	ABNNB03031	3
Coturnicops noveboracensis	yellow rail	Summer resident in Eastern Sierra Nevada in Mono County. Found in freshwater marshlands. Requires densly vegetated marshes for breeding, and may inhabit wet meadows and coastal tidal marshes in winter.	No suitable breeding habitat present; not known to breed in Southern California. Small areas of alkaline/emergent wetlands along lagoons within the BSA may provide marginal wintering habitat, although the species is rarely observed in Southern California.	Not expected to occur. This species is a rare vagrant anywhere in southern California and is not expected within the BSA. The only record for Los Angeles County is from 1998 at Manhattan Beach (CBRC 2018, CDFW 2018).	Not expected to occur	None	None	SSC		IUCN_LC; NABCI_RWL; USFS_S; USFWS_BCC	ABNME01010	1
Elanus leucurus	white-tailed kite (Nesting)	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging, close to isolated, dense-topped trees for nesting and perching.	Small portions of the BSA may provide suitable nesting habitat where riparian woodland habitats are present in proximity to suitable foraging habitat, such as within the BSA of the Zuma Creek, Emergency Source of Water Supply Connection (Las Virgenes Connection), PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Carbon Canyon Road & Carbon Mesa Road, PCH & Topanga Beach Drive Segment 1, Big Rock Bypass Improvement, and Pena Canyon Creek sites.	Moderate potential to occur/nest within the BSA. Suitable foraging and nesting habitat is present with the BSA; however, the nearest recent observation of nesting was recorded near CSU Channel Islands, in Camarillo, in 2009 (CDFW 2018). Therefore, there is a moderate potential for white-tailed kite to occur or nest within the BSA.	Moderate potential to occur	None	None	FP		BLM_S; IUCN_LC	ABNKC06010	1
Empidonax traillii extimus	Southwestern willow flycatcher (Nesting)	Occurs in riparian woodlands in Southern California. Generally flycatchers nest in areas with willows, tamarisk, or both. Nesting usually occurs along major drainages. Patches or small areas of riparian vegetation are usually unsuitable for nest placement (e.g. vegertation is too short, too sparse, or patch is too small).	No suitable breeding habitat present; patches of riparian woodland are likely too small to support nesting. Riparian habitats within the BSA could be used by flycatcher for foraging, migrating, and dispersing.	Not expected to nest within the BSA. Low potential to occur in marginal foraging habitat (not nesting) in patches of riparian woodland within BSA. This species is recorded in casual numbers (i.e. may or may not be found annually) in the Malibu area, strictly during migration, most often at Malibu Lagoon.	Not expected to occur	Endangered	Endangered	None		NABCI:RWL		USFWS IPAC query
Falco peregrinus anatum	American peregrine falcon (Nesting)	Nests near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Suitable nesting habitat may be present where steep canyons, creek banks, or structures occur within the BSA.	Moderate potential to occur and/or nest within the BSA at creek banks, ledges, or structures. This species is commonly found along cliffy coastlines. It is known to occur in the Santa Monica Mountains regional area (CDFW 2018).	Moderate potential to occur	Delisted	Delisted	FP		CDF_S; USFWS_BCC	ABNKD06071	1
Haliaeetus leucocephalus	bald eagle (Nesting & wintering)	Permanent resident, and uncommon winter migrant, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties. Fairly common as a local winter migrant at a few favored inland waters in southern California. Largest numbers occur at Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and along the Colorado River. Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches. Perches high in large, stoutly limbed trees, on snags or broken-topped trees, or on rocks near water. Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Nests most frequently in stands with less than 40% canopy, but usually some foliage shading the nest. Nest located 16-61 m (50-200 ft) above ground, usually below tree crown. Species of tree apparently not so important as height and size. Nest usually located near a permanent water source.	Suitable breeding habitat not present within the BSA. Open water habitat within the BSA is not extensive enough to provide foraging opportunities for bald eagle.	Not expected to nest or forage within the BSA because suitable habitat is not present.	Not expected to occur	Delisted	Endangered	FP		BLM_S; CDF_S; IUCN_LC; USFS_S; USFWS_BCC	ABNKC10010	1

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Laterallus jamaicensis coturniculus	California black rail	Inhabits freshwater marshes, wet meadows, and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat. Usually nests in pickleweed.	Suitable nesting habitat is not present within the BSA. Wetland habitats within the BSA do not consists of extensive enough marsh habitat to support California black rail.	Not expected to occur within the BSA. There is no suitable habitat present within BSA. The nearest recorded occurrences are in the Oxnard and Santa Monica areas from the 1920s and 1930s (CDFW 2018).	Not expected to occur	None	Threatened	FP		BLM_S; IUCN_NT; NABCI_RWL; USFWS_BCC	ABNME03041	1
Passerculus sandwichensis beldingi	Belding's savannah sparrow	Inhabits coastal salt marshes, from Santa Barbara south through San Diego County. Nests in Salicornia, on and about margins of tidal flats.	Suitable nesting habitat is not present within the BSA. Wetland habitats within the BSA do not consists of extensive enough marsh habitat to support Belding's savannah sparrow.	Not expected to occur within the BSA. There is no suitable habitat present within BSA. The nearest recorded occurrence of an extant breeding population is at the Ballona Wetlands in 2001 (CDFW 2018).	Not expected to occur	None	Endangered			0	ABPBX99015	3
Pelecanus occidentalis californicus	California brown pelican (Nesting colony & communal roosts)	Colonial nester on Anacapa and Santa Barbara Islands. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Roosts communally. Marine forager.	Suitable nesting and foraging habitat is not present within the BSA, but limited roosting habitat is present.	Not expected to nest or roost communally within the BSA.	Not expected to occur	Delisted	Delisted	FP		BLM_S; USFS_S	ABNFC01021	2
Polioptila californica californica	coastal California gnatcatcher	Obligate, permanent resident of coastal sage scrub below 2,500 feet elevation in Southern California. Low, coastal sage scrub in arid washes, on mesas, and slopes. Not all areas classified as coastal sage scrub are occupied.	Coastal sage scrub habitat is present within portions of the BSA. Most of the coastal sage scrub-chaparral habitat is disturbed.	Not expected to occur within the BSA. Although coastal sage scrub habitat is present within the BSA, the species is known to be generally absent from the coastal side of the Santa Monica Mountains [cite USFWS communication? Yes, cite USFWS and Kimball Garrett as personal communications].	Not expected to occur	Threatened	None	SSC		NABCI_YWL	ABPBJ08081	5
Rallus obsoletus levipes (formerly Rallus longirostris levipes)	light-footed Ridgway's rail (formerly light-footed clapper rail)	Found in salt marshes traversed by tidal sloughs, where cordgrass and pickleweed are the dominant vegetation. Requires dense growth of either pickleweed or cordgrass for nesting or escape cover.	Suitable nesting habitat is not present within the BSA. Wetland habitats within the BSA do not consists of extensive enough marsh habitat to support Ridgway's rail.	Not expected to occur within the BSA. There is no suitable habitat present within BSA. While one lone bird was present at Malibu Legacy Park in fall 2017, the otherwise nearest recorded occurrences are in the Mugu Lagoon marshes and at Ballona Freshwater Marsh (eBird 2018).	Not expected to occur	Endangered	Endangered	FP		NABCI_RWL	ABNME05014	1
Riparia riparia	bank swallow (Nesting)	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks and/or cliffs with fine-textured and/or sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Marginal nesting habitat may be present within the BSA where creeks pass through steep canyons.	Not expected to occur. Marginal nesting habitat may be present within the BSA; however, the species is not known to nest in Southern California and nearby historic colonies have been extirpated (CDFW 2018).	Not expected to occur	None	Threatened	None		BLM_S; IUCN_LC	ABPAU08010	2
Sternula antillarum browni	California least tern (Nesting colony)	Nests along the coast from San Francisco Bay south to Northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, land fills, or paved areas.	Marginal nesting habitat may be present within the BSA where open sand is present.	Not expected to occur. Marginal nesting habitat may be present within the BSA; however, the species is not known to nest along the Malibu coastline and does not forage more than a few miles from colonies (USFWS 2006, CDFW 2018).	Not expected to occur	Endangered	Endangered	FP		NABCI_RWL	ABNNM08103	4
Vireo bellii pusillus	least Bell's vireo (Nesting)	Summer resident of Southern California in low riparian habitat in the vicinity of water or in dry river bottoms, below 2,000 feet. Nests are placed along margins of bushes or on twigs projecting into pathways, usually in willow, baccharis, or mesquite.	Marginal breeding habitat present where riparian vegetation consists of willows and baccharis. Riparian habitats within the BSA could be used by vireo for foraging, migrating, and dispersing.	Low potential to occur in marginal foraging habitat (not nesting) within BSA. Nearest recent observation was in 2017 along the northern half of the Santa Monica Mountains (eBird 2018).	Low potential to occur	Endangered	Endangered	None		IUCN_NT; NABCI_YWL	ABPBW01114	9
Amphibians & Reptiles												
Anaxyrus californicus	arroyo toad	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in the drier parts of the range.	Marginal habitat may be present in small drainages within the BSA; however, the species' known range does not include the coastal side of the Santa Monica Mountains.	Not expected to occur. Marginal habitat in small drainages is present within the BSA; however, the BSA is outside of the species known range, and the nearest documented occurrence is from the San Fernando Valley (CDFW 2018).	Not expected to occur	Endangered	None	SSC		IUCN_EN	AAABB01230	1
Anniella sp. 1	California legless lizard	**Note - this element record represents California records of Anniella not yet assiged to the new species within the Anniella pulchra complex.** Contra Costa County south to San Diego, within a variegy to open habitats. Found in a variety of habitats, generally in moist, loose soil. Prefer soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats. This sub-species of legless lizard is no longer recognized (SSAR 2017). See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur within the BSA. Nearest recent occurrences of Anniella sp. documented in Westlake in 2009 (CDFW 2018); however, this sub-species is no longer recognized in the area. See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur	None	None	SSC		0	ARACC01070	5

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Anniella pulchra pulchra	silvery legless lizard	**Note - this is a subspecies of California legless lizard entered in unprocessed CNDDB data, and CNDDB treats it as Anniella sp. 1.** Found in chaparral, coastal dunes, or coastal scrub habitats with sandy or loose loamy soils, usually under sparse vegetation. Soil moisture is essential. Species prefers soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats. This sub-species of legless lizard is no longer recognized (SSAR 2017). See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur within the BSA. Nearest recent occurrences of Anniella sp. were documented in Westlake in 2009 (CDFW 2018); however, this sub-species is no longer recognized in the area. See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur	None	None	SSC		0	ARACC01012	1
Anniella stebbinsi	southern California legless lizard	Generally found south of the Transverse Range, extending to the Northwestern Baja California. Occurs in sandy or loose, loamy soils under sparse vegetation. Disjunct populations occur in the Tehachapi and Piute Mountains in Kern County. Found in a variety of habitats; generally in moist, loose soils. Pefer soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrence of southern California legless lizard was documented at Point Dume in 2017, within the geographic extent of the project sites' distribution (CDFW 2018).	Moderate potential to occur	None	None	SSC		USFS_S	ARACC01060	9
Aspidoscelis tigris stejnegeri	coastal whiptail (= San Diegan tiger whiptail)	Found in deserts and semiarid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. Ground may be firm soil, sandy, or rocky.	Suitable habitat present within the BSA in coastal sage scrub, chaparral, woodland, and riparian habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Multiple recent occurrence of coastal whiptail were documented in the Santa Monica Mountains during the 2000s (CDFW 2018).	Moderate potential to occur	None	None	SSC		0	ARACJ02143	9
Caretta caretta	North Pacific loggerhead sea turtle	Pelagic species that rarely comes to land. Nests on beaches in Mexico, Braziil, Japan, South Africa, Oman, Australia, and the southeastern United States.	No suitable habitat present.	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Chelonia mydas	East Pacific green sea turtle	Marine species that rarely comes to land. Nesting sites in the Eastern Pacific include Panama, Costa Rica, Nicaragua, Guatemala, El Salvador, Michoacan, Chiapas, and Baja California. Can be found in shallow waters of lagoons, bays, estuaries, mangroves, eelgrass and seaweed beds. Uncommon to the California coast.	No suitable habitat present.	Not expected to occur. No suitable habitat present.	Not expected to occur	Threatened	None	None				
Dermochelys coriacea	leatherback sea turtle	Marine, pelagic species that rarely comes to land. Primary nesting beaches are in the Pacific are Mexico, Costa Rica, and Indonesia. In the United States, nesting occurs on beaches in Florida and Georgia.	No suitable habitat present.	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Emys marmorata (=Actinemys pallida)	western pond turtle (=southwestern pond turtle)	Aquatic turtle found in ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation, below 6,000 feet elevation. Requires basking sites and suitable upland habitat (usually sandy banks or grassy open fields) up to 0.5 kilometer from water for egg-laying.	Suitable aquatic and upland nesting habitat is present within the BSA. Wetland habitats within the BSA could provide freshwater feeding areas, with exposed basking opportunities, and adjacent upland habitat for nesting.	High potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of southwestern pond turtle were in Trancas Canyon, Triunfo, Las Virgenes, Malibu, and Topanga creeks in the 1980s through 2000s (CDFW 2018), the species generally is known to occur in streams of the Santa Monica Mountains (Nafis 2018, RCD of the Santa Monica Mountains 2015).	High potential to occur	None	None	SSC		BLM_S; IUCN_VU; USFS_S	ARAAD02030	18
Lepidochelys olivacea	Olive Ridley sea turtle	Marine species that is found out to sea and in protected, relatively shallow bays and lagoons, and in shallow water between reefs and the shore. Nesting occurs from Costa Rica to Baja California.	No suitable habitat present.	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered (breeding populations on the Pacific Coast of Mexico); Threatened (all other populations)	None	None				

Scientific Name	Common Name	Habitat Requirements	Habitat Occurrence within BSA (to be filled in from fieldwork)	Potential to Occur within BSA & Rationale	PTO for filtering	Federal Listing	State Listing	CDFW Status	Rare Plant Rank	Other Listing	Element Code	Occurrences in CNDDB quads search or other source
Phrynosoma blainvillii	coast horned lizard (=Blainville's horned lizard)	Frequents a wide variety of habitats including chaparral, cismontane woodland, coastal bluff scrub, coastal scrub, desert wash, pinon and juniper woodlands, riparian scrub, riparian woodland, and valley and foothill grassland. Most common in lowlands along sandy washes with scattered low bushes. Uses open areas for sunning, bushes for cover, patches of loose soil for burial, and requires an abundant supply of ants and other insects.	Suitable habitat present within the BSA in coastal sage scrub, chaparral, woodland, and riparian habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of horned lizard were in Latigo Canyon, Topanga Canyon areas in the 1990s (CDFW 2018), and the species generally is known to occur in the Santa Monica Mountains (Nafis 2018). If present this species is most likely to occur at the more inland sites where coastal sage scrub and chaparral are present.	Moderate potential to occur	None	None	SSC		BLM_S; IUCN_LC	ARACF12100	12
Rana draytonii	California red-legged frog	Lowlands and foothills in or near permanent sources of deep water (2 feet or greater) with dense, shrubby, or emergent riparian vegetration. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat (such as existing burrows or downed tree debris).	Suitable habitat may occur within the BSA where semi-permanent to permanent water is present, such as in perennial or intermittent streams. California red-legged frogs do not tolerate elevated salinity, such as may occur in the small coastal lagoons and alkaline wetlands along the Malibu coastline.	Low potential to occur where suitable habitat may be present within the BSA. There is a known population in upper Las Virgenes Creek (CDFW 2018), and the species has been reintroduced to portions of the Santa Monica Mountains but it is not likely to occur within the lowest reaches of coastal streams within the BSA at this time (USFWS pers. comm. 2018). Therefore, there is a low potential for California red-legged frog to occur within the BSA.	Low potential to occur	Threatened	None	SSC		IUCN_VU	AAABH01022	2
Spea hammondii	western spadefoot	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	No suitable habitat present within the BSA.	Not expected to occur. No suitable habitat present.	Not expected to occur	None	None	SSC		BLM_S; IUCN_NT	AAABF02020	1
Thamnophis hammondii	two-striped gartersnake	Found in coastal California from the vicinity of Salinas to northwest Baja California, from sea level to about 7,000 feet of elevation. Highly aquatic, found in or near permanent fresh water, often along streams with rocky beds and riparian growth.	Suitable habitat may occur within the BSA where permanent water is present in perennial streams. Two-striped gartersnake do not tolerate elevated salinity, such as may occur in the small coastal lagoons and alkaline wetlands along the Malibu coastline.	Low potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of two-striped gartersnake were in Triunfo Creek in 1998 and in Sycamore Canyon in 2009 (CDFW 2018). The species is known to occur in the Santa Monica Mountains (Nafis 2018).	Low potential to occur	None	None	SSC		BLM_S; IUCN_LC; USFS_S	ARADB36160	7
Fishes												
Acipenser medirostris	green sturgeon - Southern DPS	Most marine species of sturgeon, mostly found north of Point Conception. Spawns in the Sacramento, Klamath, and Trinity rivers. Spawns at water temperaturess between 8-14°C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	No suitable habitat present and outside known range of species.	Not expected to occur. No suitable habitat present, and outside known range of species.	Not expected to occur	Threatened	None	SSC				
Eucyclogobius newberryi	tidewater goby	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches. The species needs fairly still but not stagnant water and high oxygen levels.	Suitable habitat is present within the BSA where PCH crosses Malibu Lagoon/Malibu Creek and Topanga Creek, and may also be present at other perennial, brackish waters within the BSA.	High potential to occur. This species was reintroduced to Malibu Lagoon in the 1990s (CDFW 2018), and now occurs in both Malibu Lagoon/Creek and Topanga Creek (USFWS 2013). It is unknown if it tidewater goby are present within the BSA at other locations at this time.	High potential to occur	Endangered	None	SSC		AFS_EN; IUCN_VU	AFCQN04010	2
Gila orcuttii	arroyo chub	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mohave, and San Diego river basins. Found in slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	Suitable habitat is present within the BSA where PCH crosses Malibu Lagoon/Malibu Creek, and may also be present at other perennial, fresh waters within the BSA.	High potential to occur. Arroyo chub are known to occur in Malibu Creek (CDFW 2018), and may occur in other coastal streams within the geographic area of the Project. When sandbars block saltwater from entering lagoons and upstream areas may be dominated by freshwater, conditions may exist for this species to occur within the BSA.	High potential to occur	None	None	SSC		AFS_VU; USFS_S	AFCJB13120	6
Oncorhynchus mykiss irideus pop. 10	steelhead - Southern California DPS	Can be found in streams that have connectivity to the ocean. Federally listed populations occur from the Santa Maria River south to southern extent of the species' range (San Mateo Creek in San Diego County). Southern steelhead likely have greater physiological tolerances to warmer water more variable conditions than their northern counterparts.	Suitable habitat is present within the BSA where the BSA crosses Topanga Creek, and may also be present at other small coastal streams within the BSA depending on hydrologic and water quality conditions.	High potential to occur. Within the BSA, steelhead are known to occur in Topanga Creek. They also occur nearby in Malibu Creek and Arroyo Sequit (CDFW 2018, NMFS 2016). When sandbars are open, adults or smolts may enter or exit through estuaries, and if sandbars are closed, smolts, juveniles, and/or resident adults may also be present in lagoons or lower creek reaches.	High potential to occur	Endangered	None	None		AFS_EN	AFCHA0209J	4
Mammals												

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Antrozous pallidus	pallid bat	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Pallid bats are known to use bridges for roosting. Very sensitive to disturbance of roosting sites.	Suitable foraging habitat is present within the BSA where dry shrublands, such as chaparral habitat, and woodlands occur. Suitable roosting habitat, such as bridges, is present within the BSA.	Low potential to occur. The nearest records of occurrence are from the Simi Hills in 2004, and historically from Encino Park in 1951 and near Culver City in 1932 (CDFW 2018). Suitable foraging habitat is present within the BSA. Pallid bats are known to use bridges for roosting (Caltrans 2016); therefore, suitable roosting habitat is present within the BSA. However, roosting pallid bats are very sensitive to disturbance and habitats in the vicinity of the BSA are generally disturbed by road and residential activities. Thus, the species has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC		BLM_S; IUCN_LC; USFS_S; WBWG_H	AMACC10010	3
Arctocephalus townsendi	Guadalupe fur seal	Guadalupe fur seals breed along the eastern coast of Guadalupe Island, and have been observed in the southern California Channel Islands.	No suitable habitat present and outside known range of species.	Not expected to occur. No suitable habitat present and outside known range of species.	Not expected to occur	Threatened	Threatened	FP				NMFS
Balaenoptera musculus	blue whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Balaenoptera physalus	fin whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Balaenoptera borealis	sei whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Euderma maculatum	spotted bat	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting, and rarely uses bridges.	Suitable foraging habitat is present within the BSA at lagoons and creeks. Marginally suitable roosting habitat is present within the BSA at bridges.	Low potential to occur. Suitable foraging habitat is present within or adjacent to the BSA at coastal lagoons and creek crossings. The nearest record of occurrence is from Malibu Creek State Park in 2003, approximately 4 miles north of the BSA (CDFW 2018). Marginally suitable roosting habitat is present within the BSA at bridges. Thus, the species has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC		BLM_S; IUCN_LC; WBWG_H	AMACC07010	1
Eubalaena japonica	North Pacific right whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Eumops perotis californicus	western mastiff bat	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces, high buildings, trees, and tunnels, and might use bridges.	Suitable foraging habitat is present within the BSA in woodland, coastal scrub, and chaparral habitats. Potentially suitable roosting habitat occurs within the BSA at bridges, high buildings, or large trees.	Moderate potential to occur. Suitable foraging habitat and roosting habitat is present within the BSA. The nearest records of occurrence are approximately 4 to 5 miles north of the BSA, from Malibu Creek State Park in 2004, Topanga State Park in 2003, and Peter Strauss Ranch in 2004 (CDFW 2018). Thus, western mastiff bat has a moderate potential to occur within the BSA.	Moderate potential to occur	None	None	SSC		BLM_S; WBWG_H	AMACD02011	7
Lasiurus blossevillii	western red bat	Roosts primarily in trees, 2-40 feet above ground, from sea level up through mixed conifer forests. Not known to roost in bridges. Prefers habitat edges and mosaics, with trees that are protected from above and open below, with open areas for foraging.	Suitable foraging habitat is present within the BSA in relatively open coastal scrub and chaparral habitats. Suitable roosting habitat occurs within the BSA where large trees occur.	Moderate potential to occur. Suitable foraging habitat and roosting habitat is present within the BSA. The nearest records of occurrence are approximately 3 to 5 miles north of the BSA, at Paramount Ranch, Peter Strauss Ranch, and the Stunt Ranch Reserve in 2004 (CDFW 2018). Thus, western red bat has a moderate potential to occur within the BSA.	Moderate potential to occur	None	None	SSC		IUCN_LC; WBWG_H	AMACC05060	3
Macrotus californicus	California leaf-nosed bat	Found in desert riparian, desert wash, desert scrub, desert succulent scrub, alkali scrub, and palm oasis habitats. Needs rocky, rugged terrain with mines or caves for roosting. Rarely roosts in bridges.	No suitable foraging habitat present. Marginally suitable roosting habitat present at bridges. Species only known from desert habitats of Southern California.	Not expected to occur. Marginally suitable roosting habitat is present at bridges; however, the BSA is outside of the known range of the species, and no suitable foraging habitat is present or known to occur in the vicinity. Thus, California leaf-nosed bat is not expected to occur within the BSA.	Not expected to occur	None	None	SSC		BLM_S; IUCN_LC; WBWG_H	AMACB01010	1
Megaptera novaeangliae	humpback whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				

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Microtus californicus stephensi	south coast marsh vole	Found in tidal marshes in Los Angeles, Orange, and southern Ventura counties.	Potentially suitable tidal marsh habitats are present within the BSA.	Low potential to occur. Potentially suitable tidal marsh habitats (alkaline wetlands) are present within the BSA; however their small extents and generally disturbed nature due to recreational, nearby residential, and/or road usage activities reduces their potential to be used by south coast marsh vole. The nearest record of occurrence is approximately 9 miles southwest of the BSA at the Ballona Wetlands from 2004 (CDFW 2018). Thus, the south coast marsh vole has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC		0	AMAFF11035	3
Neotoma lepida intermedia	San Diego desert woodrat	Found in coastal scrub of Southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. Particularly abundant in rock outcrops and in rocky cliffs and slopes.	Suitable coastal scrub habitat is present within the BSA.	Present. San Diego desert woodrat nest was observed within the BSA, and suitable coastal scrub habitat occurs within the BSA. The nearest record of occurrence is from Pepperdine University campus in 1995 (CDFW 2018).	Present	None	None	SSC		0	AMAFF08041	2
Nyctinomops ma	Big free-tailed bat	Found in low-lying arid areas in Southern California. Needs high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.	Suitable foraging habitat is present within the BSA; however, suitable roosting habitat, such as rock out croppings, is not present within the BSA.	Low potential to occur. The nearest records of occurrence are from the Burbank in 1987, and from central Los Angeles in 1985 (CDFW 2018). Suitable foraging habitat is present within the BSA; however, suitable roosting habitat is not present within the BSA. Big free-tailed bats are rarely found on bridges (Caltrans 2016). Thus, big free-tailed bat has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC				
Orcinus orca	Southern resident killer whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Perognathus longimembris brevinasus	Los Angeles pocket mouse	Found in lower elevation grasslands and coastal sage communities in and around the Los Angeles Basin. Open ground with fine, sandy soils. May not dig extensive burrows, hiding under weeds and dead leaves instead.	Suitable coastal scrub habitat is present within the BSA.	Low potential to occur. There are no recent records of Los Angeles pocket mouse in the vicinity of the project; the nearest historical record is from the San Fernando Valley in 1903 (CDFW 2018).	Low potential to occur	None	None	SSC		0	AMAFD01041	1
Perognathus longimembris pacificus	Pacific pocket mouse	Inhabits the narrow coastal plains from the Mexican border north to El Segundo, Los Angeles County. Seems to prefer soils of fine alluvial sands near the ocean.	Suitable habitat present within the BSA; however, outside the known range of the species.	Not expected to occur. Outside known range of species.	Not expected to occur	Endangered	None	SSC		0	AMAFD01042	1
Physeter macrocephalus	sperm whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Sorex ornatus salicornicus	southern California saltmarsh shrew	Found in coastal marshes in Los Angeles, Orange, and Ventura counties. Requires dense vegetation and woody debris for cover.	Potentially suitable tidal marsh habitats are present within the BSA.	Low potential to occur. Potentially suitable tidal marsh habitats (alkaline wetlands) are present within the BSA; however their small extents and generally disturbed nature due to recreational, nearby residential, and/or road usage activities reduces their potential to be used by southern California saltmarsh shrew. The nearest record of occurrence is approximately 9 miles southwest of the BSA at the Ballona Wetlands from 1991 (CDFW 2018). Thus, the species has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC		0	AMABA01104	2
Taxidea taxus	American badger	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Marginally suitable habitat is present within the BSA in chaparral, scrub, woodland, and/or grassland habitats; however, no large burrows were observed within the BSA.	Low potential to occur. The nearest recent records of badger were observed within the Santa Monica Mountains National Recreation Area north of Malibu along Kanan-Dume Road, within the geographic extent of the project. Marginally suitable habitat is present within the BSA. However, no large burrows were observed within the BSA; thus, there is a low potential for badger to use the area for foraging and denning.	Low potential to occur	None	None	SSC		IUCN_LC	AMAJF04010	3
Plants												
Abronia maritima	red sand-verbena	Perennial herb. Occurs in coastal dunes. 0-328 feet. Blooms February-November.	Open sand habitat is present within the BSA, and some dune habitat is also present.	Present within the BSA at the Trancas Creek Staging Area and the Zuma Creek Staging Area. There are multiple occurrences of red sand-verbena along the Malibu coastline from the early 1900s through 2013, including at Zuma Beach (Calflora 2018).	Present	None	None		4.2			

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Arenaria paludicola	Marsh sandwort	Perennial stoloniferous herb. Occurs in marshes and swamps. Found growing up through dense mats of Typha, Juncus, Scirpus, etc. in freshwater marsh with sandy soil. 10-558 feet. Blooms May-August.	Freshwater marsh habitat is not present within the BSA.	Not expected to occur. There is no freshwater marsh habitat present within the BSA. Nearest historical occurrence was recorded in Cienega area in 1900 (Calflora 2018, CDFW 2018). Thus, there marsh sandwort is not expected to occur within the BSA.	Not expected to occur	Endangered	Endangered		1B.1		PDCAR040L0	USFWS IPAC query
Asplenium vespertinum	western spleenwort	Perennial rhizomatous herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, in rocky areas. 262-3,281 feet. Blooms February-June.	Coastal scrub habitats are present in portions of the BSA.	Low potential to occur. Most of the coastal scrub habitats within the BSA are disturbed and dominated by non-native species. The nearest record of occurrence is from Lake Sherwood near Westlake Village in 1963 (Calflora 2018). Thus, there is a low potential for western spleenwort to occur within the BSA.	Low potential to occur	None	None		4.2			
Astragalus brauntonii	Braunton's milk-vetch	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in recent burns or disturbed areas; usually on sandstone with carbonate layers. Soil specialist; requires shallow soils to defeat pocket gophers and open areas, preferably on hilltops, saddles, or bowls between hills. 10-2,100 feet. Blooms January-August.	Chaparral, coastal scrub, and non-native grassland habitats are present in portions of the BSA.	Moderate potential to occur. Most of the coastal scrub habitats within the BSA are disturbed and dominated by non-native species. Nearest recent occurrences were recorded at Zuma Ridge in 2007, at upper Zuma Canyon near 2002, at Malibu Lagoon in the 1980s (Calflora 2018, CDFW 2018). Thus, there is a moderate potential for Braunton's milk-vetch to occur within the BSA.	Moderate potential to occur	Endangered	None		1B.1	SB_RSABG; SB_SBBG	PDFAB0F1G0	35
Astragalus pycnostachyus var. lanosissimus	Ventura Marsh milk-vetch	Perennial herb. Occurs in marshes, swamps, coastal dunes, and coastal scrub habitats. Found within reach of high tide or protected by barrier beaches; more rarely found near seeps on sandy bluffs. 3-115 feet. Blooms June-October.	Marsh, coastal dune, and coastal scrub habitats within reach of high tide are present within the BSA.	Low potential to occur. Most of the marsh and coastal scrub habitats within the BSA are disturbed and/or dominated by non-native species. Nearest historical occurrences were recorded near Santa Monica in the late 1800s and early 1900s (Calflora 2018). Thus, there is a low potential for Ventura Marsh milk-vetch to occur within the BSA.	Low potential to occur	Endangered	Endangered		1B.1	SB_RSABG; SB_SBBG	PDFAB0F7B1	2
Astragalus tener var. titi	coastal dunes milk-vetch	Annual herb. Occurs in coastal bluff scrub, coastal dunes, and coastal prairie habitats. Found in moist, sandy depressions of bluffs or dunes along and near the Pacific Ocean; one site was found on a clay terrace. 3-148 feet. Blooms March-May.	Coastal dune habitat is present within the BSA.	Low potential to occur. The coastal dune habitats within the BSA are highly disturbed. Nearest historical occurrence was in Santa Monica in 1930 (Calflora 2018). Thus, there is a low potential for coastal dunes milk-vetch to occur within the BSA.	Low potential to occur	Endangered	Endangered		1B.1	SB_RSABG	PDFAB0F8R2	1
Atriplex coulteri	Coulter's saltbush	Perennial herb. Occurs in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland habitats. Found on ocean bluffs and ridgetops, as well as in low places in alkaline or clay soils. 6-1,509 feet. Blooms March-October.	Coastal dune, coastal scrub, and non-native grassland habitats are present within the BSA.	Moderate potential to occur. There are coastal dune, coastal scrub, and non-native grassland habitats within the BSA. Nearest recent occurrences were at Malibu Bluffs in 2009 and at Point Dume around 1991 (CDFW 2018, Calflora 2018). Thus, there is a moderate potential for Coulter's saltbush to occur within the BSA.	Moderate potential to occur	None	None		1B.2	SB_RSABG	PDCHE040E0	4
Atriplex pacifica	south coast saltscale	Annual herb. Occurs in coastal scrub, coastal bluff scrub, playas, and coastal dunes habitats. Found in alkali soils. 3-1,312 feet. Blooms March-October.	Coastal scrub and coastal dune habitats are present within the BSA.	Low potential to occur within the BSA. The coastal dune and coastal scrub habitats within the BSA are highly disturbed. Nearest historical occurrence was in Santa Monica Mountains in 1881 (Calflora 2018). Thus, there is a low potential for Coulter's saltbush to occur within the BSA.	Low potential to occur	None	None		1B.2	0	PDCHE041C0	1
Atriplex parishii	Parish's brittlescale	Annual herb. Occurs in vernal pools, chenopod scrub, and playas habitats. Usually found on drying alkali flats with fine soils. 16-4,659 feet. Blooms June-October.	No suitable habitat present within the BSA.	Not expected to occur within the BSA. There are no vernal pools, chenopod scrub, or playas habitats present within the BSA. Additionally, the Calflora lists Parish's brittlescale as occuring in the Beverly Hills quad; however, there are no records for the species there (Calflora 2018). The CNDDB has an undated record of the species collected near Santa Monica (CDFW 2018). Thus, Parish's brittlescale is not expected to occur within the BSA.	Not expected to occur	None	None		1B.1	USFS_S	PDCHE041D0	1
Atriplex serenana var. davidsonii	Davidson's saltscale	Annual herb. Occurs in coastal bluff scrub and coastal scrub habitats. Found in alkaline soil. 33-656 feet. Blooms April-October.	Coastal scrub habitats are present within the BSA.	Low potential to occur within the BSA. The coastal scrub habitats within the BSA are highly disturbed. Nearest recorded occurrence was in Malibu/Las Virgenes Canyon in 1974 (Calflora 2018). Thus, there is a low potential for Davidson's saltscale to occur within the BSA.	Low potential to occur	None	None		1B.2	0	PDCHE041T1	1

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Baccharis malibuensis	Malibu baccharis	Perennial deciduous shrub. Occurs in coastal scrub, chaparral, cismontane woodland, and riparian woodland habitats. Found in Conejo volcanic substrates, often on exposed roadcuts. Sometimes occupies oak woodland habitat. 492-1,050 feet. Blooms August.	Coastal scrub, chaparral, and riparian woodland habitats occur within the BSA; however, Conejo volcanic substrates may not be present, as indicated by existing soil map units (USDA 2018).	Moderate potential to occur within the BSA. The coastal scrub, chaparral, and riparian woodland habitats within the BSA are highly disturbed, but Conejo volcanic substrates may not be present (USDA 2018). However, the nearest recorded occurrence was in Solstice Canyon Park in 2000 (Calflora 2018). Thus, there is a moderate potential for Malibu baccharis to occur within the BSA.	Moderate potential to occur	None	None		1B.1	SB_RSABG	PDAST0W0W0	10
Calandrinia breweri	Brewer's calandrinia	Annual herb. Occurs in chaparral and coastal scrub habitats, in sandy or loamy soils, and at disturbed sites and burns.33-4,003 feet. Blooms (January)March-June.	Chaparral and coastal scrub habitats with sandy or loamy soils, and disturbed sites occur within the BSA.	Moderate potential to occur within the BSA. Most of the coastal scrub and chaparral habitats within the BSA are highly disturbed. Multiple occurrences were recorded along the Santa Monica Mountains and Malibu Coastline from the early 1900s through 2005 (Calflora 2018). Thus, there is a moderate potential for Brewer's calandrinia to occur within the BSA.	Moderate potential to occur	None	None		4.2			
Calochortus catalinae	Catalina mariposa-lily	Perennial bulbiferous herb. Occurs in valley and foothill grassland, chaparral, coastal scrub, and cismontane woodland habitats. Found in heavy soils, open slopes, openings in brush. 49-2,297 feet. Blooms (February)March-June, occasionally as early as February.	Chaparral, coastal scrub, and non-native grassland habitats with sandy or loamy soils, and disturbed sites occur within the BSA.	Moderate potential to occur within the BSA. Most of the grassland, coastal scrub, and chaparral habitats within the BSA are highly disturbed. Many occurrences were recorded along the Santa Monica Mountains and Malibu Coastline from the early 1900s through 2010 (Calflora 2018). Thus, there is a moderate potential for Catalina mariposa-lily to occur within the BSA.	Moderate potential to occur	None	None		4.2	0	PMLIL0D080	19
Calochortus clavatus var. clavatus	club-haired mariposa lily	Perennial bulbiferous herb. Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats, usually in serpentinite, clay, or rocky soils. 246-4,265 feet. Blooms (March)May-June.	Chaparral, coastal scrub, and non-native grassland habitats occur within the BSA. Serpentinite or clay soils are not mapped within the BSA (USDA 2018).	Low potential to occur within the BSA. Most of the grassland, coastal scrub, and chaparral habitats within the BSA are highly disturbed. Serpentine or clay soils are not mapped within the BSA (USDA 2018). A few occurrences were recorded along the Santa Monica Mountains and Malibu Coastline from the early 1920s through 1980s (Calflora 2018). Thus, there is a low potential for club-haired mariposa lily to occur within the BSA.	Low potential to occur	None	None		4.3			
Calochortus clavatus var. gracilis	slender mariposa-lily	Perennial bulbiferous herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in shaded foothill canyons; often on grassy slopes within other habitat. 689-5,955 feet. Blooms March-June, occasionally to November.	Chaparral, coastal scrub, and non-native grassland habitats occur within the BSA, including areas with shaded canyon and/or grassy slopes.	Low potential to occur within the BSA. Most of the coastal scrub, grassland, and chaparral habitats within the BSA are highly disturbed. Only recently documented occurrences along the Santa Monica Mountains were from 2010 and 2017 along Topanga Canyon Boulevard at Garapito Creek, on the northern side of the Santa Monica Mountains (Calflora 2018). Thus, there is a low potential for slender mariposa lily to occur within the BSA.	Low potential to occur	None	None		1B.2	BLM_S; SB_RSABG; USFS_S	PMLIL0D096	7
Calochortus plummerae	Plummer's mariposa-lily	Perennial bulbiferous herb. Occurs in coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest. Found at rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire. 197-8,202 feet. Blooms May-July.	Chaparral, coastal scrub, and non-native grassland habitats ocurr within the BSA, including areas of rocky and sandy sites with granitic or alluvial soils (USDA 2018).	Moderate potential to occur within the BSA. Most of the coastal scrub, grassland, and chaparral habitats within the BSA are highly disturbed. Multiple occurrences were recorded along the Santa Monica Mountains from the late 1800s through 2015 (Calflora 2018). The nearest recent record of occurrence was observed near Zuma Creek in 2010 (CDFW 2018). Thus, there is a moderate potential for Plummer's mariposa lily to occur within the BSA.	Moderate potential to occur	None	None		4.2	SB_RSABG	PMLIL0D150	23
Camissoniopsis lewisii	Lewis' evening-primrose	Annual herb. Occurs in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland habitats, in sandy or clay soils. 0-984 feet. Blooms March-May(June).	Coastal dune, coastal scrub, non-native grassland, and woodland habitats, with sandy soils, occur within the BSA.	Moderate potential to occur within the BSA. Most of the coastal dune, coastal scrub, non-native grassland, and woodland habitats within the BSA are highly disturbed. Historical occurrences were recorded at Point Dume from the 1950s (Calflora 2018). Thus, there is a moderate potential for Lewis' evening-primrose to occur within the BSA.	Moderate potential to occur	None	None		3			
Centromadia parryi ssp. australis	southern tarplant	Annual herb. Occurs in marshes and swamps (at margins), valley and foothill grassland, and vernal pools. Often found in disturbed sites near the coast at marsh edges; also in alkaline soils, sometimes with saltgrass. Sometimes found on vernal pool margins. 0-3,199 feet. Blooms May-November.	Marsh (alkaline wetland) and non-native grassland habitats occur within the BSA.	Low potential to occur within the BSA. The alkaline wetland and native grassland habitats within the BSA are highly disturbed. The nearest historical occurrences were recorded at UCLA, Del Rey, and Ballona areas from the early 1900s to 1950s (Calflora 2018). Thus, there is a low potential for southern tarplant to occur within the BSA.	Low potential to occur	None	None		1B.1	SB_RSABG	PDAST4R0P4	3

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Cercocarpus betuloides var. blancheae	island mountain-mahogany	Perennial evergreen shrub. Occurs in closed-cone coniferous forest and chaparral habitats. 98-1,969 feet. Blooms February-May.	Chaparral habitats occur within the BSA.	Low potential to occur within the BSA. The chaparral habitats within the BSA are highly disturbed. A few occurrences were recorded in the Santa Monica Mountains from the early 1900s to early 2000s (Calflora 2018). Thus, there is a low potential for island mountain mahogany to occur within the BSA.	Low potential to occur	None	None		4.3			
Chaenactis glabriuscula var. orcuttiana	Orcutt's pincushion	Annual herb. Occurs in coastal bluff scrub and coastal dunes. Found in sandy sites. 10-262 feet. Blooms January-August.	Coastal dune habitat is present within the BSA.	Low potential to occur within the BSA. The coastal dune habitat within the BSA is highly disturbed. An historical occurrence was recorded in 1898 near the present-day location of Leo Carillo State Beach, and multiple records exist through 2015 at the Ballona Wetlands (Calflora 2018). Thus, there is a low potential for Orcutt's pincushion to occur within the BSA.	Low potential to occur	None	None		1B.1	BLM_S; SB_RSABG	PDAST20095	6
Chenopodium littoreum	coastal goosefoot	Annual herb. Found in coastal dunes. 33-98 feet. Blooms April - August.	Coastal dune habitat is present within the BSA.	Not expected to occur within the BSA. There is coastal dune habitat present within the BSA; however, the nearest historical record was near Playa Del Rey in 1904 (CDFW 2018). Thus, coastal goosefoot is not expected to occur within the BSA.	Not expected to occur	None	None		1B.2	0	PDCHE091Z0	1
Chloropyron maritimum ssp. maritimum	salt marsh bird's-beak	Annual herb (hemiparasitic). Occurs in marshes, swamps, and coastal dune habitats. Limited to the higher zones of salt marsh habitat. 0-10 meters. Blooms May-October(November)	Coastal dune and salt marsh habitats are present within the BSA.	Low potential to occur within the BSA. The coastal dune and salt marsh present within the BSA are highly disturbed. The nearest occurrences were recorded at Ballona Harbor in 1901 and Point Mugu Lagoon in the 1980s (Calflora 2018). Thus, there is low potential for salt marsh bird's-beak to occur within the BSA.	Low potential to occur	Endangered	Endangered		1B.2	SB_RSABG; SB_SBBG	PDSCR0J0C2	5
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	Annual herb. Occurs in coastal scrub and valley and foothill grassland habitats. Found in sandy soils. 49-3,330 feet. Blooms April-July.	Coastal scrub and non-native grassland habitats with sandy soils are present within the BSA.	Low potential to occur within the BSA. The coastal scrub and non-native grassland habitats present within the BSA are highly disturbed. The nearest occurrences were recorded at Ballona Harbor in 1901 and at upper Las Virgenes Canyon from 1999 to 2014 (Calflora 2018). Thus, there is low potential for San Fernando Valley spineflower to occur within the BSA.	Low potential to occur	Proposed Th	Endangered		1B.1	SB_RSABG; USFS_S	PDPGN040J1	3
Chorizanthe parryi var. parryi	Parry's spineflower	Annual herb. Occurs in coastal scrub, chaparral, cismontane woodland, and valley and foothill grassland habitats. Found on dry slopes and flats; sometimes at interface of 2 vegetation types, such as chaparral and oak woodland. Found in dry, sandy soils. 738-4,003 feet. Blooms April-June.	Coastal scrub, chaparral, woodland, and non-native grassland habitats with sandy soils are present within the BSA.	Low potential to occur within the BSA. Most of the coastal scrub, chaparral, woodland and non-native grassland habitats present within the BSA are highly disturbed. The nearest historical occurrence was recorded at Latigo Canyon in 1957 (Calflora 2018). Thus, there is low potential for Parry's spineflower to occur within the BSA.	Low potential to occur	None	None		1B.1	BLM_S; SB_RSABG; USFS_S	PDPGN040J2	1
Cistanthe maritima	seaside cistanthe	Annual herb. Occurs in coastal bluff scrub, coastal scrub, and valley and foothill grassland habitats. Found in sandy sites on sea bluffs. 16-984 feet. Blooms (February)March-June(August).	Coastal scrub and non-native grassland habitats with sandy soils are present within the BSA.	Not expected to occur within the BSA. There are coastal scrub and grassland habitats present within the BSA; however, the BSA is not on bluff areas. The only nearby historical occurrence was recorded in Santa Monica in 1881 (Calflora 2018). Thus, seaside cistanthe is not expected to occur within the BSA.	Not expected to occur	None	None		4.2	0	PDPOR09020	1
Convolvulus simulans	small-flowered morning-glory	Crustose lichen (terricolous). Occurs in chaparral (openings) habitats, on soil, small mammal pellets, dead twigs, and on Selaginella spp. 197-2,165 feet.	Chaparral habitats occur within the BSA.	Low potential to occur within the BSA. Chaparral habitats occur within the BSA; however, the nearest records of occurrence are from the Agoura Hills area north of Highway 101, and there are no records in the Santa Monica Mountains (Calflora 2018). Thus, there is a low potential for small-flowered morning-glory to occur within the BSA.	Low potential to occur	None	None		4.2			
Deinandra minthornii	Santa Susana tarplant	Perennial deciduous shrub. Occurs in chaparral and coastal scrub habitats. Found on sandstone outcrops and crevices, in shrubland. 919-2,313 feet. Blooms July-November.	Chaparral and coastal scrub habitats occur within the BSA, and sandstone rock outcrops are mapped within the BSA (USDA 2018).	Low potential to occur within the BSA. Chaparral and coastal scrub habitats, occur within the BSA, but these habitats are highly disturbed. There are a few records of occurrence from the southern Santa Monica Mountains from 1978 to 2010 (Calflora 2018, CDFW 2010). However, the area within the BSA that is mapped as sandstone rock outcrops soil map unit (USDA 2018) was observed during field surveys to be vegetated with disturbed ruderal. Thus, there is a low potential for Santa Susana tarplant to occur within the BSA.	Low potential to occur	None	Rare		1B.2	BLM_S; SB_RSABG	PDAST4R0J0	23

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Deinandra paniculata	paniculate tarplant	Annual herb. Occurs in coastal scrub, valley and foothill grassland, and vernal pools habitats, in usually vernally mesic, sometimes sandy soils. 82-3,084 feet. Blooms (March)April-November.	Coastal scrub and non-native grassland habitats with sandy soils occur within the BSA.	Low potential to occur within the BSA. Most chaparral and coastal scrub habitats within the BSA are highly disturbed. The nearest record of occurrence was from Santa Monica from 1973 (Calflora 2018). Thus, there is a low potential for paniculate tarplant to occur within the BSA.	Low potential to occur	None	None		4.2			
Delphinium parryi ssp. blochmaniae	dune larkspur	Perennial herb. Occurs in chaparral and coastal dunes (maritime) habitats, on rocky areas and dunes. 59-1,001 feet. Blooms April-June.	Chaparral and coastal dune habitats, with rocky areas or dunes, are present within the BSA.	Low potential to occur within the BSA. Most chaparral and coastal dune habitats within the BSA are highly disturbed. The nearest record of occurrence was from near the present-day location of CSU Channel Islands in 1969 (Calflora 2018). Thus, there is a low potential for dune larkspur to occur within the BSA.	Low potential to occur	None	None		1B.2	BLM_S	PDRAN0B1B1	1
Delphinium parryi ssp. purpureum	Mt. Pinos larkspur	Perennial herb. Occurs in chaparral, Mojavean desert scrub, and pinyon and juniper woodland habitats. 3,281-8,530 feet. Blooms May-June.	Chaparral habitats are present within the BSA.	Not expected to occur within the BSA. There is chaparral habitat present within the BSA; however, the Calflora lists Mt. Pinos larkspur as occuring in the Thousand Oaks and Newberry Park quads but there are no records for the species there (Calflora 2018). Thus, Mt. Pinos larkspur is not expected to occur within the BSA.	Not expected to occur	None	None		4.3			
Dichondra occidentalis	western dichondra	Perennial rhizomatous herb. Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. Found on sandy loam, clay, and rocky soils. 164-1,640 feet. Blooms (January)March-July.	Chaparral, woodland, coastal scrub, and non-native grassland habitats are present within the BSA, and sandy loam, clay, and/or rocky soils have been mapped within the BSA (USDA 2018).	Moderate potential to occur within the BSA. Although suitable soils are present within the BSA, most chaparral, woodland, coastal scrub, and non-native grassland habitats within the BSA are highly disturbed. The nearest record of occurrence was from Tuna Canyon in 1994 (Calflora 2018). Thus, there is a moderate potential for western dichondra to occur within the BSA.	Moderate potential to occur	None	None		4.2	0	PDCON08060	1
Dithyrea maritima	beach spectaclepod	Perennial rhizomatous herb. Occurs in coastal dunes and coastal scrub habitats. Found on sea shores, sand dunes, and sandy places near the shore. 10-213 feet. Blooms March-May.	Coastal dune and coastal scrub habitats are present within the BSA, including along the sea shore with sand dunes and sandy areas.	Not expected to occur within the BSA. There are coastal dune and coastal scrub habitats present within the BSA; however, the nearest historical occurrences were from near Santa Monica in the late 1880s and early 1900s (CDFW 2018). Thus, beach spectaclepod is not expected to occur within the BSA.	Not expected to occur	None	Threatened		1B.1	BLM_S	PDBRA10020	3
Dudleya blochmaniae ssp. blochmaniae	Blochman's dudleya	Perennial herb. Occurs in coastal scrub, coastal bluff scrub, chaparral, and valley and foothill grassland habitats. Found on open, rocky slopes; often in shallow clays over serpentine or in rocky areas with little soil. 16-1,476 feet. Blooms April-June.	Coastal scrub, chaparral, and non-native grassland habitats occur in the BSA. Rocky slopes were not observed during field surveys, and clay or serpentine soils were not mapped within the BSA (USDA 2018).	Low potential to occur within the BSA. Coastal scrub, chaparral, and non-native grassland habitats occur within the BSA, and most are highly disturbed. Rocky slopes were not observed during field surveys, and clay or serpentine soils were not mapped within the BSA (USDA 2018). The nearest records of occurrence were from Point Dume in 1959, near Malibu Beach in 1948, and Little Sycamore Canyon in 1985 (Calflora 2018). Thus, there is a low potential for Blochman's dudleya to occur within the BSA.	Low potential to occur	None	None		1B.1	SB_RSABG	PDCRA04051	11
Dudleya cymosa ssp. agourensis	Agoura Hills dudleya	Perennial herb. Occurs in chaparral and cismontane woodland in rocky or volcanic soils. 656-1,640 feet. Blooms May-June.	Chaparral and woodland habitats occur within the BSA. Rocky or volcanic soils were not mapped within the BSA (USDA 2018).	Low potential to occur within the BSA. Most chaparral and woodland habitats occur within the BSA but most are highly disturbed. Rocky or volcanic soils were not mapped within the BSA, and most soils present are derived from alluvium, shale, and sandstone (USDA 2018). The nearest occurrences of Agoura Hills dudleya were recorded in the northern side of the Santa Monica Mountains near Agoura Hills from 1978 to 2007 (Calflora 2018). Thus, there is a low potential for Agoura Hills dudleya to occur within the BSA.	Low potential to occur	Threatened	None		1B.2	SB_RSABG	PDCRA040A7	8
Dudleya cymosa ssp. marcescens	marcescent dudleya	Perennial herb. Occurs in chaparral habitat, on sheer rock surfaces and rocky volcanic cliffs. 476-2,198 feet. Blooms April-July.	Chaparral habitat occurs within the BSA; however, no sheer rock surfaces or rocky volcanic cliffs were observed during field surveys.	Not expected to occur within the BSA. Observations were recorded from the early 1900s through 2006 at four specific locations along the Santa Monica Mountains (Malibu Creek, Topanga Canyon, Seminole Hot Springs, Little Sycamore Canyon) (Calflora 2018). However, no suitable habitat is present within the BSA; thus, marscent dudleya is not expected to occur within the BSA.	Not expected to occur	Threatened	Rare		1B.2	SB_RSABG	PDCRA040A3	14

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Dudleya cymosa ssp. ovatifolia	Santa Monica dudleya	Perennial herb. Occurs in chaparral and coastal habitats. Found in canyons on volcanic or sedimentary substrates; primarily on north-facing slopes. 492-1,099 feet. Blooms March-June.	Chaparral and coastal habitats occur within the BSA, including with sedimentary soils (USDA 2018).	Moderate potential to occur within the BSA. Chaparral and coastal habitats occur within the BSA, including with sedimentary soils (USDA 2018), but most of these habitats are highly disturbed. Occurrences were recorded at various locations in the Santa Monica Mountains from 1948 to 2011, including Malibu Canyon and Topanga Canyon (Calflora 2018, CDFW 2011). Thus, there is a moderate potential for Santa Monica dudleya to occur within the BSA.	Moderate potential to occur	Threatened	None		1B.1	SB_RSABG	PDCRA040A5	3
Dudleya multicaulis	many-stemmed dudleya	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland, often in clay soils. 49-2,592 feet. Blooms April-July.	Chaparral, coastal scrub, and non-native grassland habitats occur within the BSA. No clay soils were mapped within the BSA (USDA 2018), and might not occur.	Low potential to occur within the BSA. Most chaparral and coastal habitats within the BSA are highly disturbed. No clay soils were mapped within the BSA (USDA 2018), and might not occur. The nearest historical occurrences were recorded near Thousand Oaks from 1958 and in Santa Monica in 1891 (Calflora 2018). Thus, there is a low potential for many-stemmed dudleya to occur within the BSA.	Low potential to occur	None	None		1B.2	BLM_S; SB_RSABG; USFS_S	PDCRA040H0	1
Dudleya parva	Conejo dudleya	Perennial herb. Occurs in coastal scrub, valley and foothill grassland, in clay or volcanic soils on rocky slopes and grassy hillsides. 295-1,247 feet. Blooms May-June.	Coastal scrub and non-native grassland habitats are present within the BSA; however, no clay or volcanic soils were mapped in the BSA and might not occur (USDA 2018), and the BSA is outside the known range of the species (CNPS 2018).	Not expected to occur within the BSA. Conejo dudleya is only known to occur north of the Santa Monica Mountains; it does not occur on the Malibu Coast or southern Santa Monica Mountains. Occurrences were recorded near Thousand Oaks and Newberry Park, north of Highway 101, from 1922 through 2001 (Calflora 2018).	Not expected to occur	Threatened	None		1B.2	SB_RSABG	PDCRA04016	11
Dudleya verityi	Verity's dudleya	Perennial herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, on volcanic rock outcrops in the Santa Monica Mountains. 197-1,099 feet. Blooms May-June.	Chaparral, coastal scrub, and woodland habitats are present within the BSA; however, no volcanic outcrops were observed during field surveys, and the BSA is outside the known range of the species.	Not expected to occur within the BSA. No suitable habitat present within the BSA. Verity's dudleya is only known to occur in the western-most portion of the Santa Monica Mountains near CSU Channel Islands, where observations were recorded from 1944 through 2016 (Calflora 2018); it does not occur on the Malibu Coast or southern Santa Monica Mountains.	Not expected to occur	Threatened	None		1B.1	SB_RSABG	PDCRA040U0	8
Eriogonum crocatum	Conejo buckwheat	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats, at rocky sites on Conejo volcanic outcrops. 295-1,903 feet. Blooms April-July.	Chaparral, coastal scrub, and non-native grassland habitats occur within the BSA; however, no volcanic outcrops were observed during field surveys.	Not expected to occur within the BSA. No suitable habitat present within the BSA. Conejo buckwheat currently only known to occur in the northwestern Santa Monica Mountains (Calflora 2018). An historical occurrence was recorded in the Malibu Hills 1926 (Calflora 2018); however, it not known to occur on the Malibu Coast or southern Santa Monica Mountains at present day. Thus, Conejo buckwheat is not expected to occur within the BSA.	Not expected to occur	None	Rare		1B.2	SB_RSABG	PDPGN081G0	13
Eryngium aristulatum var. parishii	San Diego button-celery	Annual/perennial herb. Occurs in vernal pools, coastal scrub, valley and foothill grassland habitats. Specifically found in San Diego mesa hardpan and claypan vernal pools, and in southern interior basalt flow vernal pools; usually surrounded by scrub. 49-2,887 feet. Blooms April-June.	San Diego mesa hardpan, claypan vernal pools, or southern interior basalt flow vernal pools habitats are not present within the BSA.	Not expected to occur within the BSA. There are no suitable habitats present within the BSA. The nearest historical occurrence was recorded near Wiseburn in the Venice Quad in 1901, but is now extirpated at that site (Calflora 2018). Thus, San Diego button-celery is not expected to occur within the BSA.	Not expected to occur	Endangered	Endangered		1B.1	SB_RSABG	PDAPI0Z042	1
Erysimum suffrutescens	suffrutescent wallflower	Perennial herb. Occurs in coastal bluff scrub, chaparral (maritime), coastal dunes, and coastal scrub habitats. 0-492 feet. Blooms January-July(August).	Chaparral, coastal dune, and coastal scrub habitats are present within the BSA.	Low potential to occur within the BSA. Most chaparral, coastal dune, and coastal scrub habitats within the BSA are highly disturbed. The nearest recent occurrences were recorded at Ballona Wetlands in 1980 and Point Mugu in 2002. Thus, there is a low potential for suffrutescent wallflower to occur within the BSA.	Low potential to occur	None	None		4.2			
Hordeum intercedens	vernal barley	Annual herb. Occurs in coastal dunes, coastal scrub, valley and foothill grassland (saline flats and depressions), and vernal pool habitats. 16-3,281 feet. Blooms March-June.	No suitable saline flats or vernal pool habitats present within the BSA.	Not expected to occur within the BSA. There are no suitable habitats present within the BSA. The nearest occurrence was recorded in 1984 near Glenview, on the northern side of the Santa Monica Mountains (Calflora 2018). Thus, vernal barley is not expected to occur within the BSA.	Not expected to occur	None	None		3.2			

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Horkelia cuneata var. puberula	mesa horkelia	Perennial herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, at sandy or gravelly sites. 49-5,397 feet. Blooms February-July, occasionally to September.	Chaparral, woodland, and coastal scrub habitats, including with sandy or gravelly sites, are present within the BSA.	Moderate potential to occur within the BSA. Most chaparral, woodland, and coastal scrub habitats within the BSA are highly disturbed. The nearest occurrences were recorded at Charmlee Wilderness Park in 2008 and Point Dume in 1955 (Calflora 2018). Thus, there is a moderate potential for mesa horkelia to occur within the BSA.	Moderate potential to occur	None	None		1B.1	USFS_S	PDROS0W045	5
Isocoma menziesii var. decumbens	decumbent goldenbush	Perennial shrub. Occurs in coastal scrub and chaparral habitats. Found in sandy soils; often in disturbed sites. 3-3,002 feet. Blooms April-November.	Coastal scrub and chaparral habitats with sandy soils are present within the BSA.	Moderate potential to occur within the BSA. Most chaparral and coastal scrub habitats within the BSA are highly disturbed, but decumbent goldenbush is often found in disturbed areas. The nearest occurrence was recorded at Malibu Colony in 1975 (Calflora 2018). Thus, there is a moderate potential for decumbent goldenbush to occur within the BSA.	Moderate potential to occur	None	None		1B.2	0	PDAST57091	1
Juglans californica var. californica	Southern California black walnut	Perennial deciduous tree. Occurs in chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats, in alluvial soils. 164-2,953 feet.	Chaparral, woodland, coastal scrub, and riparian woodland habitats with alluvial soils are present within the BSA.	Present. Walnut woodland habitat with Southern California black walnut trees is present within the BSA.	Present	None	None		4.2			
Juncus acutus ssp. leopoldii	southwestern spiny rush	Perennial rhizomatous herb. Occurs in coastal dunes (mesic), meadows and seeps (alkaline seeps), and marshes and swamps (coastal salt) habitats. 10-2,953 feet. Blooms (March)May-June.	Coastal dune and coastal marsh/lagoon habitats are present within the BSA.	Moderate potential to occur within the BSA. Coastal dune and coastal lagoon habitats within the BSA are highly disturbed. The nearest historical occurrences were recorded at Point Mugu in 1959 and 1977, and at Pacific Palisades in 1959 (Calflora 2018). Thus, there is a moderate potential for southwestern spiny rush to occur within the BSA.	Moderate potential to occur	None	None		4.2			
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Annual herb. Occurs in coastal salt marshes, playas, and vernal pools habitats. Usually found on alkaline soils in playas, sinks, and grassland areas. 3-4,511 feet. Blooms February-June.	Coastal salt marsh/lagoon habitat is present within the BSA.	Low potential to occur within the BSA. Coastal coastal lagoon habitats within the BSA are highly disturbed. The nearest historical occurrence was recorded along the highway near Malibu in 1933 (Calflora 2018). Thus, there is a low potential for Coulter's goldfields to occur within the BSA.	Low potential to occur	None	None		1B.1	BLM_S; SB_RSABG	PDAST5L0A1	6
Lepechinia fragrans	fragrant pitcher sage	Perennial shrub. Occurs in chaparral habitat. 66-4,298 feet. Blooms March-October.	Chaparral habitat is present within the BSA.	Moderate potential to occur within the BSA. Chaparral habitat is present within the BSA, although most is highly disturbed. There are multiple occurrences recorded from 1930s through 2000s in the Santa Monica Mountains, although the nearest records were from 1931 in Los Alisos Canyon (Calflora 2018). Thus, there is a moderate potential for fragrant pitcher sage to occur within the BSA.	Moderate potential to occur	None	None		4.2			
Lilium humboldtii ssp. humboldtii	Humboldt lily	Perennial bulbiferous herb. Occurs in chaparral, lower montane coniferous forest, and cismontane woodland habitats. Found in yellow-pine forest, at openings, or open forest. 295-4,199 feet. Blooms May-July, occasionally as late as August.	Chaparral and woodland habitats are present within the BSA.	Low potential to occur within the BSA. Chaparral and woodland habitats are present within the BSA, although most are highly disturbed. There was an historical observation recorded in 1957 at Latigo Canyon (Calflora 2018). Thus, there is a low potential for ocellated Humboldt lily to occur within the BSA.	Low potential to occur	None	None		4.2	0	PMLIL1A071	6
Lilium humboldtii ssp. ocellatum	ocellated Humboldt lily	Perennial bulbiferous herb. Occurs within openings in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland habitats. 98-5,906 feet. Blooms March-July(August).	Chaparral, coastal scrub, and woodland habitats are present within the BSA.	Moderate potential to occur within the BSA. Chaparral, coastal scrub, and woodland habitats are present within the BSA, although most are highly disturbed. There are multiple occurrences recorded from early 1900s through 2000s in the Santa Monica Mountains, and the most recent and nearest record was from 2009 in lower Solstice Canyon (Calflora 2018). Thus, there is a moderate potential for ocellated Humboldt lily to occur within the BSA.	Moderate potential to occur	None	None		4.2			
Malacothamnus davidsonii	Davidson's bush-mallow	Perennial deciduous shrub. Occurs in coastal scrub, riparian woodland, chaparral, and cismontane woodland habitats, in sandy washes. 492-5,003 feet. Blooms June-January.	Coastal scrub, woodland, and chaparral habitats are present within the BSA.	Low potential to occur within the BSA. Chaparral, coastal scrub, and woodland habitats are present within the BSA, although most are highly disturbed. The nearest historical observation was recorded in the San Fernando Valley in 1931 (Calflora 2018). Thus, there is a low potential for Davidson's bush-mallow to occur within the BSA.	Low potential to occur	None	None		1B.2	0	PDMAL0Q040	1

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Monardella hypoleuca ssp. hypoleuca	white-veined monardella	Perennial herb. Occurs in chaparral and cismontane woodland habitats, on dry slopes. 164-4,199 feet. Blooms May-August, occasionally as early as April or as late as December.	Chaparral and woodland habitats with dry slopes are present within the BSA.	Moderate potential to occur within the BSA. Chaparral and woodland habitats are present within the BSA, although most are highly disturbed. The nearest recent observation was recorded in Santa Ynez Canyon in 2009, and historically in Malibu Canyon from 1898 and in Topanga Canyon from 1907 (Calflora 2018). Thus, there is a moderate potential for white-veined monardella to occur within the BSA.	Moderate potential to occur	None	None		1B.3	0	PDLAM180A3	4
Monardella sinuata ssp. gerryi	Gerry's curly-leaved monardella	Annual herb. Occurs in coastal scrub, in sandy openings. 492-804 feet. Blooms April-June.	Coastal scrub habitat with sandy openings is present within the BSA.	Low potential to occur within the BSA. There are coastal scrub habitats with sandy openings present within the BSA; however, the nearest records for the species are from observations north of Camarillo and Thousand Oaks in 1934, 1976, and 2015 (CDFW 2018). Thus, Gerry's curly-leaved monardella has a low potential to occur within the BSA.	Low potential to occur	None	None		1B.1	0	PDLAM18163	1
Monardella sinuata ssp. sinuata	southern curly-leaved monardella	Annual herb. Occurs in chaparral, cismontane woodland, coastal dunes, and coastal scrub (openings) habitats, in sandy soils. 0-984 feet. Blooms April-September.	Chaparral, woodland, coastal dune, and coastal scrub habitats with openings in sandy soil are present within the BSA.	Low potential to occur within the BSA. There are coastal scrub, woodland, coastal dune, and chaparral habitats with sandy openings present within the BSA; however, the nearest records of occurrence are from the Las Posas Hills area, north of Highway 101, in 1975 and 2013 (Calflora 2018). Thus, southern curly-leaved monardella has a low potential to occur within the BSA.	Low potential to occur	None	None		1B.2			
Nama stenocarpa	mud nama	Annual herb. Occurs in marshes and swampes, at lake shores, river banks, and intermittently wet areas. 16-1,640 feet. Blooms January-July.	Wetland and intermittent stream habitats are present within the BSA.	Low potential to occur within the BSA. There are wetland and intermittent stream habitats present within the BSA; however, the nearest historical records of occurrence are from the Santa Monica and Brentwood areas in the late 1800s and early 1900s (Calflora 2018). Thus, mud nama has a low potential to occur within the BSA.	Low potential to occur	None	None		2B.2	0	PDHYD0A0H0	1
Navarretia fossalis	Spreading navarretia	Annual herb. Occurs in vernal pools, chenopod scrub, marshes, swamps, and playas habitats. Found in San Diego hardpan and San Diego claypan vernal pools, and in swales, often surrouded by other habitat types. 49-2,789 feet. Blooms April-June.	Vernal pool habitat is not present within the BSA.	Not expected to occur within the BSA because there is no suitable vernal pool habitat present. The nearest records of occurrence for the species are from near Santa Clarita in 2003, and historically from near Inglewood in 1906 (Calflora 2018).	Not expected to occur	Threatened	None		1B.1			USFWS IPAC query
Navarretia ojaiensis	Ojai navarretia	Annual herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in openings in shrublands or grasslands. 902-2,034 feet. Blooms May-July.	Chaparral, coastal scurb, and non-native grassland habitats with openings are present within the BSA.	Low potential to occur. Chaparral, coastal scrub, and grassland habitats are present within the BSA, although most of these habitats are highly disturbed. The nearest recent observations were recorded in the Santa Monica Mountains along upper Latigo Canyon Road in 2012, and near Malibu Springs in 2007 (Calflora 2018, CDFW 2018). Thus, Ojai navarretia has a low potential to occur within the BSA.	Low potential to occur	None	None		1B.1	SB_RSABG; USFS_S	PDPLM0C130	10
Navarretia prostrata	prostrate vernal pool navarretia	Annual herb. Occurs in coastal scrub, valley and foothill grassland, vernal pools, and meadows and seeps habitats. Found in in mesic, alkaline sites, including alkaline soils in grassland, or in vernal pools. 10-4,052 feet. Blooms April-July.	No suitable vernal pool or mesic, alkaline grassland habitats are present within the BSA.	Not expected to occur within the BSA because there is no suitable vernal pool or mesic, alkaline habitat present. The nearest historical records of occurrence for the species are from near Inglewood in the early 1900s and from near Manhattan Beach in the 1940s (Calflora 2018, CDFW 2018).	Not expected to occur	None	None		1B.1	0	PDPLM0C0Q0	1
Nolina cismontana	chaparral nolina	Perennial evergreen shrub. Occurs in chaparral and coastal scrub habitats, primarily on sandstone and shale substrates; also known from gabbro. 459-3,609 feet. Blooms (March)May-July.	Chaparral and coastal scrub habitats with sandstone substrates occur within the BSA.	Low potential to occur. Chaparral and coastal scrub habitats are present within the BSA, although most of these habitats are highly disturbed. The nearest observations were recorded north of Thousand Oaks and Agoura Hills (Calflora 2018, CDFW 2018). Thus, chaparral nolina has a low potential to occur within the BSA.	Low potential to occur	None	None		1B.2	SB_RSABG; SB_SBBG; USFS_S	PMAGA080E0	9
Orcuttia californica	California Orcutt grass	Annual herb. Found in vernal pools. 33-2,165 feet. Blooms April-August.	No vernal pool habitat is present within the BSA.	Not expected to occur within the BSA because no vernal pool habitat is present. Nearest recent record of occurrence was from near Moorpark in 2011, and historically observed near Inglewood in 1946 (Calflora 2018).	Not expected to occur	Endangered	Endangered		1B.1	SB_RSABG	PMPOA4G010	1

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Pentachaeta lyonii	Lyon's pentachaeta	Annual herb. Occurs in chaparral, valley and foothill grassland, and coastal scrub habitats. Found at edges of clearings in chaparral, usually at the ecotone between grassland and chaparral or edges of firebreaks. 98-2,067 feet. Blooms March-August, occasionally as early as February.	Chaparral, non-native grassland, and coastal scrub habitats occur within the BSA.	Moderate potential to occur within the BSA. Chaparral, grassland, and coastal scrub habitats are present within the BSA, although most of these habitats are highly disturbed. There are multiple observations of Lyon's pentachaeta across the Santa Monica Mountains from the early 1900s through 2017. The most recent or nearby occurrences were recorded in 2017 approximately 4 miles north of Malibu Beach, in 2015-2016 along upper Malibu Creek, in 2012 along Kanan-Dune Road, (Calflora 2018, CDFW 2018). Thus, Lyon's pentachaeta has a moderate potential to occur within the BSA.	Moderate potential to occur	Endangered	Endangered		1B.1	SB_RSABG	PDAST6X060	37
Phacelia hubbyi	Hubby's phacelia	Annual herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats, in gravelly, rocky, and talus soils. 0-3,281 feet. Blooms April-July.	Chaparral, grassland, and coastal scrub habitats with gravelly and rocky soils are present within the BSA.	Low potential to occur within the BSA. Chaparral, grassland, and coastal scrub habitats are present within the BSA, although most of these habitats are highly disturbed. There are multiple observations of Hubby's phacelia across the Santa Monica Mountains from the 1920s through 2016, although the observations from the south side of the range are from the 1920s through 1940s (Calflora 2018). Thus, Hubby's phacelia has a low potential to occur within the BSA.	Low potential to occur	None	None		4.2			
Phacelia ramosissima var. austrolitoralis	south coast branching phacelia	Perennial herb. Occurs in chaparral, coastal dunes, coastal scrub, and marshes and swamps (coastal salt) habitats, in sandy and sometimes rocky soils. 16-984 feet. Blooms March-August.	Chaparral, coastal dune, coastal scrub, and coastal lagoon habitats with sandy soils occur within the BSA	Moderate potential to occur within the BSA. Chaparral, coastal dune, coastal scrub, and coastal lagoon habitats with sandy soils occur within the BSA, although most of these habitats are highly disturbed. There are multiple historical occurrences recorded from the 1930s through 1980s across the Malibu Coastline at Point Dume, Carbon Canyon, and Topanga Canyon (Calflora 2018). Thus, south coast branching phacelia has a moderate potential to occur within the BSA.	Moderate potential to occur	None	None		3.2			
Phacelia stellaris	Brand's star phacelia	Annual herb. Occurs in coastal dunes and coastal scrub habitats. 3-1,312 feet. Blooms March-June.	Coastal dunes and coastal scrub occur within the BSA.	Low potential to occur within the BSA. Coastal dunes and coastal scrub habitats occur within the BSA, although most of these habitats are highly disturbed. The nearest historical occurrences are from the 1930s and 1940s near Playa Del Rey (Calflora 2018). Thus, Brand's star phacelia has a low potential to occur within the BSA.	Low potential to occur	None	None		1B.1	SB_RSABG	PDHYD0C510	2
Piperia michaelii	Michael's rein orchid	Perennial herb. Occurs in coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest habitats. 10-3,002 feet. Blooms April-August.	Coastal scrub and woodland habitats are present within the BSA.	Not expected to occur within the BSA. Coastal scrub and woodland habitats are present within the BSA, although most of these habitats are highly disturbed. The nearest historical occurrences are from the late 1800s and early 1900s near Glendale (Calflora 2018). Thus, there is a low potential for Michael's rein orchid to occur within the BSA.	Not expected to occur	None	None		4.2			
Potentilla multijuga	Ballona cinquefoil	Perennial herb. Found in brackish meadows and seeps. 0-7 feet. Blooms June-August.	Alkaline wetland and coastal lagoon habitats are present within the BSA.	Not expected to occur within the BSA. Alkaline wetland and coastal lagoon habitats are present within the BSA, although they are highly disturbed. The nearest historical occurrence was recorded near Ballona Wetlands in the late 1800s (Calflora 2018). Thus, it is not likely that Ballona cinquefoil would occur within the BSA.	Not expected to occur	None	None		1A	0	PDROS1B120	1
Pseudognaphalium leucocephalum	white rabbit-tobacco	Perennial herb. Occurs in riparian woodland, cismontane woodland, coastal scrub, and chaparral habitats. Found in sandy and gravelly sites. 100 to 4,035 feet. Blooms (July)August-November(December).	Woodland, coastal scrub, and chaparral habitats with sandy sites are present within the BSA.	Not expected to occur within the BSA. Woodland, coastal scrub, and chaparral habitats with sandy sites are present within the BSA, although they are highly disturbed. The nearest historical occurrences were recorded near Camarillo in the 1950s and near Hollywood in the early 1900s (Calflora 2018). Thus, it is not likely that white rabbit-tobacco would occur within the BSA.	Not expected to occur	None	None		2B.2	0	PDAST440C0	1
Quercus dumosa	Nuttall's scrub oak	Perennial evergreen shrub. Occurs in closed-cone coniferous forest, chaparral, and coastal scrub habitats. Generally found on sandy soils near the coast; sometimes found on clay loam. 49-2,100 feet. Blooms February-April(May-August).	Chaparral and coastal scrub habitats with sandy soils are present within the BSA.	Not present within the BSA. Chaparral and coastal scrub habitats with sandy soils are present within the BSA. There are multiple records of Nuttall's scrub oak across the Santa Monica Mountains from the early 1900s through 1990s (Calflora 2018). This species was not observed during field surveys within the BSA.	Not present	None	None		1B.1	USFS_S	PDFAG050D0	1

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Nasturtium gambelii (Rorippa gambellii)	Gambel's watercress	Perennial rhizomatous herb. Occus in freshwater and brackish marshes, and at the margins of lakes and along streams, in or or just above the waterline. Blooms April-October.	Alkaline wetland and coastal lagoon habitats are present within the BSA.	Not expected to occur within the BSA. Alkaline wetland and coastal lagoon habitats are present within the BSA, although are highly disturbed. The nearest historical occurrences were from Los Angeles near Cienega in the late 1800s and early 1900s (Calflora 2018). Thus, Gambel's watercress is not expected to occur within the BSA.	Not expected to occur	Endangered	Threatened		1B.1		PDBRA270V0	USFWS IPAC query
Senecio aphanactis	chaparral ragwort	Annual herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, sometimes in alkaline soils. 49-2,625 feet. Blooms January-April(May).	Chaparral, woodland, and scrub habitats are present within the BSA.	Moderate potential to occur within the BSA. Chaparral, woodland, and coastal scrub habitats are present within the BSA, although most are highly disturbed. The nearest observation was recorded at Deer Creek Canyon, east of Point Mugu in 1997 (Calflora 2018). Thus, there is a moderate potential for chaparral ragwort to occur within the BSA.	Moderate potential to occur	None	None		2B.2	0	PDAST8H060	7
Sidalcea neomexicana	salt spring checkerbloom	Perennial herb. Occurs in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas habitats, in alkaline and mesic soils. 49-5,020 feet. Blooms March-June.	Chaparral and coastal scrub habitats are present within the BSA.	Low potential to occur. Chaparral and coastal scrub habitats are present within the BSA, although most are highly disturbed. The nearest historical observation was recorded at Santa Monica in 1900 (Calflora 2018). Thus, there is a low potential for salt spring checkerbloom to occur within the BSA.	Low potential to occur	None	None		2B.2	USFS_S	PDMAL110J0	1
Spermolepis lateriflora	western bristly scaleseed	Annual herb. Occurs in Sonoran desert scrub habitats on rocky or sandy areas. 1198-2,198 feet. Blooms March-April.	There are no Sonoran desert scrub habitats present within the BSA.	Not expected to occur. There are no Sonoran desert scrub habitats present within the BSA. Additionally, the Calflora lists western bristly scaleseed as occuring in the Topanga quad; however, there are no records for the species there (Calflora 2018). The CNDDB maps an occurrence in Tuna Canyon near Topanga Creek, but the record indiactes Tuna Canyon in the Verdugo Mountains, suggesting the record is mapped incorrectly in the Santa Monica Mountains (CNDDB 2018). Thus, western bristly scaleseed is not expected to occur within the BSA.	Not expected to occur	None	None		2A	0	PDAPI23080	1
Suaeda esteroa	estuary seablite	Perennial herb. Occurs in marshes and swamps (coastal salt). 0-16 feet. Blooms (May)July-October(January)	Coastal lagoon and alkaline wetland habitats are present within the BSA.	Low potential to occur within the BSA. Coastal lagoon and alkaline wetland habitats are present within the BSA, although they are highly disturbed. The nearest observations were recorded at Point Mugu from 1948 through 2012 (Calflora 2018, CDFW 2018). Thus, there is a low potential for estuary seablit to occur within the BSA.	Low potential to occur	None	None		1B.2	0	PDCHE0P0D0	3
Suaeda taxifolia	woolly seablite	Perennial evergreen shrub. Occurs in coastal bluff scrub, coastal dunes, and marshes and swamps (margins of coastal salt) habitats. 0-164 feet. Blooms January-December.	Coastal dunes, coastal lagoon, and alkaline wetland habitats are present within the BSA.	High potential to occur within the BSA. Coastal dunes, coastal lagoon, and alkaline wetland habitats are present within the BSA, although most are highly disturbed. There are multiple observations recorded across the Malibu coastline from the 1930s through 1990s, including a 1997 observation at Zuma Beach (Calflora 2018). Thus, there is a high potential for woolly seablite to occur within the BSA.	High potential to occur	None	None		4.2			
Symphyotrichum greatae	Greata's aster	Perennial rhizomatous herb. Occurs in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and riparian woodland, in mesic areas. 984-6,594 feet. Blooms June-October.	Chaparral and woodland habitats are present within the BSA, possibly with mesic areas.	Not expected to occur within the BSA. Chaparral and woodland habitats are present within the BSA, possibly with mesic areas; however, the Calflora lists Greata's aster as occuring in the Beverly Hills quad and the nearest occurrence was in Benedicts Canyon, north of Beverly Hills, from an undated collection (Calflora 2018, CDFW 2018). Thus, Greata's aster is not expected to occur within the BSA.	Not expected to occur	None	None		1B.3	BLM_S	PDASTE80U0	1
Texosporium sancti-jacobi	woven-spored lichen	Crustose lichen (terricolous). Occurs in chaparral (openings) habitats, on soil, small mammal pellets, dead twigs, and on Selaginella spp. 197-2,165 feet.	Chaparral habitats are present within the BSA.	Low potential to occur within the BSA. Chaparral habitats are present within the BSA; however, the Calflora lists woven-spored lichen as occuring in the Camarillo quad and the nearest record was from 2003 near CSU Channel Islands in Long Grade Canyon (Calflora 2018, CDFW 2018). Thus, woven-spored lichen has a low potential to occur within the BSA.	Low potential to occur	None	None		3	0	NLTEST7980	1

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Thelypteris puberula var. sonorensis	Sonoran maiden fern	Perennial rhizomatous herb. Occurs in meadows and seeps, along streams or at seepage areas. 164-2,001 feet. Blooms January-September.	Wetland and intermittent stream habitats are present within the BSA.	Low potential to occur within the BSA. Wetland and intermittent stream habitats are present within the BSA. The nearest and most recent observations were recorded at Lachusa Canyon and Encinal Canyon in the 1960s, and in Arroyo Sequit in the 1950s (Calflora 2018, CDFW 2018). Thus, there is a low potential for Sonoran maiden fern to occur within the BSA.	Low potential to occur	None	None		2B.2	USFS_S	PPTHE05192	4
Tortula californica	California screw moss	Moss. Occurs in chenopod scrub and valley and foothill grassland habitats. Moss grows on sandy soil. 33-4,790 feet.	Non-native grassland habitats with sandy soil are present within the BSA.	Moderate potential to occur within the BSA. Non-native grassland habitats with sandy soil are present within the BSA. The nearest recent observeation was recorded in Newton Canyon, just east of Zuma Canyon, in 2004, and near Triunfo Pass and upper Arroyo Sequit Creek in 2006 (CDFW 2018). Thus, California screw moss has a moderate potential to occur within the BSA.	Moderate potential to occur	None	None		1B.2	BLM_S	NBMUS7L090	3
Sensitive Habitats												
Sensitive Natural Communities												
California Walnut Woodland	California Walnut Woodland	Juglans californica is dominant or co-dominant in the tree canopy with Alnus rhombifolia, Fraxinus dipetala, Heteromeles arbutifolia, Quercus agrifolia, Quercus lobata, Salix laevigata, Salix lasiolepis, Sambucus nigra and Umbellularia californica. Trees < 15 m tall; canopy is open to continuous. Shrub layer is sparse to intermittent. Herbaceous layer is sparse or grassy. Juglans californica > 50% relative cover in the tree canopy or > 30% relative cover with Quercus agrifolia present (Keeler-Wolf and Evens 2006). Riparian corridors, but most stands cover all hillslopes. The USFWS Wetland Inventory (1996 national list) recognizes Juglans californica as a FAC plant.	California Walnut Woodland habitat is present within the BSA.	Walnut woodland habitat is present within the BSA. There are no previously mapped occurrences of California walnut woodland within the BSA, although there are multiple habitats mapped within the foothills on the northern side of the Santa Monica Mountains (CDFW 2018). Walnut woodland habitats were observed during field surveys within the BSA of the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) project and within the BSA of the Emergency Source of Water Supply Connection (Las Virgenes Connection) project.	Present					0	CTT71210CA	10
Riversidian Alluvial Fan Sage Scrub	Riversidian Alluvial Fan Sage Scrub	Found on California's inner southern coast and inland along the base of the Transverse and Peninsular ranges extending south into Baja California, Mexico. This alliance consists for shrublands dominated by Artemisia californica, Eriogonum fasciculatum, Salvia apiana, and/or Salvia mellifera. Other species present include Encelia farinosa, Ericameria spp., Isocoma menziesii, Malacothamnus fasciculatus, Malosma laurina, Rhus spp., and/or Yucca whipplei (= Hesperoyucca whipplei). In more mesic settings, on rockier soil, often closer to the coast, black sage increases in importance and this alliance shifts to ~Artemisia californica - Salvia mellifera - Salvia leucophylla Mesic Scrub Alliance. Habitats are slopes that are steep and south-facing, sometimes bouldery, as well as intermittently flooded arroyos, channels and washes, and rarely flooded low-gradient deposits. Elevation ranges from 250-1600 m. Soils are coarse or fine-textured, well-drained, moderately acidic to slightly saline, and colluvial-derived, or in some cases alluvial.	Riversidian Alluvial Fan Sage Scrub habitat is not present within the BSA.	Riversidian Alluvial Fan Sage Scrub habitat is not present within the BSA. There are no previously mapped occurrences of California walnut woodland within the BSA, and the nearest mapped occurrence is in the San Fernando Valley (CDFW 2018). Riversidian Alluvial Fan Sage Scrub habitat was not observed during field surveys within the BSA.	Not present					0	CTT32720CA	1

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Southern California Coastal Lagoon	Southern California Coastal Lagoon	Coastal lagoon habitat.	Southern California Coastal Lagoon habitat is present within the BSA.	Coastal lagoon habitat is present within the BSA. There are no previously mapped occurrences of Southern California Coastal Lagoon within the BSA, although there is nearby habitat mapped at the Malibu Creek mouth (CDFW 2018). Coastal lagoon habitats were observed during field surveys within the BSAs of the PCH & Topanga Beach Drive (segment 2), Las Flores Canyon Creek, Corral Canyon Creek, Trancas Creek, Escondido Creek, Topanga Canyon Creek, and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) projects and the BSA of the Topanga County Beach Staging Area.	Present					0	CALE1220CA	1
Southern California Steelhead Stream	Southern California Steelhead Stream	Suitable habitat for southern California ste	Southern California Steelhead Stream habitat is present within the BSA.	Southern California Steelhead Stream habitat is present within the BSA. There are no previously mapped occurrences of Southern California Steelhead Stream within the BSA, although there is nearby habitat mapped in Malibu Creek (CDFW 2018). Steelhead are also known to occur in Topanga Creek (CDFW 2018), and could occur within the BSA of the Topanga Canyon Creek project and the BSA of the Topanga County Beach Staging Area.	Present					0	CARE2310CA	1
Southern Coast Live Oak Riparian Forest	Southern Coast Live Oak Riparian Forest	Quercus agrifolia is dominant or co-dominant in the tree canopy with Acer macrophyllum, Acer negundo, Arbutus menziesii, Juglans californica, Platanus racemosa, Populus fremontii, Quercus douglasii, Quercus engelmannii, Quercus kelloggii, Quercus lobata, Salix lasiolepis and Umbellularia californica. Trees < 30 m tall; canopy is open to continuous. Shrub layer is sparse to intermittent. Herbaceous layer is sparse or grassy. Membership rules: Quercus agrifolia > 50% relative cover in the tree canopy; if Umbellularia californica trees present, then < 33% relative cover in the tree canopy (Keeler-Wolf et al. 2003a, Evens and San. 2004, Keeler-Wolf and Evens 2006); or Quercus agrifolia > 60% relative cover in the tree canopy (Evens and San 2005, Klein and Evens 2005).	Coast live oak woodland habitat is present within the BSA.	Coast live oak woodland habitat is present within the BSA. There are no previously mapped occurrences of Southern Coast Live Oak Riparian Forest within the BSA, although there are multiple habitats mapped along the souther side of the Santa Monica Mountains; the nearest is at San Nicholas Canyon north of Highway 1 (CDFW 2018). Coast live oak woodland habitats were observed during field surveys within the BSA of the Applefield Lane Vacant Lot Staging Area and within the BSAs of the Emergency Source of Water Supply Connection (Las Virgenes Connection), and the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) projects.	Present					0	CTT61310CA	24
Southern Coastal Salt Marsh	Southern Coastal Salt Marsh	Occurs in bays, lagoons, and estuaries along the coast from about Point Conception to the Mexican border. Nowhere as extensive as the larger northern marshes, and now considerably reduced by land development activities. Good to fair examples occur at Goltea Slough and near Carpinteria, Santa Barbara Coounty; Point Mugu, Ventura County; Upper Newport Bay, Orange Coounty; and several small areas in San Diego County. Very similar to Northern Coastal Salt Marsh but with warmer water and air temperatures. Southern "specialties" include Atriplex watsonii, Batis maritima, Lycium californicum, Monanthochloe littoralis, Suaeda californica, and Salicornia subterminalis. *Frankenia, Suaeda* , and/or *Salicornia subterminalis* often occur along the upper, landward edges of the marshes; *Salicornia bigelovii* , *S. virginica* and *Batis maritima* at middle elevations; and *Spartina* closest to open water.	Coastal Salt Marsh habitat (alkaline/emergent wetland) is present within the BSA.	Coastal Salt Marsh habitat (alkaline/emergent wetland) is present within the BSA. There are no previously mapped occurrences of Southern Coastal Salt Marsh within the BSA, although there is nearby habitat mapped at the Malibu Creek Lagoon (CDFW 2018). Alkaline/emergent wetland habitats were observed during field surveys within the BSAs of the PCH & Topanga Beach Drive (Segment 2), Las Flores Canyon Creek, Corral Canyon Creek, Trancas Creek, Escondido Creek, and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) projects.	Present					0	CTT52120CA	3

Scientific Name	Common Name	Habitat Requirements	Habitat Occurrence within BSA (to be filled in from fieldwork)	Potential to Occur within BSA & Rationale	PTO for filtering	Federal Listing	State Listing	CDFW Status	Rare Plant Rank	Other Listing	Element Code	Occurrences in CNDDB quads search or other source
Southern Dune Scrub	Southern Dune Scrub	This alliance occurs from southern Oregon to central and southern California along the Pacific Coast and in the interior of the Coast Ranges, as well as in the Transverse Ranges. The shrublands are scattered on river mouths, streamsides, terraces, stabilized dunes of coastal bars, spits along coastline, coastal bluffs, open slopes, and ridges. The dominant or codominant species Baccharis pilularis behaves similarly in southern California mountains as it does in other areas of northern California where it often forms the first wave of woody species to recolonize cleared land. Other shrubs species vary depending on the habitat and location within California, but even locally, no other shrub species are consistently present. South of San Francisco Bay, the coastal scrub is similar in structure but different in species composition. Associated shrub species include Artemisia californica, Diplacus aurantiacus (= Mimulus aurantiacus), Eriogonum fasciculatum, Eriophyllum confertiflorum, and Salvia spp. Herbaceous species decrease in abundance and non-native	Southern Dune Scrub habitat is not present within the BSA.	Southern Dune Scrub habitat is not present within the BSA. There are no previously mapped occurrences of Southern Dune Scrub within the BSA, and the nearest mapped habitat is at El Segundo Dunes (CDFW 2018).	Not present					0	CTT21330CA	1
Southern Riparian Forest	Southern Riparian Forest	This alliance consists of riparian woodlands dominated by Platanus racemosa and/or Quercus agrifolia. Other trees present may include Alnus rhombifolia, Juglans californica, Populus fremontii, Salix exigua, Salix gooddingii, Salix laevigata, Salix lasiolepis, Salix lutea, and Umbellularia californica. Shrubs can be uncommon to frequent and may include Baccharis salicifolia and Toxicodendron diversilobum. The ground layer is grassy and may include Avena barbata and/or Bromus hordeaceus. This alliance is not to be confused with upland stands of Quercus agrifolia, and must have wetland understory indicators to belong to this riparian alliance. It is found in California and possibly Baja California in gullies, intermittent streams, springs, seeps, streambanks and terraces adjacent to floodplains subject to flooding and seasonal saturation.	Southern Riparian Forest habitat is present within the BSA.	Southern Riparian Forest habitat is present within the BSA. There are no previously mapped occurrences of Southern Riparian Forest within the BSA, and the nearest mapped habitat is at Arroyo Conejo, north of Thousand Oaks (CDFW 2018). Southern Riparian Forest habitats were observed during field surveys within the BSAs of the Emergency Source of Water Supply Connection (Las Virgenes Connection), Zume Creek, Carbon Canyon Carbon Mesa Road, Big Rock Bypass Improvements, Pena Canyon Creek, and PCH & Topanga Beach Drive (Segement 1) projects, and within the BSA of the Vista Del Ventada staging Area.	Present					0	CTT61300CA	1
Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	A tall, open, broadleafed, winter-deciduous streamside woodland dominated by *Platanus racemosa* (and often also *Alnus rhombifolia*). These stands seldom form closed canopy forests, and even may appear as trees scattered in a shrubby thicket of sclerophyllous and deciduous species. Lianas include Rubus ursinus and Toxicodendron diversilobum. Occurs on the Transverse and Peninsular ranges from Point Conception south into Baja California Norte, along very rocky streambeds subject to seasonally high-intensity flooding. *Alnus* increases in abundance on more perennial streams, while *Platanus* favors more intermittent hydrographs.	Southern Sycamore Adler Riparian Woodland habitat is present within the BSA.	Southern Sycamore Alder Riparian Woodland habitat is present within the BSA. There are previously mapped occurrences of Southern Sycamore Alder Riparian Woodland within the BSAs of the Topanga Field Yard Staging Area, Topanga Creek Project, and Topanga County Beach Staging Area (CDFW 2018). Sycamore Alder Riparian Woodland habitats were also observed during field surveys within the BSAs of the Emergency Source of Water Supply Connection (Las Virgenes Connection), Zume Creek, Carbon Canyon Carbon Mesa Road, Big Rock Bypass Improvements, Pena Canyon Creek, and PCH & Topanga Beach Drive (Segement 1) projects, and within the BSA of the Vista Del Ventada staging Area.	Present					0	CTT62400CA	22

Scientific Name	Common Name	Habitat Requirements	Habitat Occurrence within BSA (to be filled in from fieldwork)	Potential to Occur within BSA & Rationale	PTO for filtering	Federal Listing	State Listing	CDFW Status	Rare Plant Rank	Other Listing	Element Code	Occurrences in CNDDB quads search or other source
Valley Needlegrass Grassland	Valley Needlegrass Grassland	Nassella pulchra is dominant or characteristically present in the herbaceous layer with other perennial grasses and herbs including Astragalus spp., Avena barbata, Avena fatua, Bromus hordeaceus, Bromus rubens, Calochortus spp., Calystegia spp., Clarkia spp., Croton setigerus, Cryptantha spp., Elymus glaucus, Erodium spp., Festuca californica, Hirschfeldia incana, Holocarpha virgata, Hordeum brachyantherum, Koeleria macrantha, Lasthenia spp., Lepidium nitidum, Lolium perenne, Lupinus spp., Melica californica, Melica imperfecta, Nassella cernua, Nassella lepida, Plantago spp., Poa secunda, Sanicula spp., Sisyrinchium bellum and Trifolium spp. Emergent trees and shrubs may be present at low cover, including trees Quercus spp. and shrubs:Artemisia californica, Eriogonum fasciculatum and Hazardia squarrosa. Herbs < 1 m; cover is open to continuous. Membership Rules: Nassella pulchra > 5% absolute cover as a characteristic to dominant species in the herbaceous layer (Klein et al. 2007); Nassella pulchra usually > 10% relative	Valley Needlegrass Grassland habitat is not present within the BSA.	Valley Needlegrass Grassland habitat is not present within the BSA. There are no previously mapped occurrences of Valley Needlegrass Grassland within the BSA, and the nearest mapped habitats are at Point Mugu and north of Calabasas (CDFW 2018).	Not present					0	CTT42110CA	3
Valley Oak Woodland	Valley Oak Woodland	Typically forms a grassy-understoried savanna rather than a closed woodland. *Quercus lobata* is usually the only tree present. This winter-deciduous species is California's largest broad-leaved tree, with mature individuals reaching 15-35 meters. Most stands consist of open-canopy growth form trees and seldom exceed 30-40% absolute cover. Occurs in the Sacramento and San Joaquin valleys adjacent to the Sierra Nevada foothills, and in valleys of the Coast Ranges from Lake County to western Los Angeles County. Usually occurs below 2,000 feet (610 meters) on deep, well-drained alluvial soils, usually in valley bottoms. Also found on nonalluvial settings in the South Coast and Transverse ranges.	Valley Oak Woodland is not present within the BSA.	Valley Oak Woodland is not present within the BSA. There are no previously mapped occurrences of Valley Oak Woodland within the BSA, and the nearest mapped habitat is in Malibu Creek State Park on the north side of the Santa Monica Mountains (CDFW 2018).	Not present					0	CTT71130CA	15
Designated Critical Habitat												
Tidewater goby critical habitat	Tidewater goby critical habitat	The primary constituent elements of tidewater goby critical habitat are, "(1) Persistent, shallow (in the range of approximately 0.3 to 6.6 ft (0.1 to 2 m)), still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 ppt, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following: (a) Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction; (b) Submerged and emergent aquatic vegetation, such as Potamogeton pectinatus, Ruppia maritima, Typha latifolia, and Scirpus spp., that provides protection from predators and high flow events; or (c) Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity." (USFWS 2013)	Tidewater goby critical habitat is present within the BSA according to USFWS critical habitat shapefile overlays.	According to the USFWS critical habitat shapefiles, tidewater goby critical habitat occurs within the BSAs of the Topanga Canyon Creek site and the Topanga County Beach Staging Area.								

Scientific Name	Common Name	Habitat Requirements	Habitat Occurrence within BSA (to be filled in from fieldwork)	Potential to Occur within BSA & Rationale	PTO for filtering	Federal Listing	State Listing	CDFW Status	Rare Plant Rank	Other Listing	Element Code	Occurrences in CNDDB quads search or other source
Western snowy plover critical habitat	Western snowy plover critical habitat	The primary constituent elements of western snowy plover critical habitat are, "Sandy beaches, dune systems immediately inland of an active beach face, salt flats, mud flats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoil sites, with: (1) Areas that are below heavily vegetated areas or developed areas and above the daily high tides; (2) Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or lowwater flow and annual high tide or highwater flow, subject to inundation but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources; (3) Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in PCE 2 for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis)	Western snowy plover critical habitat is present within the BSA according to USFWS critical habitat shapefile overlays.	According to the USFWS critical habitat shapefiles, western snowy plover critical habitat occurs within the BSAs of the Trancas Creek site and the Zuma County Beach Staging Area.								
Essential Fish Habitat												
Groundfish EFH	Groundfish EFH	All waters and substrate within the following areas: • Depths less than or equal to 3,500 m (1,914 fathoms) to mean higher high water level or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt during the period of average annual low flow. • Seamounts in depths greater than 3,500 m as mapped in the EFH assessment GIS. • Areas designated as Habitat Areas of Particular Concern not already identified by the above criteria.	Groundfish EFH is present within the BSA.	According to the definition of Groundfish EFH (PFMC 2005), Groundfish EFH occurs within the BSAs of Big Rock Bypass Improvements, Las Tunas County Beach Staging Area below the mean higher high water level. Groundfish EFH may occur within the BSAs of the Trancas Creek, Corral Canyon Creek, Las Flores Canyon Creek, PCH & Topanga Beach Drive Segment 2, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Escondido Creek, and Topanga Creek projects, and Topanga County Beach Staging Area, depending on the upstream extent of saltwater intrusion in the small lagoons and coastal streams.	Present							
Coastal Pelagics EFH	Coastal Pelagics EFH	All marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the exclusive economic zone and above the thermocline where sea surface temperatures range between 10C to 26C. The southern boundary is the United States-Mexico maritime boundary. The northern boundary is the position of the 10C isotherm which varies seasonally and annually.	Coastal Pelagics EFH is present within the BSA.	According to the definition of Coastal Pelagics EFH (PFMC 1998), Coastal Pelagics EFH occurs within the BSAs of Big Rock Bypass Improvements, Las Tunas County Beach Staging Area below the mean higher high water level. Coastal Pelagics EFH may occur within the BSAs of the Trancas Creek, Corral Canyon Creek, Las Flores Canyon Creek, PCH & Topanga Beach Drive Segment 2, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Escondido Creek, and Topanga Creek projects, and Topanga County Beach Staging Area, depending on the upstream extent of estuarine habitat.	Present							
Highly Migratory Species EFH	Highly Migratory Species EFH	Varies by species. Generally, all Highly Migratory Species EFH consists of predominantly oceanic waters offshore the 6 fathom (36 feet) isobath along coastal California from the U.S. Mexico border to a northern boundary dependent on water temperature.	There is no Highly Migratory Species EFH within the BSA.	According to the definition of Highly Migratory Species EFH (PFMC 2007), there is no highly migratory Species EFH within the BSA.	Not present							

Table D-3
Species Lists and PTO Table: October 2018

Scientific Name	Common Name	Habitat Requirements	Habitat Occurrence within BSA (to be filled in from fieldwork)	Potential to Occur within BSA & Rationale	PTO for filtering	Federal Listing	State Listing	CDFW Status	Rare Plant Rank	Other Listing	Element Code	Occurrences in CNDDB quads search or other source
<u>Animals</u>												
<u>Invertebrates</u>												
Branchinecta lynchi	Vernal pool fairy shrimp	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains. Inhabit astatic, small rain-filled pools. Usually in clear-water sandstone-depression pools and grassed swales, earth slump, or basalt-flow depression pools.	No suitable habitat present.	Not expected to occur. There is no vernal pool habitat present within BSA.	Not expected to occur	Threatened	None	None		IUCN:VU		USFWS IPAC query
Euphilotes battoides allyni	El Segundo blue butterfly	Restricted to remnant coastal dune habitat in Southern California. Host plant is Eriogonum parvifolium; larvae feed only on the flowers and seeds; used by adults as major nectar source.	No suitable habitat present. Open sand habitat within the BSA was not observed to have Sea cliff buckwheat (*Eriogonum parvifolium*).	Not expected to occur. The nearest record of occurrence is from approximately 9 miles south west at El Segundo Dunes in 2005. The open sand habitat within the BSA does not contain the host plant of El Segundo blue butterfly (*Eriogonum parvifolium*).	Not expected to occur	Endangered	None	None		XERCES_CI	IILEPG201B	2
Euphydryas editha quino	quino checkerspot butterfly	Sunny openings within chaparral and coastal sage shrublands in parts of Riverside and San Diego counties. Hills and mesas near the coast. Need high densities of food plants (Plantago erecta, P. insualris, and Orthocarpus purpurescens).	Outside known range of species distribution.	Not expected to occur. Outside of known range.	Not expected to occur	Endangered	None	None		XERCES_CI	IILEPK405L	1
Haliotis cracherodii	black abalone	Occurs in mid to low rocky intertidal areas.	No suitable habitat present.	Not expected to occur. There is no rocky intertidal habitat present within BSA.	Not expected to occur	Endangered	None	None				
Haliotis sorenseni	white abalone	Found subtidally on rocky pinnacles and deep reefs in Southern California; especially those off the Channel Islands. Occurs at depths of at least 80 feet to over 200 feet.	No suitable habitat present.	Not expected to occur. There is no subtidal habitat present within BSA.	Not expected to occur	Endangered	None	None				
Streptocephalus woottoni	Riverside fairy shrimp	Endemic to western Riverside, Orange, and San Diego Counties in areas of tectonic swales/earth slump basins in grassland and coastal sage scrub. Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season.	Outside known range of species distribution.	Not expected to occur. Outside of known range.	Not expected to occur	Endangered	None	None		IUCN_EN	ICBRA07010	3
<u>Birds</u>												
Agelaius tricolor	tricolored blackbird (Nesting colony)	Inhabits freshwater marsh, swamp, and wetland areas. Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate (e.g. cattails), and foraging areas with insect prey within a few kilometers of the colony.	Openwater habitats with cattails are present within the BSA at estuaries; however the small extents of open water and cattails are not suitable for supporting tricolored blackbird.	Not expected to occur. Available habitat is too small in extent to support foraging and nesting within the BSA. Additionally, the BSA is outside of the typical distribution range for this species.	Not expected to occur	None	Candidate End	SSC		BLM_S; IUCN_EN; NABCI_RWL; USFWS_BCC	ABPBXB0020	3
Aquila chrysaetos	golden eagle (Nesting & wintering)	Rolling foothills, mountain areas, sage-juniper flats, and desert habitats. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	There is no nesting habitat present within the BSA. Marginal foraging habitat is present within the BSA as sites at the base of the Santa Monica Mountains.	Low potential to occur at marginal foraging habitat within BSA. Golden eagles occur in the Santa Monica Mountains; however, the species typically stays inland and is rarely found on the immediate coast.	Low potential to occur	None	None	FP; WL		BLM_S; CDF_S; IUCN_LC; USFWS_BCC	ABNKC22010	4
Athene cunicularia	burrowing owl (Burrow sites & some wintering sites)	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Marginally suitable habitat is present within the BSA in grassland and scrub habitats; however, the BSA is outside the known and predicted ranges for burrowing owl (CDFW 2018).	Not expected to to occur. The most consistently used areas for this species are in the Playa del Rey area near Ballona Creek and at Naval Air Station Point Mugu (eBird 2018). The BSA is outside the known and predicted ranges for burrowing owl (CDFW 2018).	Not expected to occur	None	None	SSC		BLM_S; IUCN_LC; USFWS_BCC	ABNSB10010	11
Buteo swainsoni	Swainson's hawk (Nesting)	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areaas such as grasslands, or alfalfa or grain fields supporting rodent populations.	No suitable habitat present.	Not expected to occur. This species is an occasional migrant along the coast, but there is no suitable breeding habitat present within BSA. This species no longer breeds in Los Angeles County outside of the Antelope Valley on the western end of the Mojave Desert.	Not expected to occur	None	Threatened	None		BLM_S; IUCN_LC; USFWS_BCC	ABNKC19070	3

Charadrius alexandrinus nivosus	western snowy plover (Nesting)	Sandy beaches, salt ponds levees, and shores of large alkali lakes. Needs sandy, gravelly, or friable soils for nesting. Forages in areas of sandy beach above and below the high-tide line, with occasional surf-cast wrack supporting small invertebrates, and generally barren to sparsely vegetated terrain.	Sandy beach habitats are present within BSA; however, they are heavily disturbed by adjacent residences and/or recreational use. Thus, they are generally not suitable for snowy plover nesting. The sandy beach habitats within the BSA may support marginal foraging habitat for snowy plover, with marginal breeding habitat at Malibu State Beach.	Low potential to nest within BSA; high potential to occur within the BSA for foraging. This species is a regular non-breeding inhabitant of Malibu-area beaches. More recently, snowy plovers began nesting for the first time in 70 years in very small numbers in Los Angeles County in spring 2017, including two nests on Malibu State Beach. This species has continued to nest on Malibu State Beach in 2018, with a fenced enclosure surrounding the nest(s) for protection. It may be present year-round, albeit in small numbers during the breeding season, but has a low potential to nest on sandy beach habitat within the BSA.	Low potential to occur	Threatened	None	SSC	NABCI_RWL; USFWS_BCC	ABNNB03031	3
Coturnicops noveboracensis	yellow rail	Summer resident in Eastern Sierra Nevada in Mono County. Found in freshwater marshlands. Requires densly vegetated marshes for breeding, and may inhabit wet meadows and coastal tidal marshes in winter.	No suitable breeding habitat present; not known to breed in Southern California. Small areas of alkaline/emergent wetlands along lagoons within the BSA may provide marginal wintering habitat, although the species is rarely observed in Southern California.	Not expected to occur. This species is a rare vagrant anywhere in southern California and is not expected within the BSA. The only record for Los Angeles County is from 1998 at Manhattan Beach (CBRC 2018, CDFW 2018).	Not expected to occur	None	None	SSC	IUCN_LC; NABCI_RWL; USFS_S; USFWS_BCC	ABNME01010	1
Elanus leucurus	white-tailed kite (Nesting)	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging, close to isolated, dense-topped trees for nesting and perching.	Small portions of the BSA may provide suitable nesting habitat where riparian woodland habitats are present in proximity to suitable foraging habitat, such as within the BSA of the Zuma Creek, Emergency Source of Water Supply Connection (Las Virgenes Connection), PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Carbon Canyon Road & Carbon Mesa Road, PCH & Topanga Beach Drive Segment 1, Big Rock Bypass Improvement, and Pena Canyon Creek sites.	Moderate potential to occur/nest within the BSA. Suitable foraging and nesting habitat is present with the BSA; however, the nearest recent observation of nesting was recorded near CSU Channel Islands, in Camarillo, in 2009 (CDFW 2018). Therefore, there is a moderate potential for white-tailed kite to occur or nest within the BSA.	Moderate potential to occur	None	None	FP	BLM_S; IUCN_LC	ABNKC06010	1
Empidonax traillii extimus	Southwestern willow flycatcher (Nesting)	Occurs in riparian woodlands in Southern California. Generally flycatchers nest in areas with willows, tamarisk, or both. Nesting usually occurs along major drainages. Patches or small areas of riparian vegetation are usually unsuitable for nest placement (e.g. vegertation is too short, too sparse, or patch is too small).	No suitable breeding habitat present; patches of riparian woodland are likely too small to support nesting. Riparian habitats within the BSA could be used by flycatcher for foraging, migrating, and dispersing.	Not expected to nest within the BSA. Low potential to occur in marginal foraging habitat (not nesting) in patches of riparian woodland within BSA. This species is recorded in casual numbers (i.e. may or may not be found annually) in the Malibu area, strictly during migration, most often at Malibu Lagoon.	Not expected to occur	Endangered	Endangered	None	NABCI:RWL		USFWS IPAC query
Falco peregrinus anatum	American peregrine falcon (Nesting)	Nests near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Suitable nesting habitat may be present where steep canyons, creek banks, or structures occur within the BSA.	Moderate potential to occur and/or nest within the BSA at creek banks, ledges, or structures. This species is commonly found along cliffy coastlines. It is known to occur in the Santa Monica Mountains regional area (CDFW 2018).	Moderate potential to occur	Delisted	Delisted	FP	CDF_S; USFWS_BCC	ABNKD06071	1
Haliaeetus leucocephalus	bald eagle (Nesting & wintering)	Permanent resident, and uncommon winter migrant, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties. Fairly common as a local winter migrant at a few favored inland waters in southern California. Largest numbers occur at Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and along the Colorado River. Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches. Perches high in large, stoutly limbed trees, on snags or broken-topped trees, or on rocks near water. Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Nests most frequently in stands with less than 40% canopy, but usually some foliage shading the nest. Nest located 16-61 m (50-200 ft) above ground, usually below tree crown. Species of tree apparently not so important as height and size. Nest usually located near a permanent water source.	Suitable breeding habitat not present within the BSA. Open water habitat within the BSA is not extensive enough to provide foraging opportunities for bald eagle.	Not expected to nest or forage within the BSA because suitable habitat is not present.	Not expected to occur	Delisted	Endangered	FP	BLM_S; CDF_S; IUCN_LC; USFS_S; USFWS_BCC	ABNKC10010	1

Laterallus jamaicensis coturniculus	California black rail	Inhabits freshwater marshes, wet meadows, and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat. Usually nests in pickleweed.	Suitable nesting habitat is not present within the BSA. Wetland habitats within the BSA do not consists of extensive enough marsh habitat to support California black rail.	Not expected to occur within the BSA. There is no suitable habitat present within BSA. The nearest recorded occurrences are in the Oxnard and Santa Monica areas from the 1920s and 1930s (CDFW 2018).	Not expected to occur	None	Threatened	FP	BLM_S; IUCN_NT; NABCI_RWL; USFWS_BCC	ABNME03041	1
Passerculus sandwichensis beldingi	Belding's savannah sparrow	Inhabits coastal salt marshes, from Santa Barbara south through San Diego County. Nests in Salicornia, on and about margins of tidal flats.	Suitable nesting habitat is not present within the BSA. Wetland habitats within the BSA do not consists of extensive enough marsh habitat to support Belding's savannah sparrow.	Not expected to occur within the BSA. There is no suitable habitat present within BSA. The nearest recorded occurrence of an extant breeding population is at the Ballona Wetlands in 2001 (CDFW 2018).	Not expected to occur	None	Endangered		0	ABPBX99015	3
Pelecanus occidentalis californicus	California brown pelican (Nesting colony & communal roosts)	Colonial nester on Anacapa and Santa Barbara Islands. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Roosts communally. Marine forager.	Suitable nesting and foraging habitat is not present within the BSA, but limited roosting habitat is present.	Not expected to nest or roost communally within the BSA.	Not expected to occur	Delisted	Delisted	FP	BLM_S; USFS_S	ABNFC01021	2
Polioptila californica californica	coastal California gnatcatcher	Obligate, permanent resident of coastal sage scrub below 2,500 feet elevation in Southern California. Low, coastal sage scrub in arid washes, on mesas, and slopes. Not all areas classified as coastal sage scrub are occupied.	Coastal sage scrub habitat is present within portions of the BSA. Most of the coastal sage scrub-chaparral habitat is disturbed.	Not expected to occur within the BSA. Although coastal sage scrub habitat is present within the BSA, the species is known to be generally absent from the coastal side of the Santa Monica Mountains	Not expected to occur	Threatened	None	SSC	NABCI_YWL	ABPBJ08081	5
Rallus obsoletus levipes (formerly Rallus longirostris levipes)	light-footed Ridgway's rail (formerly light-footed clapper rail)	Found in salt marshes traversed by tidal sloughs, where cordgrass and pickleweed are the dominant vegetation. Requires dense growth of either pickleweed or cordgrass for nesting or escape cover.	Suitable nesting habitat is not present within the BSA. Wetland habitats within the BSA do not consists of extensive enough marsh habitat to support Ridgway's rail.	Not expected to occur within the BSA. There is no suitable habitat present within BSA. While one lone bird was present at Malibu Legacy Park in fall 2017, the otherwise nearest recorded occurrences are in the Mugu Lagoon marshes and at Ballona Freshwater Marsh (eBird 2018).	Not expected to occur	Endangered	Endangered	FP	NABCI_RWL	ABNME05014	1
Riparia riparia	bank swallow (Nesting)	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks and/or cliffs with fine-textured and/or sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Marginal nesting habitat may be present within the BSA where creeks pass through steep canyons.	Not expected to occur. Marginal nesting habitat may be present within the BSA; however, the species is not known to nest in Southern California and nearby historic colonies have been extirpated (CDFW 2018).	Not expected to occur	None	Threatened	None	BLM_S; IUCN_LC	ABPAU08010	2
Sternula antillarum browni	California least tern (Nesting colony)	Nests along the coast from San Francisco Bay south to Northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, land fills, or paved areas.	Marginal nesting habitat may be present within the BSA where open sand is present.	Not expected to occur. Marginal nesting habitat may be present within the BSA; however, the species is not known to nest along the Malibu coastline and does not forage more than a few miles from colonies (USFWS 2006, CDFW 2018).	Not expected to occur	Endangered	Endangered	FP	NABCI_RWL	ABNNM08103	4
Vireo bellii pusillus	least Bell's vireo (Nesting)	Summer resident of Southern California in low riparian habitat in the vicinity of water or in dry river bottoms, below 2,000 feet. Nests are placed along margins of bushes or on twigs projecting into pathways, usually in willow, baccharis, or mesquite.	Marginal breeding habitat present where riparian vegetation consists of willows and baccharis. Riparian habitats within the BSA could be used by vireo for foraging, migrating, and dispersing.	Low potential to occur in marginal foraging habitat (not nesting) within BSA. Nearest recent observation was in 2017 along the northern half of the Santa Monica Mountains (eBird 2018).	Low potential to occur	Endangered	Endangered	None	IUCN_NT; NABCI_YWL	ABPBW01114	9
<u>Amphibians & Reptiles</u>											
Anaxyrus californicus	arroyo toad	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in the drier parts of the range.	Marginal habitat may be present in small drainages within the BSA; however, the species' known range does not include the coastal side of the Santa Monica Mountains.	Not expected to occur. Marginal habitat in small drainages is present within the BSA; however, the BSA is outside of the species known range, and the nearest documented occurrence is from the San Fernando Valley (CDFW 2018).	Not expected to occur	Endangered	None	SSC	IUCN_EN	AAABB01230	1
Anniella sp. 1	California legless lizard	**Note - this element record represents California records of Anniella not yet assiged to the new species within the Anniella pulchra complex.** Contra Costa County south to San Diego, within a variegy to open habitats. Found in a variety of habitats, generally in moist, loose soil. Prefer soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats. This sub-species of legless lizard is no longer recognized (SSAR 2017). See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur within the BSA. Nearest recent occurrences of Anniella sp. documented in Westlake in 2009 (CDFW 2018); however, this sub-species is no longer recognized in the area. See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur	None	None	SSC	0	ARACC01070	5

Anniella pulchra pulchra	silvery legless lizard	**Note - this is a subspecies of California legless lizard entered in unprocessed CNDDB data, and CNDDB treats it as Anniella sp. 1.** Found in chaparral, coastal dunes, or coastal scrub habitats with sandy or loose loamy soils, usually under sparse vegetation. Soil moisture is essential. Species prefers soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats. This subspecies of legless lizard is no longer recognized (SSAR 2017). See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur within the BSA. Nearest recent occurrences of Anniella sp. were documented in Westlake in 2009 (CDFW 2018); however, this subspecies is no longer recognized in the area. See Anniella stebbinsi for species relevant to the Malibu Coast and Santa Monica Mountains (Nafis 2018).	Not expected to occur	None	None	SSC	0	ARACC01012	1
Anniella stebbinsi	southern California legless lizard	Generally found south of the Transverse Range, extending to the Northwestern Baja California. Occurs in sandy or loose, loamy soils under sparse vegetation. Disjunct populations occur in the Tehachapi and Piute Mountains in Kern County. Found in a variety of habitats; generally in moist, loose soils. Pefer soils with a high moisture content.	Suitable habitat may be present in areas with appropriately moist and loose soil within the BSA, such as adjacent to stream and wetland habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrence of southern California legless lizard was documented at Point Dume in 2017, within the geographic extent of the project sites' distribution (CDFW 2018).	Moderate potential to occur	None	None	SSC	USFS_S	ARACC01060	9
Aspidoscelis tigris stejnegeri	coastal whiptail (= San Diegan tiger whiptail)	Found in deserts and semiarid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. Ground may be firm soil, sandy, or rocky.	Suitable habitat present within the BSA in coastal sage scrub, chaparral, woodland, and riparian habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Multiple recent occurrence of coastal whiptail were documented in the Santa Monica Mountains during the 2000s (CDFW 2018).	Moderate potential to occur	None	None	SSC	0	ARACJ02143	9
Caretta caretta	North Pacific loggerhead sea turtle	Pelagic species that rarely comes to land. Nests on beaches in Mexico, Braziil, Japan, South Africa, Oman, Australia, and the southeastern United States.	No suitable habitat present.	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None			
Chelonia mydas	East Pacific green sea turtle	Marine species that rarely comes to land. Nesting sites in the Eastern Pacific include Panama, Costa Rica, Nicaragua, Guatemala, El Salvador, Michoacan, Chiapas, and Baja California. Can be found in shallow waters of lagoons, bays, estuaries, mangroves, eelgrass and seaweed beds. Uncommon to the California coast.	No suitable habitat present.	Not expected to occur. No suitable habitat present.	Not expected to occur	Threatened	None	None			
Dermochelys coriacea	leatherback sea turtle	Marine, pelagic species that rarely comes to land. Primary nesting beaches are in the Pacific are Mexico, Costa Rica, and Indonesia. In the United States, nesting occurs on beaches in Florida and Georgia.	No suitable habitat present.	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None			
Emys marmorata (=Actinemys pallida)	western pond turtle (=southwestern pond turtle)	Aquatic turtle found in ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation, below 6,000 feet elevation. Requires basking sites and suitable upland habitat (usually sandy banks or grassy open fields) up to 0.5 kilometer from water for egg-laying.	Suitable aquatic and upland nesting habitat is present within the BSA. Wetland habitats within the BSA could provide freshwater feeding areas, with exposed basking opportunities, and adjacent upland habitat for nesting.	High potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of southwestern pond turtle were in Trancas Canyon, Triunfo, Las Virgenes, Malibu, and Topanga creeks in the 1980s through 2000s (CDFW 2018), the species generally is known to occur in streams of the Santa Monica Mountains (Nafis 2018, RCD of the Santa Monica Mountains 2015).	High potential to occur	None	None	SSC	BLM_S; IUCN_VU; USFS_S	ARAAD02030	18
Lepidochelys olivacea	Olive Ridley sea turtle	Marine species that is found out to sea and in protected, relatively shallow bays and lagoons, and in shallow water between reefs and the shore. Nesting occurs from Costa Rica to Baja California.	No suitable habitat present.	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered (breeding populations on the Pacific Coast of Mexico); Threatened (all other populations)	None	None			

Phrynosoma blainvillii	coast horned lizard (=Blainville's horned lizard)	Frequents a wide variety of habitats including chaparral, cismontane woodland, coastal bluff scrub, coastal scrub, desert wash, pinon and juniper woodlands, riparian scrub, riparian woodland, and valley and foothill grassland. Most common in lowlands along sandy washes with scattered low bushes. Uses open areas for sunning, bushes for cover, patches of loose soil for burial, and requires an abundant supply of ants and other insects.	Suitable habitat present within the BSA in coastal sage scrub, chaparral, woodland, and riparian habitats.	Moderate potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of horned lizard were in Latigo Canyon, Topanga Canyon areas in the 1990s (CDFW 2018), and the species generally is known to occur in the Santa Monica Mountains (Nafis 2018). If present this species is most likely to occur at the more inland sites where coastal sage scrub and chaparral are present.	Moderate potential to occur	None	None	SSC	BLM_S; IUCN_LC	ARACF12100	12
Rana draytonii	California red-legged frog	Lowlands and foothills in or near permanent sources of deep water (2 feet or greater) with dense, shrubby, or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat (such as existing burrows or downed tree debris).	Suitable habitat may occur within the BSA where semi-permanent to permanent water is present, such as in perennial or intermittent streams. California red-legged frogs do not tolerate elevated salinity, such as may occur in the small coastal lagoons and alkaline wetlands along the Malibu coastline.	Low potential to occur where suitable habitat may be present within the BSA. There is a known population in upper Las Virgenes Creek (CDFW 2018), and the species has been reintroduced to portions of the Santa Monica Mountains but it is not likely to occur within the lowest reaches of coastal streams within the BSA at this time (USFWS pers. comm. 2018). Therefore, there is a low potential for California red-legged frog to occur within the BSA.	Low potential to occur	Threatened	None	SSC	IUCN_VU	AAABH01022	2
Spea hammondii	western spadefoot	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	No suitable habitat present within the BSA.	Not expected to occur. No suitable habitat present.	Not expected to occur	None	None	SSC	BLM_S; IUCN_NT	AAABF02020	1
Thamnophis hammondii	two-striped gartersnake	Found in coastal California from the vicinity of Salinas to northwest Baja California, from sea level to about 7,000 feet of elevation. Highly aquatic, found in or near permanent fresh water, often along streams with rocky beds and riparian growth.	Suitable habitat may occur within the BSA where permanent water is present in perennial streams. Two-striped gartersnake do not tolerate elevated salinity, such as may occur in the small coastal lagoons and alkaline wetlands along the Malibu coastline.	Low potential to occur where suitable habitat may be present within the BSA. Nearest recent occurrences of two-striped gartersnake were in Triunfo Creek in 1998 and in Sycamore Canyon in 2009 (CDFW 2018). The species is known to occur in the Santa Monica Mountains (Nafis 2018).	Low potential to occur	None	None	SSC	BLM_S; IUCN_LC; USFS_S	ARADB36160	7
Fishes											
Acipenser medirostris	green sturgeon - Southern DPS	Most marine species of sturgeon, mostly found north of Point Conception. Spawns in the Sacramento, Klamath, and Trinity rivers. Spawns at water temperaturess between 8-14°C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	No suitable habitat present and outside known range of species.	Not expected to occur. No suitable habitat present, and outside known range of species.	Not expected to occur	Threatened	None	SSC			
Eucyclogobius newberryi	tidewater goby	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches. The species needs fairly still but not stagnant water and high oxygen levels.	Suitable habitat is present within the BSA where PCH crosses Malibu Lagoon/Malibu Creek and Topanga Creek, and may also be present at other perennial, brackish waters within the BSA.	High potential to occur. This species was reintroduced to Malibu Lagoon in the 1990s (CDFW 2018), and now occurs in both Malibu Lagoon/Creek and Topanga Creek (USFWS 2013). It is unknown if it tidewater goby are present within the BSA at other locations at this time.	High potential to occur	Endangered	None	SSC	AFS_EN; IUCN_VU	AFCQN04010	2
Gila orcuttii	arroyo chub	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mohave, and San Diego river basins. Found in slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	Suitable habitat is present within the BSA where PCH crosses Malibu Lagoon/Malibu Creek, and may also be present at other perennial, fresh waters within the BSA.	High potential to occur. Arroyo chub are known to occur in Malibu Creek (CDFW 2018), and may occur in other coastal streams within the geographic area of the Project. When sandbars block saltwater from entering lagoons and upstream areas may be dominated by freshwater, conditions may exist for this species to occur within the BSA.	High potential to occur	None	None	SSC	AFS_VU; USFS_S	AFCJB13120	6
Oncorhynchus mykiss irideus pop. 10	steelhead - Southern California DPS	Can be found in streams that have connectivity to the ocean. Federally listed populations occur from the Santa Maria River south to southern extent of the species' range (San Mateo Creek in San Diego County). Southern steelhead likely have greater physiological tolerances to warmer water more variable conditions than their northern counterparts.	Suitable habitat is present within the BSA where the BSA crosses Topanga Creek, and may also be present at other small coastal streams within the BSA depending on hydrologic and water quality conditions.	High potential to occur. Within the BSA, steelhead are known to occur in Topanga Creek. They also occur nearby in Malibu Creek and Arroyo Sequit (CDFW 2018, NMFS 2016). When sandbars are open, adults or smolts may enter or exit through estuaries, and if sandbars are closed, smolts, juveniles, and/or resident adults may also be present in lagoons or lower creek reaches.	High potential to occur	Endangered	None	None	AFS_EN	AFCHA0209J	4
Mammals											

Antrozous pallidus	pallid bat	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Pallid bats are known to use bridges for roosting. Very sensitive to disturbance of roosting sites.	Suitable foraging habitat is present within the BSA where dry shrublands, such as chaparral habitat, and woodlands occur. Suitable roosting habitat, such as bridges, is present within the BSA.	Low potential to occur. The nearest records of occurrence are from the Simi Hills in 2004, and historically from Encino Park in 1951 and near Culver City in 1932 (CDFW 2018). Suitable foraging habitat is present within the BSA. Pallid bats are known to use bridges for roosting (Caltrans 2016); therefore, suitable roosting habitat is present within the BSA. However, roosting pallid bats are very sensitive to disturbance and habitats in the vicinity of the BSA are generally disturbed by road and residential activities. Thus, the species has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC	BLM_S; IUCN_LC; USFS_S; WBWG_H	AMACC10010	3
Arctocephalus townsendi	Guadalupe fur seal	Guadalupe fur seals breed along the eastern coast of Guadalupe Island, and have been observed in the southern California Channel Islands.	No suitable habitat present and outside known range of species.	Not expected to occur. No suitable habitat present and outside known range of species.	Not expected to occur	Threatened	Threatened	FP			NMFS
Balaenoptera musculus	blue whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None			
Balaenoptera physalus	fin whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None			
Balaenoptera borealis	sei whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None			
Euderma maculatum	spotted bat	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting, and rarely uses bridges.	Suitable foraging habitat is present within the BSA at lagoons and creeks. Marginally suitable roosting habitat is present within the BSA at bridges.	Low potential to occur. Suitable foraging habitat is present within or adjacent to the BSA at coastal lagoons and creek crossings. The nearest record of occurrence is from Malibu Creek State Park in 2003, approximately 4 miles north of the BSA (CDFW 2018). Marginally suitable roosting habitat is present within the BSA at bridges. Thus, the species has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC	BLM_S; IUCN_LC; WBWG_H	AMACC07010	1
Eubalaena japonica	North Pacific right whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None			
Eumops perotis californicus	western mastiff bat	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces, high buildings, trees, and tunnels, and might use bridges.	Suitable foraging habitat is present within the BSA in woodland, coastal scrub, and chaparral habitats. Potentially suitable roosting habitat occurs within the BSA at bridges, high buildings, or large trees.	Moderate potential to occur. Suitable foraging habitat and roosting habitat is present within the BSA. The nearest records of occurrence are approximately 4 to 5 miles north of the BSA, from Malibu Creek State Park in 2004, Topanga State Park in 2003, and Peter Strauss Ranch in 2004 (CDFW 2018). Thus, western mastiff bat has a moderate potential to occur within the BSA.	Moderate potential to occur	None	None	SSC	BLM_S; WBWG_H	AMACD02011	7
Lasiurus blossevillii	western red bat	Roosts primarily in trees, 2-40 feet above ground, from sea level up through mixed conifer forests. Not known to roost in bridges. Prefers habitat edges and mosaics, with trees that are protected from above and open below, with open areas for foraging.	Suitable foraging habitat is present within the BSA in relatively open coastal scrub and chaparral habitats. Suitable roosting habitat occurs within the BSA where large trees occur.	Moderate potential to occur. Suitable foraging habitat and roosting habitat is present within the BSA. The nearest records of occurrence are approximately 3 to 5 miles north of the BSA, at Paramount Ranch, Peter Strauss Ranch, and the Stunt Ranch Reserve in 2004 (CDFW 2018). Thus, western red bat has a moderate potential to occur within the BSA.	Moderate potential to occur	None	None	SSC	IUCN_LC; WBWG_H	AMACC05060	3
Macrotus californicus	California leaf-nosed bat	Found in desert riparian, desert wash, desert scrub, desert succulent scrub, alkali scrub, and palm oasis habitats. Needs rocky, rugged terrain with mines or caves for roosting. Rarely roosts in bridges.	No suitable foraging habitat present. Marginally suitable roosting habitat present at bridges. Species only known from desert habitats of Southern California.	Not expected to occur. Marginally suitable roosting habitat is present at bridges; however, the BSA is outside of the known range of the species, and no suitable foraging habitat is present or known to occur in the vicinity. Thus, California leaf-nosed bat is not expected to occur within the BSA.	Not expected to occur	None	None	SSC	BLM_S; IUCN_LC; WBWG_H	AMACB01010	1
Megaptera novaeangliae	humpback whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None			
Microtus californicus stephensi	south coast marsh vole	Found in tidal marshes in Los Angeles, Orange, and southern Ventura counties.	Potentially suitable tidal marsh habitats are present within the BSA.	Low potential to occur. Potentially suitable tidal marsh habitats (alkaline wetlands) are present within the BSA; however their small extents and generally disturbed nature due to recreational, nearby residential, and/or road usage activities reduces their potential to be used by south coast marsh vole. The nearest record of occurrence is approximately 9 miles southwest of the BSA at the Ballona Wetlands from 2004 (CDFW 2018). Thus, the south coast marsh vole has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC	0	AMAFF11035	3

Neotoma lepida intermedia	San Diego desert woodrat	Found in coastal scrub of Southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. Particularly abundant in rock outcrops and in rocky cliffs and slopes.	Suitable coastal scrub habitat is present within the BSA.	Present. San Diego desert woodrat nest was observed within the BSA, and suitable coastal scrub habitat occurs within the BSA. The nearest record of occurrence is from Pepperdine University campus in 1995 (CDFW 2018).	Present	None	None	SSC		0	AMAFF08041	2
Nyctinomops ma	Big free-tailed bat	Found in low-lying arid areas in Southern California. Needs high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.	Suitable foraging habitat is present within the BSA; however, suitable roosting habitat, such as rock out croppings, is not present within the BSA.	Low potential to occur. The nearest records of occurrence are from the Burbank in 1987, and from central Los Angeles in 1985 (CDFW 2018). Suitable foraging habitat is present within the BSA; however, suitable roosting habitat is not present within the BSA. Big free-tailed bats are rarely found on bridges (Caltrans 2016). Thus, big free-tailed bat has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC				
Orcinus orca	Southern resident killer whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Perognathus longimembris brevinasus	Los Angeles pocket mouse	Found in lower elevation grasslands and coastal sage communities in and around the Los Angeles Basin. Open ground with fine, sandy soils. May not dig extensive burrows, hiding under weeds and dead leaves instead.	Suitable coastal scrub habitat is present within the BSA.	Low potential to occur. There are no recent records of Los Angeles pocket mouse in the vicinity of the project; the nearest historical record is from the San Fernando Valley in 1903 (CDFW 2018).	Low potential to occur	None	None	SSC		0	AMAFD01041	1
Perognathus longimembris pacificus	Pacific pocket mouse	Inhabits the narrow coastal plains from the Mexican border north to El Segundo, Los Angeles County. Seems to prefer soils of fine alluvial sands near the ocean.	Suitable habitat present within the BSA; however, outside the known range of the species.	Not expected to occur. Outside known range of species.	Not expected to occur	Endangered	None	SSC		0	AMAFD01042	1
Physeter macrocephalus	sperm whale	Marine pelagice species.	No suitable habitat present	Not expected to occur. No suitable habitat present.	Not expected to occur	Endangered	None	None				
Sorex ornatus salicornicus	southern California saltmarsh shrew	Found in coastal marshes in Los Angeles, Orange, and Ventura counties. Requires dense vegetation and woody debris for cover.	Potentially suitable tidal marsh habitats are present within the BSA.	Low potential to occur. Potentially suitable tidal marsh habitats (alkaline wetlands) are present within the BSA; however their small extents and generally disturbed nature due to recreational, nearby residential, and/or road usage activities reduces their potential to be used by southern California saltmarsh shrew. The nearest record of occurrence is approximately 9 miles southwest of the BSA at the Ballona Wetlands from 1991 (CDFW 2018). Thus, the species has a low potential to occur within the BSA.	Low potential to occur	None	None	SSC		0	AMABA01104	2
Taxidea taxus	American badger	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Marginally suitable habitat is present within the BSA in chaparral, scrub, woodland, and/or grassland habitats; however, no large burrows were observed within the BSA.	Low potential to occur. The nearest recent records of badger were observed within the Santa Monica Mountains National Recreation Area north of Malibu along Kanan-Dume Road, within the geographic extent of the project. Marginally suitable habitat is present within the BSA. However, no large burrows were observed within the BSA; thus, there is a low potential for badger to use the area for foraging and denning.	Low potential to occur	None	None	SSC		IUCN_LC	AMAJF04010	3
Plants												
Abronia maritima	red sand-verbena	Perennial herb. Occurs in coastal dunes. 0-328 feet. Blooms February-November.	Open sand habitat is present within the BSA, and some dune habitat is also present.	Present within the BSA at the Trancas Creek Staging Area and the Zuma Creek Staging Area. There are multiple occurrences of red sand-verbena along the Malibu coastline from the early 1900s through 2013, including at Zuma Beach (Calflora 2018).	Present	None	None		4.2			
Arenaria paludicola	Marsh sandwort	Perennial stoloniferous herb. Occurs in marshes and swamps. Found growing up through dense mats of Typha, Juncus, Scirpus, etc. in freshwater marsh with sandy soil. 10-558 feet. Blooms May-August.	Freshwater marsh habitat is not present within the BSA.	Not expected to occur. There is no freshwater marsh habitat present within the BSA. Nearest historical occurrence was recorded in Cienega area in 1900 (Calflora 2018, CDFW 2018). Thus, there marsh sandwort is not expected to occur within the BSA.	Not expected to occur	Endangered	Endangered		1B.1		PDCAR040L0	USFWS IPAC query
Asplenium vespertinum	western spleenwort	Perennial rhizomatous herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, in rocky areas. 262-3,281 feet. Blooms February-June.	Coastal scrub habitats are present in portions of the BSA.	Low potential to occur. Most of the coastal scrub habitats within the BSA are disturbed and dominated by non-native species. The nearest record of occurrence is from Lake Sherwood near Westlake Village in 1963 (Calflora 2018). Thus, there is a low potential for western spleenwort to occur within the BSA.	Low potential to occur	None	None		4.2			

Astragalus brauntonii	Braunton's milk-vetch	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in recent burns or disturbed areas; usually on sandstone with carbonate layers. Soil specialist; requires shallow soils to defeat pocket gophers and open areas, preferably on hilltops, saddles, or bowls between hills. 10-2,100 feet. Blooms January-August.	Chaparral, coastal scrub, and non-native grassland habitats are present in portions of the BSA.	Moderate potential to occur. Most of the coastal scrub habitats within the BSA are disturbed and dominated by non-native species. Nearest recent occurrences were recorded at Zuma Ridge in 2007, at upper Zuma Canyon near 2002, at Malibu Lagoon in the 1980s (Calflora 2018, CDFW 2018). Thus, there is a moderate potential for Braunton's milk-vetch to occur within the BSA.	Moderate potential to occur	Endangered	None	1B.1	SB_RSABG; SB_SBBG	PDFAB0F1G0	35
Astragalus pycnostachyus var. lanosissimus	Ventura Marsh milk-vetch	Perennial herb. Occurs in marshes, swamps, coastal dunes, and coastal scrub habitats. Found within reach of high tide or protected by barrier beaches; more rarely found near seeps on sandy bluffs. 3-115 feet. Blooms June-October.	Marsh, coastal dune, and coastal scrub habitats within reach of high tide are present within the BSA.	Low potential to occur. Most of the marsh and coastal scrub habitats within the BSA are disturbed and/or dominated by non-native species. Nearest historical occurrences were recorded near Santa Monica in the late 1800s and early 1900s (Calflora 2018). Thus, there is a low potential for Ventura Marsh milk-vetch to occur within the BSA.	Low potential to occur	Endangered	Endangered	1B.1	SB_RSABG; SB_SBBG	PDFAB0F7B1	2
Astragalus tener var. titi	coastal dunes milk-vetch	Annual herb. Occurs in coastal bluff scrub, coastal dunes, and coastal prairie habitats. Found in moist, sandy depressions of bluffs or dunes along and near the Pacific Ocean; one site was found on a clay terrace. 3-148 feet. Blooms March-May.	Coastal dune habitat is present within the BSA.	Low potential to occur. The coastal dune habitats within the BSA are highly disturbed. Nearest historical occurrence was in Santa Monica in 1930 (Calflora 2018). Thus, there is a low potential for coastal dunes milk-vetch to occur within the BSA.	Low potential to occur	Endangered	Endangered	1B.1	SB_RSABG	PDFAB0F8R2	1
Atriplex coulteri	Coulter's saltbush	Perennial herb. Occurs in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland habitats. Found on ocean bluffs and ridgetops, as well as in low places in alkaline or clay soils. 6-1,509 feet. Blooms March-October.	Coastal dune, coastal scrub, and non-native grassland habitats are present within the BSA.	Moderate potential to occur. There are coastal dune, coastal scrub, and non-native grassland habitats within the BSA. Nearest recent occurrences were at Malibu Bluffs in 2009 and at Point Dume around 1991 (CDFW 2018, Calflora 2018). Thus, there is a moderate potential for Coulter's saltbush to occur within the BSA.	Moderate potential to occur	None	None	1B.2	SB_RSABG	PDCHE040E0	4
Atriplex pacifica	south coast saltscale	Annual herb. Occurs in coastal scrub, coastal bluff scrub, playas, and coastal dunes habitats. Found in alkali soils. 3-1,312 feet. Blooms March-October.	Coastal scrub and coastal dune habitats are present within the BSA.	Low potential to occur within the BSA. The coastal dune and coastal scrub habitats within the BSA are highly disturbed. Nearest historical occurrence was in Santa Monica Mountains in 1881 (Calflora 2018). Thus, there is a low potential for Coulter's saltbush to occur within the BSA.	Low potential to occur	None	None	1B.2	0	PDCHE041C0	1
Atriplex parishii	Parish's brittlescale	Annual herb. Occurs in vernal pools, chenopod scrub, and playas habitats. Usually found on drying alkali flats with fine soils. 16-4,659 feet. Blooms June-October.	No suitable habitat present within the BSA.	Not expected to occur within the BSA. There are no vernal pools, chenopod scrub, or playas habitats present within the BSA. Additionally, the Calflora lists Parish's brittlescale as occuring in the Beverly Hills quad; however, there are no records for the species there (Calflora 2018). The CNDDB has an undated record of the species collected near Santa Monica (CDFW 2018). Thus, Parish's brittlescale is not expected to occur within the BSA.	Not expected to occur	None	None	1B.1	USFS_S	PDCHE041D0	1
Atriplex serenana var. davidsonii	Davidson's saltscale	Annual herb. Occurs in coastal bluff scrub and coastal scrub habitats. Found in alkaline soil. 33-656 feet. Blooms April-October.	Coastal scrub habitats are present within the BSA.	Low potential to occur within the BSA. The coastal scrub habitats within the BSA are highly disturbed. Nearest recorded occurrence was in Malibu/Las Virgenes Canyon in 1974 (Calflora 2018). Thus, there is a low potential for Davidson's saltscale to occur within the BSA.	Low potential to occur	None	None	1B.2	0	PDCHE041T1	1
Baccharis malibuensis	Malibu baccharis	Perennial deciduous shrub. Occurs in coastal scrub, chaparral, cismontane woodland, and riparian woodland habitats. Found in Conejo volcanic substrates, often on exposed roadcuts. Sometimes occupies oak woodland habitat. 492-1,050 feet. Blooms August.	Coastal scrub, chaparral, and riparian woodland habitats occur within the BSA; however, Conejo volcanic substrates may not be present, as indicated by existing soil map units (USDA 2018).	Low potential to occur within the BSA. The coastal scrub, chaparral, and riparian woodland habitats within the BSA are highly disturbed, but Conejo volcanic substrates may not be present (USDA 2018). However, the nearest recorded occurrence was in Solstice Canyon Park in 2000 (Calflora 2018). Thus, there is a low potential for Malibu baccharis to occur within the BSA.	Low potential to occur	None	None	1B.1	SB_RSABG	PDAST0W0W0	10
Calandrinia breweri	Brewer's calandrinia	Annual herb. Occurs in chaparral and coastal scrub habitats, in sandy or loamy soils, and at disturbed sites and burns.33-4,003 feet. Blooms (January)March-June.	Chaparral and coastal scrub habitats with sandy or loamy soils, and disturbed sites occur within the BSA.	Moderate potential to occur within the BSA. Most of the coastal scrub and chaparral habitats within the BSA are highly disturbed. Multiple occurrences were recorded along the Santa Monica Mountains and Malibu Coastline from the early 1900s through 2005 (Calflora 2018). Thus, there is a moderate potential for Brewer's calandrinia to occur within the BSA.	Moderate potential to occur	None	None	4.2			

Calochortus catalinae	Catalina mariposa-lily	Perennial bulbiferous herb. Occurs in valley and foothill grassland, chaparral, coastal scrub, and cismontane woodland habitats. Found in heavy soils, open slopes, openings in brush. 49-2,297 feet. Blooms (February)March-June, occasionally as early as February.	Chaparral, coastal scrub, and non-native grassland habitats with sandy or loamy soils, and disturbed sites occur within the BSA.	Moderate potential to occur within the BSA. Most of the grassland, coastal scrub, and chaparral habitats within the BSA are highly disturbed. Many occurrences were recorded along the Santa Monica Mountains and Malibu Coastline from the early 1900s through 2010 (Calflora 2018). Thus, there is a moderate potential for Catalina mariposa-lily to occur within the BSA.	Moderate potential to occur	None	None	4.2	0	PMLIL0D080	19
Calochortus clavatus var. clavatus	club-haired mariposa lily	Perennial bulbiferous herb. Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats, usually in serpentinite, clay, or rocky soils. 246-4,265 feet. Blooms (March)May-June.	Chaparral, coastal scrub, and non-native grassland habitats occur within the BSA. Serpentinite or clay soils are not mapped within the BSA (USDA 2018).	Low potential to occur within the BSA. Most of the grassland, coastal scrub, and chaparral habitats within the BSA are highly disturbed. Serpentine or clay soils are not mapped within the BSA (USDA 2018). A few occurrences were recorded along the Santa Monica Mountains and Malibu Coastline from the early 1920s through 1980s (Calflora 2018). Thus, there is a low potential for club-haired mariposa lily to occur within the BSA.	Low potential to occur	None	None	4.3			
Calochortus clavatus var. gracilis	slender mariposa-lily	Perennial bulbiferous herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in shaded foothill canyons; often on grassy slopes within other habitat. 689-5,955 feet. Blooms March-June, occasionally to November.	Chaparral, coastal scrub, and non-native grassland habitats occur within the BSA, including areas with shaded canyon and/or grassy slopes.	Low potential to occur within the BSA. Most of the coastal scrub, grassland, and chaparral habitats within the BSA are highly disturbed. Only recently documented occurrences along the Santa Monica Mountains were from 2010 and 2017 along Topanga Canyon Boulevard at Garapito Creek, on the northern side of the Santa Monica Mountains (Calflora 2018). Thus, there is a low potential for slender mariposa lily to occur within the BSA.	Low potential to occur	None	None	1B.2	BLM_S; SB_RSABG; USFS_S	PMLIL0D096	7
Calochortus plummerae	Plummer's mariposa-lily	Perennial bulbiferous herb. Occurs in coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest. Found at rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire. 197-8,202 feet. Blooms May-July.	Chaparral, coastal scrub, and non-native grassland habitats ocurr within the BSA, including areas of rocky and sandy sites with granitic or alluvial soils (USDA 2018).	Moderate potential to occur within the BSA. Most of the coastal scrub, grassland, and chaparral habitats within the BSA are highly disturbed. Multiple occurrences were recorded along the Santa Monica Mountains from the late 1800s through 2015 (Calflora 2018). The nearest recent record of occurrence was observed near Zuma Creek in 2010 (CDFW 2018). Thus, there is a moderate potential for Plummer's mariposa lily to occur within the BSA.	Moderate potential to occur	None	None	4.2	SB_RSABG	PMLIL0D150	23
Camissoniopsis lewisii	Lewis' evening-primrose	Annual herb. Occurs in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland habitats, in sandy or clay soils. 0-984 feet. Blooms March-May(June).	Coastal dune, coastal scrub, non-native grassland, and woodland habitats, with sandy soils, occur within the BSA.	Low potential to occur within the BSA. Most of the coastal dune, coastal scrub, non-native grassland, and woodland habitats within the BSA are highly disturbed. Historical occurrences were recorded at Point Dume from the 1950s (Calflora 2018). Thus, there is a low potential for Lewis' evening-primrose to occur within the BSA.	Low potential to occur	None	None	3			
Centromadia parryi ssp. australis	southern tarplant	Annual herb. Occurs in marshes and swamps (at margins), valley and foothill grassland, and vernal pools. Often found in disturbed sites near the coast at marsh edges; also in alkaline soils, sometimes with saltgrass. Sometimes found on vernal pool margins. 0-3,199 feet. Blooms May-November.	Marsh (alkaline wetland) and non-native grassland habitats occur within the BSA.	Low potential to occur within the BSA. The alkaline wetland and native grassland habitats within the BSA are highly disturbed. The nearest historical occurrences were recorded at UCLA, Del Rey, and Ballona areas from the early 1900s to 1950s (Calflora 2018). Thus, there is a low potential for southern tarplant to occur within the BSA.	Low potential to occur	None	None	1B.1	SB_RSABG	PDAST4R0P4	3
Cercocarpus betuloides var. blancheae	island mountain-mahogany	Perennial evergreen shrub. Occurs in closed-cone coniferous forest and chaparral habitats. 98-1,969 feet. Blooms February-May.	Chaparral habitats occur within the BSA.	Low potential to occur within the BSA. The chaparral habitats within the BSA are highly disturbed. A few occurrences were recorded in the Santa Monica Mountains from the early 1900s to early 2000s (Calflora 2018). Thus, there is a low potential for island mountain mahogany to occur within the BSA.	Low potential to occur	None	None	4.3			
Chaenactis glabriuscula var. orcuttiana	Orcutt's pincushion	Annual herb. Occurs in coastal bluff scrub and coastal dunes. Found in sandy sites. 10-262 feet. Blooms January-August.	Coastal dune habitat is present within the BSA.	Low potential to occur within the BSA. The coastal dune habitat within the BSA is highly disturbed. An historical occurrence was recorded in 1898 near the present-day location of Leo Carillo State Beach, and multiple records exist through 2015 at the Ballona Wetlands (Calflora 2018). Thus, there is a low potential for Orcutt's pincushion to occur within the BSA.	Low potential to occur	None	None	1B.1	BLM_S; SB_RSABG	PDAST20095	6
Chenopodium littoreum	coastal goosefoot	Annual herb. Found in coastal dunes. 33-98 feet. Blooms April - August.	Coastal dune habitat is present within the BSA.	Not expected to occur within the BSA. There is coastal dune habitat present within the BSA; however, the nearest historical record was near Playa Del Rey in 1904 (CDFW 2018). Thus, coastal goosefoot is not expected to occur within the BSA.	Not expected to occur	None	None	1B.2	0	PDCHE091Z0	1

Chloropyron maritimum ssp. maritimum	salt marsh bird's-beak	Annual herb (hemiparasitic). Occurs in marshes, swamps, and coastal dune habitats. Limited to the higher zones of salt marsh habitat. 0-10 meters. Blooms May-October(November)	Coastal dune and salt marsh habitats are present within the BSA.	Low potential to occur within the BSA. The coastal dune and salt marsh present within the BSA are highly disturbed. The nearest occurrences were recorded at Ballona Harbor in 1901 and Point Mugu Lagoon in the 1980s (Calflora 2018). Thus, there is low potential for salt marsh bird's-beak to occur within the BSA.	Low potential to occur	Endangered	Endangered	1B.2		SB_RSABG; SB_SBBG	PDSCR0J0C2	5
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	Annual herb. Occurs in coastal scrub and valley and foothill grassland habitats. Found in sandy soils. 49-3,330 feet. Blooms April-July.	Coastal scrub and non-native grassland habitats with sandy soils are present within the BSA.	Low potential to occur within the BSA. The coastal scrub and non-native grassland habitats present within the BSA are highly disturbed. The nearest occurrences were recorded at Ballona Harbor in 1901 and at upper Las Virgenes Canyon from 1999 to 2014 (Calflora 2018). Thus, there is low potential for San Fernando Valley spineflower to occur within the BSA.	Low potential to occur	Proposed Th	Endangered	1B.1		SB_RSABG; USFS_S	PDPGN040J1	3
Chorizanthe parryi var. parryi	Parry's spineflower	Annual herb. Occurs in coastal scrub, chaparral, cismontane woodland, and valley and foothill grassland habitats. Found on dry slopes and flats; sometimes at interface of 2 vegetation types, such as chaparral and oak woodland. Found in dry, sandy soils. 738-4,003 feet. Blooms April-June.	Coastal scrub, chaparral, woodland, and non-native grassland habitats with sandy soils are present within the BSA.	Low potential to occur within the BSA. Most of the coastal scrub, chaparral, woodland and non-native grassland habitats present within the BSA are highly disturbed. The nearest historical occurrence was recorded at Latigo Canyon in 1957 (Calflora 2018). Thus, there is low potential for Parry's spineflower to occur within the BSA.	Low potential to occur	None	None	1B.1		BLM_S; SB_RSABG; USFS_S	PDPGN040J2	1
Cistanthe maritima	seaside cistanthe	Annual herb. Occurs in coastal bluff scrub, coastal scrub, and valley and foothill grassland habitats. Found in sandy sites on sea bluffs. 16-984 feet. Blooms (February)March-June(August).	Coastal scrub and non-native grassland habitats with sandy soils are present within the BSA.	Not expected to occur within the BSA. There are coastal scrub and grassland habitats present within the BSA; however, the BSA is not on bluff areas. The only nearby historical occurrence was recorded in Santa Monica in 1881 (Calflora 2018). Thus, seaside cistanthe is not expected to occur within the BSA.	Not expected to occur	None	None	4.2		0	PDPOR09020	1
Convolvulus simulans	small-flowered morning-glory	Crustose lichen (terricolous). Occurs in chaparral (openings) habitats, on soil, small mammal pellets, dead twigs, and on Selaginella spp. 197-2,165 feet.	Chaparral habitats occur within the BSA.	Low potential to occur within the BSA. Chaparral habitats occur within the BSA; however, the nearest records of occurrence are from the Agoura Hills area north of Highway 101, and there are no records in the Santa Monica Mountains (Calflora 2018). Thus, there is a low potential for small-flowered morning-glory to occur within the BSA.	Low potential to occur	None	None		4.2			
Deinandra minthornii	Santa Susana tarplant	Perennial deciduous shrub. Occurs in chaparral and coastal scrub habitats. Found on sandstone outcrops and crevices, in shrubland. 919-2,313 feet. Blooms July-November.	Chaparral and coastal scrub habitats occur within the BSA, and sandstone rock outcrops are mapped within the BSA (USDA 2018).	Low potential to occur within the BSA. Chaparral and coastal scrub habitats, occur within the BSA, but these habitats are highly disturbed. There are a few records of occurrence from the southern Santa Monica Mountains from 1978 to 2010 (Calflora 2018, CDFW 2010). However, the area within the BSA that is mapped as sandstone rock outcrops soil map unit (USDA 2018) was observed during field surveys to be vegetated with disturbed ruderal. Thus, there is a low potential for Santa Susana tarplant to occur within the BSA.	Low potential to occur	None	Rare	1B.2		BLM_S; SB_RSABG	PDAST4R0J0	23
Deinandra paniculata	paniculate tarplant	Annual herb. Occurs in coastal scrub, valley and foothill grassland, and vernal pools habitats, in usually vernally mesic, sometimes sandy soils. 82-3,084 feet. Blooms (March)April-November.	Coastal scrub and non-native grassland habitats with sandy soils occur within the BSA.	Low potential to occur within the BSA. Most chaparral and coastal scrub habitats within the BSA are highly disturbed. The nearest record of occurrence was from Santa Monica from 1973 (Calflora 2018). Thus, there is a low potential for paniculate tarplant to occur within the BSA.	Low potential to occur	None	None		4.2			
Delphinium parryi ssp. blochmaniae	dune larkspur	Perennial herb. Occurs in chaparral and coastal dunes (maritime) habitats, on rocky areas and dunes. 59-1,001 feet. Blooms April-June.	Chaparral and coastal dune habitats, with rocky areas or dunes, are present within the BSA.	Low potential to occur within the BSA. Most chaparral and coastal dune habitats within the BSA are highly disturbed. The nearest record of occurrence was from near the present-day location of CSU Channel Islands in 1969 (Calflora 2018). Thus, there is a low potential for dune larkspur to occur within the BSA.	Low potential to occur	None	None	1B.2		BLM_S	PDRAN0B1B1	1
Delphinium parryi ssp. purpureum	Mt. Pinos larkspur	Perennial herb. Occurs in chaparral, Mojavean desert scrub, and pinyon and juniper woodland habitats. 3,281-8,530 feet. Blooms May-June.	Chaparral habitats are present within the BSA.	Not expected to occur within the BSA. There is chaparral habitat present within the BSA; however, the Calflora lists Mt. Pinos larkspur as occuring in the Thousand Oaks and Newberry Park quads but there are no records for the species there (Calflora 2018). Thus, Mt. Pinos larkspur is not expected to occur within the BSA.	Not expected to occur	None	None		4.3			

Dichondra occidentalis	western dichondra	Perennial rhizomatous herb. Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. Found on sandy loam, clay, and rocky soils. 164-1,640 feet. Blooms (January)March-July.	Chaparral, woodland, coastal scrub, and non-native grassland habitats are present within the BSA, and sandy loam, clay, and/or rocky soils have been mapped within the BSA (USDA 2018).	Low potential to occur within the BSA. Although suitable soils are present within the BSA, most chaparral, woodland, coastal scrub, and non-native grassland habitats within the BSA are highly disturbed. The nearest record of occurrence was from Tuna Canyon in 1994 (Calflora 2018). Thus, there is a low potential for western dichondra to occur within the BSA.	Low potential to occur	None	None	4.2	0	PDCON08060	1
Dithyrea maritima	beach spectaclepod	Perennial rhizomatous herb. Occurs in coastal dunes and coastal scrub habitats. Found on sea shores, sand dunes, and sandy places near the shore. 10-213 feet. Blooms March-May.	Coastal dune and coastal scrub habitats are present within the BSA, including along the sea shore with sand dunes and sandy areas.	Not expected to occur within the BSA. There are coastal dune and coastal scrub habitats present within the BSA; however, the nearest historical occurrences were from near Santa Monica in the late 1880s and early 1900s (CDFW 2018). Thus, beach spectaclepod is not expected to occur within the BSA.	Not expected to occur	None	Threatened	1B.1	BLM_S	PDBRA10020	3
Dudleya blochmaniae ssp. blochmaniae	Blochman's dudleya	Perennial herb. Occurs in coastal scrub, coastal bluff scrub, chaparral, and valley and foothill grassland habitats. Found on open, rocky slopes; often in shallow clays over serpentine or in rocky areas with little soil. 16-1,476 feet. Blooms April-June.	Coastal scrub, chaparral, and non-native grassland habitats occur in the BSA. Rocky slopes were not observed during field surveys, and clay or serpentine soils were not mapped within the BSA (USDA 2018).	Low potential to occur within the BSA. Coastal scrub, chaparral, and non-native grassland habitats occur within the BSA, and most are highly disturbed. Rocky slopes were not observed during field surveys, and clay or serpentine soils were not mapped within the BSA (USDA 2018). The nearest records of occurrence were from Point Dume in 1959, near Malibu Beach in 1948, and Little Sycamore Canyon in 1985 (Calflora 2018). Thus, there is a low potential for Blochman's dudleya to occur within the BSA.	Low potential to occur	None	None	1B.1	SB_RSABG	PDCRA04051	11
Dudleya cymosa ssp. agourensis	Agoura Hills dudleya	Perennial herb. Occurs in chaparral and cismontane woodland in rocky or volcanic soils. 656-1,640 feet. Blooms May-June.	Chaparral and woodland habitats occur within the BSA. Rocky or volcanic soils were not mapped within the BSA (USDA 2018).	Low potential to occur within the BSA. Most chaparral and woodland habitats occur within the BSA but most are highly disturbed. Rocky or volcanic soils were not mapped within the BSA, and most soils present are derived from alluvium, shale, and sandstone (USDA 2018). The nearest occurrences of Agoura Hills dudleya were recorded in the northern side of the Santa Monica Mountains near Agoura Hills from 1978 to 2007 (Calflora 2018). Thus, there is a low potential for Agoura Hills dudleya to occur within the BSA.	Low potential to occur	Threatened	None	1B.2	SB_RSABG	PDCRA040A7	8
Dudleya cymosa ssp. marcescens	marcescent dudleya	Perennial herb. Occurs in chaparral habitat, on sheer rock surfaces and rocky volcanic cliffs. 476-2,198 feet. Blooms April-July.	Chaparral habitat occurs within the BSA; however, no sheer rock surfaces or rocky volcanic cliffs were observed during field surveys.	Not expected to occur within the BSA. Observations were recorded from the early 1900s through 2006 at four specific locations along the Santa Monica Mountains (Malibu Creek, Topanga Canyon, Seminole Hot Springs, Little Sycamore Canyon) (Calflora 2018). However, no suitable habitat is present within the BSA; thus, marscent dudleya is not expected to occur within the BSA.	Not expected to occur	Threatened	Rare	1B.2	SB_RSABG	PDCRA040A3	14
Dudleya cymosa ssp. ovatifolia	Santa Monica dudleya	Perennial herb. Occurs in chaparral and coastal habitats. Found in canyons on volcanic or sedimentary substrates; primarily on north-facing slopes. 492-1,099 feet. Blooms March-June.	Chaparral and coastal habitats occur within the BSA, including with sedimentary soils (USDA 2018).	Moderate potential to occur within the BSA. Chaparral and coastal habitats occur within the BSA, including with sedimentary soils (USDA 2018), but most of these habitats are highly disturbed. Occurrences were recorded at various locations in the Santa Monica Mountains from 1948 to 2011, including Malibu Canyon and Topanga Canyon (Calflora 2018, CDFW 2011). Thus, there is a moderate potential for Santa Monica dudleya to occur within the BSA.	Moderate potential to occur	Threatened	None	1B.1	SB_RSABG	PDCRA040A5	3
Dudleya multicaulis	many-stemmed dudleya	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland, often in clay soils. 49-2,592 feet. Blooms April-July.	Chaparral, coastal scrub, and non-native grassland habitats occur within the BSA. No clay soils were mapped within the BSA (USDA 2018), and might not occur.	Low potential to occur within the BSA. Most chaparral and coastal habitats within the BSA are highly disturbed. No clay soils were mapped within the BSA (USDA 2018), and might not occur. The nearest historical occurrences were recorded near Thousand Oaks from 1958 and in Santa Monica in 1891 (Calflora 2018). Thus, there is a low potential for many-stemmed dudleya to occur within the BSA.	Low potential to occur	None	None	1B.2	BLM_S; SB_RSABG; USFS_S	PDCRA040H0	1
Dudleya parva	Conejo dudleya	Perennial herb. Occurs in coastal scrub, valley and foothill grassland, in clay or volcanic soils on rocky slopes and grassy hillsides. 295-1,247 feet. Blooms May-June.	Coastal scrub and non-native grassland habitats are present within the BSA; however, no clay or volcanic soils were mapped in the BSA and might not occur (USDA 2018), and the BSA is outside the known range of the species (CNPS 2018).	Not expected to occur within the BSA. Conejo dudleya is only known to occur north of the Santa Monica Mountains; it does not occur on the Malibu Coast or southern Santa Monica Mountains. Occurrences were recorded near Thousand Oaks and Newberry Park, north of Highway 101, from 1922 through 2001 (Calflora 2018).	Not expected to occur	Threatened	None	1B.2	SB_RSABG	PDCRA04016	11

Dudleya verityi	Verity's dudleya	Perennial herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, on volcanic rock outcrops in the Santa Monica Mountains. 197-1,099 feet. Blooms May-June.	Chaparral, coastal scrub, and woodland habitats are present within the BSA; however, no volcanic outcrops were observed during field surveys, and the BSA is outside the known range of the species.	Not expected to occur within the BSA. No suitable habitat present within the BSA. Verity's dudleya is only known to occur in the western-most portion of the Santa Monica Mountains near CSU Channel Islands, where observations were recorded from 1944 through 2016 (Calflora 2018); it does not occur on the Malibu Coast or southern Santa Monica Mountains.	Not expected to occur	Threatened	None	1B.1	SB_RSABG	PDCRA040U0	8
Eriogonum crocatum	Conejo buckwheat	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats, at rocky sites on Conejo volcanic outcrops. 295-1,903 feet. Blooms April-July.	Chaparral, coastal scrub, and non-native grassland habitats occur within the BSA; however, no volcanic outcrops were observed during field surveys.	Not expected to occur within the BSA. No suitable habitat present within the BSA. Conejo buckwheat currently only known to occur in the northwestern Santa Monica Mountains (Calflora 2018). An historical occurrence was recorded in the Malibu Hills 1926 (Calflora 2018); however, it not known to occur on the Malibu Coast or southern Santa Monica Mountains at present day. Thus, Conejo buckwheat is not expected to occur within the BSA.	Not expected to occur	None	Rare	1B.2	SB_RSABG	PDPGN081G0	13
Eryngium aristulatum var. parishii	San Diego button-celery	Annual/perennial herb. Occurs in vernal pools, coastal scrub, valley and foothill grassland habitats. Specifically found in San Diego mesa hardpan and claypan vernal pools, and in southern interior basalt flow vernal pools; usually surrounded by scrub. 49-2,887 feet. Blooms April-June.	San Diego mesa hardpan, claypan vernal pools, or southern interior basalt flow vernal pools habitats are not present within the BSA.	Not expected to occur within the BSA. There are no suitable habitats present within the BSA. The nearest historical occurrence was recorded near Wiseburn in the Venice Quad in 1901, but is now extirpated at that site (Calflora 2018). Thus, San Diego button-celery is not expected to occur within the BSA.	Not expected to occur	Endangered	Endangered	1B.1	SB_RSABG	PDAPI0Z042	1
Erysimum suffrutescens	suffrutescent wallflower	Perennial herb. Occurs in coastal bluff scrub, chaparral (maritime), coastal dunes, and coastal scrub habitats. 0-492 feet. Blooms January-July(August).	Chaparral, coastal dune, and coastal scrub habitats are present within the BSA.	Low potential to occur within the BSA. Most chaparral, coastal dune, and coastal scrub habitats within the BSA are highly disturbed. The nearest recent occurrences were recorded at Ballona Wetlands in 1980 and Point Mugu in 2002. Thus, there is a low potential for suffrutescent wallflower to occur within the BSA.	Low potential to occur	None	None	4.2			
Hordeum intercedens	vernal barley	Annual herb. Occurs in coastal dunes, coastal scrub, valley and foothill grassland (saline flats and depressions), and vernal pool habitats. 16-3,281 feet. Blooms March-June.	No suitable saline flats or vernal pool habitats present within the BSA.	Not expected to occur within the BSA. There are no suitable habitats present within the BSA. The nearest occurrence was recorded in 1984 near Glenview, on the northern side of the Santa Monica Mountains (Calflora 2018). Thus, vernal barley is not expected to occur within the BSA.	Not expected to occur	None	None	3.2			
Horkelia cuneata var. puberula	mesa horkelia	Perennial herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, at sandy or gravelly sites. 49-5,397 feet. Blooms February-July, occasionally to September.	Chaparral, woodland, and coastal scrub habitats, including with sandy or gravelly sites, are present within the BSA.	Moderate potential to occur within the BSA. Most chaparral, woodland, and coastal scrub habitats within the BSA are highly disturbed. The nearest occurrences were recorded at Charmlee Wilderness Park in 2008 and Point Dume in 1955 (Calflora 2018). Thus, there is a moderate potential for mesa horkelia to occur within the BSA.	Moderate potential to occur	None	None	1B.1	USFS_S	PDROS0W045	5
Isocoma menziesii var. decumbens	decumbent goldenbush	Perennial shrub. Occurs in coastal scrub and chaparral habitats. Found in sandy soils; often in disturbed sites. 3-3,002 feet. Blooms April-November.	Coastal scrub and chaparral habitats with sandy soils are present within the BSA.	Moderate potential to occur within the BSA. Most chaparral and coastal scrub habitats within the BSA are highly disturbed, but decumbent goldenbush is often found in disturbed areas. The nearest occurrence was recorded at Malibu Colony in 1975 (Calflora 2018). Thus, there is a moderate potential for decumbent goldenbush to occur within the BSA.	Moderate potential to occur	None	None	1B.2	0	PDAST57091	1
Juglans californica	Southern California black walnut	Perennial deciduous tree. Occurs in chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats, in alluvial soils. 164-2,953 feet.	Chaparral, woodland, coastal scrub, and riparian woodland habitats with alluvial soils are present within the BSA.	Present. Walnut woodland habitat with Southern California black walnut trees is present within the BSA.	Present	None	None	4.2			
Juncus acutus ssp. leopoldii	southwestern spiny rush	Perennial rhizomatous herb. Occurs in coastal dunes (mesic), meadows and seeps (alkaline seeps), and marshes and swamps (coastal salt) habitats. 10-2,953 feet. Blooms (March)May-June.	Coastal dune and coastal marsh/lagoon habitats are present within the BSA.	Low potential to occur within the BSA. Coastal dune and coastal lagoon habitats within the BSA are highly disturbed. The nearest historical occurrences were recorded at Point Mugu in 1959 and 1977, and at Pacific Palisades in 1959 (Calflora 2018). Thus, there is a low potential for southwestern spiny rush to occur within the BSA.	Low potential to occur	None	None	4.2			

Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Annual herb. Occurs in coastal salt marshes, playas, and vernal pools habitats. Usually found on alkaline soils in playas, sinks, and grassland areas. 3-4,511 feet. Blooms February-June.	Coastal salt marsh/lagoon habitat is present within the BSA.	Low potential to occur within the BSA. Coastal coastal lagoon habitats within the BSA are highly disturbed. The nearest historical occurrence was recorded along the highway near Malibu in 1933 (Calflora 2018). Thus, there is a low potential for Coulter's goldfields to occur within the BSA.	Low potential to occur	None	None	1B.1		BLM_S; SB_RSABG	PDAST5L0A1	6
Lepechinia fragrans	fragrant pitcher sage	Perennial shrub. Occurs in chaparral habitat. 66-4,298 feet. Blooms March-October.	Chaparral habitat is present within the BSA.	Moderate potential to occur within the BSA. Chaparral habitat is present within the BSA, although most is highly disturbed. There are multiple occurrences recorded from 1930s through 2000s in the Santa Monica Mountains, although the nearest records were from 1931 in Los Alisos Canyon (Calflora 2018). Thus, there is a moderate potential for fragrant pitcher sage to occur within the BSA.	Moderate potential to occur	None	None	4.2				
Lilium humboldtii ssp. humboldtii	Humboldt lily	Perennial bulbiferous herb. Occurs in chaparral, lower montane coniferous forest, and cismontane woodland habitats. Found in yellow-pine forest, at openings, or open forest. 295-4,199 feet. Blooms May-July, occasionally as late as August.	Chaparral and woodland habitats are present within the BSA.	Low potential to occur within the BSA. Chaparral and woodland habitats are present within the BSA, although most are highly disturbed. There was an historical observation recorded in 1957 at Latigo Canyon (Calflora 2018). Thus, there is a low potential for ocellated Humboldt lily to occur within the BSA.	Low potential to occur	None	None	4.2	0		PMLIL1A071	6
Lilium humboldtii ssp. ocellatum	ocellated Humboldt lily	Perennial bulbiferous herb. Occurs within openings in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland habitats. 98-5,906 feet. Blooms March-July(August).	Chaparral, coastal scrub, and woodland habitats are present within the BSA.	Moderate potential to occur within the BSA. Chaparral, coastal scrub, and woodland habitats are present within the BSA, although most are highly disturbed. There are multiple occurrences recorded from early 1900s through 2000s in the Santa Monica Mountains, and the most recent and nearest record was from 2009 in lower Solstice Canyon (Calflora 2018). Thus, there is a moderate potential for ocellated Humboldt lily to occur within the BSA.	Moderate potential to occur	None	None	4.2				
Malacothamnus davidsonii	Davidson's bush-mallow	Perennial deciduous shrub. Occurs in coastal scrub, riparian woodland, chaparral, and cismontane woodland habitats, in sandy washes. 492-5,003 feet. Blooms June-January.	Coastal scrub, woodland, and chaparral habitats are present within the BSA.	Low potential to occur within the BSA. Chaparral, coastal scrub, and woodland habitats are present within the BSA, although most are highly disturbed. The nearest historical observation was recorded in the San Fernando Valley in 1931 (Calflora 2018). Thus, there is a low potential for Davidson's bush-mallow to occur within the BSA.	Low potential to occur	None	None	1B.2	0		PDMAL0Q040	1
Monardella hypoleuca ssp. hypoleuca	white-veined monardella	Perennial herb. Occurs in chaparral and cismontane woodland habitats, on dry slopes. 164-4,199 feet. Blooms May-August, occasionally as early as April or as late as December.	Chaparral and woodland habitats with dry slopes are present within the BSA.	Moderate potential to occur within the BSA. Chaparral and woodland habitats are present within the BSA, although most are highly disturbed. The nearest recent observation was recorded in Santa Ynez Canyon in 2009, and historically in Malibu Canyon from 1898 and in Topanga Canyon from 1907 (Calflora 2018). Thus, there is a moderate potential for white-veined monardella to occur within the BSA.	Moderate potential to occur	None	None	1B.3	0		PDLAM180A3	4
Monardella sinuata ssp. gerryi	Gerry's curly-leaved monardella	Annual herb. Occurs in coastal scrub, in sandy openings. 492-804 feet. Blooms April-June.	Coastal scrub habitat with sandy openings is present within the BSA.	Low potential to occur within the BSA. There are coastal scrub habitats with sandy openings present within the BSA; however, the nearest records for the species are from observations north of Camarillo and Thousand Oaks in 1934, 1976, and 2015 (CDFW 2018). Thus, Gerry's curly-leaved monardella has a low potential to occur within the BSA.	Low potential to occur	None	None	1B.1	0		PDLAM18163	1
Monardella sinuata ssp. sinuata	southern curly-leaved monardella	Annual herb. Occurs in chaparral, cismontane woodland, coastal dunes, and coastal scrub (openings) habitats, in sandy soils. 0-984 feet. Blooms April-September.	Chaparral, woodland, coastal dune, and coastal scrub habitats with openings in sandy soil are present within the BSA.	Low potential to occur within the BSA. There are coastal scrub, woodland, coastal dune, and chaparral habitats with sandy openings present within the BSA; however, the nearest records of occurrence are from the Las Posas Hills area, north of Highway 101, in 1975 and 2013 (Calflora 2018). Thus, southern curly-leaved monardella has a low potential to occur within the BSA.	Low potential to occur	None	None	1B.2				
Nama stenocarpa	mud nama	Annual herb. Occurs in marshes and swampes, at lake shores, river banks, and intermittently wet areas. 16-1,640 feet. Blooms January-July.	Wetland and intermittent stream habitats are present within the BSA.	Low potential to occur within the BSA. There are wetland and intermittent stream habitats present within the BSA; however, the nearest historical records of occurrence are from the Santa Monica and Brentwood areas in the late 1800s and early 1900s (Calflora 2018). Thus, mud nama has a low potential to occur within the BSA.	Low potential to occur	None	None	2B.2	0		PDHYD0A0H0	1

Navarretia fossalis	Spreading navarretia	Annual herb. Occurs in vernal pools, chenopod scrub, marshes, swamps, and playas habitats. Found in San Diego hardpan and San Diego claypan vernal pools, and in swales, often surrouded by other habitat types. 49-2,789 feet. Blooms April-June.	Vernal pool habitat is not present within the BSA.	Not expected to occur within the BSA because there is no suitable vernal pool habitat present. The nearest records of occurrence for the species are from near Santa Clarita in 2003, and historically from near Inglewood in 1906 (Calflora 2018).	Not expected to occur	Threatened	None	1B.1			USFWS IPAC query
Navarretia ojaiensis	Ojai navarretia	Annual herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Found in openings in shrublands or grasslands. 902-2,034 feet. Blooms May-July.	Chaparral, coastal scurb, and non-native grassland habitats with openings are present within the BSA.	Low potential to occur. Chaparral, coastal scrub, and grassland habitats are present within the BSA, although most of these habitats are highly disturbed. The nearest recent observations were recorded in the Santa Monica Mountains along upper Latigo Canyon Road in 2012, and near Malibu Springs in 2007 (Calflora 2018, CDFW 2018). Thus, Ojai navarretia has a low potential to occur within the BSA.	Low potential to occur	None	None	1B.1	SB_RSABG; USFS_S	PDPLM0C130	10
Navarretia prostrata	prostrate vernal pool navarretia	Annual herb. Occurs in coastal scrub, valley and foothill grassland, vernal pools, and meadows and seeps habitats. Found in in mesic, alkaline sites, including alkaline soils in grassland, or in vernal pools. 10-4,052 feet. Blooms April-July.	No suitable vernal pool or mesic, alkaline grassland habitats are present within the BSA.	Not expected to occur within the BSA because there is no suitable vernal pool or mesic, alkaline habitat present. The nearest historical records of occurrence for the species are from near Inglewood in the early 1900s and from near Manhattan Beach in the 1940s (Calflora 2018, CDFW 2018).	Not expected to occur	None	None	1B.1	0	PDPLM0C0Q0	1
Nolina cismontana	chaparral nolina	Perennial evergreen shrub. Occurs in chaparral and coastal scrub habitats, primarily on sandstone and shale substrates; also known from gabbro. 459-3,609 feet. Blooms (March)May-July.	Chaparral and coastal scrub habitats with sandstone substrates occur within the BSA.	Low potential to occur. Chaparral and coastal scrub habitats are present within the BSA, although most of these habitats are highly disturbed. The nearest observations were recorded north of Thousand Oaks and Agoura Hills (Calflora 2018, CDFW 2018). Thus, chaparral nolina has a low potential to occur within the BSA.	Low potential to occur	None	None	1B.2	SB_RSABG; SB_SBBG; USFS_S	PMAGA080E0	9
Orcuttia californica	California Orcutt grass	Annual herb. Found in vernal pools. 33-2,165 feet. Blooms April-August.	No vernal pool habitat is present within the BSA.	Not expected to occur within the BSA because no vernal pool habitat is present. Nearest recent record of occurrence was from near Moorpark in 2011, and historically observed near Inglewood in 1946 (Calflora 2018).	Not expected to occur	Endangered	Endangered	1B.1	SB_RSABG	PMPOA4G010	1
Pentachaeta lyonii	Lyon's pentachaeta	Annual herb. Occurs in chaparral, valley and foothill grassland, and coastal scrub habitats. Found at edges of clearings in chaparral, usually at the ecotone between grassland and chaparral or edges of firebreaks. 98-2,067 feet. Blooms March-August, occasionally as early as February.	Chaparral, non-native grassland, and coastal scrub habitats occur within the BSA.	Moderate potential to occur within the BSA. Chaparral, grassland, and coastal scrub habitats are present within the BSA, although most of these habitats are highly disturbed. There are multiple observations of Lyon's pentachaeta across the Santa Monica Mountains from the early 1900s through 2017. The most recent or nearby occurrences were recorded in 2017 approximately 4 miles north of Malibu Beach, in 2015-2016 along upper Malibu Creek, in 2012 along Kanan-Dune Road, (Calflora 2018, CDFW 2018). Thus, Lyon's pentachaeta has a moderate potential to occur within the BSA.	Moderate potential to occur	Endangered	Endangered	1B.1	SB_RSABG	PDAST6X060	37
Phacelia hubbyi	Hubby's phacelia	Annual herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats, in gravelly, rocky, and talus soils. 0-3,281 feet. Blooms April-July.	Chaparral, grassland, and coastal scrub habitats with gravelly and rocky soils are present within the BSA.	Low potential to occur within the BSA. Chaparral, grassland, and coastal scrub habitats are present within the BSA, although most of these habitats are highly disturbed. There are multiple observations of Hubby's phacelia across the Santa Monica Mountains from the 1920s through 2016, although the observations from the south side of the range are from the 1920s through 1940s (Calflora 2018). Thus, Hubby's phacelia has a low potential to occur within the BSA.	Low potential to occur	None	None	4.2			
Phacelia ramosissima var. austrolitoralis	south coast branching phacelia	Perennial herb. Occurs in chaparral, coastal dunes, coastal scrub, and marshes and swamps (coastal salt) habitats, in sandy and sometimes rocky soils. 16-984 feet. Blooms March-August.	Chaparral, coastal dune, coastal scrub, and coastal lagoon habitats with sandy soils occur within the BSA	Low potential to occur within the BSA. Chaparral, coastal dune, coastal scrub, and coastal lagoon habitats with sandy soils occur within the BSA, although most of these habitats are highly disturbed. There are multiple historical occurrences recorded from the 1930s through 1980s across the Malibu Coastline at Point Dume, Carbon Canyon, and Topanga Canyon (Calflora 2018). Thus, south coast branching phacelia has a low potential to occur within the BSA.	Low potential to occur	None	None	3.2			
Phacelia stellaris	Brand's star phacelia	Annual herb. Occurs in coastal dunes and coastal scrub habitats. 3-1,312 feet. Blooms March-June.	Coastal dunes and coastal scrub occur within the BSA.	Low potential to occur within the BSA. Coastal dunes and coastal scrub habitats occur within the BSA, although most of these habitats are highly disturbed. The nearest historical occurrences are from the 1930s and 1940s near Playa Del Rey (Calflora 2018). Thus, Brand's star phacelia has a low potential to occur within the BSA.	Low potential to occur	None	None	1B.1	SB_RSABG	PDHYD0C510	2

Piperia michaelii	Michael's rein orchid	Perennial herb. Occurs in coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest habitats. 10-3,002 feet. Blooms April-August.	Coastal scrub and woodland habitats are present within the BSA.	Not expected to occur within the BSA. Coastal scrub and woodland habitats are present within the BSA, although most of these habitats are highly disturbed. The nearest historical occurrences are from the late 1800s and early 1900s near Glendale (Calflora 2018). Thus, there is a low potential for Michael's rein orchid to occur within the BSA.	Not expected to occur	None	None	4.2			
Potentilla multijuga	Ballona cinquefoil	Perennial herb. Found in brackish meadows and seeps. 0-7 feet. Blooms June-August.	Alkaline wetland and coastal lagoon habitats are present within the BSA.	Not expected to occur within the BSA. Alkaline wetland and coastal lagoon habitats are present within the BSA, although they are highly disturbed. The nearest historical occurrence was recorded near Ballona Wetlands in the late 1800s (Calflora 2018). Thus, it is not likely that Ballona cinquefoil would occur within the BSA.	Not expected to occur	None	None	1A	0	PDROS1B120	1
Pseudognaphalium leucocephalum	white rabbit-tobacco	Perennial herb. Occurs in riparian woodland, cismontane woodland, coastal scrub, and chaparral habitats. Found in sandy and gravelly sites. 100 to 4,035 feet. Blooms (July)August-November(December).	Woodland, coastal scrub, and chaparral habitats with sandy sites are present within the BSA.	Not expected to occur within the BSA. Woodland, coastal scrub, and chaparral habitats with sandy sites are present within the BSA, although they are highly disturbed. The nearest historical occurrences were recorded near Camarillo in the 1950s and near Hollywood in the early 1900s (Calflora 2018). Thus, it is not likely that white rabbit-tobacco would occur within the BSA.	Not expected to occur	None	None	2B.2	0	PDAST440C0	1
Quercus dumosa	Nuttall's scrub oak	Perennial evergreen shrub. Occurs in closed-cone coniferous forest, chaparral, and coastal scrub habitats. Generally found on sandy soils near the coast; sometimes found on clay loam. 49-2,100 feet. Blooms February-April(May-August).	Chaparral and coastal scrub habitats with sandy soils are present within the BSA.	Not present within the BSA. Chaparral and coastal scrub habitats with sandy soils are present within the BSA. There are multiple records of Nuttall's scrub oak across the Santa Monica Mountains from the early 1900s through 1990s (Calflora 2018). This species was not observed during field surveys within the BSA.	Not present	None	None	1B.1	USFS_S	PDFAG050D0	1
Nasturtium gambelii (Rorippa gambellii)	Gambel's watercress	Perennial rhizomatous herb. Occus in freshwater and brackish marshes, and at the margins of lakes and along streams, in or or just above the waterline. Blooms April-October.	Alkaline wetland and coastal lagoon habitats are present within the BSA.	Not expected to occur within the BSA. Alkaline wetland and coastal lagoon habitats are present within the BSA, although are highly disturbed. The nearest historical occurrences were from Los Angeles near Cienega in the late 1800s and early 1900s (Calflora 2018). Thus, Gambel's watercress is not expected to occur within the BSA.	Not expected to occur	Endangered	Threatened	1B.1		PDBRA270V0	USFWS IPAC query
Senecio aphanactis	chaparral ragwort	Annual herb. Occurs in chaparral, cismontane woodland, and coastal scrub habitats, sometimes in alkaline soils. 49-2,625 feet. Blooms January-April(May).	Chaparral, woodland, and scrub habitats are present within the BSA.	Moderate potential to occur within the BSA. Chaparral, woodland, and coastal scrub habitats are present within the BSA, although most are highly disturbed. The nearest observation was recorded at Deer Creek Canyon, east of Point Mugu in 1997 (Calflora 2018). Thus, there is a moderate potential for chaparral ragwort to occur within the BSA.	Moderate potential to occur	None	None	2B.2	0	PDAST8H060	7
Sidalcea neomexicana	salt spring checkerbloom	Perennial herb. Occurs in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas habitats, in alkaline and mesic soils. 49-5,020 feet. Blooms March-June.	Chaparral and coastal scrub habitats are present within the BSA.	Low potential to occur. Chaparral and coastal scrub habitats are present within the BSA, although most are highly disturbed. The nearest historical observation was recorded at Santa Monica in 1900 (Calflora 2018). Thus, there is a low potential for salt spring checkerbloom to occur within the BSA.	Low potential to occur	None	None	2B.2	USFS_S	PDMAL110J0	1
Spermolepis lateriflora	western bristly scaleseed	Annual herb. Occurs in Sonoran desert scrub habitats on rocky or sandy areas. 1198-2,198 feet. Blooms March-April.	There are no Sonoran desert scrub habitats present within the BSA.	Not expected to occur. There are no Sonoran desert scrub habitats present within the BSA. Additionally, the Calflora lists western bristly scaleseed as occuring in the Topanga quad; however, there are no records for the species there (Calflora 2018). The CNDDB maps an occurrence in Tuna Canyon near Topanga Creek, but the record indiactes Tuna Canyon in the Verdugo Mountains, suggesting the record is mapped incorrectly in the Santa Monica Mountains (CNDDB 2018). Thus, western bristly scaleseed is not expected to occur within the BSA.	Not expected to occur	None	None	2A	0	PDAPI23080	1
Suaeda esteroa	estuary seablite	Perennial herb. Occurs in marshes and swamps (coastal salt). 0-16 feet. Blooms (May)July-October(January)	Coastal lagoon and alkaline wetland habitats are present within the BSA.	Low potential to occur within the BSA. Coastal lagoon and alkaline wetland habitats are present within the BSA, although they are highly disturbed. The nearest observations were recorded at Point Mugu from 1948 through 2012 (Calflora 2018, CDFW 2018). Thus, there is a low potential for estuary seablit to occur within the BSA.	Low potential to occur	None	None	1B.2	0	PDCHE0P0D0	3

Suaeda taxifolia	woolly seablite	Perennial evergreen shrub. Occurs in coastal bluff scrub, coastal dunes, and marshes and swamps (margins of coastal salt) habitats. 0-164 feet. Blooms January-December.	Coastal dunes, coastal lagoon, and alkaline wetland habitats are present within the BSA.	High potential to occur within the BSA. Coastal dunes, coastal lagoon, and alkaline wetland habitats are present within the BSA, although most are highly disturbed. There are multiple observations recorded across the Malibu coastline from the 1930s through 1990s, including a 1997 observation at Zuma Beach (Calflora 2018). Thus, there is a high potential for woolly seablite to occur within the BSA.	High potential to occur	None	None	4.2			
Symphyotrichum greatae	Greata's aster	Perennial rhizomatous herb. Occurs in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and riparian woodland, in mesic areas. 984-6,594 feet. Blooms June-October.	Chaparral and woodland habitats are present within the BSA, possibly with mesic areas.	Not expected to occur within the BSA. Chaparral and woodland habitats are present within the BSA, possibly with mesic areas; however, the Calflora lists Greata's aster as occuring in the Beverly Hills quad and the nearest occurrence was in Benedicts Canyon, north of Beverly Hills, from an undated collection (Calflora 2018, CDFW 2018). Thus, Greata's aster is not expected to occur within the BSA.	Not expected to occur	None	None	1B.3	BLM_S	PDASTE80U0	1
Texosporium sancti-jacobi	woven-spored lichen	Crustose lichen (terricolous). Occurs in chaparral (openings) habitats, on soil, small mammal pellets, dead twigs, and on Selaginella spp. 197-2,165 feet.	Chaparral habitats are present within the BSA.	Low potential to occur within the BSA. Chaparral habitats are present within the BSA; however, the Calflora lists woven-spored lichen as occuring in the Camarillo quad and the nearest record was from 2003 near CSU Channel Islands in Long Grade Canyon (Calflora 2018, CDFW 2018). Thus, woven-spored lichen has a low potential to occur within the BSA.	Low potential to occur	None	None	3	0	NLTEST7980	1
Thelypteris puberula var. sonorensis	Sonoran maiden fern	Perennial rhizomatous herb. Occurs in meadows and seeps, along streams or at seepage areas. 164-2,001 feet. Blooms January-September.	Wetland and intermittent stream habitats are present within the BSA.	Low potential to occur within the BSA. Wetland and intermittent stream habitats are present within the BSA. The nearest and most recent observations were recorded at Lachusa Canyon and Encinal Canyon in the 1960s, and in Arroyo Sequit in the 1950s (Calflora 2018, CDFW 2018). Thus, there is a low potential for Sonoran maiden fern to occur within the BSA.	Low potential to occur	None	None	2B.2	USFS_S	PPTHE05192	4
Tortula californica	California screw moss	Moss. Occurs in chenopod scrub and valley and foothill grassland habitats. Moss grows on sandy soil. 33-4,790 feet.	Non-native grassland habitats with sandy soil are present within the BSA.	Moderate potential to occur within the BSA. Non-native grassland habitats with sandy soil are present within the BSA. The nearest recent observeation was recorded in Newton Canyon, just east of Zuma Canyon, in 2004, and near Triunfo Pass and upper Arroyo Sequit Creek in 2006 (CDFW 2018). Thus, California screw moss has a moderate potential to occur within the BSA.	Moderate potential to occur	None	None	1B.2	BLM_S	NBMUS7L090	3
Sensitive Habitats											
Sensitive Natural Communities											
California Walnut Woodland	California Walnut Woodland	Juglans californica is dominant or co-dominant in the tree canopy with Alnus rhombifolia, Fraxinus dipetala, Heteromeles arbutifolia, Quercus agrifolia, Quercus lobata, Salix laevigata, Salix lasiolepis, Sambucus nigra and Umbellularia californica. Trees < 15 m tall; canopy is open to continuous. Shrub layer is sparse to intermittent. Herbaceous layer is sparse or grassy. Juglans californica > 50% relative cover in the tree canopy or > 30% relative cover with Quercus agrifolia present (Keeler-Wolf and Evens 2006). Riparian corridors, but most stands cover all hillslopes. The USFWS Wetland Inventory (1996 national list) recognizes Juglans californica as a FAC plant.	California Walnut Woodland habitat is present within the BSA.	Walnut woodland habitat is present within the BSA. There are no previously mapped occurrences of California walnut woodland within the BSA, although there are multiple habitats mapped within the foothills on the northern side of the Santa Monica Mountains (CDFW 2018). Walnut woodland habitats were observed during field surveys within the BSA of the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) project and within the BSA of the Emergency Source of Water Supply Connection (Las Virgenes Connection) project.	Present				0	CTT71210CA	10

Riversidian Alluvial Fan Sage Scrub	Riversidian Alluvial Fan Sage Scrub	Found on California's inner southern coast and inland along the base of the Transverse and Peninsular ranges extending south into Baja California, Mexico. This alliance consists for shrublands dominated by Artemisia californica, Eriogonum fasciculatum, Salvia apiana, and/or Salvia mellifera. Other species present include Encelia farinosa, Ericameria spp., Isocoma menziesii, Malacothamnus fasciculatus, Malosma laurina, Rhus spp., and/or Yucca whipplei (= Hesperoyucca whipplei). In more mesic settings, on rockier soil, often closer to the coast, black sage increases in importance and this alliance shifts to ~Artemisia californica - Salvia mellifera - Salvia leucophylla Mesic Scrub Alliance. Habitats are slopes that are steep and south-facing, sometimes bouldery, as well as intermittently flooded arroyos, channels and washes, and rarely flooded low-gradient deposits. Elevation ranges from 250-1600 m. Soils are coarse or fine-textured, well-drained, moderately acidic to slightly saline, and colluvial-derived, or in some cases alluvial.	Riversidian Alluvial Fan Sage Scrub habitat is not present within the BSA.	Riversidian Alluvial Fan Sage Scrub habitat is not present within the BSA. There are no previously mapped occurrences of California walnut woodland within the BSA, and the nearest mapped occurrence is in the San Fernando Valley (CDFW 2018). Riversidian Alluvial Fan Sage Scrub habitat was not observed during field surveys within the BSA.	Not present	0	CTT32720CA	1
Southern California Coastal Lagoon	Southern California Coastal Lagoon	Coastal lagoon habitat.	Southern California Coastal Lagoon habitat is present within the BSA.	Coastal lagoon habitat is present within the BSA. There are no previously mapped occurrences of Southern California Coastal Lagoon within the BSA, although there is nearby habitat mapped at the Malibu Creek mouth (CDFW 2018). Coastal lagoon habitats were observed during field surveys within the BSAs of the PCH & Topanga Beach Drive (segment 2), Las Flores Canyon Creek, Corral Canyon Creek, Trancas Creek, Escondido Creek, Topanga Canyon Creek, and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) projects and the BSA of the Topanga County Beach Staging Area.	Present	0	CALE1220CA	1
Southern California Steelhead Stream	Southern California Steelhead Stream	Suitable habitat for southern California stee	Southern California Steelhead Stream habitat is present within the BSA.	Southern California Steelhead Stream habitat is present within the BSA. There are no previously mapped occurrences of Southern California Steelhead Stream within the BSA, although there is nearby habitat mapped in Malibu Creek (CDFW 2018). Steelhead are also known to occur in Topanga Creek (CDFW 2018), and could occur within the BSA of the Topanga Canyon Creek project and the BSA of the Topanga County Beach Staging Area.	Present	0	CARE2310CA	1
Southern Coast Live Oak Riparian Forest	Southern Coast Live Oak Riparian Forest	Quercus agrifolia is dominant or co-dominant in the tree canopy with Acer macrophyllum, Acer negundo, Arbutus menziesii, Juglans californica, Platanus racemosa, Populus fremontii, Quercus douglasii, Quercus engelmannii, Quercus kelloggii, Quercus lobata, Salix lasiolepis and Umbellularia californica. Trees < 30 m tall; canopy is open to continuous. Shrub layer is sparse to intermittent. Herbaceous layer is sparse or grassy. Membership rules: Quercus agrifolia > 50% relative cover in the tree canopy; if Umbellularia californica trees present, then < 33% relative cover in the tree canopy (Keeler-Wolf et al. 2003a, Evens and San. 2004, Keeler-Wolf and Evens 2006); or Quercus agrifolia > 60% relative cover in the tree canopy (Evens and San 2005, Klein and Evens 2005).	Coast live oak woodland habitat is present within the BSA.	Coast live oak woodland habitat is present within the BSA. There are no previously mapped occurrences of Southern Coast Live Oak Riparian Forest within the BSA, although there are multiple habitats mapped along the souther side of the Santa Monica Mountains; the nearest is at San Nicholas Canyon north of Highway 1 (CDFW 2018). Coast live oak woodland habitats were observed during field surveys within the BSA of the Applefield Lane Vacant Lot Staging Area and within the BSAs of the Emergency Source of Water Supply Connection (Las Virgenes Connection), and the PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) projects.	Present	0	CTT61310CA	24

Southern Coastal Salt Marsh	Southern Coastal Salt Marsh	Occurs in bays, lagoons, and estuaries along the coast from about Point Conception to the Mexican border. Nowhere as extensive as the larger northern marshes, and now considerably reduced by land development activities. Good to fair examples occur at Goltea Slough and near Carpinteria, Santa Barbara Coounty; Point Mugu, Ventura County; Upper Newport Bay, Orange Coounty; and several small areas in San Diego County. Very similar to Northern Coastal Salt Marsh but with warmer water and air temperatures. Southern "specialties" include Atriplex watsonii, Batis maritima, Lycium californicum, Monanthochloe littoralis, Suaeda californica, and Salicornia subterminalis. *Frankenia, Suaeda*, and/or *Salicornia subterminalis* often occur along the upper, landward edges of the marshes; *Salicornia bigelovii*, *S. virginica* and *Batis maritima* at middle elevations; and *Spartina* closest to open water.	Coastal Salt Marsh habitat (alkaline/emergent wetland) is present within the BSA.	Coastal Salt Marsh habitat (alkaline/emergent wetland) is present within the BSA. There are no previously mapped occurrences of Southern Coastal Salt Marsh within the BSA, although there is nearby habitat mapped at the Malibu Creek Lagoon (CDFW 2018). Alkaline/emergent wetland habitats were observed during field surveys within the BSAs of the PCH & Topanga Beach Drive (Segment 2), Las Flores Canyon Creek, Corral Canyon Creek, Trancas Creek, Escondido Creek, and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) projects.	Present	0	CTT52120CA	3
Southern Dune Scrub	Southern Dune Scrub	This alliance occurs from southern Oregon to central and southern California along the Pacific Coast and in the interior of the Coast Ranges, as well as in the Transverse Ranges. The shrublands are scattered on river mouths, streamsides, terraces, stabilized dunes of coastal bars, spits along coastline, coastal bluffs, open slopes, and ridges. The dominant or codominant species Baccharis pilularis behaves similarly in southern California mountains as it does in other areas of northern California where it often forms the first wave of woody species to recolonize cleared land. Other shrubs species vary depending on the habitat and location within California, but even locally, no other shrub species are consistently present. South of San Francisco Bay, the coastal scrub is similar in structure but different in species composition. Associated shrub species include Artemisia californica, Diplacus aurantiacus (= Mimulus aurantiacus), Eriogonum fasciculatum, Eriophyllum confertiflorum, and Salvia spp. Herbaceous species decrease in abundance and non-native	Southern Dune Scrub habitat is not present within the BSA.	Southern Dune Scrub habitat is not present within the BSA. There are no previously mapped occurrences of Southern Dune Scrub within the BSA, and the nearest mapped habitat is at El Segundo Dunes (CDFW 2018).	Not present	0	CTT21330CA	1
Southern Riparian Forest	Southern Riparian Forest	This alliance consists of riparian woodlands dominated by Platanus racemosa and/or Quercus agrifolia. Other trees present may include Alnus rhombifolia, Juglans californica, Populus fremontii, Salix exigua, Salix gooddingii, Salix laevigata, Salix lasiolepis, Salix lutea, and Umbellularia californica. Shrubs can be uncommon to frequent and may include Baccharis salicifolia and Toxicodendron diversilobum. The ground layer is grassy and may include Avena barbata and/or Bromus hordeaceus. This alliance is not to be confused with upland stands of Quercus agrifolia, and must have wetland understory indicators to belong to this riparian alliance. It is found in California and possibly Baja California in gullies, intermittent streams, springs, seeps, streambanks and terraces adjacent to floodplains subject to flooding and seasonal saturation.	Southern Riparian Forest habitat is present within the BSA.	Southern Riparian Forest habitat is present within the BSA. There are no previously mapped occurrences of Southern Riparian Forest within the BSA, and the nearest mapped habitat is at Arroyo Conejo, north of Thousand Oaks (CDFW 2018). Southern Riparian Forest habitats were observed during field surveys within the BSAs of the Emergency Source of Water Supply Connection (Las Virgenes Connection), Zume Creek, Carbon Canyon Carbon Mesa Road, Big Rock Bypass Improvements, Pena Canyon Creek, and PCH & Topanga Beach Drive (Segement 1) projects, and within the BSA of the Vista Del Ventada staging Area.	Present	0	CTT61300CA	1

Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	A tall, open, broadleafed, winter-deciduous streamside woodland dominated by *Platanus racemosa* (and often also *Alnus rhombifolia*). These stands seldom form closed canopy forests, and even may appear as trees scattered in a shrubby thicket of sclerophyllous and deciduous species. Lianas include Rubus ursinus and Toxicodendron diversilobum. Occurs on the Transverse and Peninsular ranges from Point Conception south into Baja California Norte, along very rocky streambeds subject to seasonally high-intensity flooding. *Alnus* increases in abundance on more perennial streams, while *Platanus* favors more intermittent hydrographs.	Southern Sycamore Adler Riparian Woodland habitat is present within the BSA.	Southern Sycamore Alder Riparian Woodland habitat is present within the BSA. There are previously mapped occurrences of Southern Sycamore Alder Riparian Woodland within the BSAs of the Topanga Field Yard Staging Area, Topanga Creek Project, and Topanga County Beach Staging Area (CDFW 2018). Sycamore Alder Riparian Woodland habitats were also observed during field surveys within the BSAs of the Emergency Source of Water Supply Connection (Las Virgenes Connection), Zume Creek, Carbon Canyon Carbon Mesa Road, Big Rock Bypass Improvements, Pena Canyon Creek, and PCH & Topanga Beach Drive (Segement 1) projects, and within the BSA of the Vista Del Ventada staging Area.	Present	0	CTT62400CA	22
Valley Needlegrass Grassland	Valley Needlegrass Grassland	Nassella pulchra is dominant or characteristically present in the herbaceous layer with other perennial grasses and herbs including Astragalus spp., Avena barbata, Avena fatua, Bromus hordeaceus, Bromus rubens, Calochortus spp., Calystegia spp., Clarkia spp., Croton setigerus, Cryptantha spp., Elymus glaucus, Erodium spp., Festuca californica, Hirschfeldia incana, Holocarpha virgata, Hordeum brachyantherum, Koeleria macrantha, Lasthenia spp., Lepidium nitidum, Lolium perenne, Lupinus spp., Melica californica, Melica imperfecta, Nassella cernua, Nassella lepida, Plantago spp., Poa secunda, Sanicula spp., Sisyrinchium bellum and Trifolium spp. Emergent trees and shrubs may be present at low cover, including trees Quercus spp. and shrubs:Artemisia californica, Eriogonum fasciculatum and Hazardia squarrosa. Herbs < 1 m; cover is open to continuous. Membership Rules: Nassella pulchra > 5% absolute cover as a characteristic to dominant species in the herbaceous layer (Klein et al. 2007); Nassella pulchra usually > 10% relative	Valley Needlegrass Grassland habitat is not present within the BSA.	Valley Needlegrass Grassland habitat is not present within the BSA. There are no previously mapped occurrences of Valley Needlegrass Grassland within the BSA, and the nearest mapped habitats are at Point Mugu and north of Calabasas (CDFW 2018).	Not present	0	CTT42110CA	3
Valley Oak Woodland	Valley Oak Woodland	Typically forms a grassy-understoried savanna rather than a closed woodland. *Quercus lobata* is usually the only tree present. This winter-deciduous species is California's largest broad-leaved tree, with mature individuals reaching 15-35 meters. Most stands consist of open-canopy growth form trees and seldom exceed 30-40% absolute cover. Occurs in the Sacramento and San Joaquin valleys adjacent to the Sierra Nevada foothills, and in valleys of the Coast Ranges from Lake County to western Los Angeles County. Usually occurs below 2,000 feet (610 meters) on deep, well-drained alluvial soils, usually in valley bottoms. Also found on nonalluvial settings in the South Coast and Transverse ranges.	Valley Oak Woodland is not present within the BSA.	Valley Oak Woodland is not present within the BSA. There are no previously mapped occurrences of Valley Oak Woodland within the BSA, and the nearest mapped habitat is in Malibu Creek State Park on the north side of the Santa Monica Mountains (CDFW 2018).	Not present	0	CTT71130CA	15

Designated Critical Habitat

Tidewater goby critical habitat	Tidewater goby critical habitat	The primary constituent elements of tidewater goby critical habitat are, "(1) Persistent, shallow (in the range of approximately 0.3 to 6.6 ft (0.1 to 2 m)), still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 ppt, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following: (a) Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction; (b) Submerged and emergent aquatic vegetation, such as Potamogeton pectinatus, Ruppia maritima, Typha latifolia, and Scirpus spp., that provides protection from predators and high flow events; or (c) Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity." (USFWS 2013)	Tidewater goby critical habitat is present within the BSA according to USFWS critical habitat shapefile overlays.	According to the USFWS critical habitat shapefiles, tidewater goby critical habitat occurs within the BSAs of the Topanga Canyon Creek site and the Topanga County Beach Staging Area.	
Western snowy plover critical habitat	Western snowy plover critical habitat	The primary constituent elements of western snowy plover critical habitat are, "Sandy beaches, dune systems immediately inland of an active beach face, salt flats, mud flats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoil sites, with: (1) Areas that are below heavily vegetated areas or developed areas and above the daily high tides; (2) Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or lowwater flow and annual high tide or highwater flow, subject to inundation but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources; (3) Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in PCE 2 for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests,	Western snowy plover critical habitat is present within the BSA according to USFWS critical habitat shapefile overlays.	According to the USFWS critical habitat shapefiles, western snowy plover critical habitat occurs within the BSAs of the Trancas Creek site and the Zuma County Beach Staging Area.	
Essential Fish Habitat					
Groundfish EFH	Groundfish EFH	All waters and substrate within the following areas: • Depths less than or equal to 3,500 m (1,914 fathoms) to mean higher high water level or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt during the period of average annual low flow. • Seamounts in depths greater than 3,500 m as mapped in the EFH assessment GIS. • Areas designated as Habitat Areas of Particular Concern not already identified by the above criteria.	Groundfish EFH is present within the BSA.	According to the definition of Groundfish EFH (PFMC 2005), Groundfish EFH occurs within the BSAs of Big Rock Bypass Improvements, Las Tunas County Beach Staging Area below the mean higher high water level. Groundfish EFH may occur within the BSAs of the Trancas Creek, Corral Canyon Creek, Las Flores Canyon Creek, PCH & Topanga Beach Drive Segment 2, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Escondido Creek, and Topanga Creek projects, and Topanga County Beach Staging Area, depending on the upstream extent of saltwater intrusion in the small lagoons and coastal streams.	Present

Coastal Pelagics EFH	Coastal Pelagics EFH	All marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the exclusive economic zone and above the thermocline where sea surface temperatures range between 10C to 26C. The southern boundary is the United States-Mexico maritime boundary. The northern boundary is the position of the 10C isotherm which varies seasonally and annually.	Coastal Pelagics EFH is present within the BSA.	According to the definition of Coastal Pelagics EFH (PFMC 1998), Coastal Pelagics EFH occurs within the BSAs of Big Rock Bypass Improvements, Las Tunas County Beach Staging Area below the mean higher high water level. Coastal Pelagics EFH may occur within the BSAs of the Trancas Creek, Corral Canyon Creek, Las Flores Canyon Creek, PCH & Topanga Beach Drive Segment 2, PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road), Escondido Creek, and Topanga Creek projects, and Topanga County Beach Staging Area, depending on the upstream extent of estuarine habitat.	Present
Highly Migratory Species EFH	Highly Migratory Species EFH	Varies by species. Generally, all Highly Migratory Species EFH consists of predominantly oceanic waters offshore the 6 fathom (36 feet) isobath along coastal California from the U.S. Mexico border to a northern boundary dependent on water temperature.	There is no Highly Migratory Species EFH within the BSA.	According to the definition of Highly Migratory Species EFH (PFMC 2007), there is no highly migratory Species EFH within the BSA.	Not present

Appendix C2
Jurisdictional Delineation Report

JURISDICTIONAL DELINEATION REPORT FOR THE LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 29 PRIORITY CAPITAL DEFICIENCIES IMPROVEMENTS PROJECT

PREPARED FOR:

Los Angeles County Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803

PREPARED BY:

ICF
525 B Street, Suite 1700
San Diego, CA 92101

February 2020

ICF. 2020. *Jurisdictional Delineation Report for the Los Angeles County Waterworks District No. 29 Priority Capital Deficiencies Improvements Project*. February. Los Angeles, CA. Prepared for Los Angeles County Department of Public Works, Los Angeles, CA.

Contents

Tables and Figures

Acronyms and Abbreviations

CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CMP	corrugated metal pipe
CWA	Clean Water Act
FEMA	Federal Emergency Management Agency
GIS	geographic information system
GPS	global positioning systems
HUC	Hydrologic Unit Code
NHD	national hydrography dataset
NRCS	Natural Resources Conservation Service
NWI	national wetlands inventory
OHWM	Ordinary High Water Mark
PCH	Pacific Coast Highway
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
proposed project	Los Angeles County Waterworks District No. 29 Priority Capital Deficiencies Improvements Project
RHA	Rivers and Harbors Act
RWQCB	Regional Water Quality Control Board
SSURGO	Soil Survey Geographic
SWRCB	State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
WMA	Watershed Management Area

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Chapter 1
Introduction

ICF conducted a routine-level delineation of potentially jurisdictional aquatic resources for the Los Angeles County Waterworks District No. 29 Priority Capital Deficiencies Improvements Project (proposed project). The purpose of this delineation was to identify the extent of potential federal and state jurisdiction within the delineation area pursuant to Sections 404 and 401 of the Clean Water Act (CWA), Section 10 of the Rivers and Harbors Act (RHA), Section 13260 of the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), Section 30231 of the California Coastal Act, and Section 1602 of the California Fish and Game Code.

Section 404 of the CWA covers waters of the U.S., including wetlands, and Section 10 of the RHA covers navigable waters of the U.S., and are regulated by the U.S. Army Corps of Engineers (USACE). Pursuant to Section 401 of the CWA, the Regional Water Quality Control Board (RWQCB) or State Water Resources Control Board (SWRCB) regulates at the state level all activities that are regulated at the federal level by the USACE. Additionally, the RWQCB and/or SWRCB may also regulate activities affecting non-federal waters and wetlands (e.g., isolated features) under the Porter-Cologne Act. Section 30231 of the California Coastal Act is implemented by the California Coastal Commission and covers aquatic resources, such as coastal wetlands, streams, and estuaries, located in the California coastal zone. Section 1602 of the California Fish and Game Code is implemented by the California Department of Fish and Wildlife (CDFW) and covers aquatic features, which include lakes or streambeds with a defined bed and bank plus any adjacent riparian vegetation.

The information and results presented herein document the investigation, best professional judgment, and conclusions of ICF. It is correct and complete to the best of our knowledge. However, all jurisdictional delineations should be considered preliminary until reviewed and approved/verified by the applicable regulatory agencies.

1.1 Project Description

The proposed project comprises eight sub-projects (Table 1) and ten staging areas, and would include the following: the demolition of two water tanks and construction of one tank reservoir in the unincorporated area of Topanga; replacement of approximately 34,300 feet of underground water pipeline in the City of Malibu, 19,000 feet of which are along Pacific Coast Highway (PCH); construction of approximately 6,300 feet of new underground pipeline in the City of Malibu; and repairing several creek crossing locations by replacing and recoating segments of pipe and air release valves on PCH. Table 1 further describes the sub-projects and their components.

1.2 Project Locations

The delineation areas are located within Los Angeles County, in and around the City of Malibu (Figure 1; all figures provided in Appendix A). Regionally, the delineation areas are located north of Interstate 10 in the northwest corner of Los Angeles County. Specifically, the delineation areas are on and in areas adjacent to State Route 1, Encinal Canyon Road, Carbon Mesa Road, South Topanga

Canyon Boulevard, Coastline Drive, and various staging area locations. The project sites are mapped in the following portions of U.S. Geological Survey (USGS) 7.5-minute quadrangle maps: Township 1S, Range 16W, Sections 18, 31, 32 and 33 of the "Topanga" quadrangle map (USGS 2015a); Township 1S, Range 17W, Sections 24, 27, 28, 31, 33, 34 and 35 of the "Malibu Beach" quadrangle map (USGS 2015b); Township 1S, Range 18W, Section 35 and Township 2S, Range 18W, Sections 4, 5, and 6 of the "Point Dume" quadrangle map (USGS 2015c); and Township 1S, Range 19W, Sections 25, 28, 29, 32 and 33 and Township 2S, Range 19W, Section 12 of the "Triunfo Pass" quadrangle map (USGS 2015d) (Figure 2). The delineation areas are located approximately between 34.046143°N, -118.890150°W and 34.041512°N, -118.567107°W.

Table 1. Sub-Project Names and Proposed Project Summary

Sub-Projects	Sub-Project Activities Summary
Big Rock Bypass Improvements	Construct a 1,500-foot-long bypass for the region's main line. The bypass will consist of three parallel pipelines in PCH to accommodate continuing movement of a major landslide in the Big Rock area.
Carbon Canyon Road & Carbon Mesa Road Waterline Improvements	Replace over 7,239 feet of leak-prone, aging, and severely deteriorated waterlines ranging in size from 1.5 to 4 inches.
Coastline Drive 12-inch Waterline Improvements	Replace over 2,112 feet of leak-prone, aging, and severely deteriorated 12-inch waterline.
District No. 29 Creek Crossing Repair	Recoat and maintain pipeline at seven sites: 1. Topanga Canyon Creek 2. Pena Canyon Creek 3. Las Flores Canyon Creek 4. Coal (Carbon) Canyon Creek) 5. Escondido Creek 6. Corral Canyon Creek 7. Zuma Creek
Emergency Source of Water Supply Connection (Las Virgenes Connection)	Construct a transmission waterline to connect to Las Virgenes Municipal Water District to provide a water source for the region in case of emergency.
Fernwood Tank	Replace two aging and severely deteriorated 50,000 gallon (each) tanks. The site is located at 19837 Horseshoe Drive, Topanga, Los Angeles County.
PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)	Replace over 9,500 feet of leak-prone, aging, and deteriorated 6-inch waterline. Also includes pipeline replacements at Corral Canyon Creek and Escondido Creek (sites that are included in the D29 Creek Crossings project above).
PCH & Topanga Beach Drive Waterline Improvements	Perform upgrades on three segments of PCH with a total length of 8,330 feet: 1. PCH & Topanga Beach Drive Segment 1 – Replace over 1,604 feet of leak-prone, aging, and deteriorated 4-inch waterline. 2. PCH & Topanga Beach Drive Segment 2 – Replace over 1,105 feet of leak-prone, aging, and deteriorated 4-inch waterline. 3. PCH & Topanga Beach Drive Segment 3 – Replace over 5,616 feet (includes an 857-foot long stretch and a 4,759-foot-long stretch) of leak-prone, aging, and deteriorated 4-inch waterline.

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Chapter 2
Methodology

2.1 Project Research

Prior to the field visit, aquatic resources were identified using high-resolution aerial imagery overlaid with geographic information system (GIS) data from the national wetlands inventory (NWI) (USFWS 2012) and national hydrography dataset (NHD) (USGS 2018). These were used to identify the locations of potential areas of USACE, RWQCB, and CDFW jurisdiction within the delineation area. In addition to the regionally available data (e.g., NWI and NHD) the approximate location and extent of aquatic resources were identified based on observed vegetation types, topographic changes, and visible drainage patterns. Maps depicting the delineation area in relation to the Federal Emergency Management Agency (FEMA) 100-year and 200-year floodplains and watersheds are provided in Figure 3.

2.2 Field Investigation

On November 7, 2018, ICF delineators, Kristen Kleinfelter and Meris Guerrero, conducted the jurisdictional field delineation within the delineation area. The delineation area consisted of the proposed project footprint plus a 50-foot-wide buffer; however, no delineation buffers were used for the project staging areas, and the delineation was limited to the staging area footprints. The survey was conducted on foot, and jurisdictional limits were recorded using high-resolution aerial photographs (1 inch = 100 feet) and an Apple iPad using Collector Map with a sub-meter accuracy global positioning systems (GPS) unit. Existing conditions were documented as field notes and site photographs (see Appendix B, *Site Photographs, November 2018*).

2.2.1 U.S. Army Corps of Engineers Jurisdiction

Potential waters of the U.S., including wetlands, were evaluated for the presence Ordinary High Water Mark (OHWM) indicators and/or wetland vegetation, soils, and hydrology. Lateral limits of tidal and non-tidal non-wetland waters of the U.S. were delineated based on the presence of OHWM indicators. For tidal waters of the U.S. lateral limits were based on a clear line on the shore established by the fluctuation of water and indicated by physical characteristics, such as discoloration on rocks and/or debris lines. Non-tidal waters were delineated using field indicators (i.e., OHWM) pursuant to *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States: A Determination Manual* (USACE 2008a). Arid West Ephemeral and Intermittent Stream OHWM Datasheets were completed for all applicable non-wetland waters (USACE 2010) and are provided in Appendix C. The project was also analyzed for potential wetlands using the methodology set forth in the 1987 *Corps of Engineers Wetland Delineation Manual* (1987 Manual; Environmental Laboratory 1987) and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Regional Supplement; USACE 2008b). Vascular plants were identified using *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012) and *The National Wetland Plant List* (Lichvar et al. 2016).

Within the delineation area, in areas located outside of the OHWM that exhibited evidence of wetland hydrology and/or hydrophytic vegetation, wetland sample soil pits were dug to examine soil color and texture and determine the wetland boundary. A paired-pit technique (i.e., one sample point with wetland results paired with one sample point with non-wetland results) was used to identify the wetland boundary. OHWM Data Forms are provided in Appendix C and Wetland Determination Forms are provided in Appendix D.

2.2.2 State Water Resources Control Board/Regional Water Quality Control Board Jurisdiction

Evaluation of state jurisdiction followed guidance from Section 401 of the CWA and typically follows the same jurisdictional areas as USACE. In addition, the delineation area was reviewed for resources potentially regulated under the Porter-Cologne Act (i.e., isolated features). Isolated vernal pools, isolated wetlands, or other aquatic features not normally subject to federal regulation did not occur within the delineation area; therefore, no further evaluation pursuant to the Porter-Cologne Act was necessary.

2.2.3 California Coastal Commission Jurisdiction

In the Coastal Zone, the California Coastal Commission (CCC) is responsible for determining the presence of wetlands. CCC only requires the presence of one criterion (e.g., wetland hydrology, hydric soils, or hydrophytic vegetation) for an area to qualify as a wetland as defined in California Code of Regulations, Title 14, Section 13577. Under this provision wetlands are defined as:

> … land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent drastic fluctuations of surface water levels, wave action, water flow, turbidity, or high concentration of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetland or deepwater habitats.

Determining whether an area has wetland hydrology, hydric soils, or hydrophyte vegetation follows the methodologies set forth in the USACE Arid West Regional Supplement (USACE 2008b).

2.2.4 California Department of Fish and Wildlife Jurisdiction

CDFW jurisdiction typically includes surface water features with a defined bed and bank. Evaluation of potentially jurisdictional areas followed the guidance of standard practices by CDFW personnel. Briefly, CDFW jurisdiction was delineated by measuring outer width and length boundaries of potentially jurisdictional areas (e.g., lakes or streambeds), consisting of the greater of either the top of bank measurement or the extent of adjacent associated riparian or wetland vegetation.

Chapter 3
Environmental Setting

This chapter describes existing topography, land use, hydrology, and soils associated with the delineation area.

3.1 Topography and Land Use

The delineation area occurs adjacent to PCH along the Malibu coast. The topography in the delineation area is relatively flat with the Malibu hills rising to the inland and bluffs dropping down to the beach south of the project.

The surrounding land uses consist primarily of a mix of open space, which consists of undeveloped bluffs and patches of land, and single-family homes. The location of the proposed project is highly scenic, as it is located along PCH with intermittent views of the ocean.

3.2 Hydrology

3.2.1 Existing Hydrology

The delineation area lies within the Santa Monica Bay Watershed Management Area (WMA) and contains Zuma Canyon Creek, Escondido Creek, Corral Canyon Creek, Carbon Canyon Creek, Las Flores Canyon Creek, Topanga Canyon Creek, and various coastal drainages. These drainages are all characterized by steep, narrow canyons that run down from the Santa Monica Mountains across a very narrow coastline where they cross underneath the PCH and flow directly into the Pacific Ocean.

The drainages are primarily surrounded by open space with single-family residences scattered throughout the canyons and concentrated low density residential areas with commercial developments along the coastline in the southern portion of the proposed project. Developed areas along the coastal plain are likely causing drainages to receive additional inputs via urban runoff before they enter the Pacific Ocean.

3.2.2 Precipitation

Based on the Malibu Hills weather station located approximately 1.5–3.0 miles east of the delineation area, total estimated precipitation within the last year was approximately 13.13 inches. The precipitation data from the Malibu Hills station for the preceding year is presented in Table 2.

Table 2. Rainfall Data Summary for the Delineation Area (in inches)

	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Total
Average	0.0	2.34	0.12	7.13	0.06	0.0	0.18	0.09	0.0	0.0	0.22	2.99	13.13

Data source: Western Regional Climate Control Center. Available: http://www.raws.dri.edu. Accessed: November 2018. Located approximately 1.5–3.0 miles east of the delineation area.

3.2.3 Watershed

The delineation area is located within the USGS Big Sycamore Canyon-Frontal Santa Monica Bay watershed (Hydrologic Unit Code [HUC] 10: 1807010402) and Garapito Creek-Frontal Santa Monica Bay watershed (HUC 10: 10807010405) (Figure 4). The majority of the hydrology is directed to this area from the adjacent hillsides and the highway located along the delineation area. General information on the watersheds is provided below.

3.2.3.1 Big Sycamore Canyon-Frontal Santa Monica Bay

The Big Sycamore Canyon-Frontal Santa Monica Bay HUC encompasses 190.5 square miles. There are no major streams within this unit; however, it is drained by numerous creeks, including Zuma Creek, Corral Creek, and Sycamore Creek, that flow directly into the Pacific Ocean. The dominant land uses in the Big Sycamore Canyon-Frontal Santa Monica Bay watershed are open space and low density development. Most development in this watershed is residential housing.

3.2.3.2 Garapito Creek-Frontal Santa Monica Bay

The Garapito Creek-Frontal Santa Monica Bay HUC encompasses 128.8 square miles. There are no major streams within this unit; however, it is drained by numerous creeks, including Topanga Creek, Temescal Creek, Las Flores Creek, and Garapito Creek, that flow directly into the Pacific Ocean. The dominant land use in the Garapito Creek-Frontal Santa Monica Bay watershed is open space with low and high density development scattered throughout. Most development in this watershed is residential housing.

3.3 Soils

3.3.1 Soil Series

The Natural Resources Conservation Service (NRCS) has mapped the soil series: Abaft, Calcic Argixerolls, Chumansh-Boades-Malibu, Cropley, Cumulic Haploxerolls, Danville, Elder, Lockwood, Mipolomol-Topanga, Pachic Argixerolls, Pits and Dumps, Rock outcrop-Sumiwawa-Hipuk, Sapwi, Topanga-Mipolomol-Sapwi, Urban land-Xerorthents, and Zumaridge-Kawenga as occurring within the delineated jurisdictional waters based on the Soil Survey Geographic (SSURGO) database (USDA/NRCS 2006).

Figure 5 depicts the soil series for the delineation areas, and descriptions of the soil series included within the SSURGO mapping units are provided below based on the official soil descriptions provided by USDA (USDA/NRCS 2012).

3.3.1.1 Abaft

The Abaft series consists of very deep, excessively drained soils, and are found on stabilized dunes and beach areas along the coast. This soil is not extensive, and is mostly found in Santa Barbara County, California, on Santa Cruz Island. The soils formed in eolian and wave reworked sands from mixed sources. Elevations are 1 to 300 feet, and slopes range from 0 to 25 percent. They have negligible runoff and rapid permeability. Within the delineation area, these soils are classified as Abaft-Beaches association and Abaft-Beaches-Urban land complex, both with 0 to 5 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.2 Calcic Argixerolls

Calcic Argixerolls have a calcic horizon (identifiable secondary carbonates) at a moderate depth, but are otherwise like Typic Argixerolls in their defined properties. Typic Argixerolls are deep to secondary carbonates, with a high base saturation, dry in summer, but they receive and store enough water in winter and early spring to provide moisture for spring and early summer crops. Slopes of Calcic Argixerolls are nearly level to very steep. Calcic Argixerolls are found widespread in the western United States. Most dominant vegetation on these soils are grasses and shrubs, and most of the soils are used as rangeland, pasture, or cropland. Within the project, these soils occur on 30 to 75 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.3 Chumash-Boades-Malibu

The Chumash-Boades-Malibu series are moderately well drained to well drained soils formed in residuum and colluvium derived from shale and sandstone. Chumash-Boades-Malibu soils occur on hills and mountains at elevations of 10 to 1,570 feet. Typical soil texture is that of loam and gravelly loam with very low to very high runoff and moderate to moderately slow to very slow permeability. Chumash-Boades-Malibu soils are moderately extensive and are located in Ventura County and Los Angeles County, California. Within the project, these soils occur with 30 to 75 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.4 Cropley

The Cropley series consists of very deep, moderately well- and well-drained soils that formed in alluvium from mixed rock sources, often in fine textured alluvium weathered from shale, sandstone, and mudstone. These soils are found on alluvial fans and floodplains, and in small basins, at elevations of 10 to 2,100 feet, and at slopes ranging from 0 to 15 percent. The soils are moderately extensive and are mapped in Central California coastal valleys and on the Southern California coastal plain. Cropley soils have medium to very high runoff and slow permeability, and are not flooded, though flooding may be controlled in some areas. These soils are used for irrigated crops, irrigated and dry pasture, some orchards, and urban development. Within the project, the Cropley series is classified specifically as coastal-urban land-Haploxererts complex with 0 to 30 percent slopes.

This soil series is identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.5 Cumulic Haploxerolls

Cumulic Haploxerolls have a thick mollic epipedon. These soils are moderately extensive in parts of the western United States. They are found on nearly level or gently sloping areas, usually on flood plains, in low areas on stream terraces, or in concave areas where fresh sediments accumulate slowly. Within the project, these soils occur on 0 to 9 percent slopes.

This soil series is identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.6 Danville

The Danville series consists of very deep, well-drained soils that formed in alluvium with some coarse sand derived from sedimentary and crystalline rocks. These soils are found on fans and terraces, at elevations of 20 to 1,500 feet, and have slopes of 0 to 9 percent. They are of moderate extent, primarily occurring in valleys in the central part of the Coast Range. Danville soils have slow to medium runoff and slow permeability. They are often used for growing irrigated crops and some small grain, and uncultivated areas support annual grasses, forbs, and scattered trees. With the project, this series occurs as the Danville-Urban land complex with 0 to 9 percent slopes and 9 to 15 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.7 Elder

The Elder series consists of well drained soils that formed in alluvial material derived from mixed rock sources. Elder soils occur on alluvial fans and in flood plains at elevations of 20 to 1,500 feet. The typical soils texture is that of fine sandy loam with negligible to low runoff. The soils are extensive and are located in the Central Valley and valleys of the Coast Range in California. Within the project, Elder soils are comprised of fine sandy loam and located coastally with 30 to 75 percent slopes.

This soil series is identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.8 Lockwood

The Lockwood series consist of well drained soils that formed in alluvial material from dominantly siliceous shales. Lockwood soils occur on alluvial fans and bench terraces at elevations of 100 to 2,000 feet. The typical soil texture is that of shaly loams with moderately slow permeability. Lockwood soils are moderately extensive and are located in the valleys of the central and southern part of coast Range in California. Within the project, this series occurs as an urban land complex with 0 to 9 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.9 Mipolomol-Topanga

The Mipolomol-Topanga series are well drained soils formed in shale and sandstone. Mipolomol-Topanga soils occur on hills and mountains at elevations of 400 to 2,510 feet. Typical soil texture is that of loams with high runoff and moderate to moderately slow permeability. Mipolomol-Topanga soils are not extensive and are located in Ventura and Los Angeles County, California. Within the project, these soils occur with 30 to 75 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.10 Pachic Argixerolls

Pachic Argixerolls have a thick mollic epipedon that commonly includes part of the argillic horizon. They are extensive in parts of the western United States, and occur in an array of areas where slopes are nearly level to very steep. Within the project, these soils occur on 30 to 75 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.11 Pits and Dumps

No soil series description is provided by USDA/NRCS (2006) for Pits and Dumps. Within the project, these soils occur on 30 to 75 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.12 Sumiwawa-Hipuk

The Sumiwawa-Hipuk series are well drained to somewhat excessively drained soils formed in in residuum and colluvium derived from sandstone. Sumiwawa-Hipuk soils occur on hills and mountains at elevations of 1,400 to 2,500 feet. Typical soil texture is that of gravelly loam and gravelly loamy sand with medium to high runoff and moderately slow to rapid permeability. Sumiwawa-Hipuk soils have a limited extent and are located in Los Angeles County, California. Within the project, these soils occur as the Sumiwawa-Hipuk-Rock outcrop complex with 30 to 75 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.13 Sapwi

The Sapwi series consists of well drained soils that formed in residuum and colluvium derived from sandstone. Sapwi soils occur on hills and mountains at elevations of 500 to 3,000 feet. The typical soil texture is that of fine loam with low to high runoff and moderate to moderately slow permeability. Sapwi soils are not extensive and are located in Ventura County and Los Angeles County, California. Within the project, these soils occur as Sapwi-Urban land complex with 0 to 50 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.14 Topanga-Mipolomol-Sapwi

The Topanga-Mipolomol-Sapwi series are well drained soils formed in shale, sandstone, and slate. Topanga-Mipolomol-Sapwi soils occur on hills and mountains at elevations of 400 to 3,000 feet. Typical soil texture is that of loams with low to high runoff and moderate to moderately slow permeability. Topanga-Mipolomol-Sapwi soils are not extensive and are located in Ventura and Los Angeles County, California. Within the project, these soils occur with 30 to 75 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.15 Urban land-Xerorthents

No soil series description is provided by USDA/NRCS (2006) for Urban land-Xerorthents. These are a taxonomic subgroup classification of a soil series. Xerorthents are orthents that have a xeric moisture regime, and have a frigid, mesic, or thermic soil temperature regime. They are generally neutral to moderately alkaline, but some are acidic. Slopes are mostly moderate to steep but are gentle in a few areas. Xerorthents are usually in sandy-skeletal families or occur in areas of very recently exposed regolith, such as loess or till; in areas of weakly cemented rocks, such as shale; or in areas of very thin regolith over hard rocks. Within the project, these soils occur as a landscaped complex and landscaped complex, rarely flooded on 0 to 5 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

3.3.1.16 Zumaridge-Kawenga

The Zumaridge-Kawenga series are well drained soils formed in residuum and colluvium derived from sandstone. Zumaridge-Kawenga soils occur on hills and mountains at elevations of 500 to 3,100 feet. Typical soil texture is that of loam and fine loam with low to very high runoff and moderate permeability. Zumaridge-Kawenga soils are not extensive and are located in Ventura County, Los Angeles County, and Santa Clara County, California. Within the project, these soils occur with 15 to 50 percent slopes and 30 to 75 percent slopes.

This soil series is not identified as hydric soils for Los Angeles County (USDA/NRCS 2011).

Chapter 4
Jurisdictional Delineation Results

The following describes the delineated features and expected jurisdictional status within the delineation area. Detailed information, including maps of the feature delineated within the delineation area, photographs, and OHWM and Wetland Determination Forms are provided in the following attachments:

- Appendix A, Figures (Jurisdictional Delineation Results –Figures 5 and 6)
- Appendix B, Site Photographs, November 2018
- Appendix C, Arid West OHWM Data Forms
- Appendix D, Arid West Wetland Determination Forms

4.1 Delineation Results

Numerous features within the delineation area were identified, evaluated, and mapped for potential federal, state, CCC, and CDFW jurisdiction pursuant to the regulations described above. Each feature evaluated within the delineation area is depicted on Figures 5 and 6, and is described below and summarized in Tables 3 and 4:

Stream 1: Stream 1 is an intermittent stream, subject to USACE, RWQCB, CCC, and CDFW jurisdiction, that occurs within the Emergency Source of Water Supply Connection (Las Virgenes Connection) Project. It flows northeast to southwest parallel to Encinal Canyon Road until it turns to cross under the road via a large culvert and flows southeast (Figure 6 – Sheet 5 and Figure 7 – Sheet 5). Dominant vegetation includes grasses and willows.

Stream 2: Stream 2 is a small intermittent stream, subject to USACE, RWQCB, CCC, and CDFW jurisdiction, that occurs within the Emergency Source of Water Supply Connection (Las Virgenes Connection) Project. It flows northwest to southeast out of a corrugated metal pipe (CMP) that runs underneath Encinal Canyon Road (Figure 6 – Sheet 5 and Figure 7 – Sheet 5). The stream, within the delineation area, is dominated by poison oak.

Stream 3 (Zuma Canyon Creek): Stream 3 is an intermittent stream within the District No. 29 Creek Crossing (Zuma Creek) Repair Project. Stream 3 is subject to CDFW jurisdiction only as it lacks a defined bed and bank with any OHWM or wetland indicators within the delineation area as required by USACE, RWQCB, and CCC. Within the delineation area, Stream 3 flows north to south under PCH where it appears to sheet flow in the Zuma Access Road (Figure 6 – Sheet 7 and Figure 7 – Sheet 7). Historically, water appeared to flow in the channel that runs parallel to the Zuma Access Road; however, due to vegetation growth, debris buildup, and sediment deposition, water is forced to flow along the access road. CDFW associated riparian vegetation includes *Salix* (willow) species and *Plantanus racemose* (western sycamore).

Stream 4 (Topanga Canyon Creek): Stream 4 is subject to USACE, RWQCB, CCC, and CDFW jurisdiction. Stream 4 is a large intermittent stream that occurs within the District No. 29 Creek Crossing (Topanga Canyon Creek) Repair Project. Water flows north to south under PCH and then backs up along the coast due to a sand plug at the river mouth (Figure 6 – Sheet 31 and Figure 7 – Sheet 31). On the north side of PCH, Stream 4 is dominated by *Arundo donax* (giant reed).

Stream 5 (Tuna Canyon Creek): Stream 5 is subject to USACE, RWQCB, CCC, and CDFW jurisdiction. Stream 5 is an intermittent stream that occurs within the PCH & Topanga Beach Drive Waterline Improvements Project. It flows north to south under PCH where it is confined due to the bridge crossing and likely receives road runoff (Figure 6 – Sheet 29 and Figure 7 – Sheet 29). Dominant vegetation includes willow species and western sycamores.

Stream 6: Stream 6 is an unnamed ephemeral tributary to the Pacific Ocean, subject to USACE, RWQCB, CCC, and CDFW jurisdiction, and that occurs within the Big Rock Bypass Improvements Project. It is a steep narrow channel. It is located on the north side of PCH and flows north to south into a culvert under PCH and likely outlets into the Pacific Ocean (Figure 6 – Sheet 26 and Figure 7 – Sheet 26).

Stream 7 (Las Flores Canyon Creek): Stream 7 is subject to USACE, RWQCB, CCC, and CDFW jurisdiction. Stream 7 is a large intermittent stream that occurs within the District No. 29 Creek Crossing (Las Flores Canyon Creek) Repair Project. It flows north to south under PCH and then outlets into the Pacific Ocean (Figure 6 – Sheet 22 and Figure 7 – Sheet 22). Stream width is limited by concrete wingwalls within the delineation area. Dominant vegetation includes upland grasses and willows.

Stream 8 (Carbon Canyon Creek): Stream 8 is subject to USACE, RWQCB, CCC, and CDFW jurisdiction (Figure 6 – Sheets 19 and 20 and Figure 7 – Sheets 19 and 20). Stream 8 is an intermittent stream that occurs within both the Carbon Canyon Road & Carbon Mesa Road Waterline Improvements Project and the District No. 29 Creek Crossing (Carbon Canyon Creek) Repair Project. It flows north to south, entering and exiting the delineation area flowing parallel to Carbon Canyon Road then entering again when it flows under PCH and into the Pacific Ocean. The stream is located at the bottom of a canyon in a small residential housing community. It is relatively undisturbed, but is located near manufactured slopes and is heavily infested with pampas grass.

Stream 9: Stream 9 is subject to USACE, RWQCB, CCC, and CDFW jurisdiction (Figure 6 – Sheets 19 and Figure 7 – Sheets 19). Stream 9, an unnamed tributary to stream 8, is a small ephemeral stream within the Carbon Canyon Road & Carbon Mesa Road Waterline Improvements Project. It flows northwest to southeast under Carbon Canyon Road and flows into stream 8 on the other side. The stream is confined by a rock wall and ornamental slope and likely only receives flow during and immediately after rain events. Dominant vegetation includes ice plant along the banks.

Stream 10 (Corral Canyon Creek): Stream 10 is subject to USACE, RWQCB, CCC, and CDFW jurisdiction (Figure 6 – Sheet 14 and Figure 7 – Sheet 14). Stream 10 is an intermittent stream within the District No. 29 Creek Crossing (Corral Canyon Creek) Repair Project. It flows northeast to southwest under PCH and into the Pacific Ocean. It likely receives runoff from PCH and is scattered with trash and debris. Stream 10 supports adjacent wetlands and is dominated by *Distichlis spicata* (salt grass) and *Jaumea carnosa* (marsh jaumea).

Stream 11 (Escondido Creek): Stream 11 is subject to USACE, RWQCB, CCC, and CDFW jurisdiction (Figure 6 – Sheets 12 and 13, Figure 7 – Sheets 12 and 13). Stream 11 is an intermittent stream within both the District No. 29 Creek Crossing (Escondido Creek) Repair Project and the PCH 8-inch Waterline Improvements Project (Zumirez Drive to Escondido Beach Road). It flows north to south under PCH and into the Pacific Ocean. Flows pond under the bridge and on the north side of PCH due to a sand berm located at the downstream end of the stream. Dominant vegetation includes upland shrubs and grasses.

Stream 12: Stream 12 is subject to USACE, RWQCB, CCC, and CDFW jurisdiction (Figure 6 – Sheet 11 and Figure 7 – Sheet 11). Stream 12 is an ephemeral stream located in the PCH 8-inch Waterline Improvements Project (Zumirez Drive to Escondido Beach Road). It flows north to southeast under PCH and into the Pacific Ocean. Surrounding land uses are residential, and therefore this feature likely receives urban hydrology inputs.

Stream 13: Stream 13 is subject to USACE, RWQCB, CCC, and CDFW jurisdiction (Figure 6 – Sheet 10 and Figure 7 – Sheet 10). Stream 13 is an intermittent stream located in the PCH 8-inch Waterline Improvements Project (Zumirez Drive to Escondido Beach Road). It flows northeast to southwest under PCH. Surrounding land uses are residential, and therefore this feature likely receives urban hydrology inputs.

Stream 14: Stream 14 is subject to USACE, RWQCB, CCC, and CDFW Jurisdiction (Figure 6 – Sheets 26 and 27 and Figure 7 – Sheets 26 and 27). Stream 14 is a concrete-lined trapezoidal channel that flows north to south and is located in the Big Rock Bypass Improvements Project and District No. 29 Creek Crossing Repair Project delineation areas. Channel slopes are approximately 45 degrees. Within the delineation area the stream lacks adjacent riparian habitat; however, sparse bunch grasses growing in the joints of the concrete slabs are present in the channel.

Pacific Ocean Area 1: Pacific Ocean Area 1 is subject to USACE, RWQCB, and CCC jurisdiction. Pacific Ocean Area 1 is a traditional navigable water, subject to the ebb and flow of the tides, located in the Big Rock Bypass Improvements Project delineation area. The lateral extent of the Pacific Ocean was delineated based on physical characteristics observed both in the field and on aerial imagery such as discoloration on rocks, debris lines, clear line impressed on the shore, and changes in topography.

Pacific Ocean Area 2: Pacific Ocean Area 2 is subject to USACE, RWQCB, and CCC jurisdiction. Pacific Ocean Area 2 is a traditional navigable water, subject to the ebb and flow of the tides, located in the PCH & Topanga Beach Drive Waterline Improvements Project delineation area. The lateral extent of the Pacific Ocean was delineated based on physical characteristics observed both in the field and on aerial imagery such as discoloration on rocks, debris lines, clear line impressed on the shore, and changes in topography.

In addition to the mapped features described above, numerous other areas that were identified as potential aquatic resources during the desktop delineation were evaluated for USACE, RWQCB, CCC, and/or CDFW jurisdiction and determined not to be potential aquatic resources. These areas lacked OHWM indicators, bed and bank, and were not considered surface waters as they were strictly erosional features or concrete v-ditches, or appeared to be water quality retention/detention areas capturing runoff from the adjacent roads and surrounding hillsides. These features did not appear to be associated with, divert, or replace a natural stream channel.

Table 3. Summary of USACE, RWQCB, and CCC Potentially Jurisdictional Aquatic Resources within the Delineation Area

			USACE/RWQCB/CCC	
			Non-wetland	**Wetland**
Feature	**Linear Feet**	**OWHM Width[1]**	**Acres[2]**	**Acres**
Stream 1	490	7	0.08	--
Stream 2	40	3	<0.01	--
Stream 3	--	--	-	--
Stream 4	185	100	0.36	--
Stream 5	178	6.5	0.03	--
Stream 6	65	1	<0.01	--
Stream 7	194	45	0.20	--
Stream 8	667	15	0.22	--
Stream 9	121	2	<0.01	--
Stream 10	185	6	0.02	0.05
Stream 11	179	30.5	0.11	--
Stream 12	219	12	0.06	--
Stream 13	67	8	0.01	--
Stream 14	164	11	0.04	--
Pacific Ocean Area 1	n/a	n/a	0.46	--
Pacific Ocean Area 2	n/a	n/a	0.03	--
Sub-Total	2,754	**--**	**1.62**	**0.05**
Total	**2,754**	**--**	**1.67**	

[1] Based on average OHWM width in the survey area.

[2] Total acreage may not add up to the total shown; total is reflective of rounding geographic information systems raw data in each category

Table 4. Summary of CDFW Jurisdictional Resources within the Delineation Area

			CDFW	
			Streambed	**Riparian**
Feature	**Linear Feet**	**Top of Bank Width**[1]	**Acres**[2]	**Acres**
Stream 1	490	13.5	0.14	--
Stream 2	40	7	<0.01	--
Stream 3	187	165	0.37	0.43
Stream 4	185	100	0.35	0.02
Stream 5	157	20	0.06	0.04
Stream 6	65	1	<0.01	--
Stream 7	194	50	0.22	--
Stream 8	667	28	0.34	--
Stream 9	121	3	<0.01	--
Stream 10	185	10	0.04	0.05
Stream 11	179	36	0.13	--
Stream 12	219	16	0.08	0.09
Stream 13	67	30	0.05	0.02
Stream 14	164	24	0.10	--
Sub-Total	2,920	--	**1.89**	**0.65**
Total	**2,920**	**--**	**2.54**	

[1] Based on average width in the survey area.

[2] Total acreage may not add up to the total shown; total is reflective of rounding geographic information systems raw data in each category.

Table 5. Aquatic Resource Project Locations

Feature	Project Title(s)
Stream 1	Emergency Source of Water Supply Connection (Las Virgenes Connection)
Stream 2	Emergency Source of Water Supply Connection (Las Virgenes Connection)
Stream 3	District No. 29 Creek Crossing Repair
Stream 4	District No. 29 Creek Crossing Repair
Stream 5	PCH & Topanga Beach Drive Waterline Improvements
Stream 6	Big Rock Bypass Improvements
Stream 7	District No. 29 Creek Crossing Repair
Stream 8	Carbon Canyon Road & Carbon Mesa Road Waterline Improvements, District No. 29 Creek Crossing Repair
Stream 9	Carbon Canyon Road & Carbon Mesa Road Waterline Improvements
Stream 10	District No. 29 Creek Crossing Repair
Stream 11	District No. 29 Creek Crossing Repair PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)
Stream 12	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)
Stream 13	PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)
Stream 14	Big Rock Bypass Improvements, District No. 29 Creek Crossing Repair
Pacific Ocean Area 1	Big Rock Bypass Improvements
Pacific Ocean Area 2	PCH & Topanga Beach Drive Waterline Improvements

4.2 Conclusion

Sixteen features within the survey areas were identified and mapped for potential federal, state, CCC, and CDFW jurisdiction. A total of 1.67 acres (2,754 linear feet) of waters of the U.S., including 0.05 acre of wetland, "may be" subject to USACE, RWQCB, and CCC regulatory jurisdiction. Additionally, 2.54 acres (2,920 linear feet) of streambed and riparian resources occur within the survey area and would be subject to CDFW jurisdiction pursuant to Sections 1600–1616 of the California Fish and Game Code.

Chapter 5
References

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.). 2012. *The Jepson Manual: Vascular Plants of California, 2nd Edition*. Berkeley, CA: University of California Press. 1,568 pp.

Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual*. Technical Report Y-87-1. Vicksburg, MS: U.S. Army Waterways Experiment Station.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 Wetland Ratings. *Phytoneuron* 2016-30: 1-17. Published April 2016.

U.S. Army Corps of Engineers (USACE). 2008a. *A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States: A Determination Manual*. Available: http://www.crrel.usace.army.mil/library/technicalreports/ERDC-CRREL-TR-08-12.pdf. Accessed: September 2018.

———. 2008b. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0). Vicksburg, MS: U.S. Army Engineer Research and Development Center. Report dated September 2008.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA/NRCS). 1994. Changes in Hydric Soils of the United States. *Federal Register* 59(133): 35680–35681, July 13, 1994.

———. 2006. Soil Survey Geographic (SSURGO) Database for Malibu, California. Prepared by Soil Survey Staff of the Natural Resources Conservation Service. Available: http://websoilsurvey.nrcs.usda.gov. Accessed: November 2018.

———. 2011. *California State List*. Available: http://soils.usda.gov/use/hydric/. Accessed: September 2018.

———. 2012. *Official Soil Series Descriptions*. Prepared by Soil Survey Staff of the Natural Resources Conservation Service. Available: http://soils.usda.gov/technical/classification/osd/index.html. Lincoln, NE. Accessed: September 2018.

———. 2016. *Field Indicators of Hydric Soils in the United States, Version 8.0*. L. M. Vasilas, G. W. Hurt, and C. V. Noble (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

U.S. Fish and Wildlife Service. 2012. *National Wetlands Inventory.* Washington, D.C. Available: http://www.fws.gov/wetlands/. Accessed: September 2018.

U.S. Geological Survey. 2015a. *Topanga, California, 7.5-minute Quadrangle.*

———. 2015b. *Malibu Beach, California, 7.5-minute Quadrangle.*

———. 2015c. *Point Dume, California, 7.5-minute Quadrangle.*

———. 2015d. *Triunfo Pass, California, 7.5-minute Quadrangle.*

———. 2018. *National Hydrography Dataset*. U.S. Geological Survey in cooperation with U.S. Environmental Protection Agency, USDA Forest Service, and other federal, state and local partners. Available: ftp://nhdftp.usgs.gov/DataSets/Staged/States/. Accessed: November 2018.

Western Regional Climate Center. Monthly Summary Time series Weather for Malibu Hills, CA 90265. Available: http://www.raws.dri.edu. Accessed: November 2018.

Appendix A

Figures

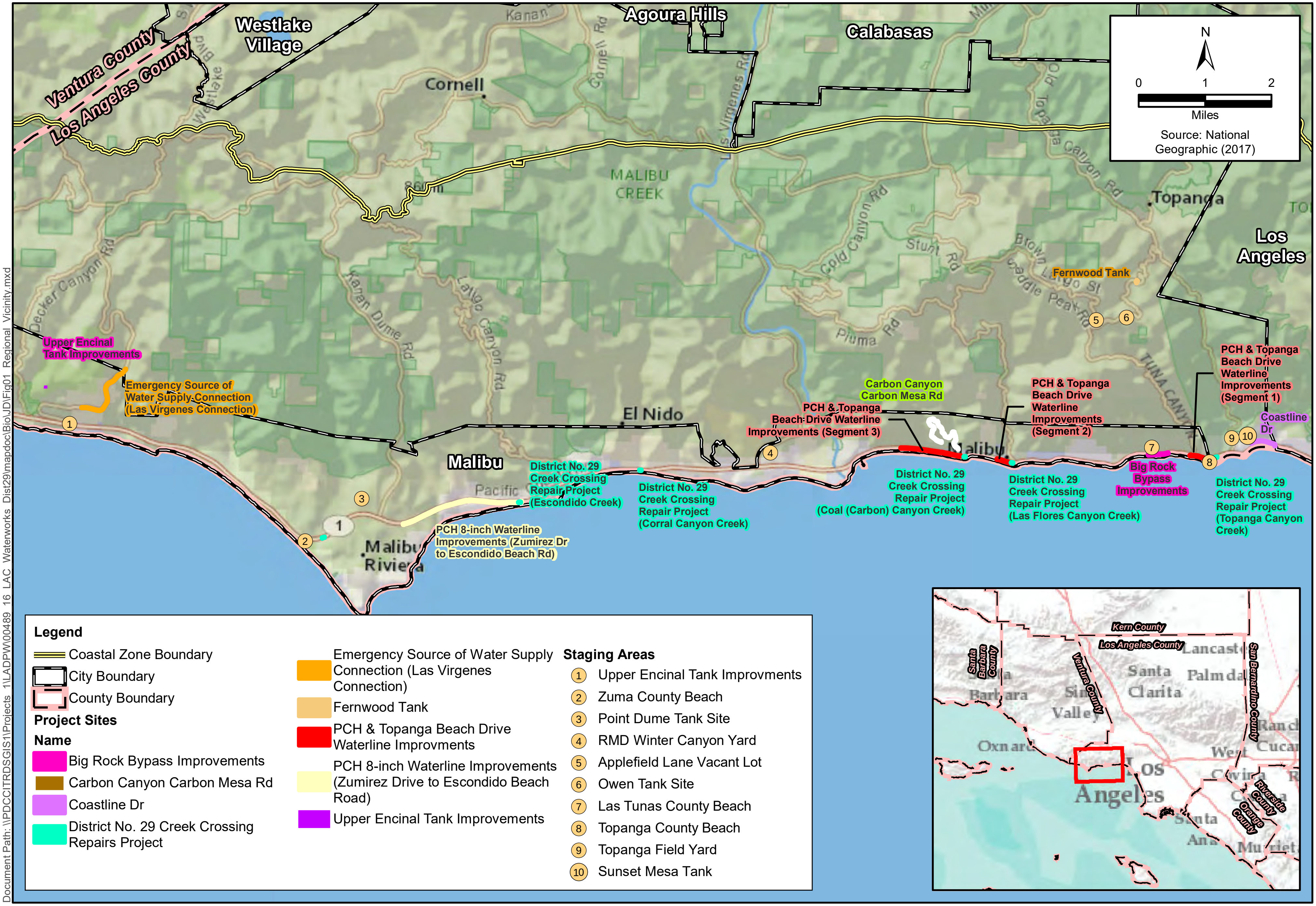

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Figure 1
Regional Vicinity
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: U.S. Geological Survey (USGS) 7.5-minute quadrangle maps: Triunfo Pass (1968), Point Dume (1982), Malibu (1982), Topanga (1981)

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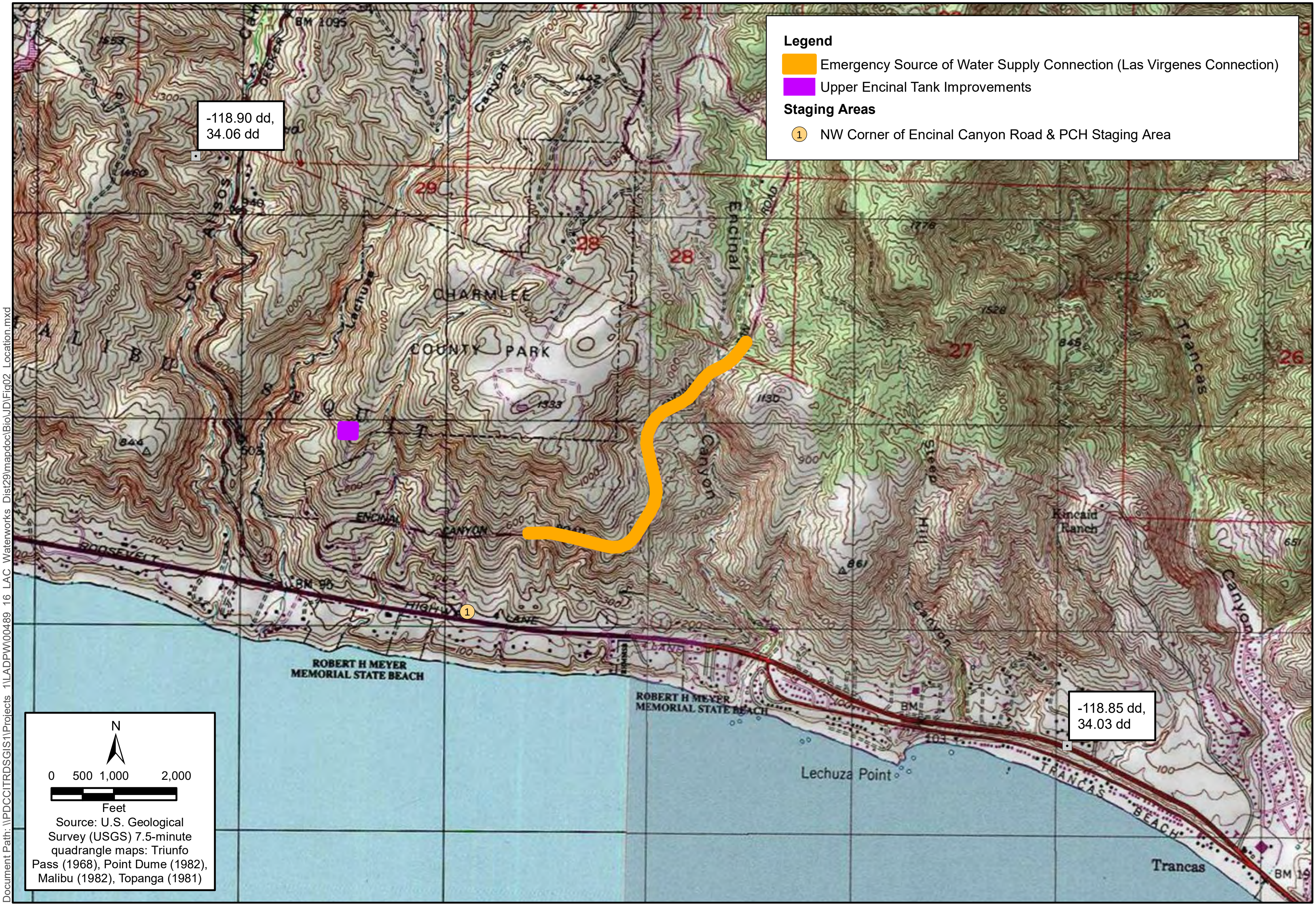
Figure 2
Location Map - Index Sheet
Los Angeles County Waterworks District No. 29 – Priority Capital Deficiencies Improvements



Source: U.S. Geological Survey (USGS) 7.5-minute quadrangle maps: Triunfo Pass (1968), Point Dume (1982), Malibu (1982), Topanga (1981)

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Figure 2a
Location Map
Los Angeles County Waterworks District No. 29 – Priority Capital Deficiencies Improvements

Source: U.S. Geological Survey (USGS) 7.5-minute quadrangle maps: Triunfo Pass (1968), Point Dume (1982), Malibu (1982), Topanga (1981)

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Figure 2b
Location Map
Los Angeles County Waterworks District No. 29 – Priority Capital Deficiencies Improvements

Source: U.S. Geological Survey (USGS) 7.5-minute quadrangle maps: Triunfo Pass (1968), Point Dume (1982), Malibu (1982), Topanga (1981)

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Figure 2c
Location Map
Los Angeles County Waterworks District No. 29 – Priority Capital Deficiencies Improvements

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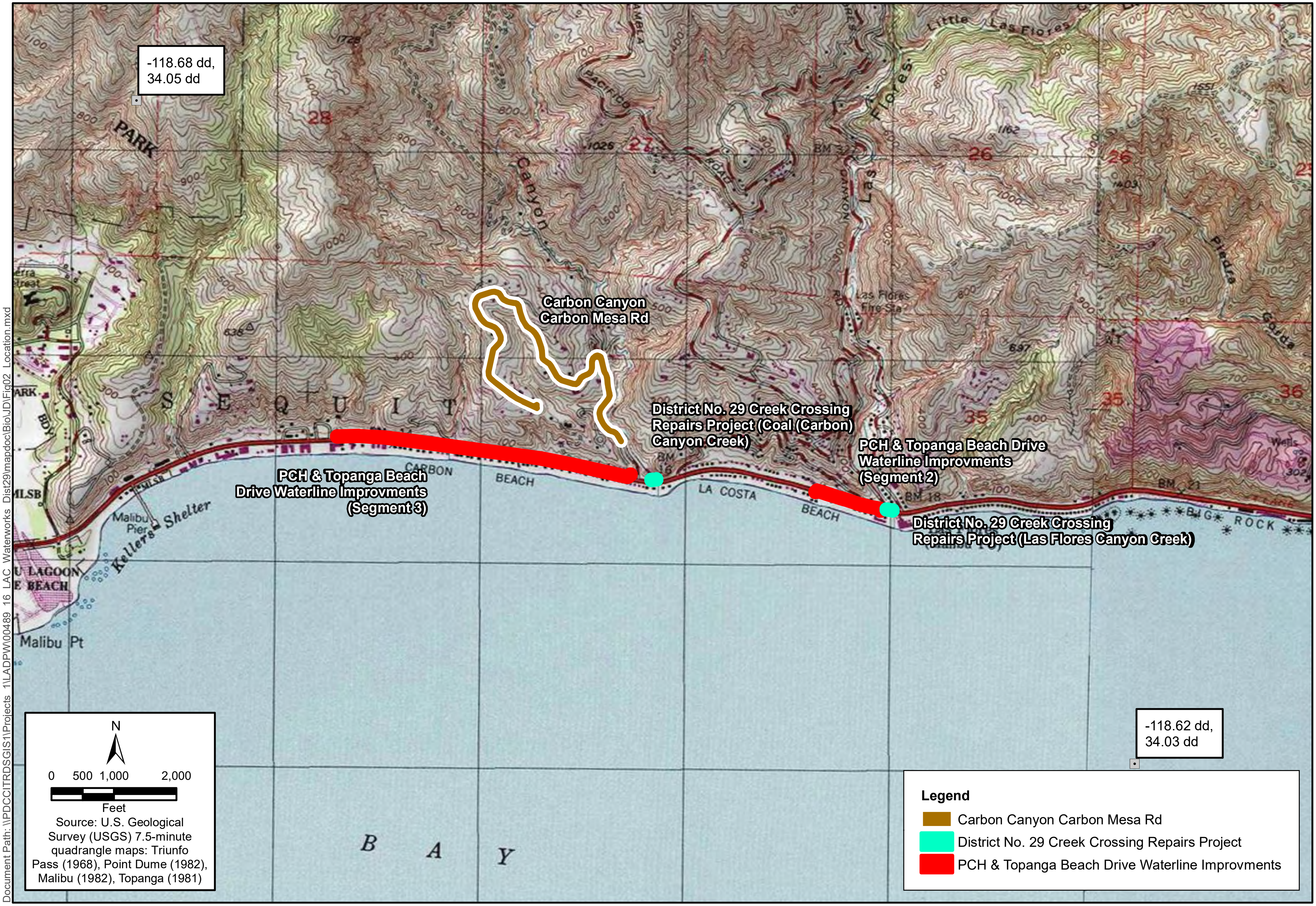


Source: U.S. Geological Survey (USGS) 7.5-minute quadrangle maps: Triunfo Pass (1968), Point Dume (1982), Malibu (1982), Topanga (1981)

ICF

Figure 2d
Location Map
Los Angeles County Waterworks District No. 29 – Priority Capital Deficiencies Improvements

Document Path: \\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig02 Location.mxd

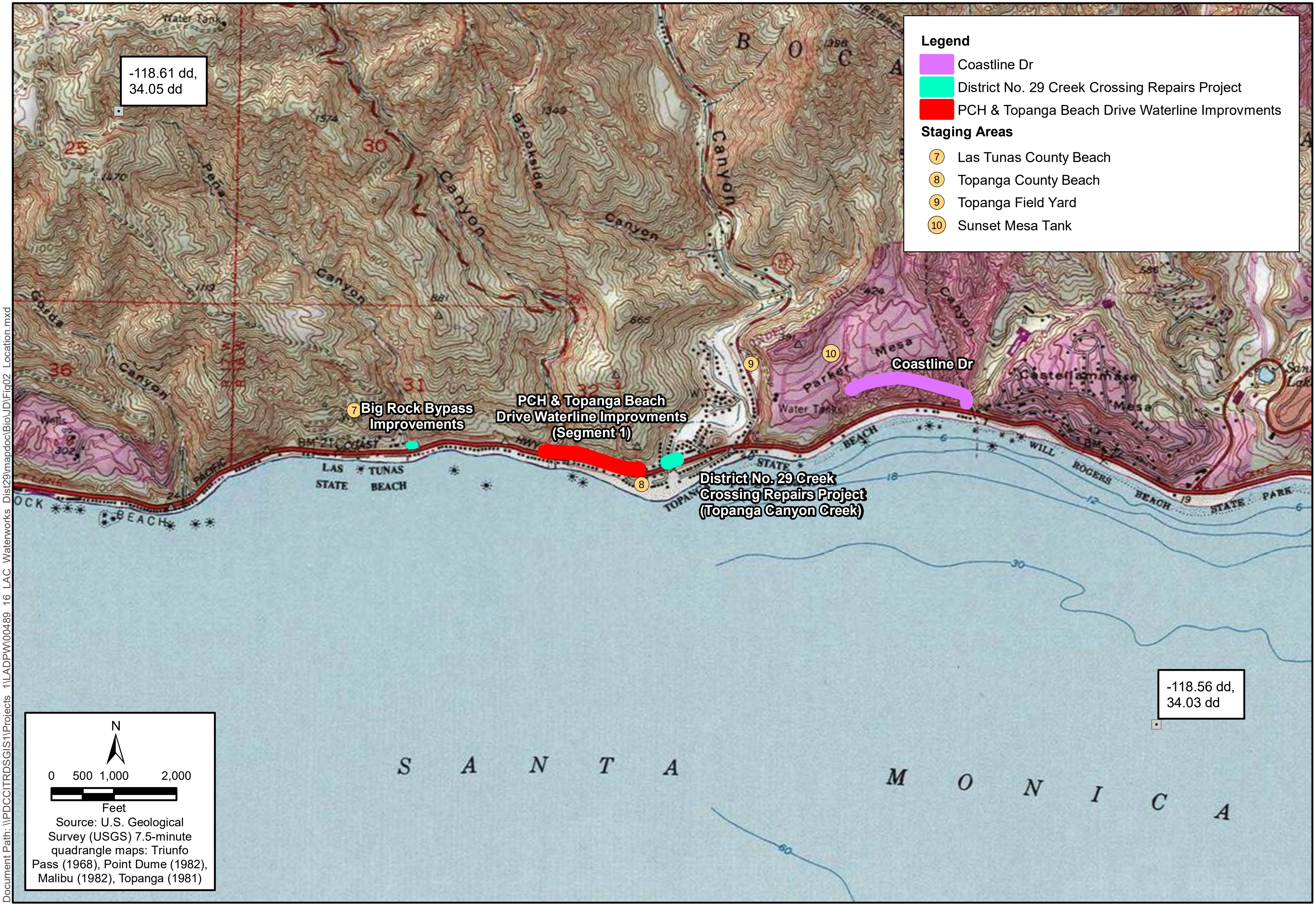
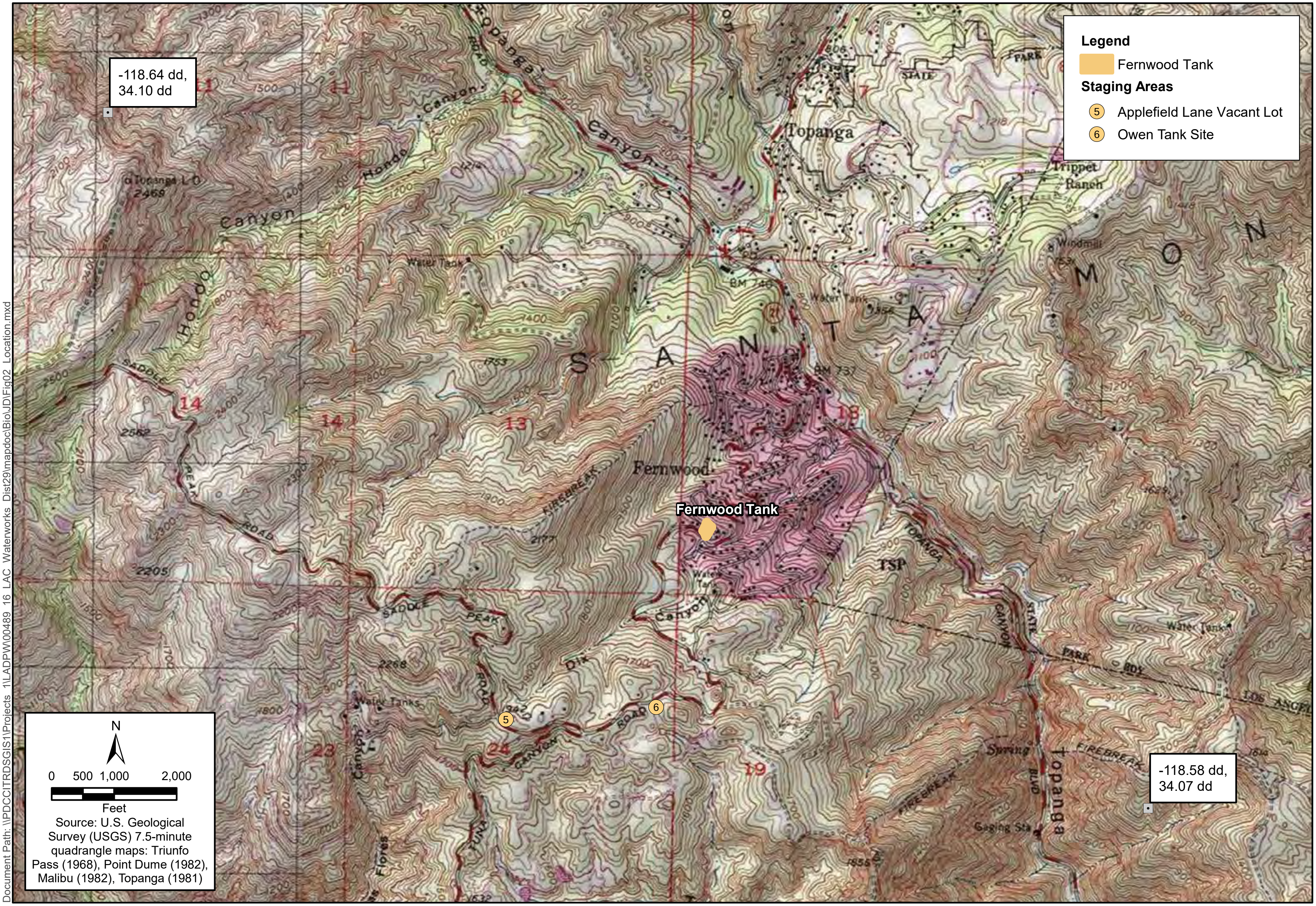


Figure 2e
Location Map
Los Angeles County Waterworks District No. 29 – Priority Capital Deficiencies Improvements



Source: U.S. Geological Survey (USGS) 7.5-minute quadrangle maps: Triunfo Pass (1968), Point Dume (1982), Malibu (1982), Topanga (1981)

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Figure 2f
Location Map
Los Angeles County Waterworks District No. 29 – Priority Capital Deficiencies Improvements

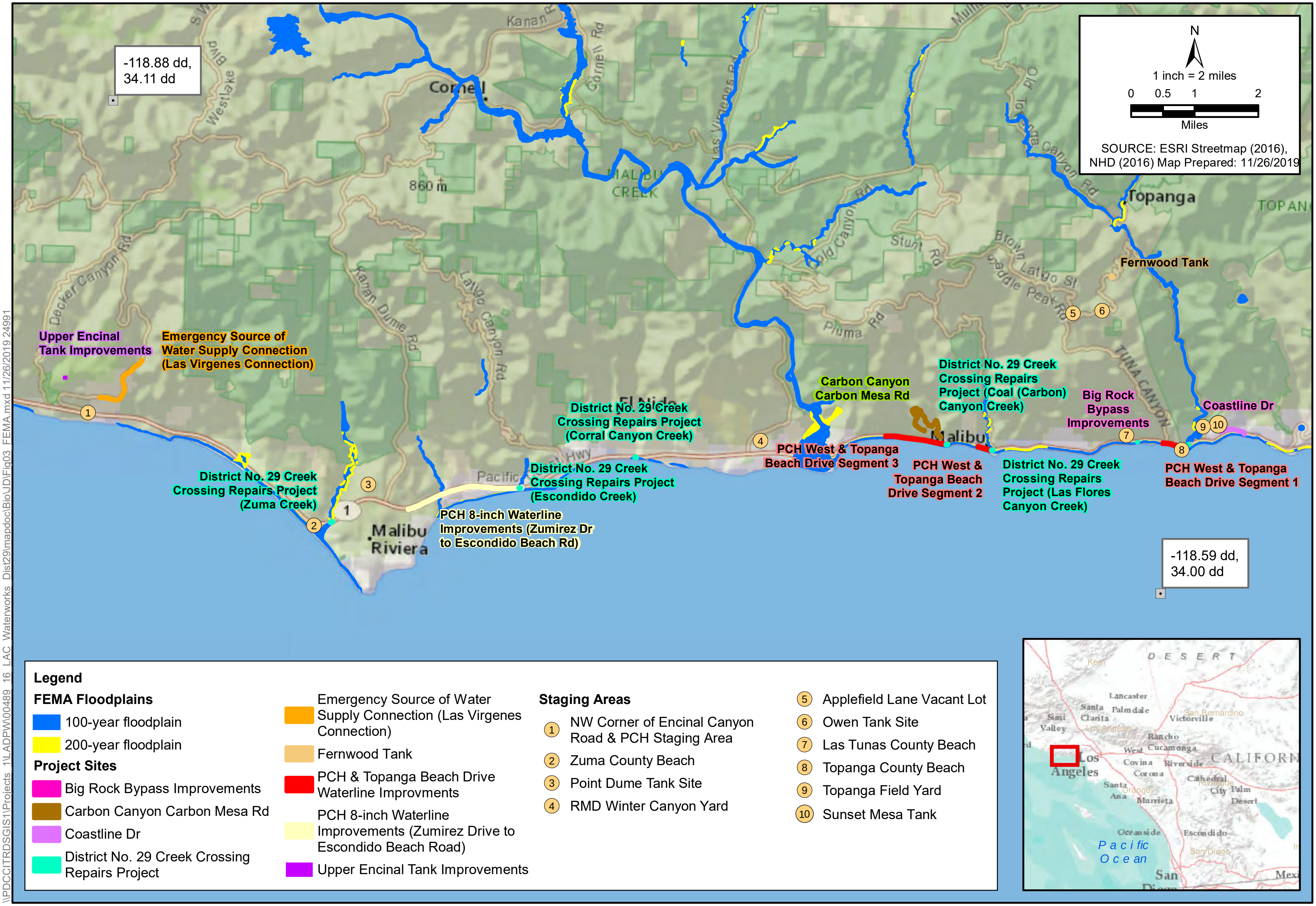

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Figure 3
FEMA Floodplain Map
Los Angeles County Waterworks District No. 29 – Priority Capital Deficiencies Improvements

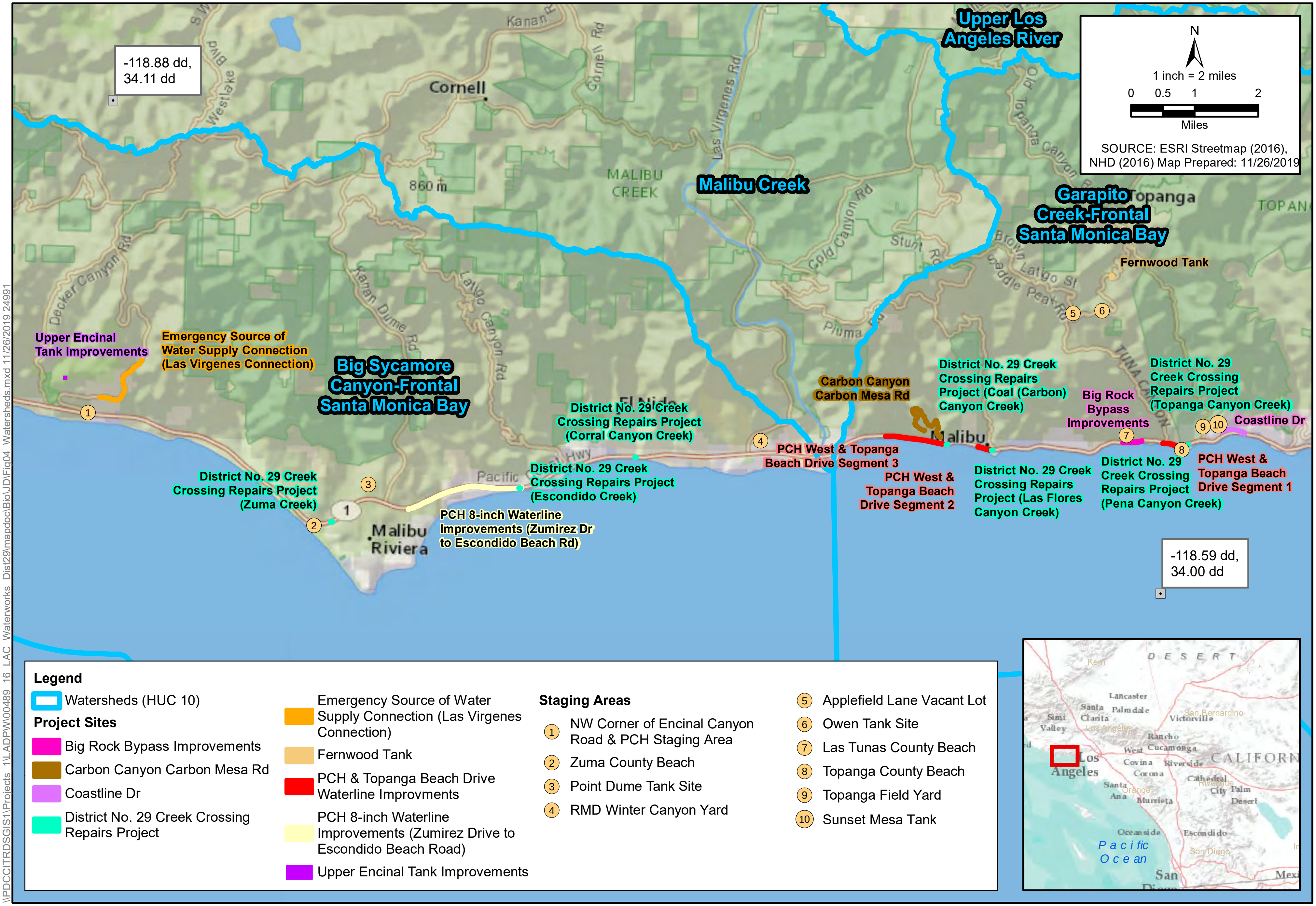

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Figure 4
Watersheds - HUC 10
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

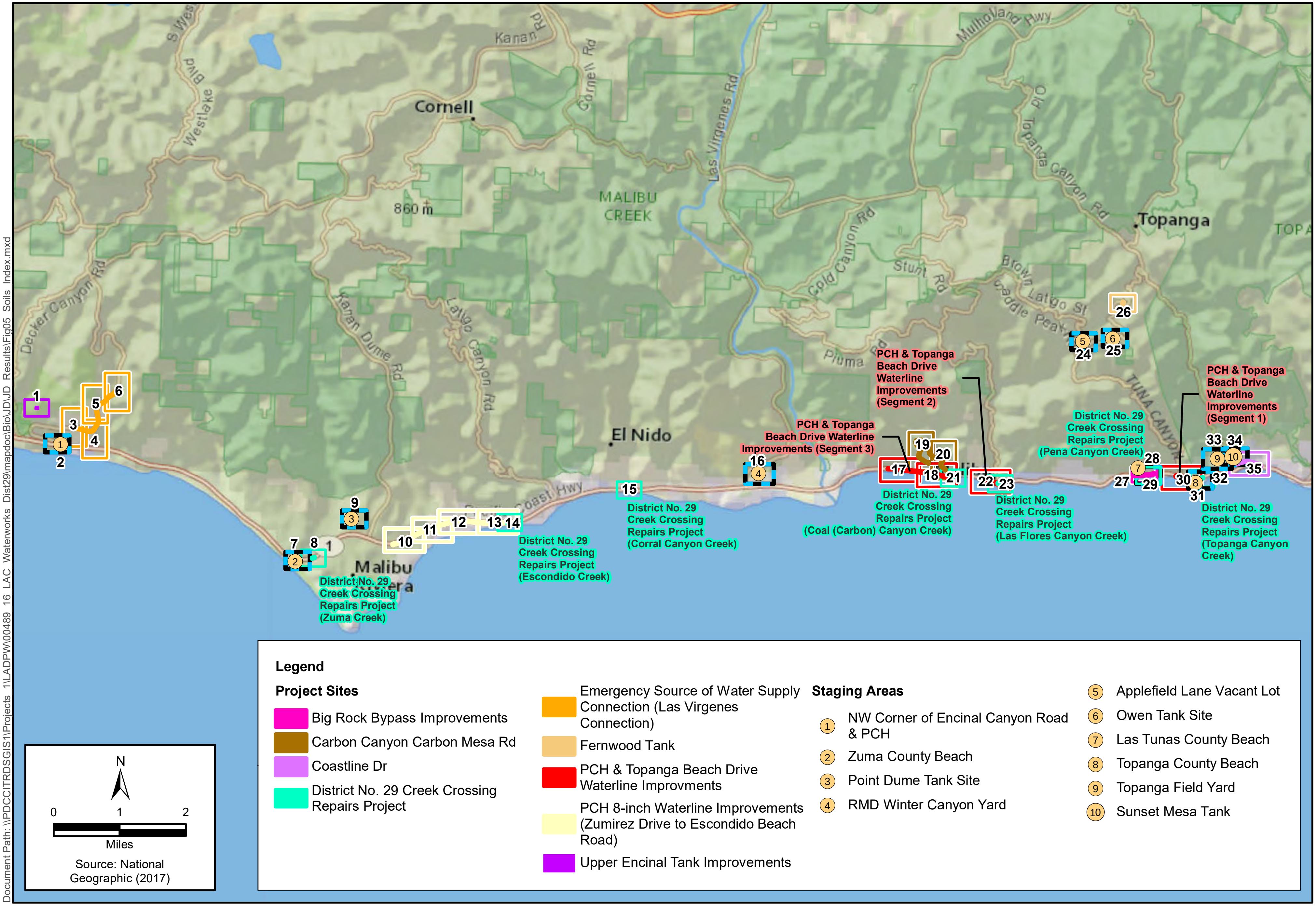

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Figure 5
Soils Map - Index Sheet
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Soils letter land updated.mxd Date: 11/27/2019 24991

Figure 5 - Sheet 1
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\UD\UD Results\Fig05 Soils letter land updated.mxd Date: 11/22/2019 24991

Figure 5 - Sheet 2
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

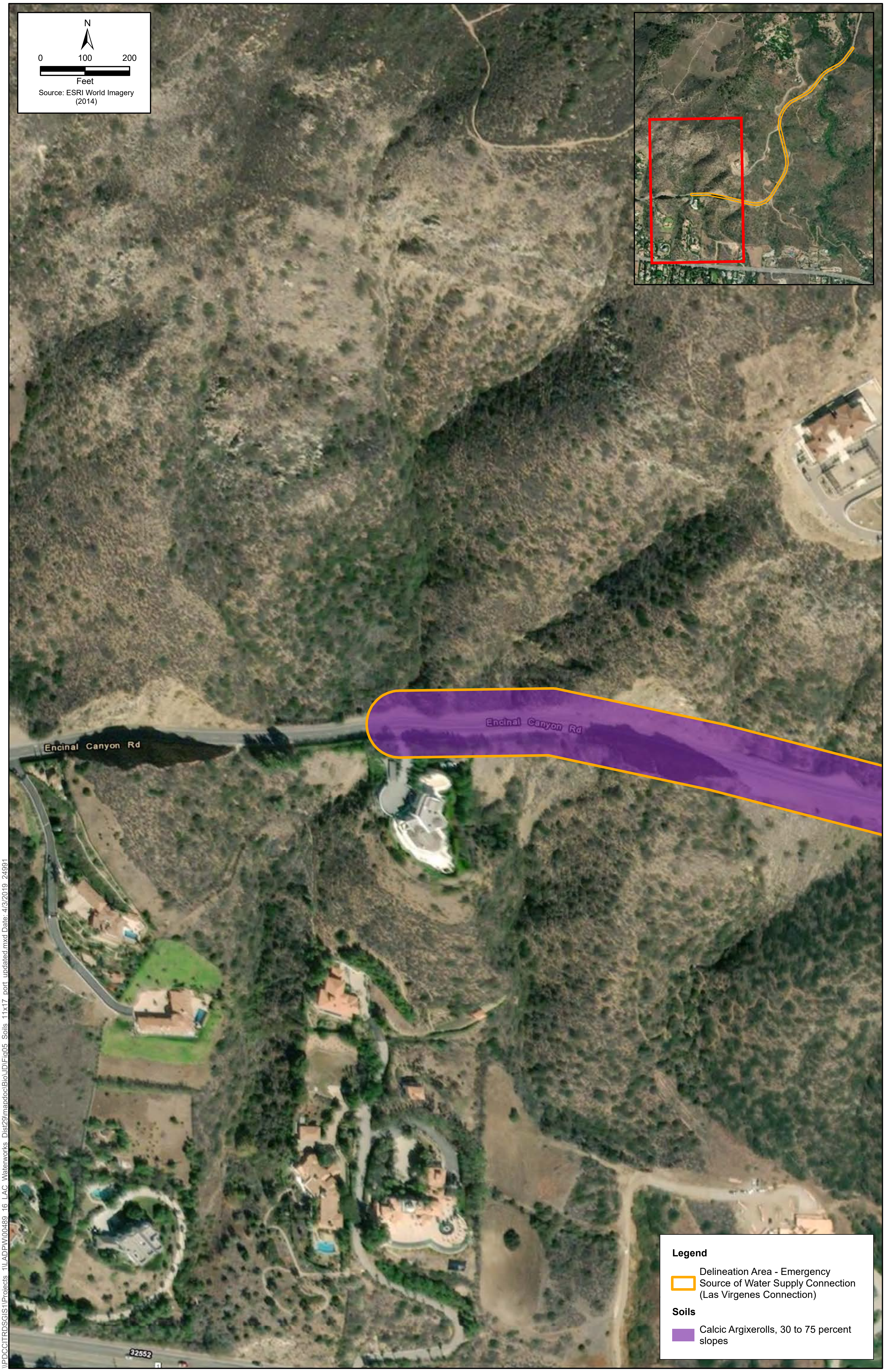

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Figure 5 - Sheet 3
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 port updated.mxd Date: 4/3/2019 24991

Figure 5 - Sheet 4
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 port updated.mxd Date: 4/3/2019 24991

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Figure 5 - Sheet 5
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 port updated.mxd Date: 4/3/2019 24991

Figure 5 - Sheet 6
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017);
Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Soils letter land updated.mxd Date: 11/22/2019 24991

Figure 5 - Sheet 7
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

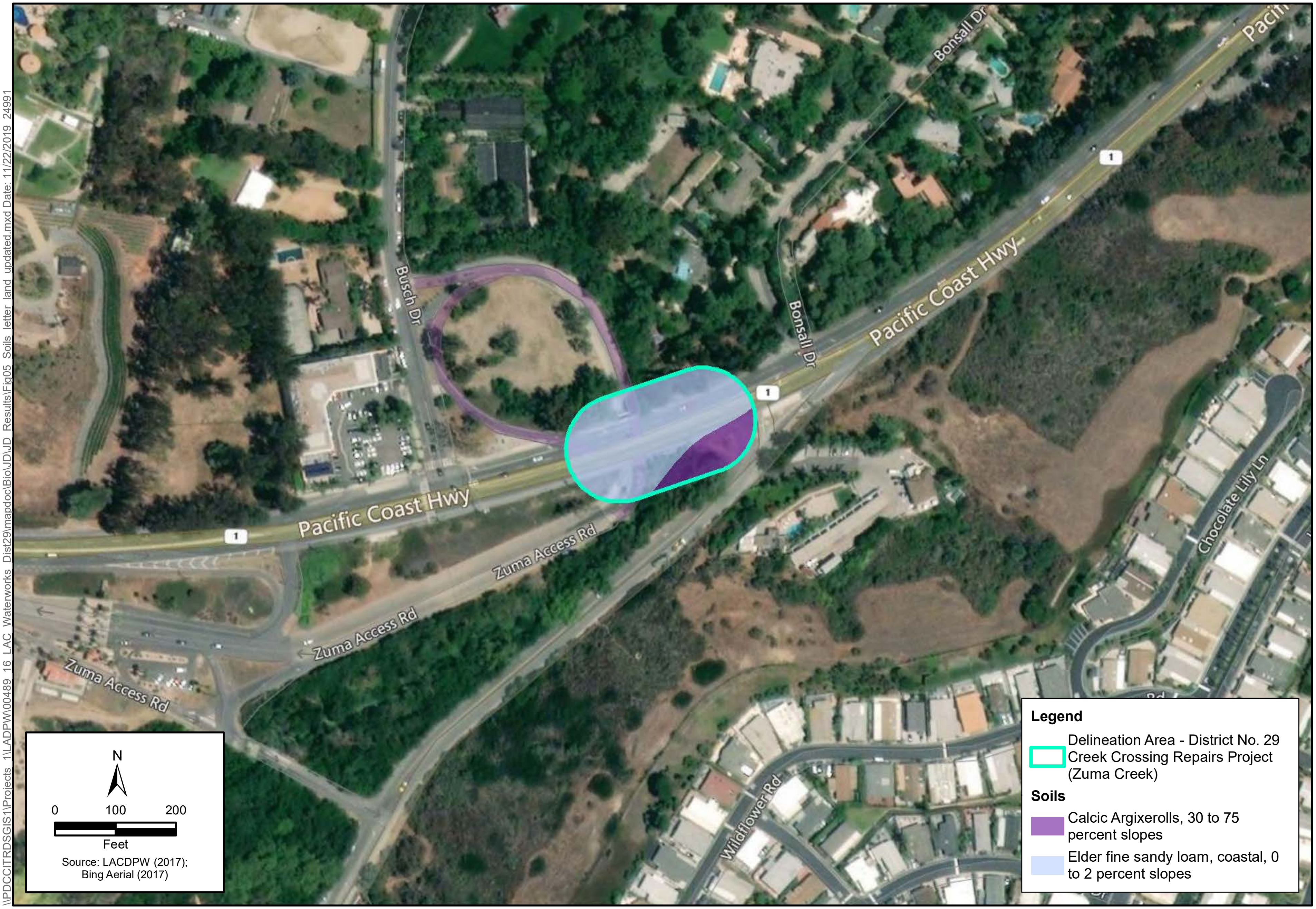

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Figure 5 - Sheet 8
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig05_Soils_letter_land_updated.mxd Date: 11/22/2019 24991

Figure 5 - Sheet 9
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

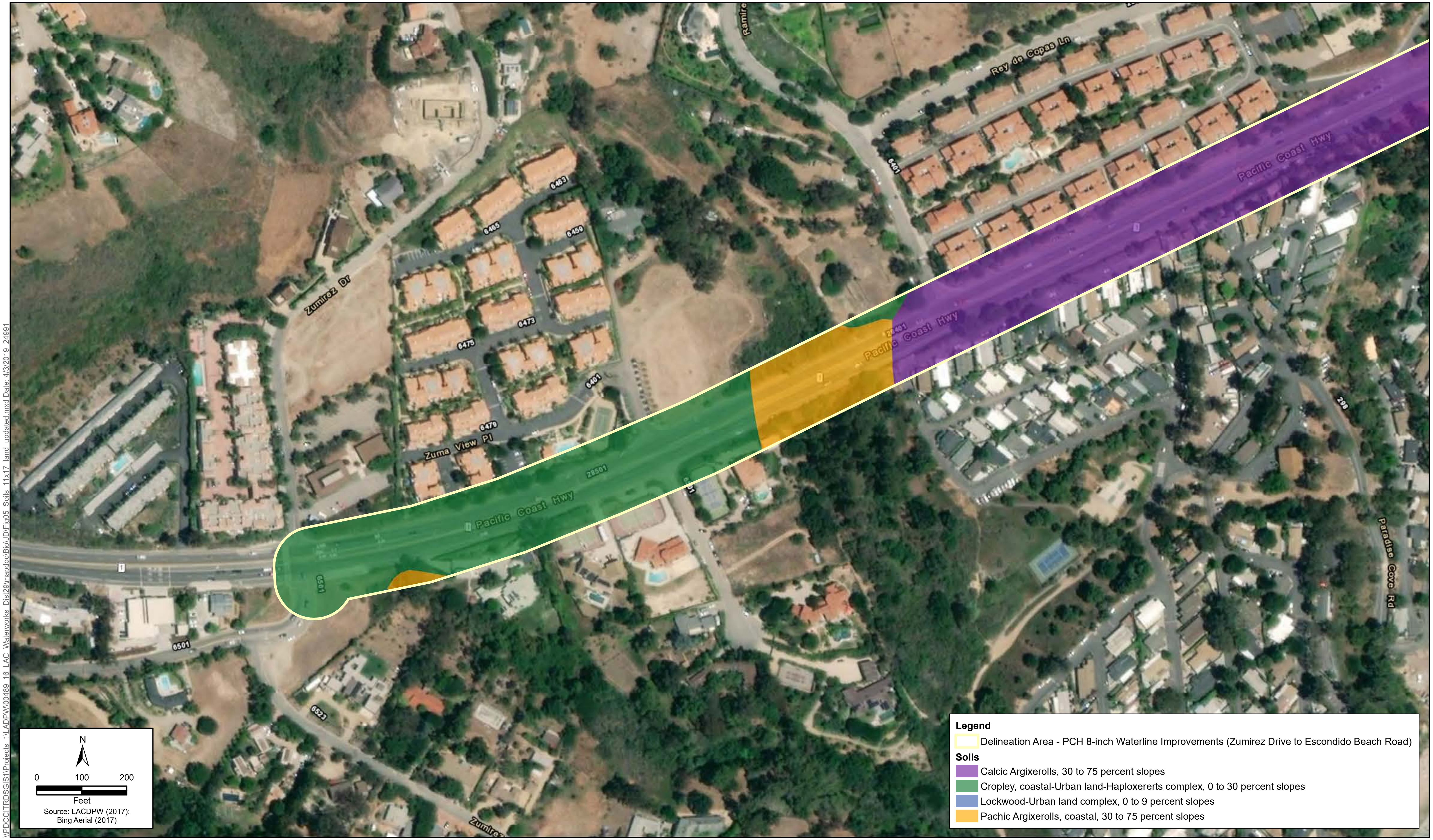

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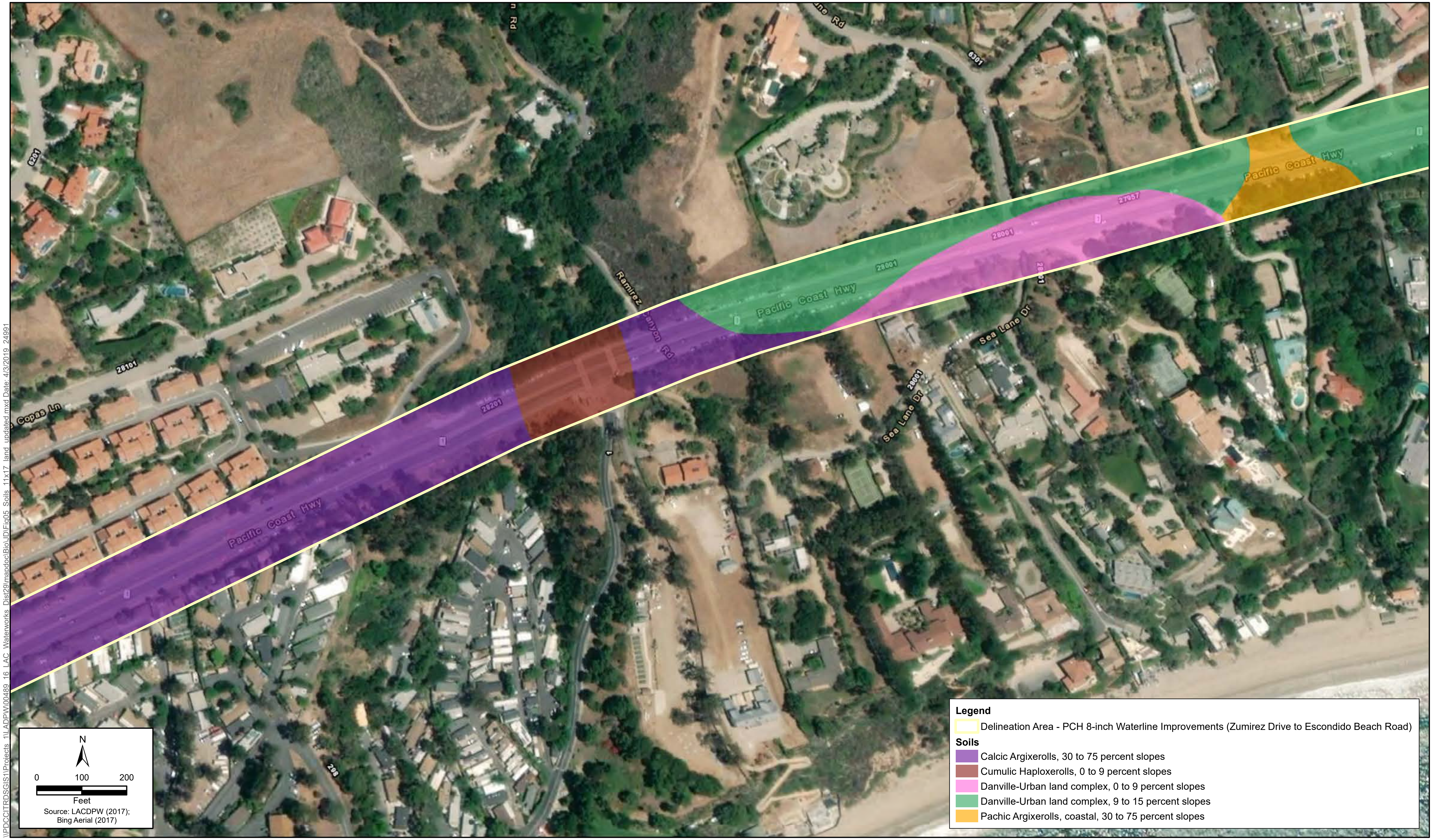
Figure 5 - Sheet 10
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

Legend

☐ Delineation Area - PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)

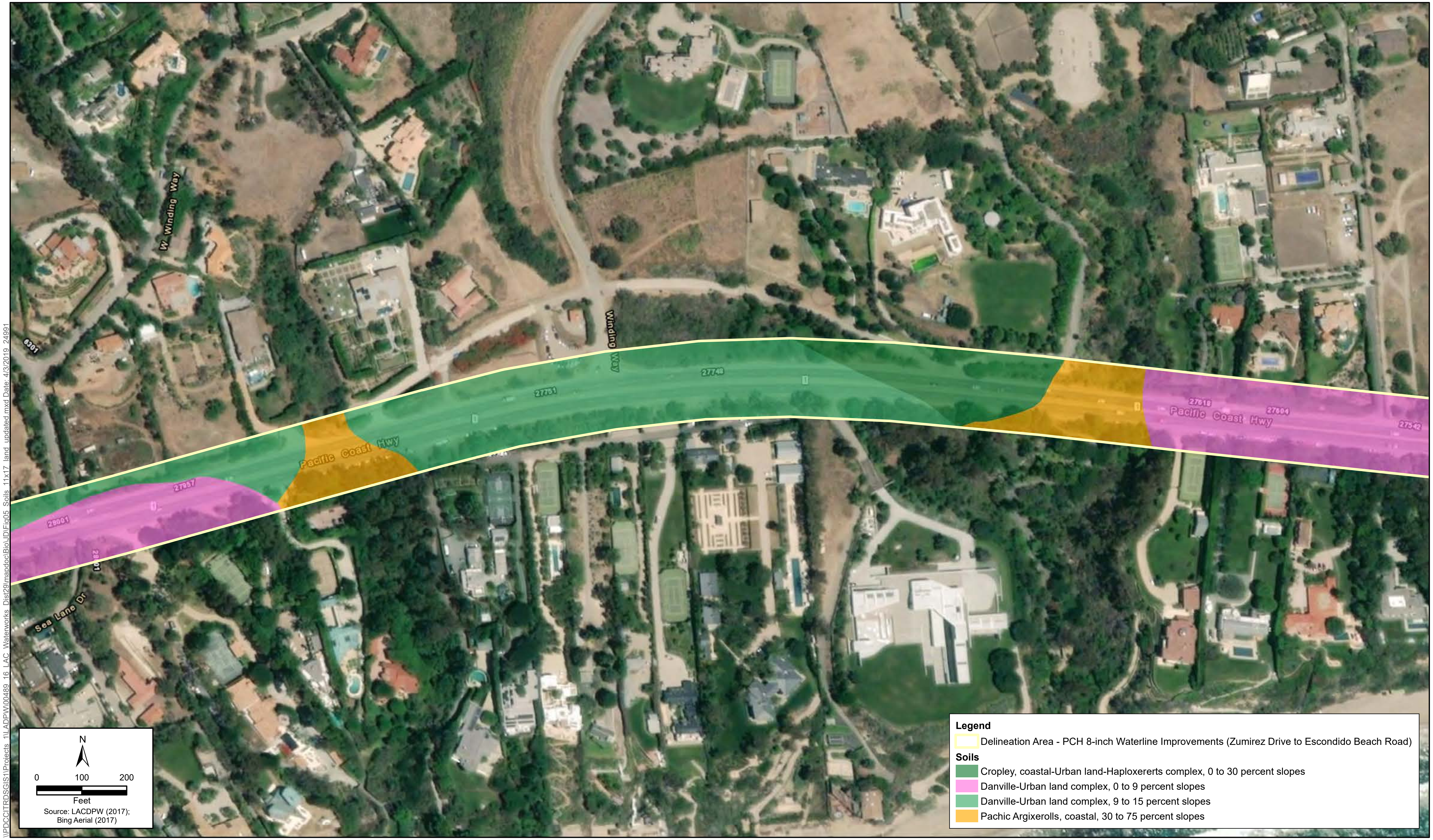
Soils

- 🟪 Calcic Argixerolls, 30 to 75 percent slopes
- 🟫 Cumulic Haploxerolls, 0 to 9 percent slopes
- 🟪 Danville-Urban land complex, 0 to 9 percent slopes
- 🟩 Danville-Urban land complex, 9 to 15 percent slopes
- 🟧 Pachic Argixerolls, coastal, 30 to 75 percent slopes

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 land updated.mxd Date: 4/3/2019 24991

ICF

Figure 5 - Sheet 11
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

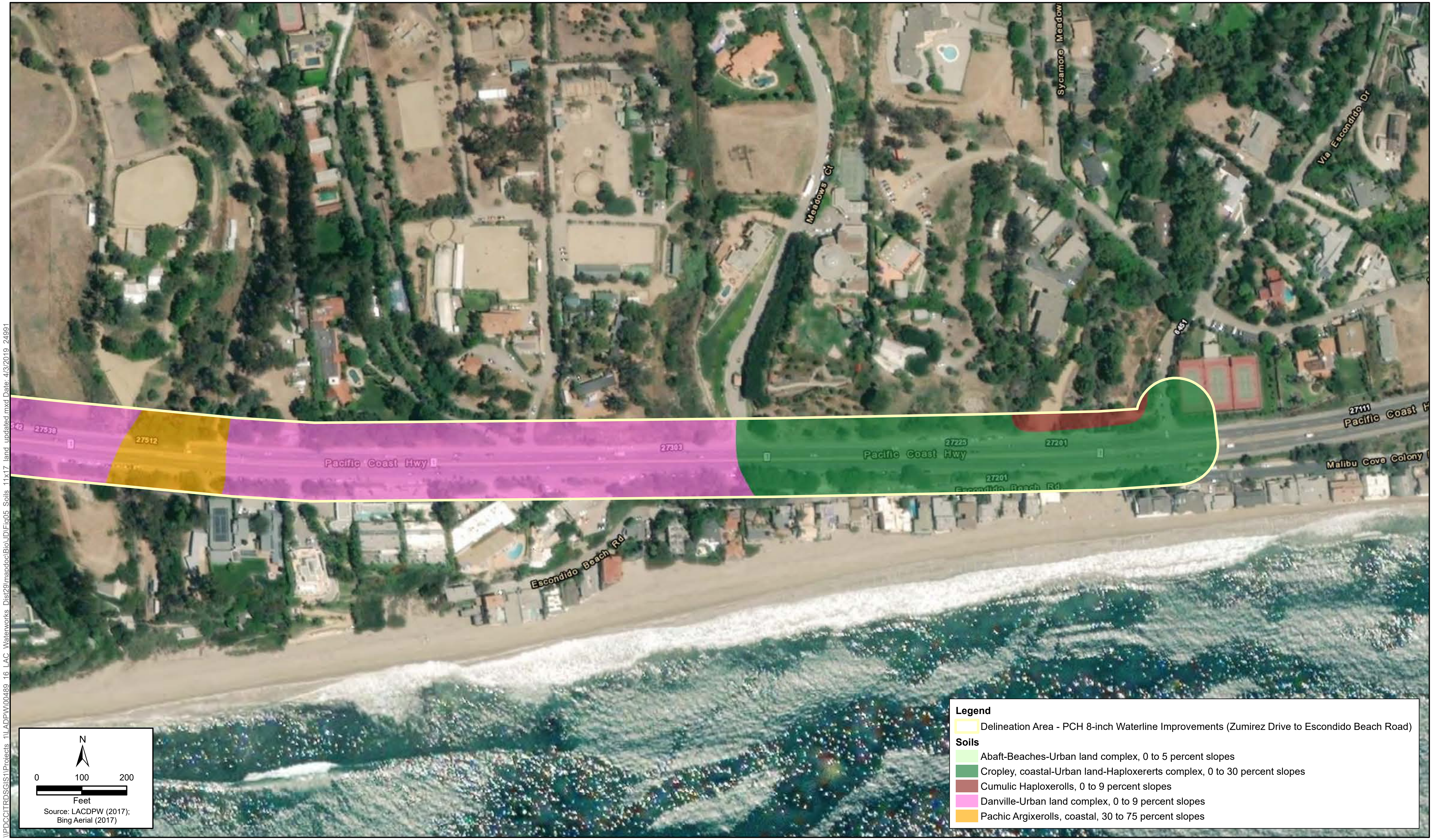


Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 land updated.mxd Date: 4/3/2019 24991

ICF

Figure 5 - Sheet 12
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

Legend

▭ Delineation Area - PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)

Soils

🟩	Abaft-Beaches-Urban land complex, 0 to 5 percent slopes
🟩	Cropley, coastal-Urban land-Haploxererts complex, 0 to 30 percent slopes
🟫	Cumulic Haploxerolls, 0 to 9 percent slopes
🟪	Danville-Urban land complex, 0 to 9 percent slopes
🟨	Pachic Argixerolls, coastal, 30 to 75 percent slopes

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 land updated.mxd Date: 4/3/2019 24991

ICF

Figure 5 - Sheet 13
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Soils letter land updated.mxd Date: 11/22/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 5 - Sheet 14

Soils Map

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Soils letter land updated.mxd Date: 11/22/2019 24991

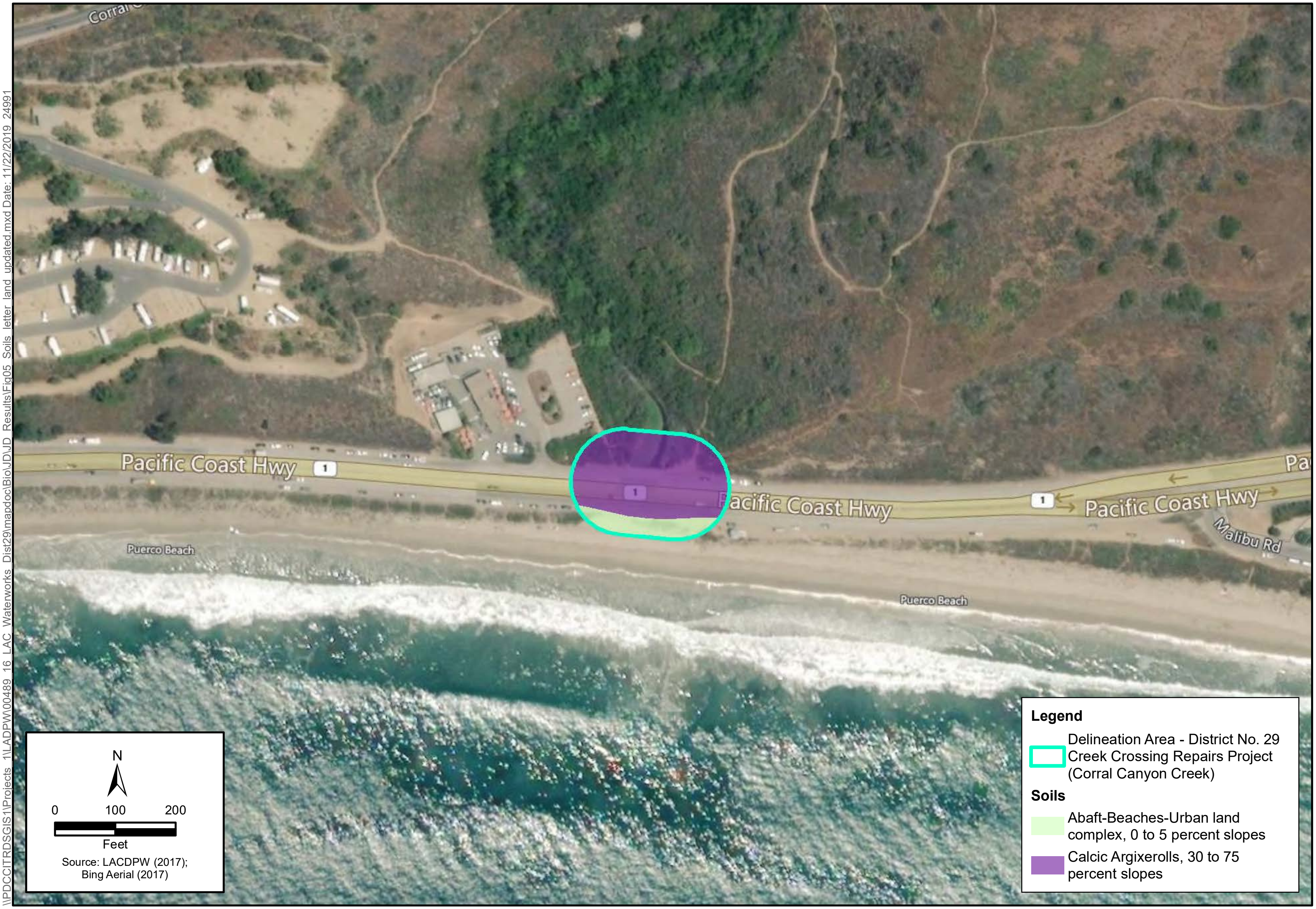


Figure 5 - Sheet 15
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 5 - Sheet 16
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\Fig05_Soils_11x17_land_updated.mxd Date: 4/2/2019 24991

Figure 5 - Sheet 17
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 land updated.mxd Date: 4/2/2019 24991

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Figure 5 - Sheet 18
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\Fig05_Soils_11x17_port_updated.mxd Date: 4/3/2019 24991

Figure 5 - Sheet 19
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

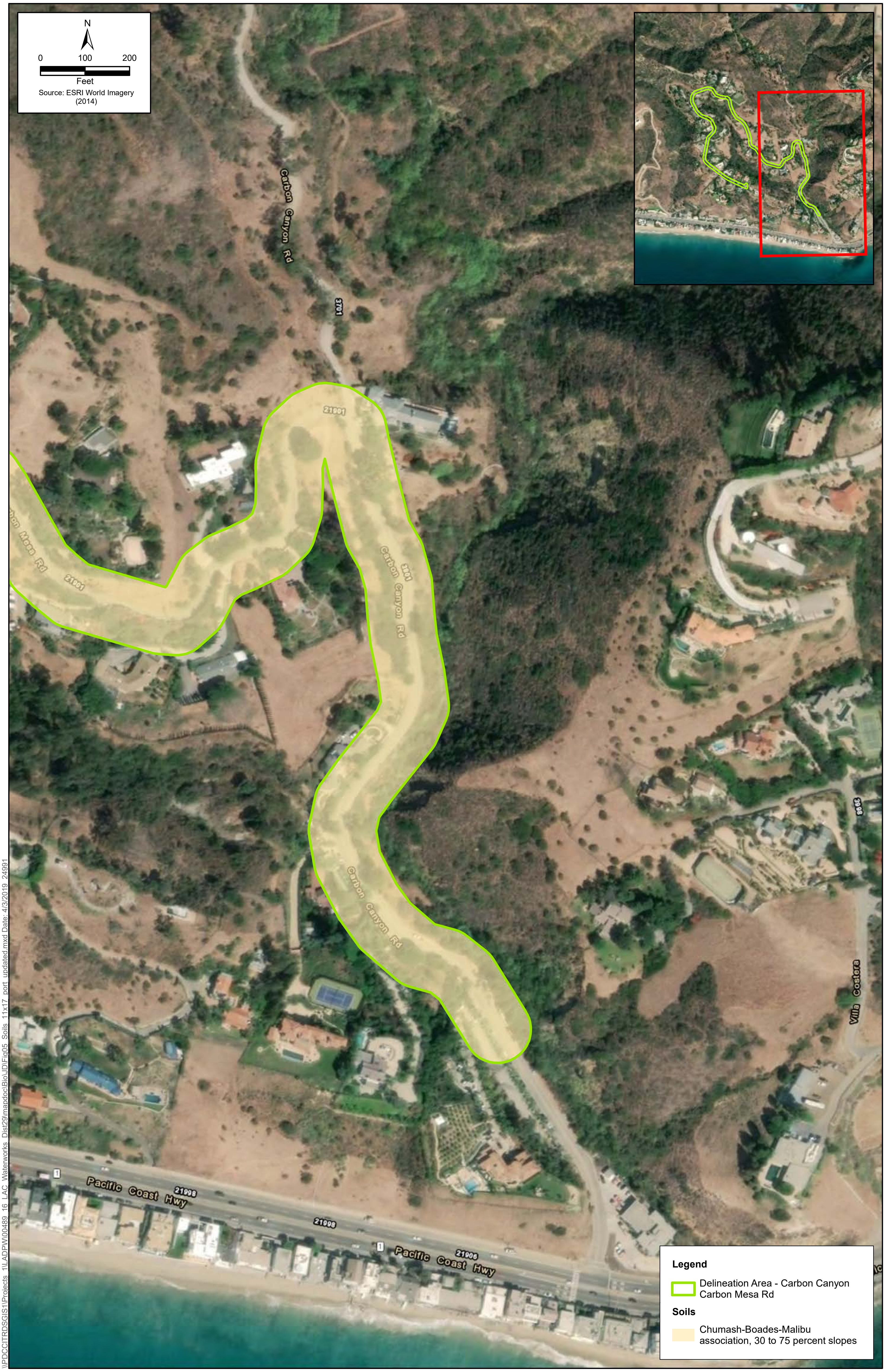

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Figure 5 - Sheet 20
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017);
Bing Aerial (2017)

Figure 5 - Sheet 21
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017);
Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 land updated.mxd Date: 4/2/2019 24991

Figure 5 - Sheet 22
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Soils letter land updated.mxd Date: 11/22/2019 24991

Figure 5 - Sheet 23
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Soils letter land updated.mxd Date: 11/22/2019 24991

Figure 5 - Sheet 24
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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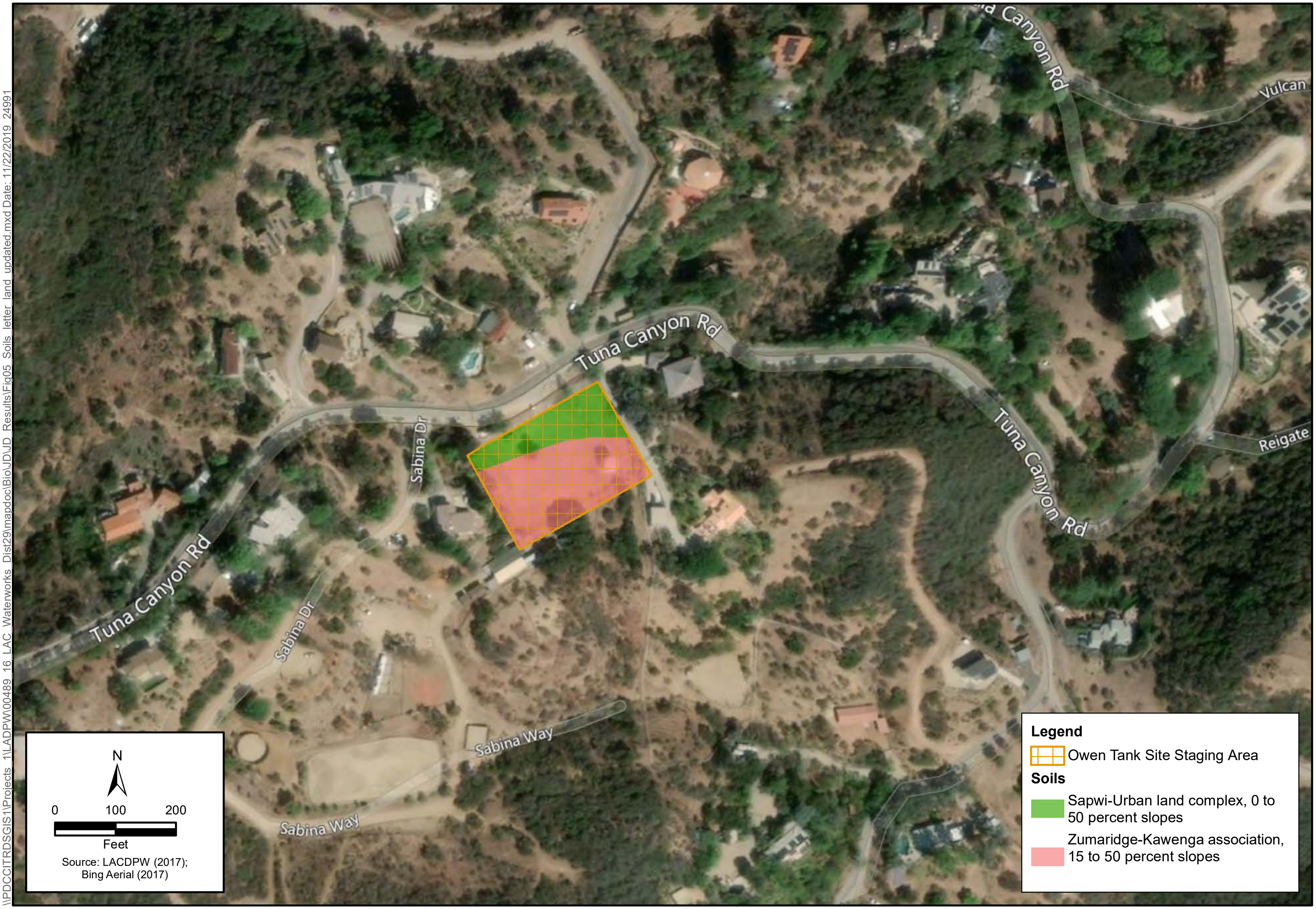

Figure 5 - Sheet 25
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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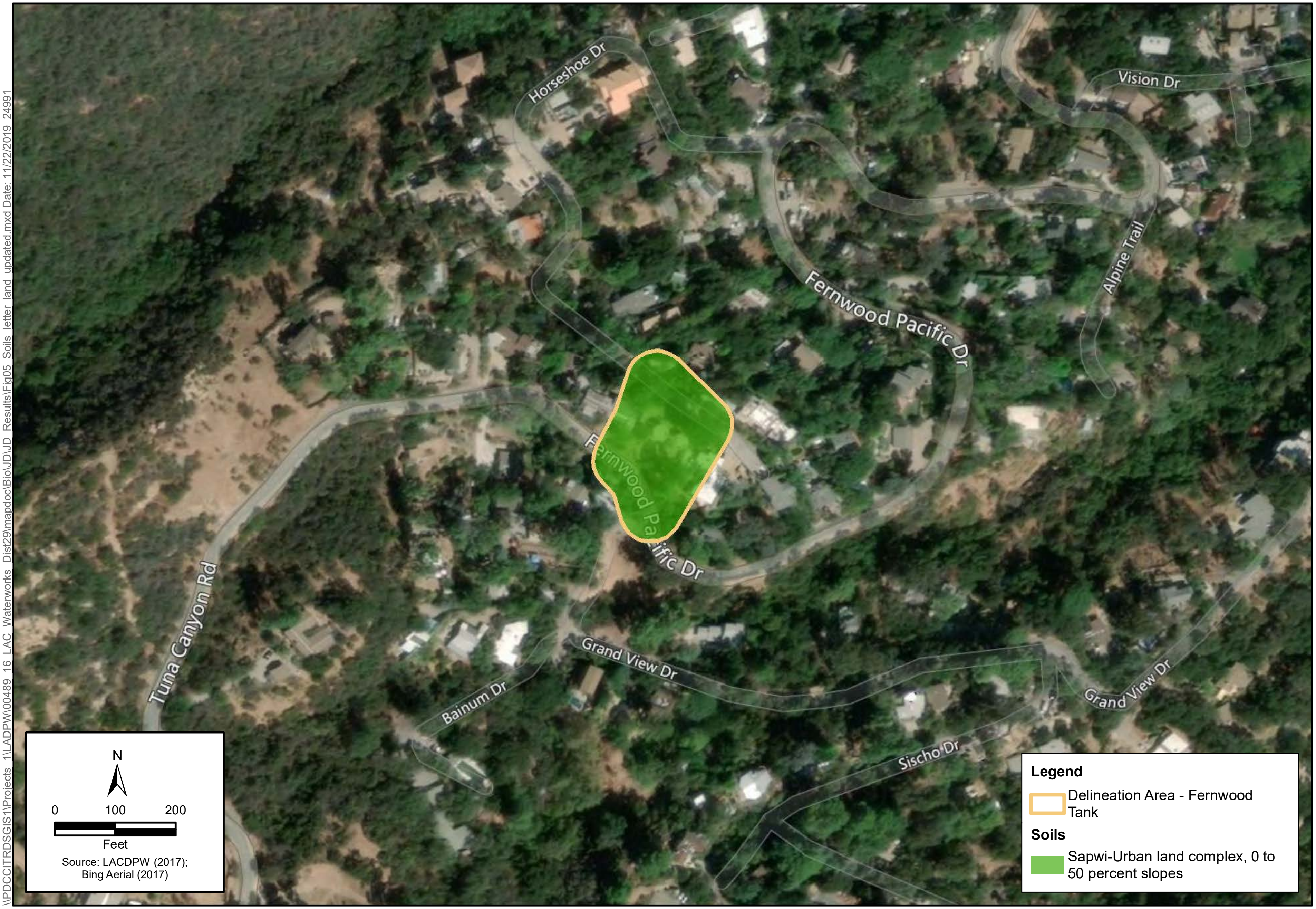


Source: LACDPW (2017); Bing Aerial (2017)

Figure 5 - Sheet 26

Soils Map

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Soils PenaCanyonCreek Sheet26.mxd Date: 4/3/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 5 - Sheet 27
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 land updated.mxd Date: 4/2/2019 24991

Figure 5 - Sheet 28
Soils Map - Big Rock Bypass Improvements Project
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Soils letter land updated.mxd Date: 11/22/2019 24991

Figure 5 - Sheet 29
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 land updated.mxd Date: 4/2/2019 24991

Figure 5 - Sheet 30
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\UD\UD Results\Fig05 Soils letter land updated.mxd Date: 4/3/2019 24991

Figure 5 - Sheet 31
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017);
Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\UD\UD Results\Fig05 Soils letter land updated.mxd Date: 4/3/2019 24991

Figure 5 - Sheet 32
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig05_Soils_letter_land_updated.mxd Date: 11/22/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Legend

▦ Topanga Field Yard Estimated Staging Area footprint (limits of disturbance)

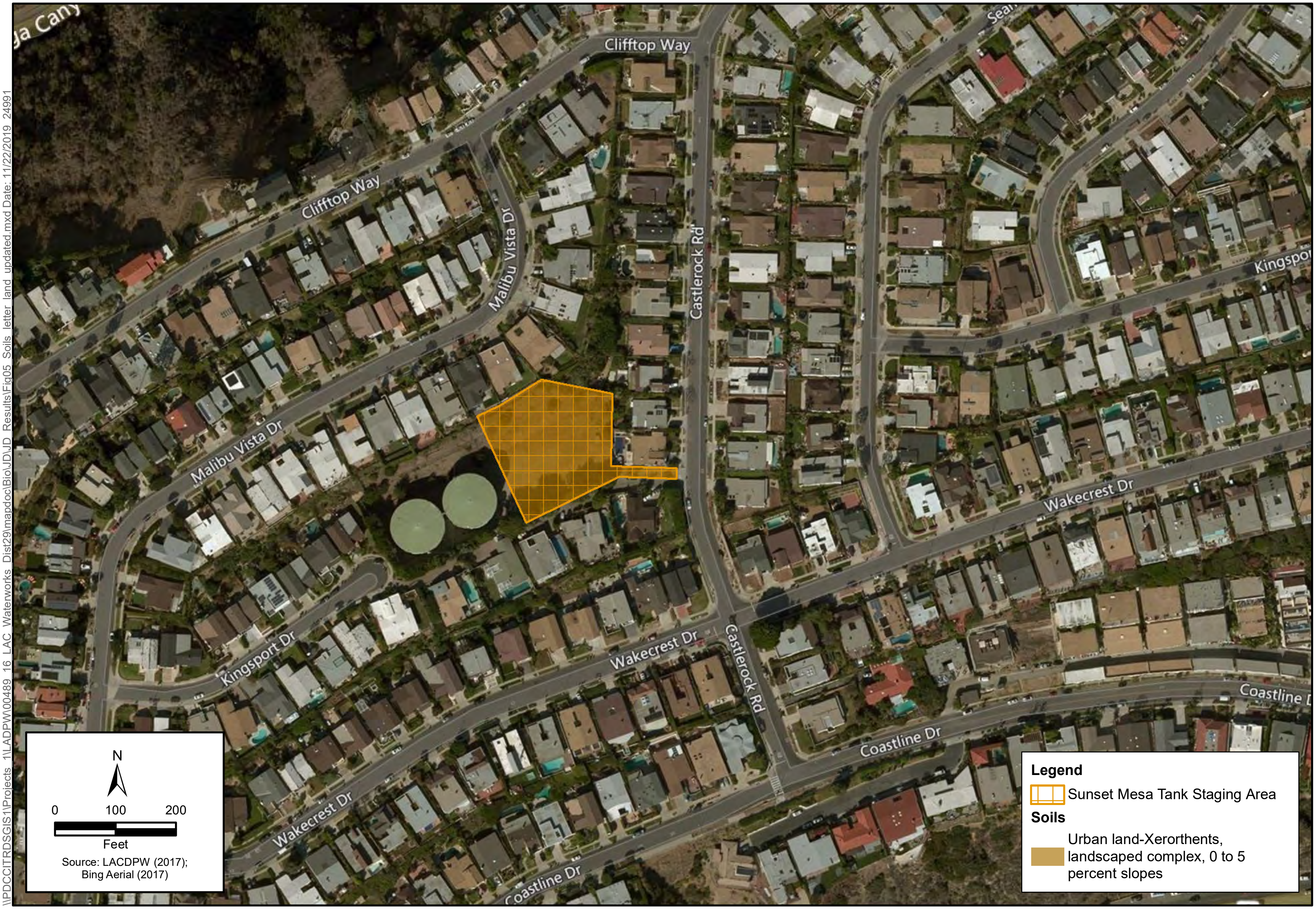
Soils

🟦 Elder fine sandy loam, coastal, 0 to 2 percent slopes

🟩 Mipolomol-Topanga association, 30 to 75 percent slopes

Figure 5 - Sheet 33
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Soils letter land updated.mxd Date: 11/22/2019 24991

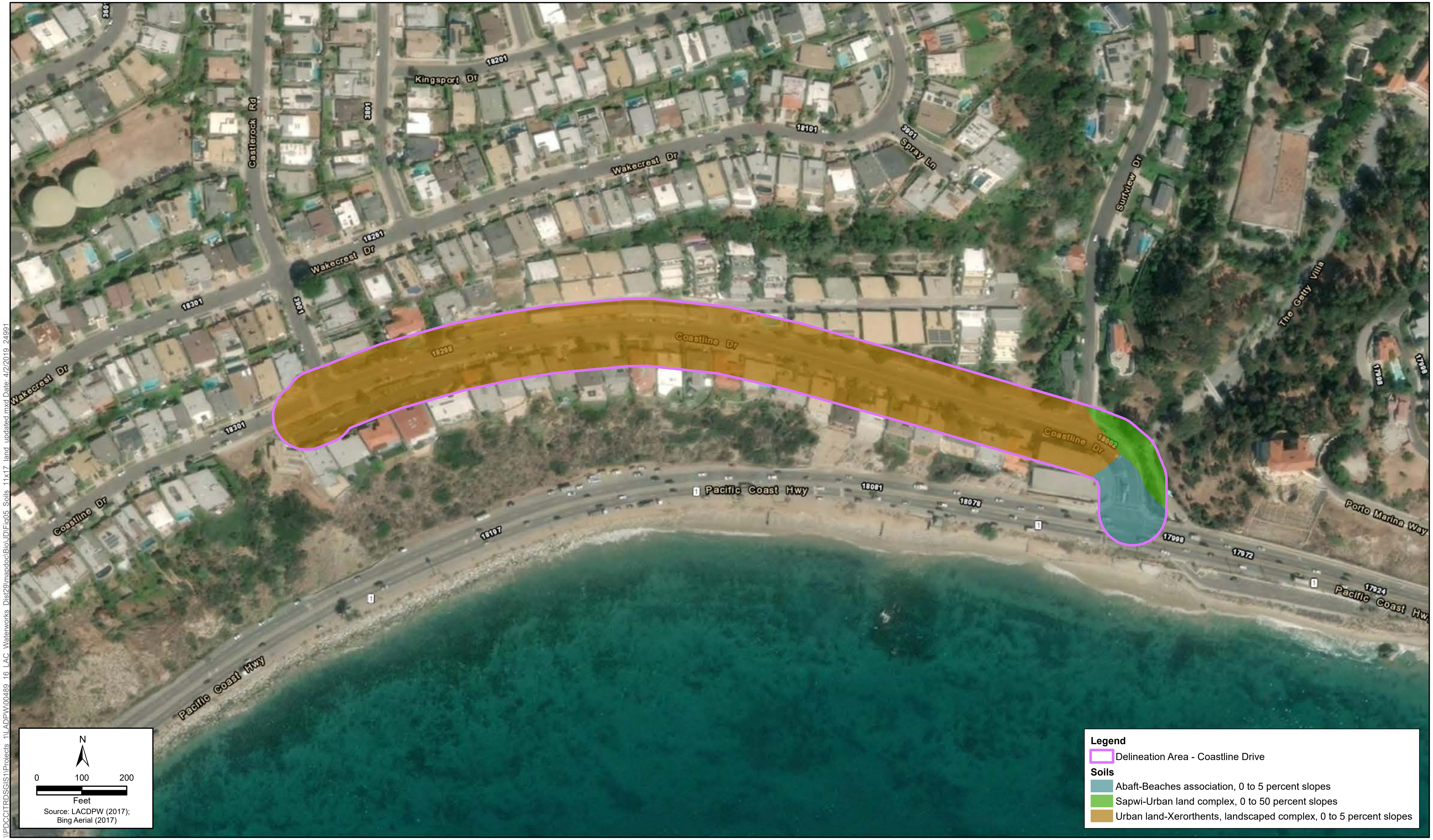


Source: LACDPW (2017); Bing Aerial (2017)

Figure 5 - Sheet 34

Soils Map

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

Legend

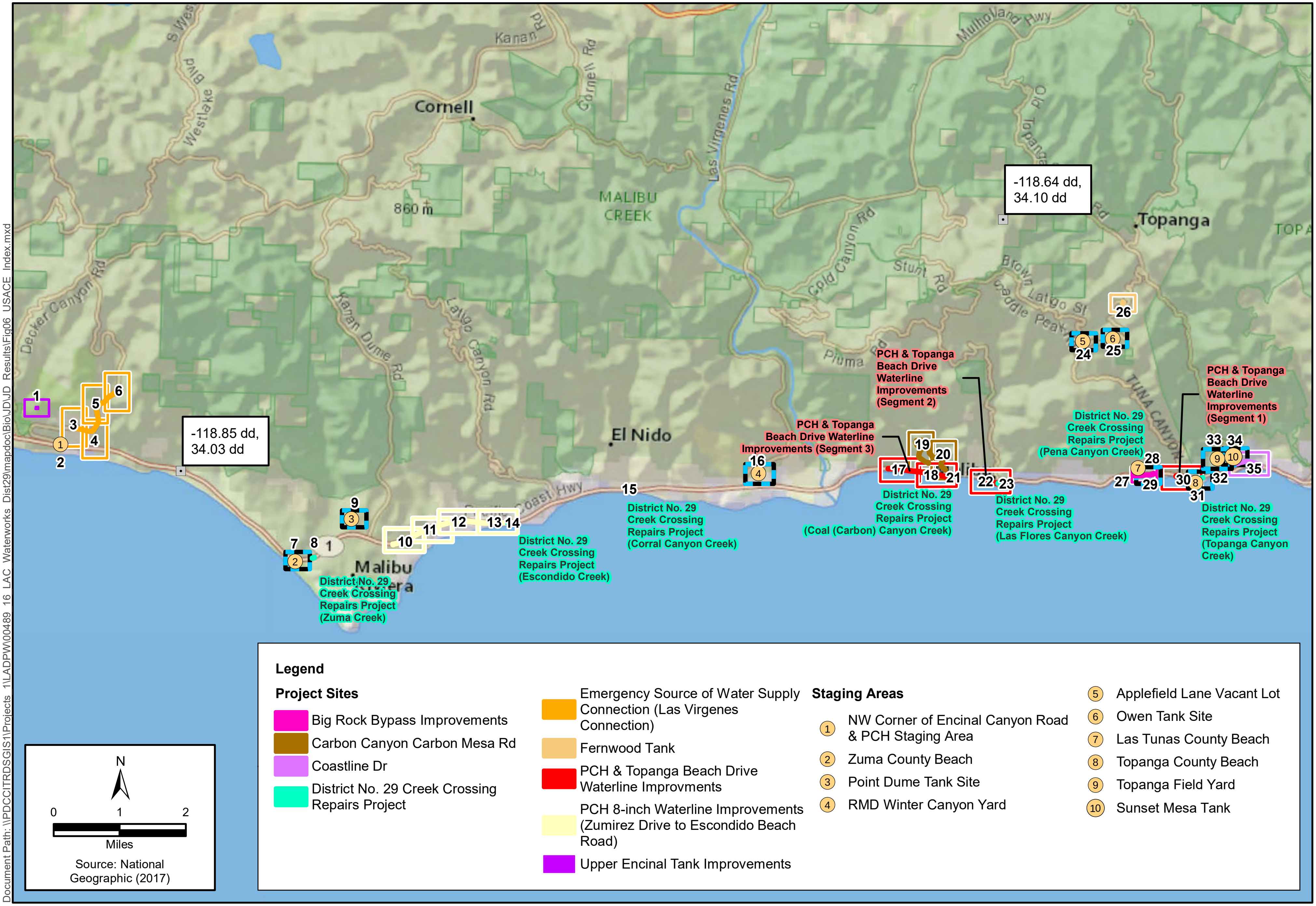
▭ Delineation Area - Coastline Drive

Soils

- ▨ Abaft-Beaches association, 0 to 5 percent slopes
- 🟩 Sapwi-Urban land complex, 0 to 50 percent slopes
- ▨ Urban land-Xerorthents, landscaped complex, 0 to 5 percent slopes

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\Fig05 Soils 11x17 land updated.mxd Date: 4/2/2019 24991

Figure 5 - Sheet 35
Soils Map
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



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ICF

Figure 6

USACE/RWQCB/CCC Potential Jurisdictional Resources - Index Sheet

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig06 UpperEncinalTank USACE Sheet1.mxd Date: 11/22/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sheet 1
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No.29 – Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sheet 2

USACE/RWQCB/CCC Potential Jurisdictional Resources

Los Angeles County Waterworks District No.29 – Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig Emergency WaterSupply USACE JD 11x17 portrait.mxd Date: 2/4/2019 24991

Figure 6 - Sheet 3
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

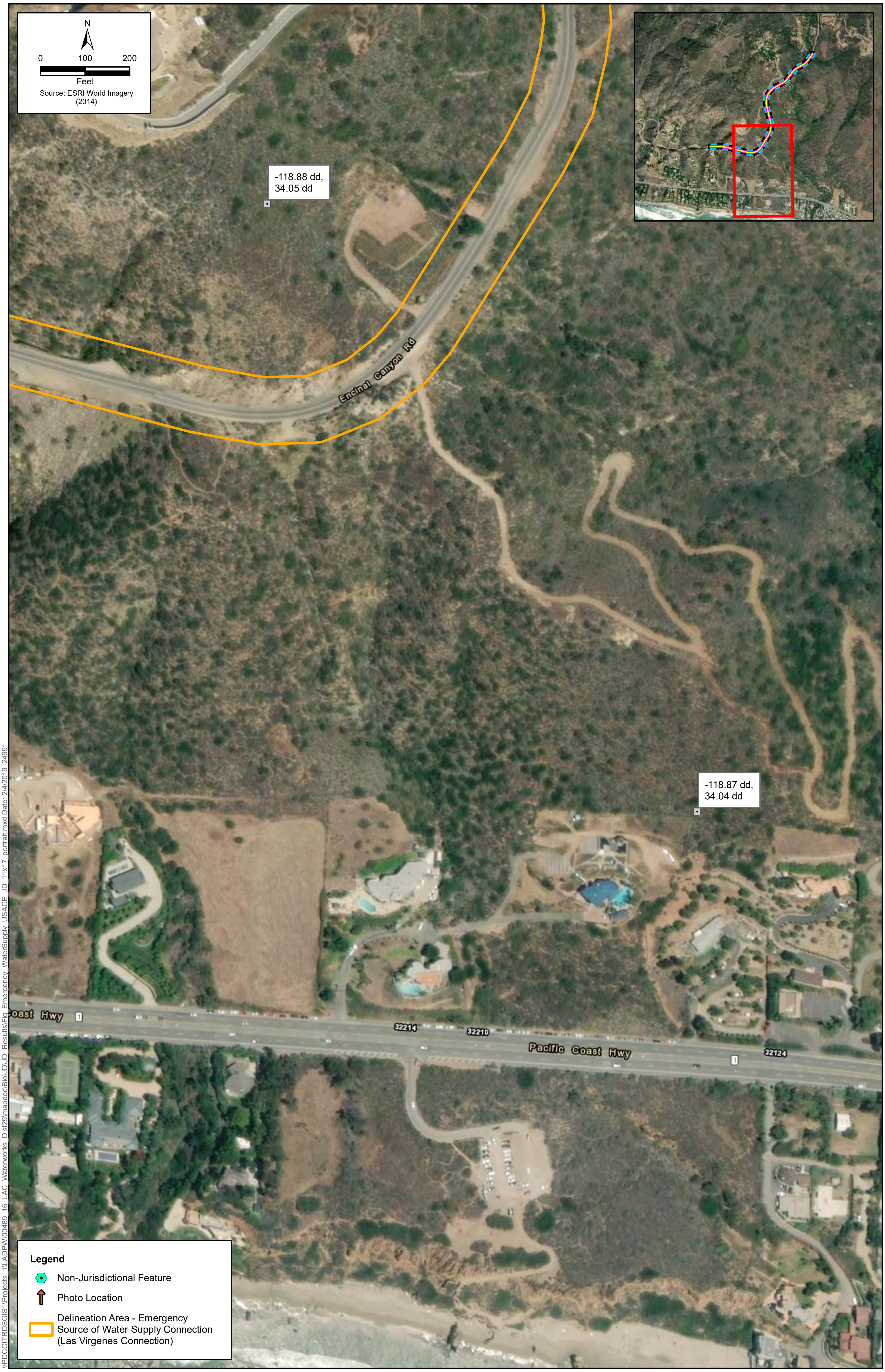

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Figure 6 - Sheet 4
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

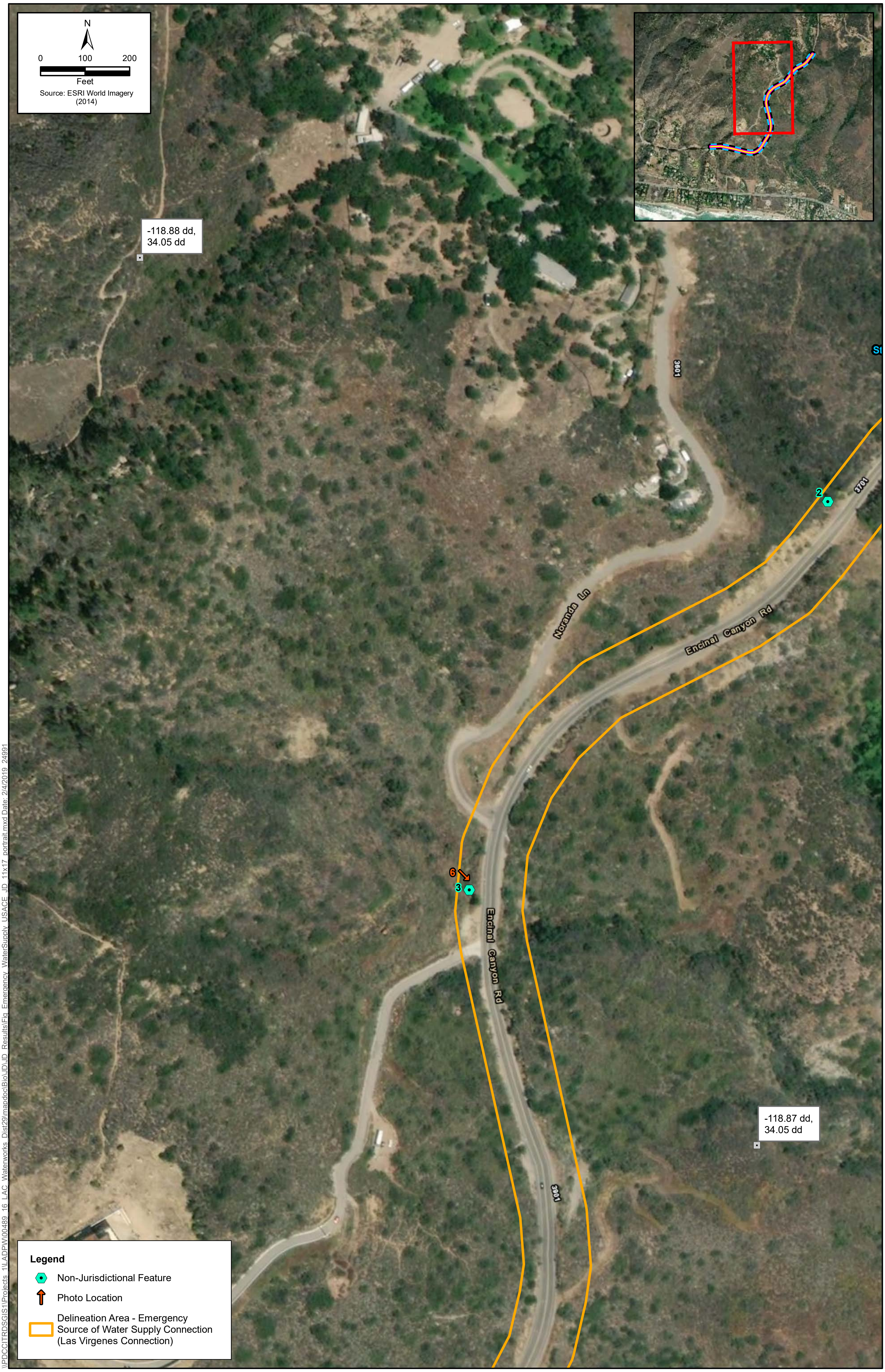

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Figure 6 - Sheet 5
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig Emergency WaterSupply USACE JD 11x17 portrait.mxd Date: 2/4/2019 24991

Figure 6 - Sheet 6
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

ICF

Figure 6 - Sheet 7
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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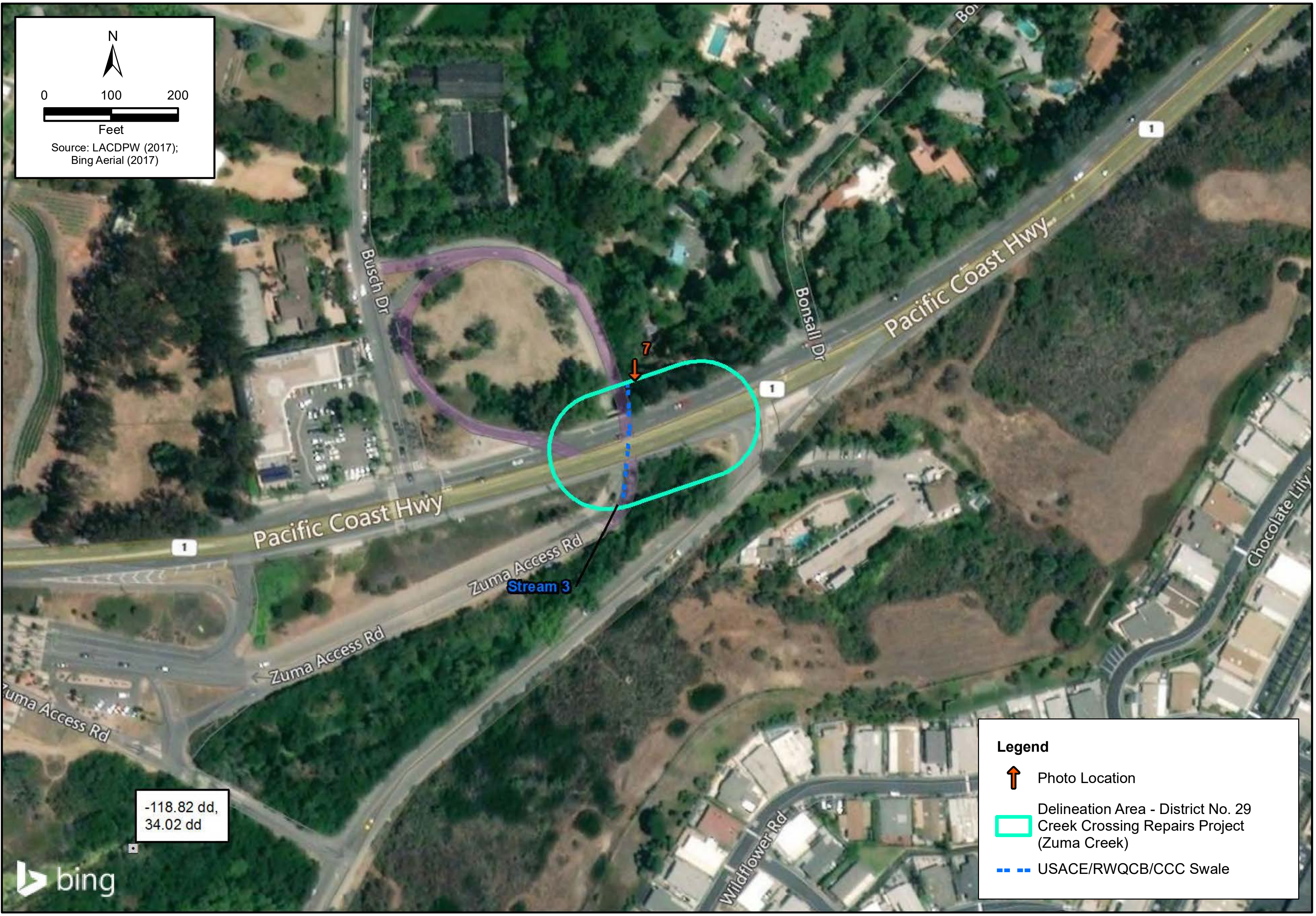

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Figure 6 - Sheet 8

USACE/RWQCB/CCC Potential Jurisdictional Resources

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sheet 9
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig05_PCH8Inch_USACE_JD_11x17_land.mxd Date: 2/4/2019 24991

ICF

Figure 6 - Sheet 10
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Legend

- ⬢ Non-Jurisdictional Feature
- ↑ Photo Location
- — OHWM Width
- ▭ Delineation Area - PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)
- 🟦 USACE/RWQCB/CCC Non-Wetland Water

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 PCH8Inch USACE JD 11x17 land.mxd Date: 2/4/2019 24991

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Figure 6 - Sheet 11

USACE/RWQCB/CCC Potential Jurisdictional Resources

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 PCH8inch USACE JD 11x17 land.mxd Date: 2/4/2019 24991

Figure 6 - Sheet 12
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 PCH8inch USACE JD 11x17 land.mxd Date: 2/4/2019 24991

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Figure 6 - Sheet 13
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig CreekCrossing EscondidoCreek USACE JD.mxd Date: 1/11/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Legend

↑	Photo Location
—	OHWM Width
▭	Delineation Area - District No. 29 Creek Crossing Repairs Project (Escondido Creek)
■	USACE/RWQCB/CCC Non-Wetland Water
▨	USACE/RWQCB/CCC Non-Wetland Water Under Bridge/Through Culvert

Figure 6 - Sheet 14
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig_CreekCrossing_CorralCanyonCreek_USACE_JD.mxd Date: 1/15/2019 24991

Figure 6 - Sheet 15
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

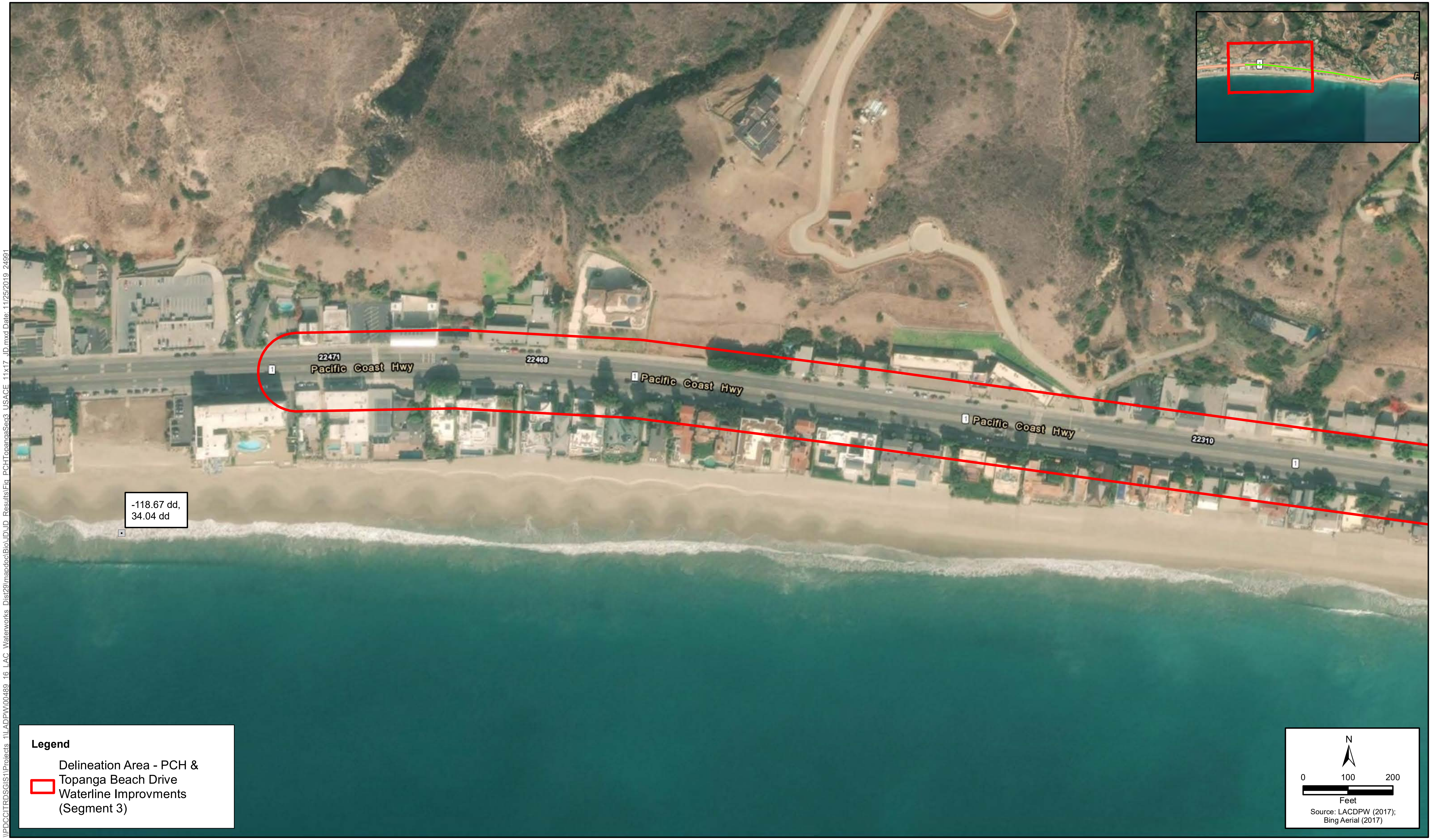
Source: LACDPW (2017); Bing Aerial (2017)

Legend

▦ RMD Winter Canyon Yard Staging Area

Figure 6 - Sheet 16
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig_PCHTopangaSeg3_USACE_11x17_JD.mxd Date: 11/25/2019 24991



Legend

🟥 Delineation Area - PCH & Topanga Beach Drive Waterline Improvments (Segment 3)

Figure 6 - Sheet 17
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

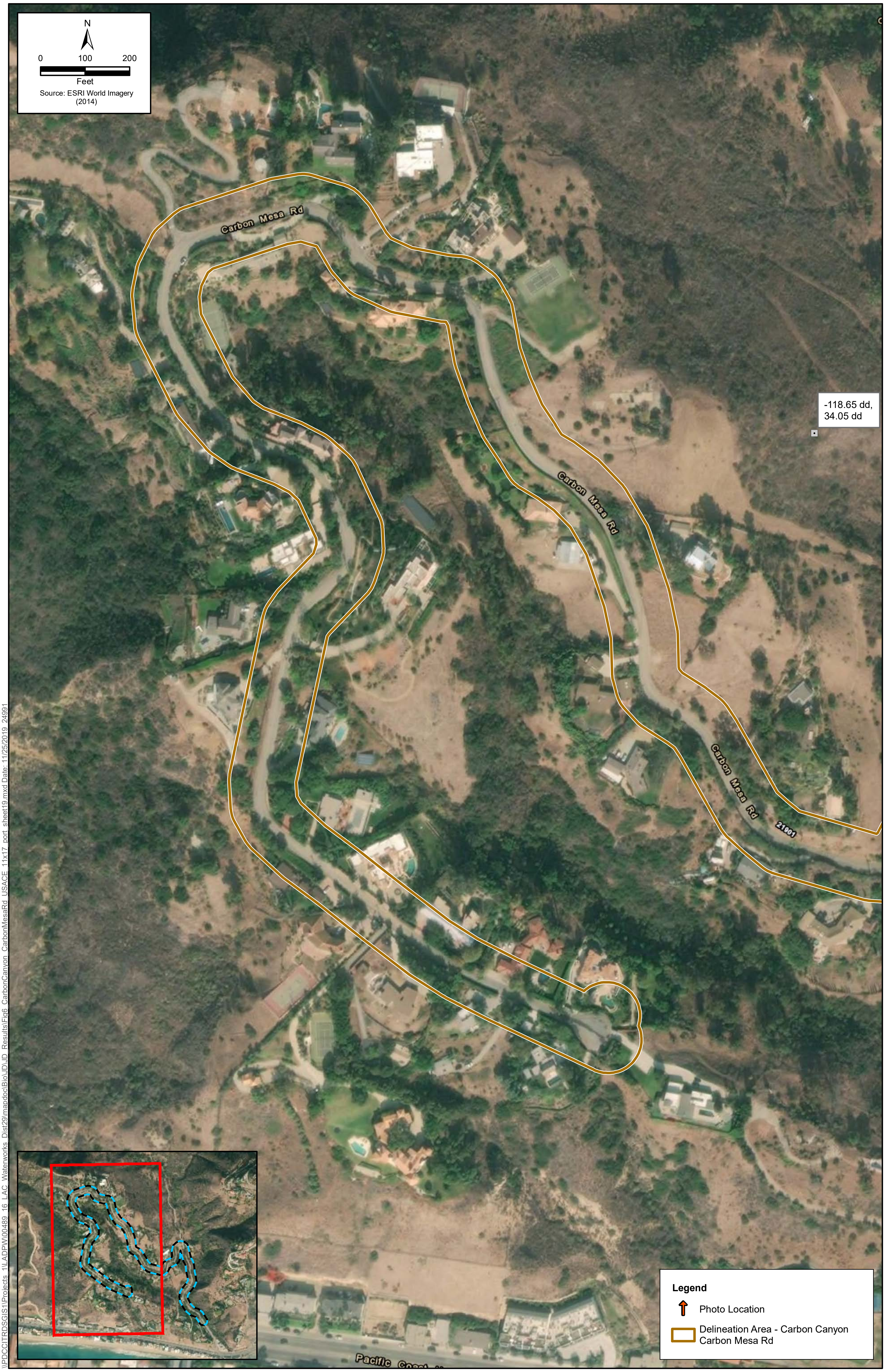
Legend

🟥 Delineation Area - PCH & Topanga Beach Drive Waterline Improvments (Segment 3)

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig PCHTopangaSeg3 USACE 11x17 JD.mxd Date: 11/25/2019 24991

Figure 6 - Sheet 18
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig6 CarbonCanyon CarbonMesaRd USACE 11x17 port sheet19.mxd Date: 11/25/2019 24991

Figure 6 - Sheet 19
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

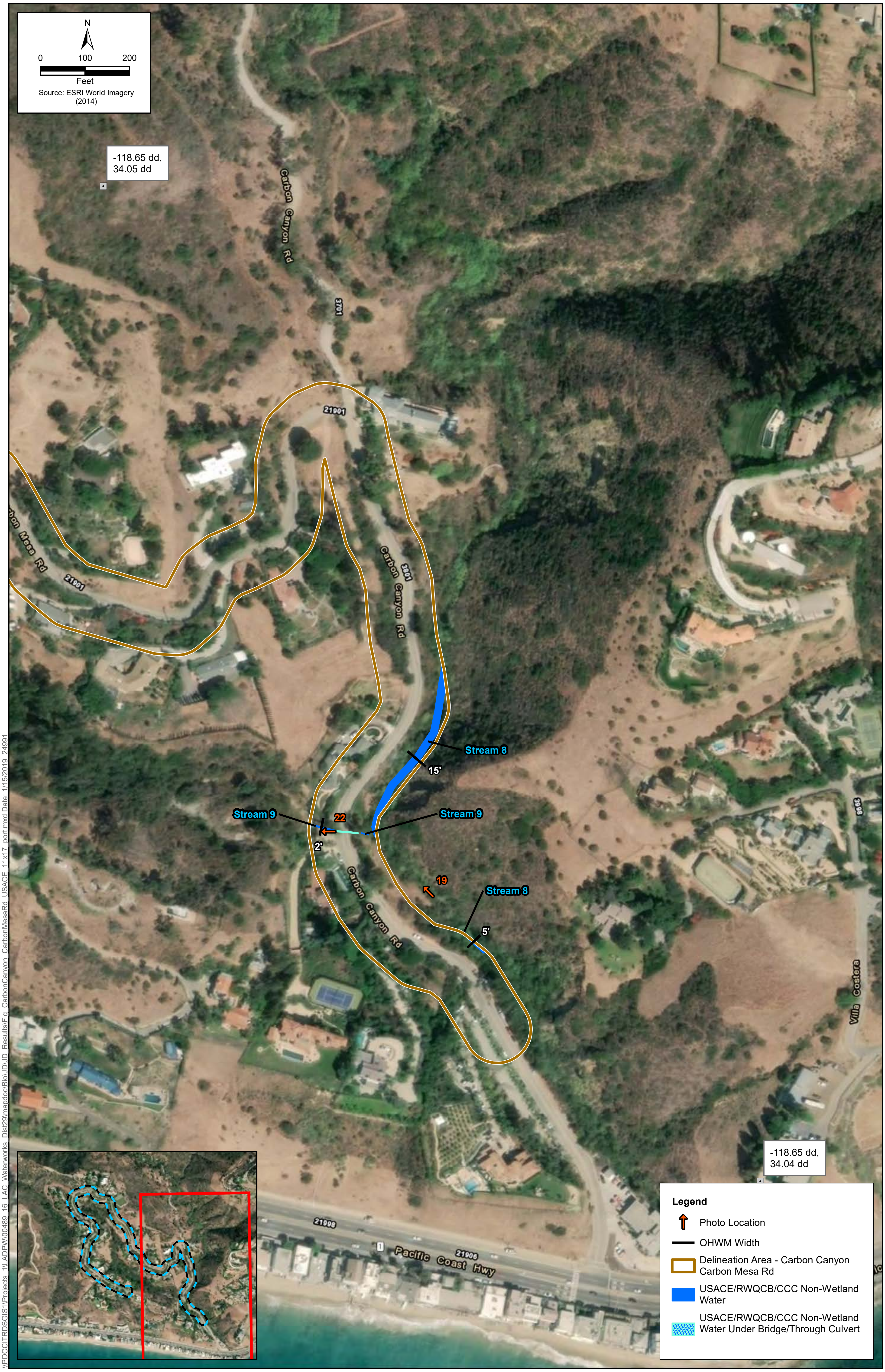


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Figure 6 - Sheet 20
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig CreekCrossing CoalCarbonCreek USACE JD.mxd Date: 1/11/2019 24991

Source: LACDPW (2017);
Bing Aerial (2017)

ICF

Figure 6 - Sheet 21
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

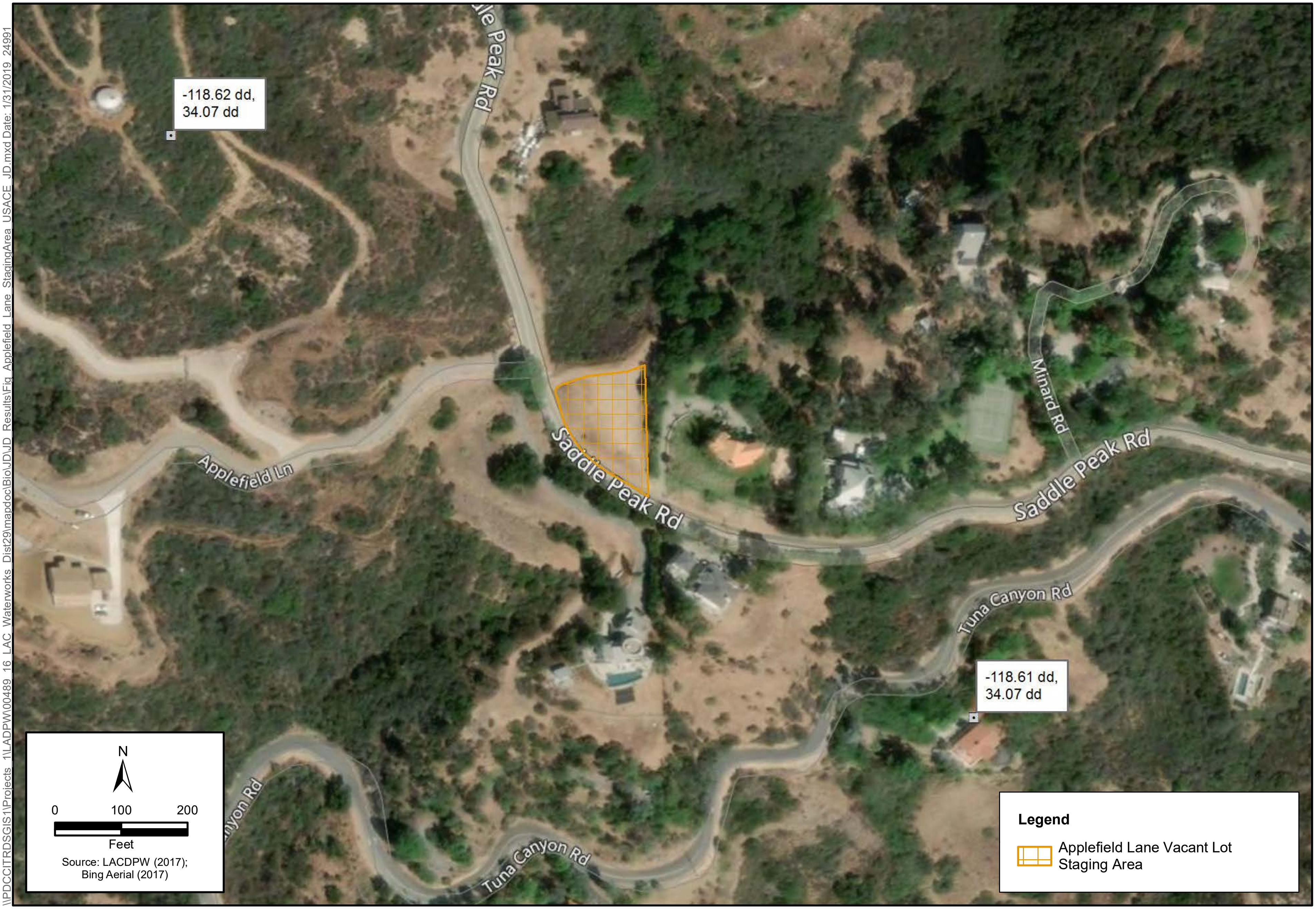
\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig6 PCHTopangaSeg2 USACE 11x17 JD Sheet22.mxd Date: 11/25/2019 24991

Figure 6 - Sheet 22
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig_CreekCrossing_LasFloresCanyonCreek_USACE_JD.mxd Date: 1/15/2019 24991

Figure 6 - Sheet 23
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig Applefield Lane StagingArea USACE JD.mxd Date: 1/31/2019 24991

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Figure 6 - Sheet 24
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig_Owen_Tank_StagingArea_USACE_JD.mxd Date: 1/31/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sheet 25
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sheet 26
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig06_BigRockBypass Improvements_USACE_11x17_land.mxd Date: 3/28/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sheet 27
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig06 PenaCanyonCreek USACE JD.mxd Date: 4/3/2019 24991

Source: LACDPW (2017);
Bing Aerial (2017)

Figure 6 - Sheet 28

USACE/RWQCB/CCC Potential Jurisdictional Resources

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig LasTunas Beach StagingArea USACE JD.mxd Date: 1/31/2019 24991

Source: LACDPW (2017);
Bing Aerial (2017)

Figure 6 - Sheet 29
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig06 PCHTopangaSeg1 USACE JD 11x17 land.mxd Date: 3/28/2019 24991

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Figure 6 - Sheet 30
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig TopangaCountyBeach StagingArea USACE JD.mxd Date: 1/31/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 6 - Sheet 31

USACE/RWQCB/CCC Potential Jurisdictional Resources

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017);
Bing Aerial (2017)

Figure 6 - Sheet 32
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig TopangaFieldYard StagingArea USACE JD.mxd Date: 1/31/2019 24991

Source: LACDPW (2017);
Bing Aerial (2017)

Figure 6 - Sheet 33
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig06 SunsetMesa Tank StagingArea USACE JD.mxd Date: 3/28/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

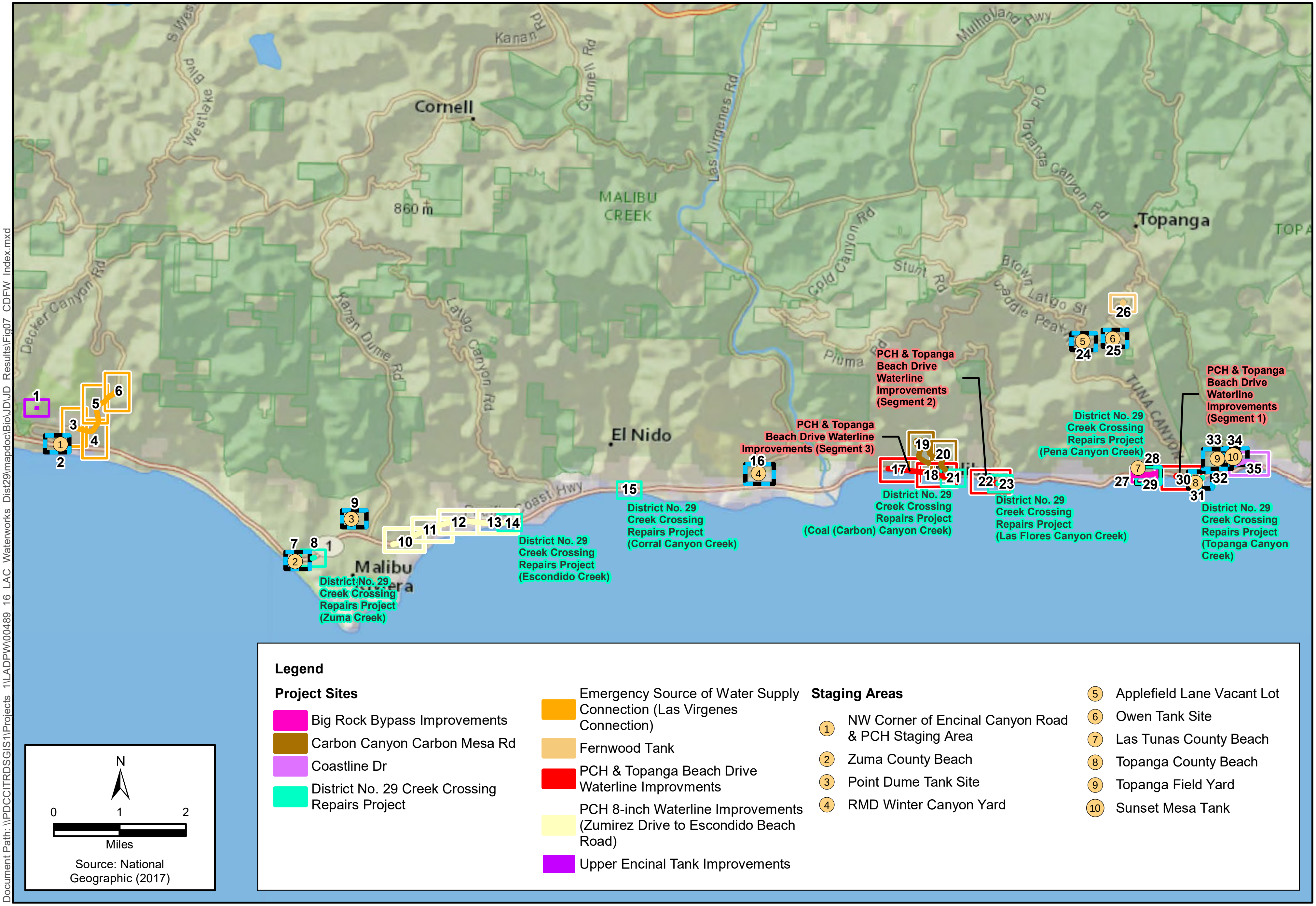
Figure 6 - Sheet 34

USACE/RWQCB/CCC Potential Jurisdictional Resources

Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig CoastlineDr USACE JD.mxd Date: 1/17/2019 24991

Figure 6 - Sheet 35
USACE/RWQCB/CCC Potential Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: National Geographic (2017)

Document Path: \\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JDJD Results\Fig07 CDFW Index.mxd

Figure 7 - Index Sheet
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig07 UpperEncinalTank CDFW Sheet1.mxd Date: 11/22/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 7 - Sheet 1

CDFW Jurisdictional Resources

Los Angeles County Waterworks District No.29 – Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JDJD Results\Fig07 UpperEncinalTank StagingArea CDFW Sheet2 .mxd Date: 11/26/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 7 - Sheet 2

CDFW Jurisdictional Resources

Los Angeles County Waterworks District No.29 – Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig05_Emergency_WaterSupply_CDFW_JD_11x17_portrait.mxd Date: 2/5/2019 24991

Figure 7 - Sheet 3
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

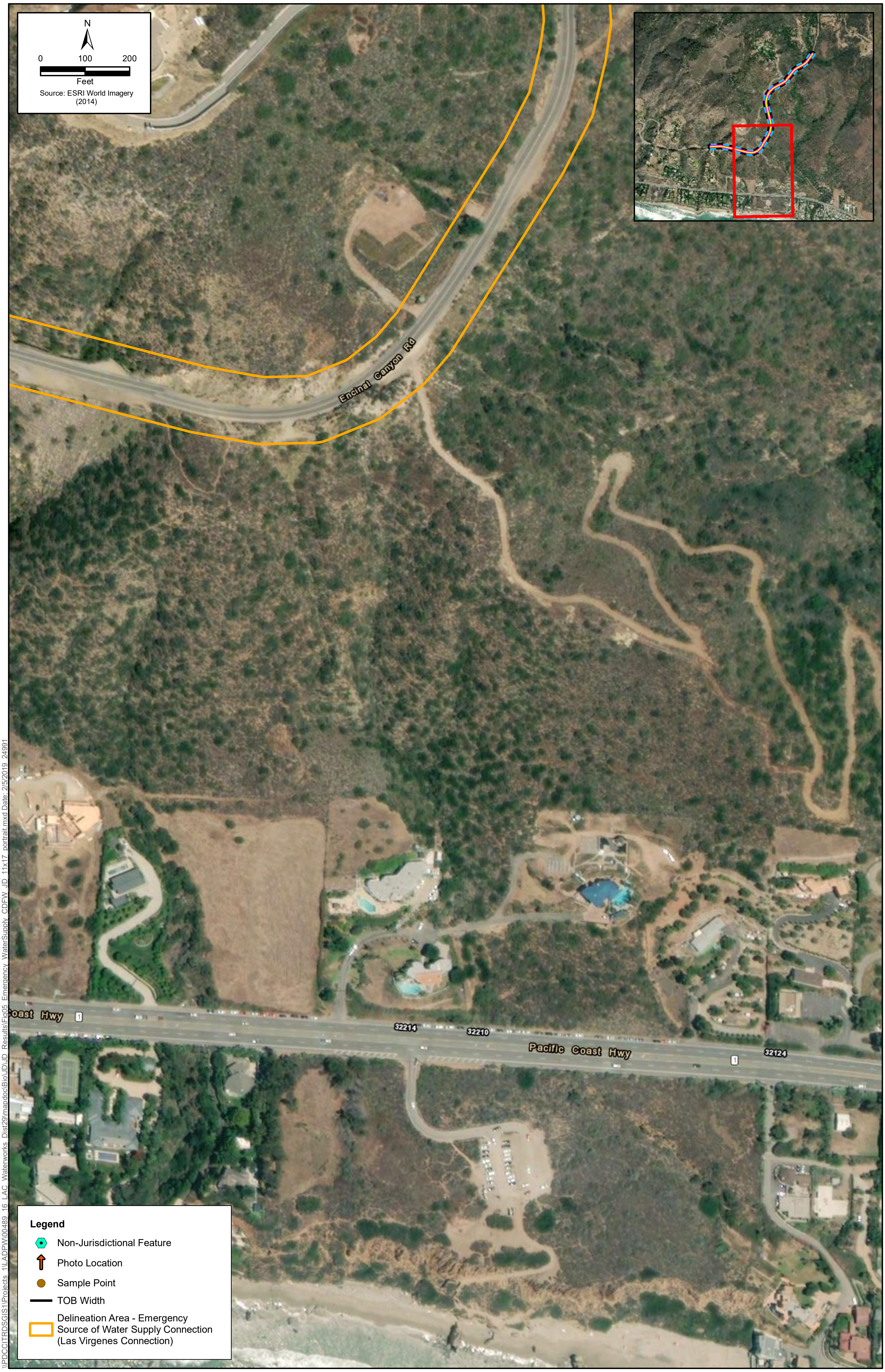


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Figure 7 - Sheet 4
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

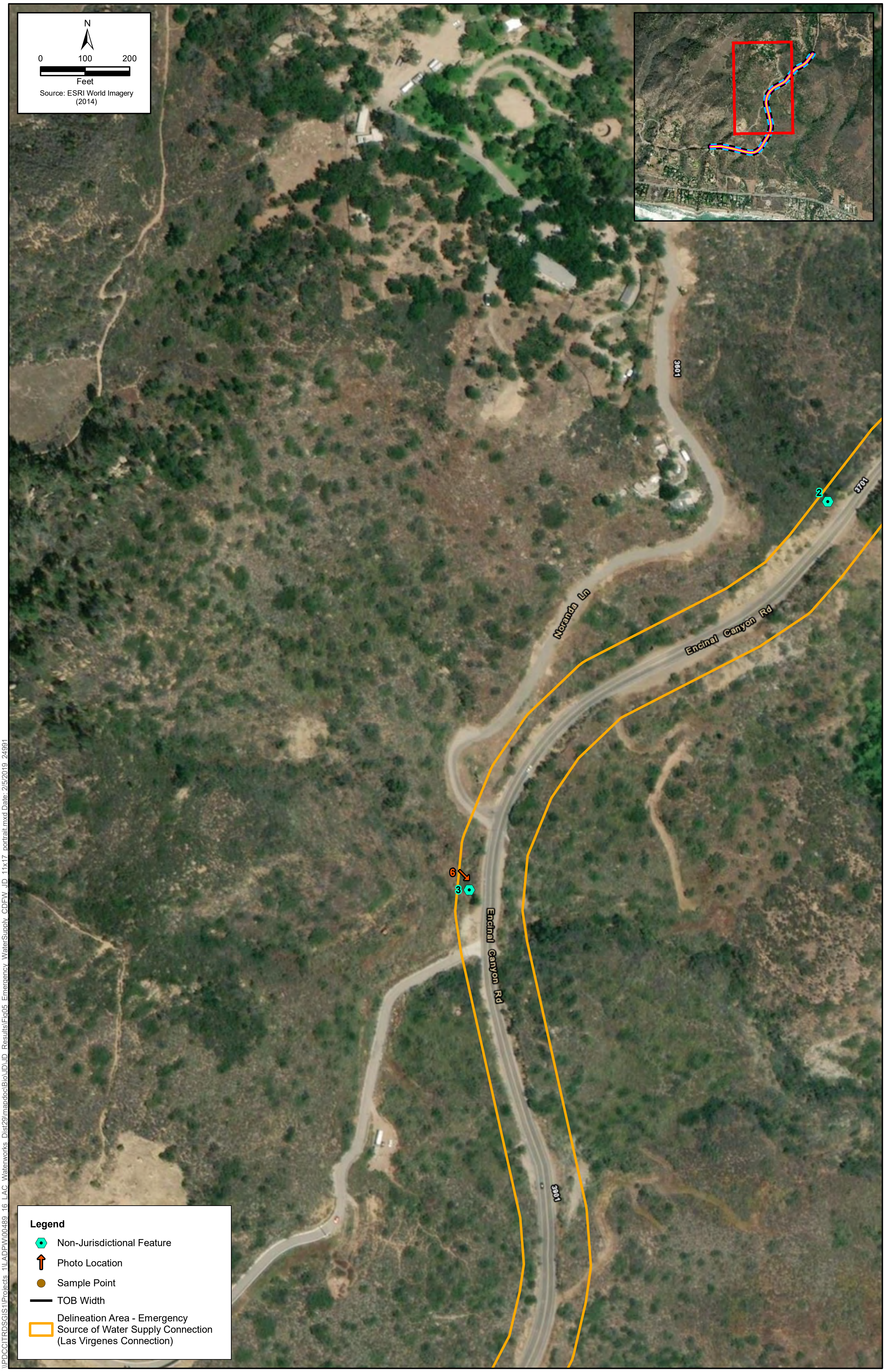

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Figure 7 - Sheet 5
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig05 Emergency WaterSupply CDFW JD 11x17 portrait.mxd Date: 4/3/2019 24991

Figure 7 - Sheet 6
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

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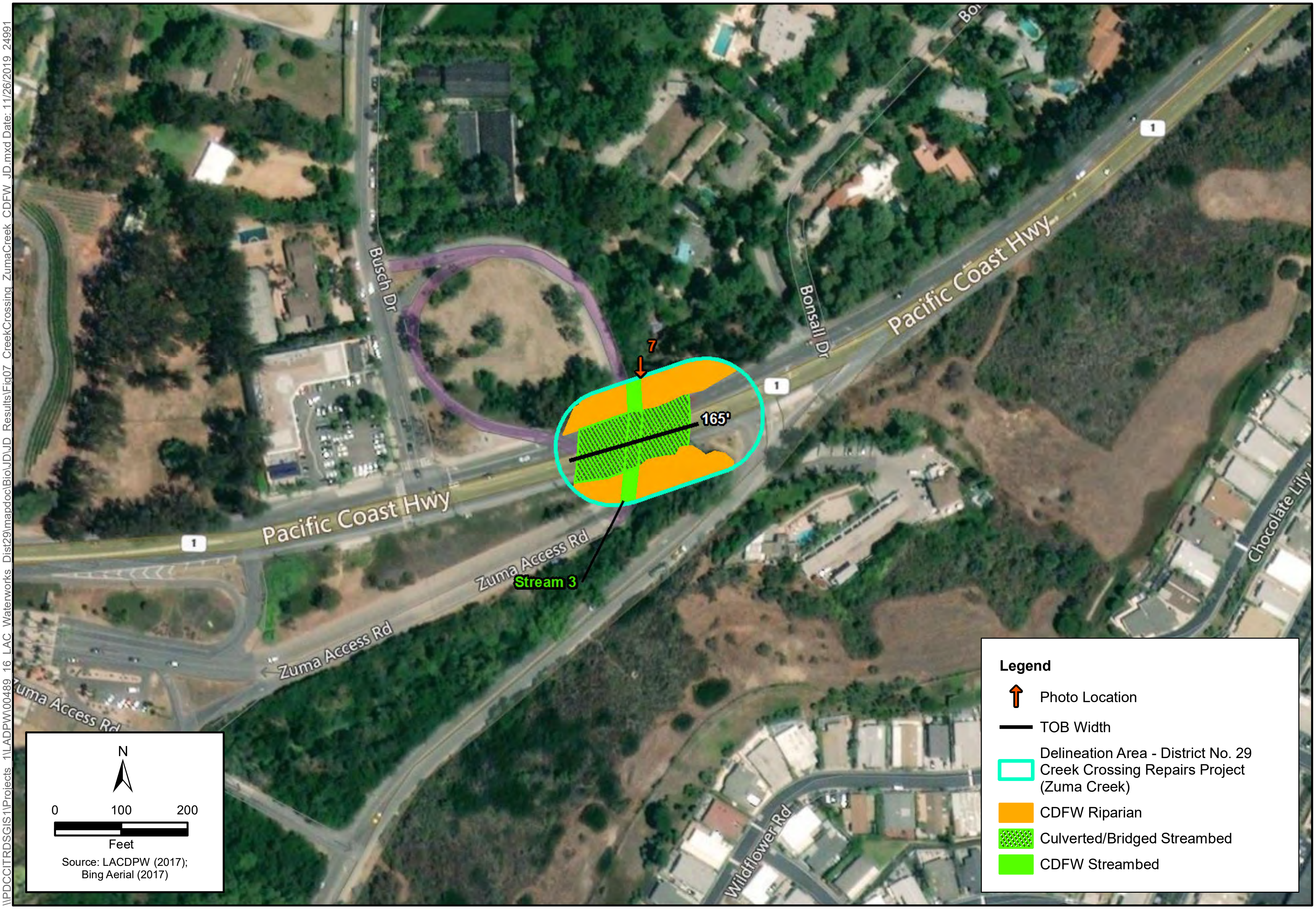
Source: LACDPW (2017); Bing Aerial (2017)

Figure 7 - Sheet 7
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

Legend

- ⇧ Photo Location
- — TOB Width
- ▭ Delineation Area - District No. 29 Creek Crossing Repairs Project (Zuma Creek)
- 🟧 CDFW Riparian
- ▨ Culverted/Bridged Streambed
- 🟩 CDFW Streambed

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig07_CreekCrossing_ZumaCreek_CDFW_JD.mxd Date: 11/26/2019 24991

Figure 7 - Sheet 8
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig Point Dume Tank StagingArea CDFW JD.mxd Date: 1/31/2019 24991

ICF

Figure 7 - Sheet 9
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

Legend

- ⬢ Non-Jurisdictional Feature
- ↑ Photo Location
- ☐ Delineation Area - PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig06 PCH8Inch CDFW JD 11x17 land.mxd Date: 2/5/2019 24991

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Figure 7 - Sheet 10
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig06 PCH8inch CDFW JD 11x17 land.mxd Date: 2/5/2019 24991

Figure 7 - Sheet 11
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig06 PCH8inch CDFW JD 11x17 land.mxd Date: 2/5/2019 24991

Figure 7 - Sheet 12
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig06_PCH8inch_CDFW_JD_11x17_land.mxd Date: 2/5/2019 24991

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Figure 7 - Sheet 13
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig CreekCrossing EscondidoCreek CDFW JD.mxd Date: 1/31/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 7 - Sheet 14
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig_CreekCrossing_CorralCanyonCreek_CDFW_JD.mxd Date: 1/31/2019 24991

Figure 7 - Sheet 15

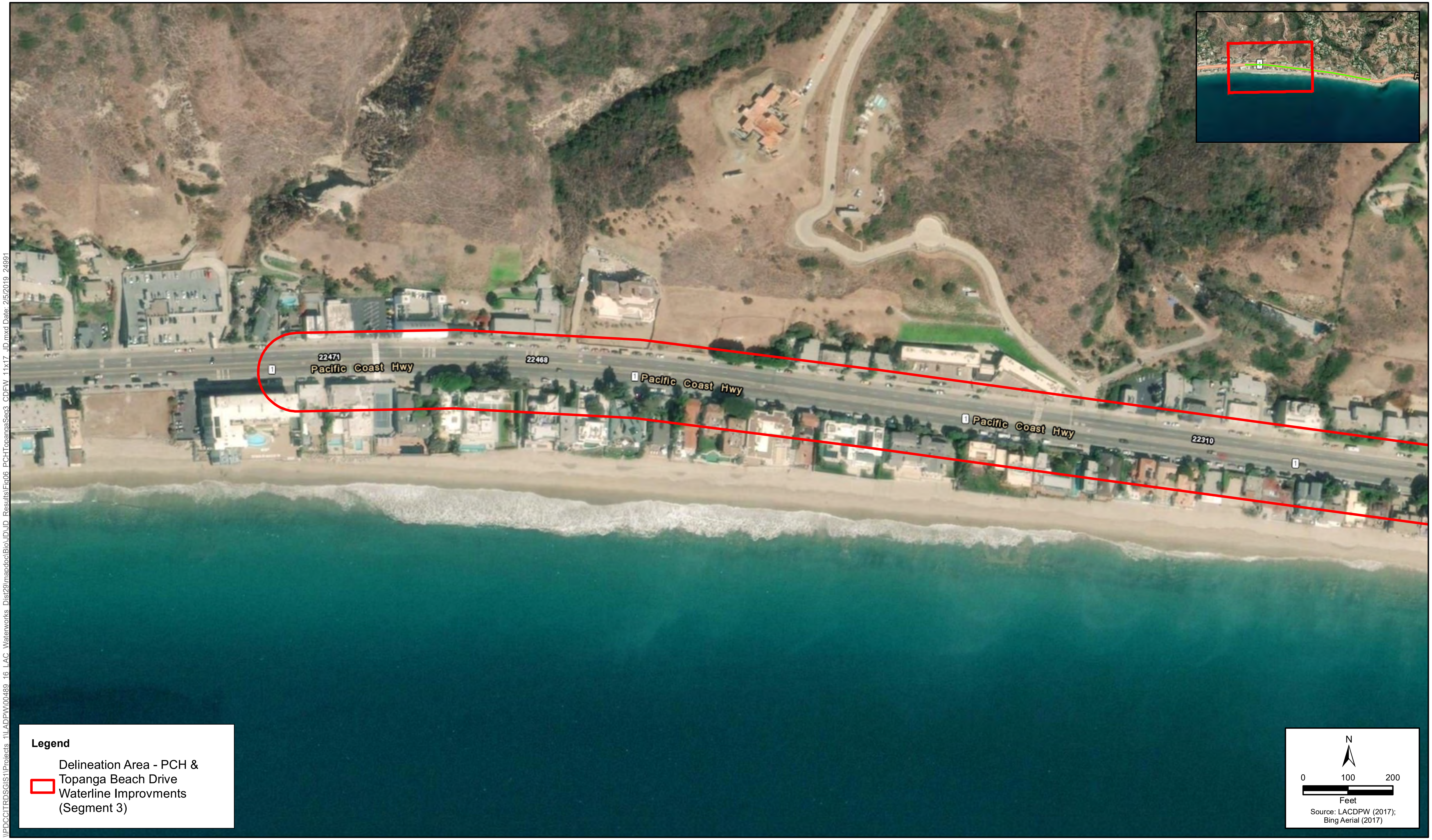
CDFW Jurisdictional Resources

Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig_RMD_WinterCanyon_StagingArea_CDFW_JD.mxd Date: 1/31/2019 24991

Figure 7 - Sheet 16
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements



Legend

🟥 Delineation Area - PCH & Topanga Beach Drive Waterline Improvments (Segment 3)

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig06 PCHTopangaSeg3 CDFW 11x17 JD.mxd Date: 2/5/2019 24991

Figure 7 - Sheet 17
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Legend

🟥 Delineation Area - PCH & Topanga Beach Drive Waterline Improvments (Segment 3)

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig06 PCHTopangaSeg3 CDFW 11x17 JD.mxd Date: 2/5/2019 24991

Figure 7 - Sheet 18
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 7 - Sheet 19
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

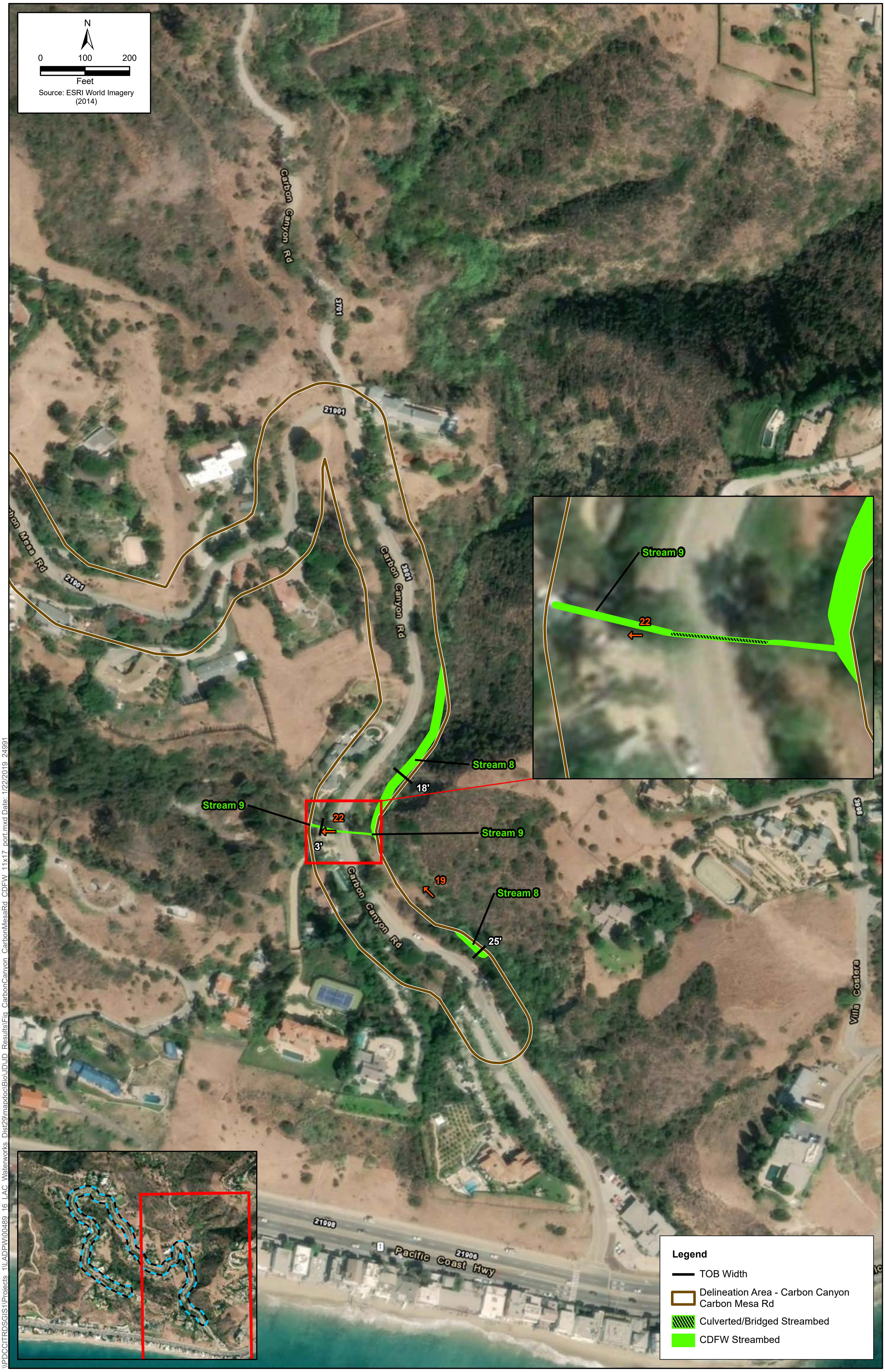

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Figure 7 - Sheet 20
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Figure 7 - Sheet 21
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig PCHTopangaSeg2 CDFW 11x17 JD.mxd Date: 1/16/2019 24991

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Figure 7 - Sheet 22
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

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Figure 7 - Sheet 23
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig_Applefield_Lane_StagingArea_CDFW_JD.mxd Date: 1/31/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

ICF

Figure 7 - Sheet 24
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig Owen Tank StagingArea CDFW JD.mxd Date: 1/31/2019 24991

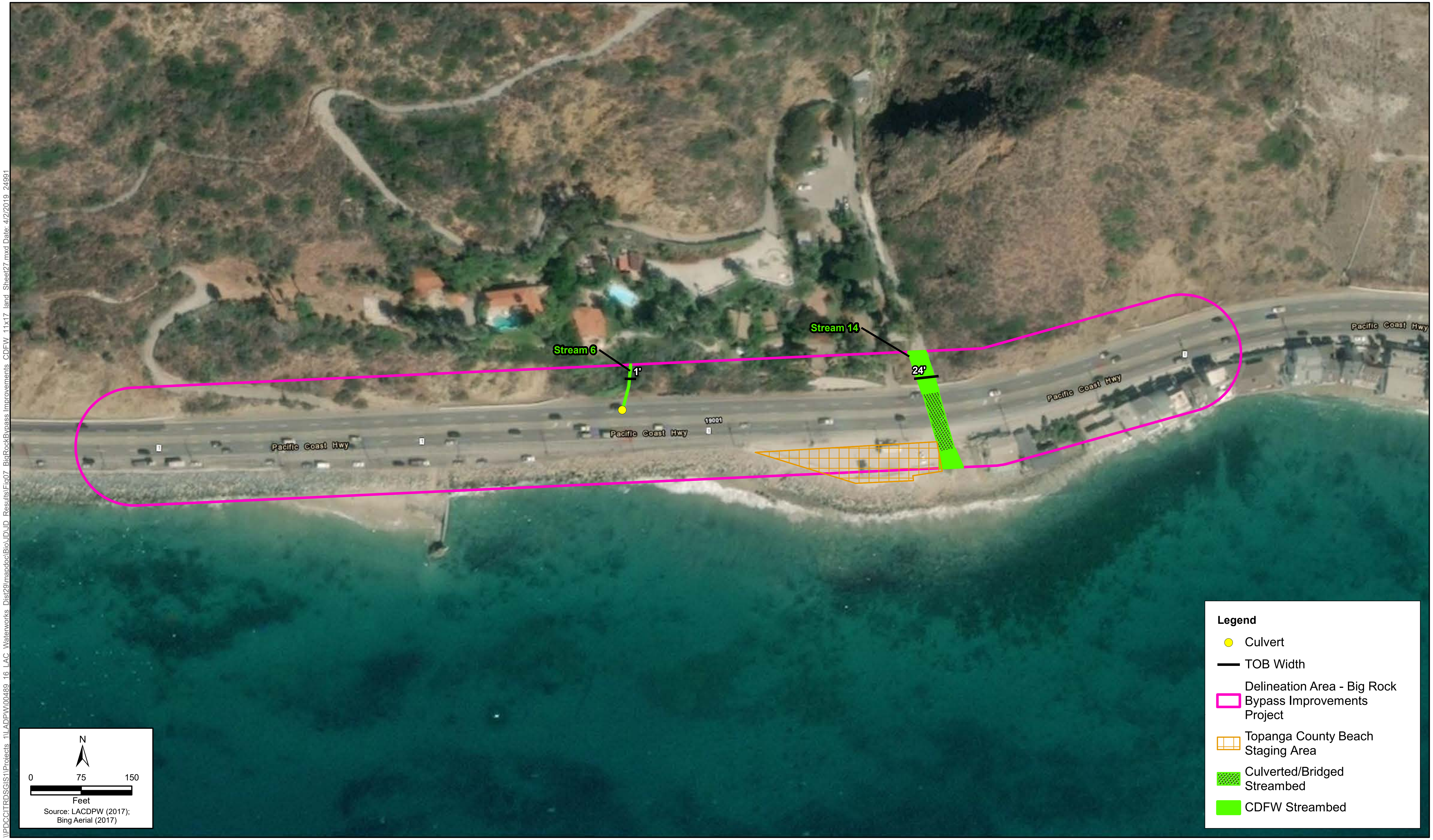
Source: LACDPW (2017);
Bing Aerial (2017)

Figure 7 - Sheet 25
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig FernwoodTank Improvements CDFW JD.mxd Date: 1/16/2019 24991

Figure 7 - Sheet 26
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements



Source: LACDPW (2017); Bing Aerial (2017)

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Figure 7 - Sheet 27

CDFW Jurisdictional Resources

Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

\PDCCITRDSGIS1\Projects 1\LADPW00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig07 PenaCanyonCreek CDFW JD Sheet26.mxd Date: 4/2/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 7 - Sheet 28
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects 1\LADPW\00489 16 LAC Waterworks Dist29\mapdoc\Bio\JD\JD Results\Fig LasTunas Beach StagingArea CDFW JD.mxd Date: 1/31/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 7 - Sheet 29

CDFW Jurisdictional Resources

Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

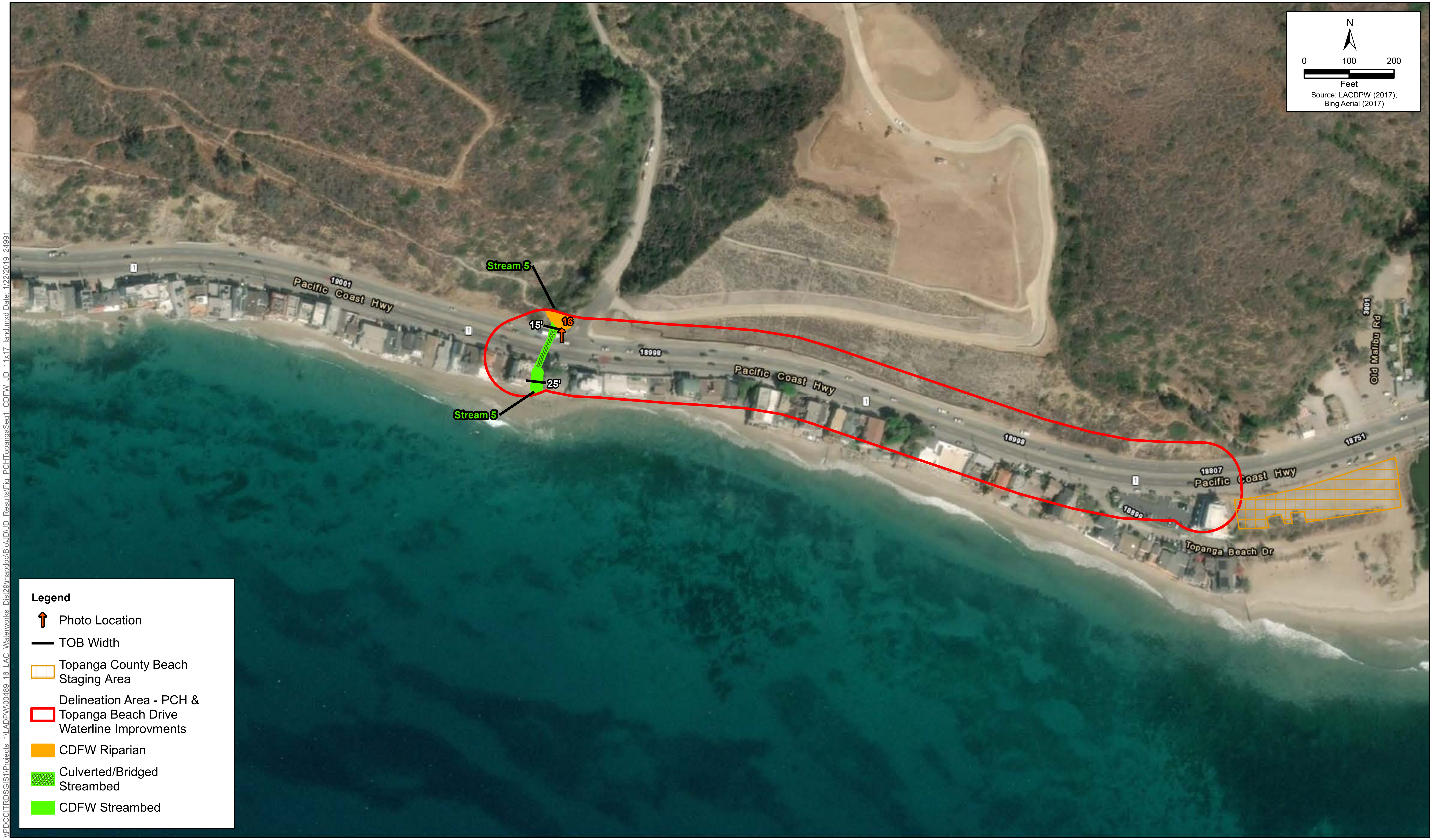

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Figure 7 - Sheet 30
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

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Figure 7 - Sheet 31
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

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Figure 7 - Sheet 32
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig_TopangaFieldYard_StagingArea_CDFW_JD.mxd Date: 1/31/2019 24991

Source: LACDPW (2017); Bing Aerial (2017)

Figure 7 - Sheet 33
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

Source: LACDPW (2017); Bing Aerial (2017)

\\PDCCITRDSGIS1\Projects_1\LADPW\00489_16_LAC_Waterworks_Dist29\mapdoc\Bio\JD\JD_Results\Fig07_SunsetMesa_Tank_StagingArea_CDFW_JD_sheet33.mxd Date: 4/3/2019 24991

ICF

Figure 7 - Sheet 34
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No.29 - Priority Capital Deficiencies Improvements

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ICF

Figure 7 - Sheet 35
CDFW Jurisdictional Resources
Los Angeles County Waterworks District No. 29 - Priority Capital Deficiencies Improvements

Appendix B

Site Photographs, November 2018

Appendix B - Photo log

Photograph # 2 (Figures 6 and 7, Sheet 5)

Project: Emergency Source of Water Supply Connection (Las Virgenes Connection)

Photo Date: November 8, 2018

Direction: South

Comment: Stream 1 facing downstream. Stream flows under Encinal Canyon Road through a 10-foot rock lined culvert. OHWM and TOB are delineated by the wing walls.

Photograph # 3 (Figures 6 and 7, Sheet 5)

Project: Emergency Source of Water Supply Connection (Las Virgenes Connection)

Photo Date: November 8, 2018

Direction: Northwest

Comment: Non-JD feature. Feature is erosional strictly capturing runoff originating from Encinal Canyon Road. Flows appear to be directed towards Stream 1.

Photograph # 4 (Figures 6 and 7, Sheet 5)

Project: Emergency Source of Water Supply Connection (Las Virgenes Connection)

Photo Date: November 8, 2018

Direction: Northwest

Comment: Stream 2 facing downstream. Stream flows under Encinal Canyon Road through a 36-inch corrugated metal pipe.

	Photograph # 6 (Figure 6 and 7, Sheet 4) Project: Emergency Source of Water Supply Connection (Las Virgenes Connection) Photo Date: November 8, 2018 Direction: Southeast Comment: Non-JD feature. 36-inch riser located at the bottom of the road embankment. Likely captures road runoff and any flows from the surrounding hills. No evidence of OHWM, bed and bank, or surface waters.
	Photograph # 7 (Figures 6 and 7, Sheet 7) Project: District No. 29 Creek Crossing Repair Photo Date: November 8, 2018 Direction: South Comment: Stream 3 is Zuma Canyon Creek. Photo faces downstream. Within the survey area, Zuma Canyon Creek sheet flows along Zuma Access Road, under PCH. There is evidence of sediment buildup along the road edges as well as evidence of a newly cut flow path on the bank on the channel downstream (south) of PCH.
	Photograph # 12 (Figures 6 and 7, Sheets 33 and 34) Staging Area: Sunset Mesa Tank (#10) Photo Date: November 8, 2018 Direction: East Comment: Non-JD feature. Concrete ditch/walkway that resembles a stream in aerial imagery.

Photograph # 13 (Figures 6 and 7, Sheet 31)

Project: District No. 29 Creek Crossing Repair

Photo Date: November 8, 2018

Direction: North

Comment: Stream 4 (Topanga Canyon Creek) facing upstream. Stream banks are heavily infested by arundo.

Photograph # 14 (Figures 6 and 7, Sheet 31)

Project: District No. 29 Creek Crossing Repair

Photo Date: November 8, 2018

Direction: South

Comment: Stream 4 (Topanga Canyon Creek) facing downstream as stream outlets into the Pacific Ocean.

Photograph # 16 (Figures 6 and 7, Sheet 29)

Project: PCH & Topanga Beach Drive Waterline Improvements

Photo Date: November 8, 2018

Direction: North

Comment: Stream 5 (Tuna Canyon Creek) facing upstream. Stream flows under PCH and then outlets into the Pacific Ocean. Dense riparian vegetation present on the banks. This stream does not appear to be subject to the ebb and flows of the tides.

	Photograph # 17 (Figures 6 and 7, Sheet 22) Project: District No. 29 Creek Crossing Repair Photo Date: November 8, 2018 Direction: North Comment: Stream 7 (Las Flores Creek) facing upstream. Wide stream flows under PCH and then outlets into the Pacific Ocean. Wetland vegetation established in the channel and below the OHWM. Limits of this stream are defined based on the concrete wingwalls. This stream does not appear to be subject to the ebb and flows of the tides.
	Photograph # 19 (Figures 6 and 7, Sheet 19) Projects: Carbon Canyon Road & Carbon Mesa Road Waterline Improvements and District No. 29 Creek Crossing Repair Photo Date: November 8, 2018 Direction: Northwest Comment: Stream 8 (Carbon Canyon Creek) facing upstream. Stream is relatively undisturbed; however it is located near manufactured slopes and is heavily infested with pampas grass.
	Photograph # 22 (Figures 6 and 7, Sheet 19) Project: Carbon Canyon Road & Carbon Mesa Road Waterline Improvements Photo Date: November 8, 2018 Direction: North Comment: Stream 9 facing upstream. This stream is an unnamed tributary to Stream 8 (Carbon Canyon Creek) and likely only flows during and immediately after rain events. Stream flows through the backyard of the adjacent residence.

	Photograph # 24 (Figures 4 and 5, Sheet 14) Project: District No. 29 Creek Crossing Repair Photo Date: November 8, 2018 Direction: South Comment: Stream 10 (Corral Canyon Creek) facing downstream towards PCH. Stream flows under PCH and then flows into the Pacific Ocean. Sample point does not appear to be subject to the ebb and flows of the tide. Stream 10 supports adjacent wetlands.
	Photograph # 25 (Figures 6 and 7, Sheets 12 and 13) Projects: District No. 29 Creek Crossing Repair and PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Photo Date: November 8, 2018 Direction: North Comment: Stream 11 facing upstream and north of PCH. Flows pond under the bridge and backup due to sand berm located at downstream end of stream.
	Photograph # 28 (Figures 6 and 7, Sheets 10 and 11) Project: PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road) Photo Date: November 8, 2018 Direction: North Comment: Non-JD feature. Water quality feature with concrete riser located at low point and adjacent to PCH embankment. Likely captures road runoff and any flows from the surrounding hills.

Appendix C

Arid West Ordinary High Water Mark Data Forms

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: LACDPW - Waterworks	**Date:** 11/8/18	**Time:** 0826
Project Number:	**Town:** Malibu	**State:** CA
Stream: Stream 1	**Photo begin file#:** 1	**Photo end file#:** 2
Investigator(s): M. Guerrero, K. Klinefelter		

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
Stream 1, Transect 1

Projection: **Datum:**
Coordinates: 34.051320, -118.872394

Potential anthropogenic influences on the channel system:

stream occurs in the canyon of a relatively undeveloped watershed. However the stream runs parallel to Encinal Canyon Rd and likely receives substantial road runoff during rains. Flows through large culvert under 2 lane road.

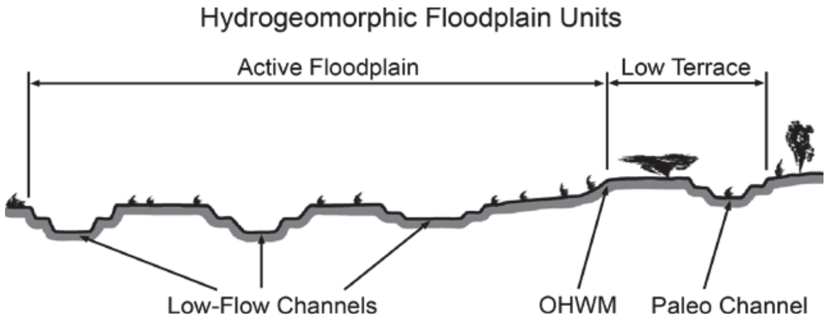
Brief site description:

sample point taken upstream of large road culvert. Long wingwall that runs parallel to the road for a distance of ~ 50 feet.

Checklist of resources (if available):

☒ Aerial photography
Dates:
☒ Topographic maps
☐ Geologic maps
☒ Vegetation maps
☒ Soils maps
☐ Rainfall/precipitation maps
☐ Existing delineation(s) for site
☒ Global positioning system (GPS)
☐ Other studies

☐ Stream gage data
Gage number:
Period of record:
☐ History of recent effective discharges
☐ Results of flood frequency analysis
☐ Most recent shift-adjusted rating
☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

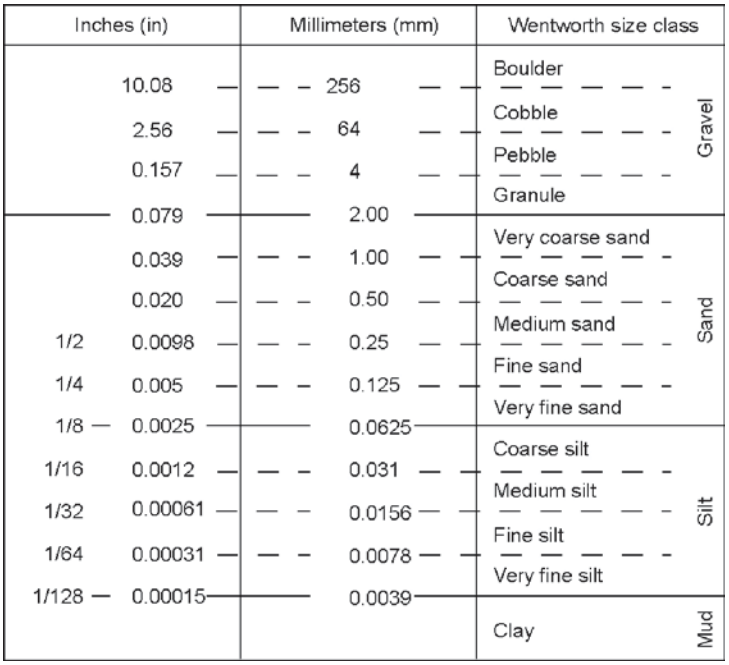


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

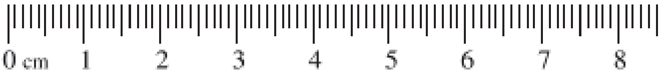
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph ☒ GPS
☐ Digitized on computer ☐ Other:

Wentworth Size Classes



Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: **Cross section ID:** T1 **Date:** 11/8/18 **Time:** 0826

Cross section drawing:

OHWM

GPS point: T1

Indicators:

☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover
☒ Break in bank slope
☒ Other: staining on wing walls
☐ Other: ____

Comments:

Clear break in slope. Channel is relatively vegetated with well developed grasses and willow shrubs on the bank. OHWM located below the well developed vegetation.

Floodplain unit:

☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____

Characteristics of the floodplain unit:

Average sediment texture: silty
Total veg cover: 0 % Tree: ____% Shrub: ____% Herb: ____%
Community successional stage:

☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: ____
☐ Other: ____
☐ Other: ____

Comments:

Project ID: **Cross section ID:** T1 **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:

Average sediment texture: silty

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: ____________________
☐ Other: ____________________
☐ Other: ____________________

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:

Average sediment texture: ___________________

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: ____________________
☐ Other: ____________________
☐ Other: ____________________

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: LACDPW - Waterworks
Project Number:
Stream: Stream 3, Zuma
Investigator(s): M. Guerrero, K. Klinefelter

Date: 11/8/18
Time: 1030
Town: Malibu
State: CA
Photo begin file#: 7
Photo end file#:

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
Stream 3 - Transect 2

Projection:
Datum:
Coordinates: 34.0127136, -118.817311

Potential anthropogenic influences on the channel system:

Flows under 4 lane Pacific Coast Highway.

Brief site description:

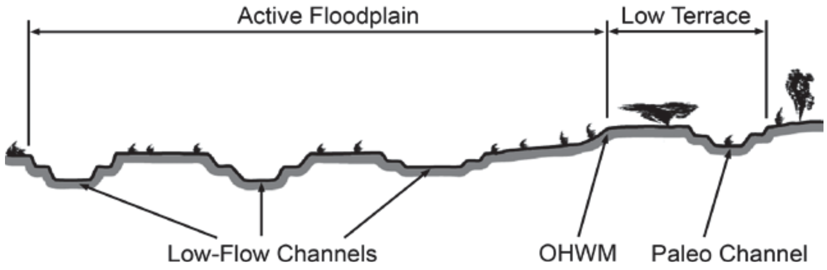
Upstream of survey area water flows in the channel; however due to debris buildup the stream likely jumps out of the channel and flows on the Zuma Access Rd. There is evidence that after storm events the access road is cleared and a channel cut to get flows back into the downstream stream channel.

Checklist of resources (if available):

☒ Aerial photography
Dates:
☒ Topographic maps
☐ Geologic maps
☒ Vegetation maps
☒ Soils maps
☐ Rainfall/precipitation maps
☐ Existing delineation(s) for site
☒ Global positioning system (GPS)
☐ Other studies

☐ Stream gage data
Gage number:
Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

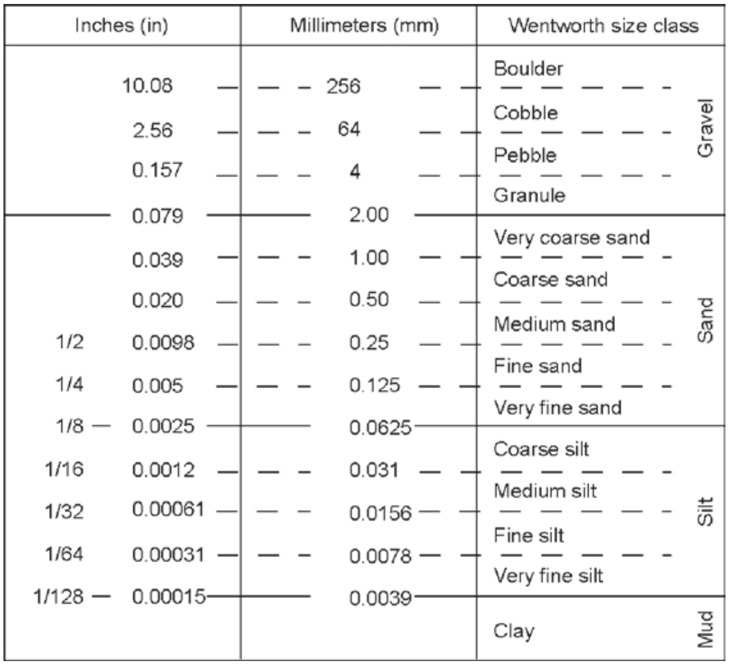


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

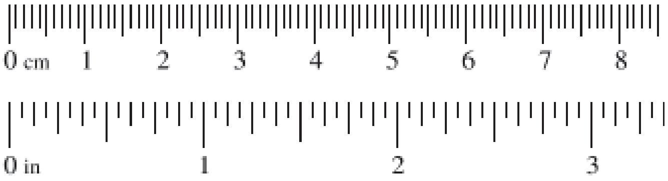
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph
☒ GPS
☐ Digitized on computer
☐ Other:

Wentworth Size Classes

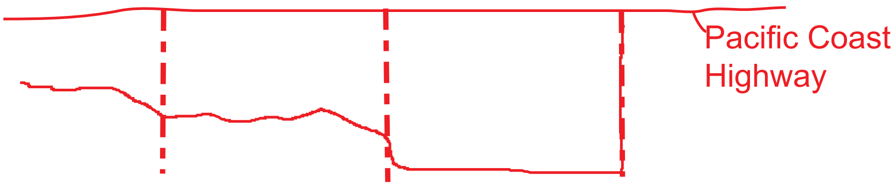


Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: **Cross section ID:** T2 **Date:** 11/8/18 **Time:** 1030

Cross section drawing:



OHWM

GPS point: T1

Indicators:

☒ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover
☒ Break in bank slope
☐ Other: ____________
☐ Other: ____________

Comments:

Water sheet flows under PCH and along the Zuma Access Road. About 20 feet upstream of the survey boundary water is in channel (adj. to Zuma Access road), water jumps out of the channel and sheet flows in the access road until it flows back into the channel. Water likely historically flowed to the north (left) of the access road, however due to vegetation growth, debris buildup and sediment deposition, water can no longer flow there.

Floodplain unit:

☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________

Characteristics of the floodplain unit:

Average sediment texture: silty
Total veg cover: 0 % Tree: ____% Shrub: ____% Herb: ____%
Community successional stage:

☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: ____________
☐ Other: ____________
☐ Other: ____________

Comments:

Project ID: **Cross section ID:** T2 **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:

Average sediment texture: silty

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____________________
- ☐ Other: ____________________
- ☐ Other: ____________________

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:

Average sediment texture: __________________

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____________________
- ☐ Other: ____________________
- ☐ Other: ____________________

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: LACDPW - Waterworks	**Date:** 11/8/18	**Time:** 1320
Project Number:	**Town:** Malibu	**State:** CA
Stream: Stream 4, Topanga Canyon Creek	**Photo begin file#:** 13	**Photo end file#:** 14
Investigator(s): M. Guerrero, K. Klinefelter		

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
Stream 4 - Transect 3

Projection: **Datum:**

Coordinates: 34.039316, -118.583168

Potential anthropogenic influences on the channel system:

Flows under 4 lane Pacific Coast Highway.

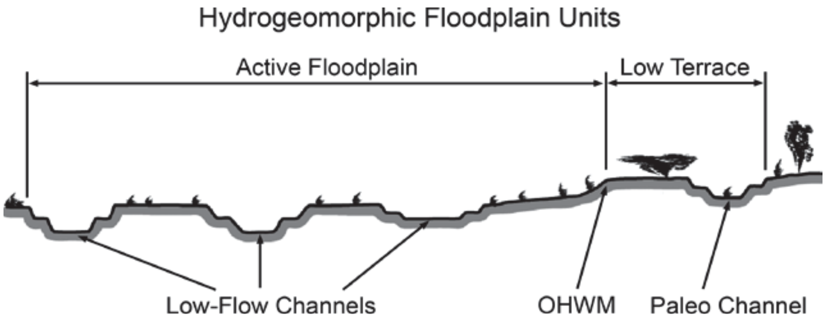
Brief site description:

Large stream that flows under PCH. Water is backed up due to sand plug at river mouth and ponded under the bridge.

Checklist of resources (if available):

☒ Aerial photography
Dates:
☒ Topographic maps
☐ Geologic maps
☒ Vegetation maps
☒ Soils maps
☐ Rainfall/precipitation maps
☐ Existing delineation(s) for site
☒ Global positioning system (GPS)
☐ Other studies

☐ Stream gage data
Gage number:
Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

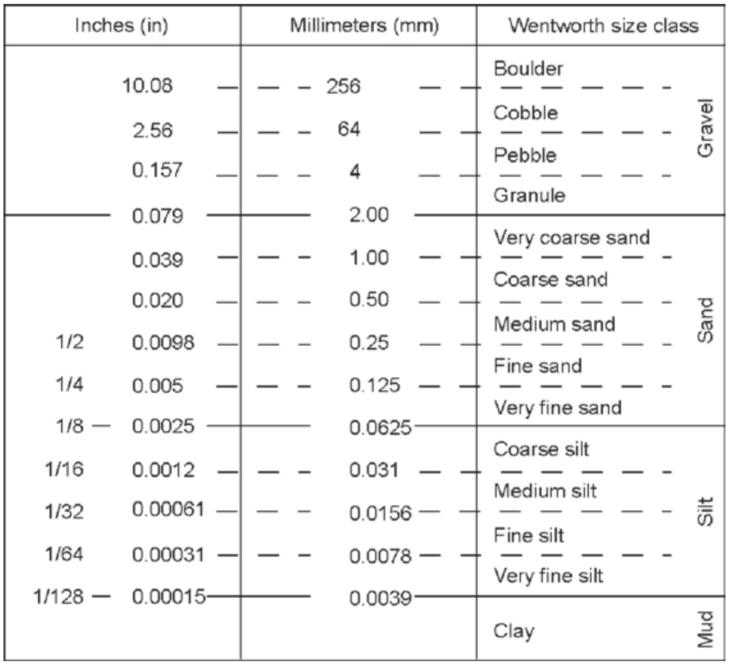


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

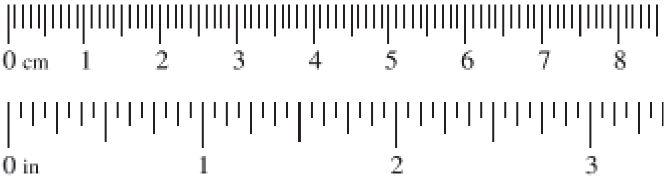
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph ☒ GPS
☐ Digitized on computer ☐ Other:

Wentworth Size Classes

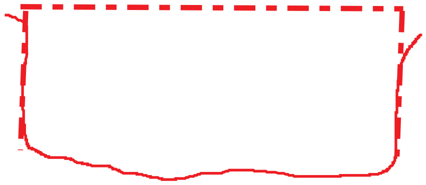


Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: **Cross section ID:** T3 **Date:** 11/8/18 **Time:** 1320

Cross section drawing:



OHWM

GPS point: T3

Indicators:

☒ Change in average sediment texture	☒ Break in bank slope
☐ Change in vegetation species	☒ Other: water staining on piles and wingwalls
☒ Change in vegetation cover	☐ Other: ______

Comments:

OHWM clearly defined based on bridge wingwalls and staining on the walls. Sample location taken upstream of bridge. Ponded water with scattered arundo in and along the edges of the channel. OHWM and TOB are the same at this site due to wingwalls.

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ______

Characteristics of the floodplain unit:

Average sediment texture: silty

Total veg cover: 0 % Tree: ___% Shrub: ___% Herb: ___%

Community successional stage:

☐ NA	☐ Mid (herbaceous, shrubs, saplings)
☐ Early (herbaceous & seedlings)	☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks	☐ Soil development
☐ Ripples	☐ Surface relief
☐ Drift and/or debris	☐ Other: ______
☐ Presence of bed and bank	☐ Other: ______
☐ Benches	☐ Other: ______

Comments:

Project ID: **Cross section ID:** T3 **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:

Average sediment texture: silty

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: _____________________
☐ Other: _____________________
☐ Other: _____________________

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:

Average sediment texture: ___________________

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: _____________________
☐ Other: _____________________
☐ Other: _____________________

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: LACDPW - Waterworks
Project Number:
Stream: Stream 5, Tuna Canyon
Investigator(s): M. Guerrero, K. Klinefelter

Date: 11/8/18
Time: 1344
Town: Malibu
State: CA
Photo begin file#: 15
Photo end file#: 16

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
Stream 5 - Transect 4

Projection:
Datum:
Coordinates: 34.039584 -118.589616

Potential anthropogenic influences on the channel system:

Confined channel due to bridge crossing. Likely receives road runoff.

Brief site description:

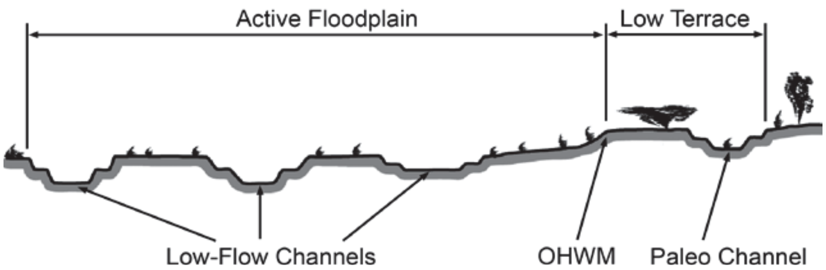
PCH Bridge Crossing

Checklist of resources (if available):

☒ Aerial photography
Dates:
☒ Topographic maps
☐ Geologic maps
☒ Vegetation maps
☒ Soils maps
☐ Rainfall/precipitation maps
☐ Existing delineation(s) for site
☒ Global positioning system (GPS)
☐ Other studies

☐ Stream gage data
Gage number:
Period of record:
☐ History of recent effective discharges
☐ Results of flood frequency analysis
☐ Most recent shift-adjusted rating
☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

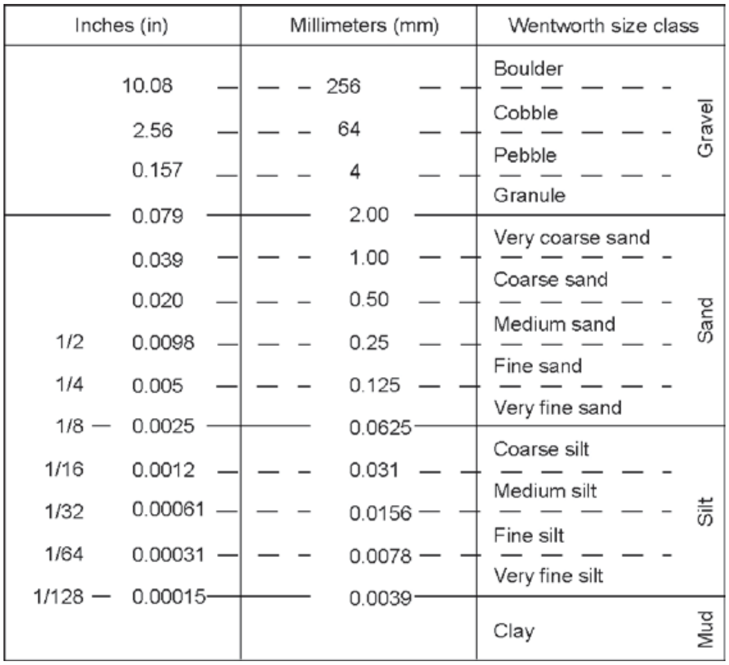


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

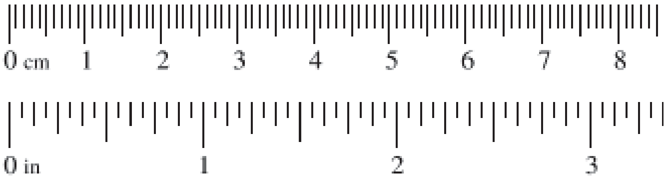
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph
☒ GPS
☐ Digitized on computer
☐ Other:

Wentworth Size Classes



Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: **Cross section ID:** T4 **Date:** 11/8/18 **Time:** 1344

Cross section drawing:

OHWM

GPS point: T4

Indicators:

☐ Change in average sediment texture
☒ Change in vegetation species
☒ Change in vegetation cover
☒ Break in bank slope
☒ Other: water staining on rocks
☒ Other: clear line impressed on the bank

Comments:

Floodplain unit:

☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: __________

Characteristics of the floodplain unit:

Average sediment texture: silty
Total veg cover: 0 % Tree: ____% Shrub: ____% Herb: ____%
Community successional stage:

☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: __________
☐ Other: __________
☐ Other: __________

Comments:

Project ID: **Cross section ID:** T4 **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:
Average sediment texture: silty
Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%
Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____________________
- ☐ Other: _____________________
- ☐ Other: _____________________

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:
Average sediment texture: ___________________
Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%
Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____________________
- ☐ Other: _____________________
- ☐ Other: _____________________

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: LACDPW - Waterworks
Project Number:
Stream: Stream 8, Carbon Canyon Creek
Investigator(s): M. Guerrero, K. Klinefelter

Date: 11/8/18
Town: Malibu
Photo begin file#: 19

Time: 1500
State: CA
Photo end file#: 21

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
Stream 8 - Transect 5

Projection:
Datum:
Coordinates: 34.040609, -118.651519

Potential anthropogenic influences on the channel system:

urban runoff from adjacent developments.

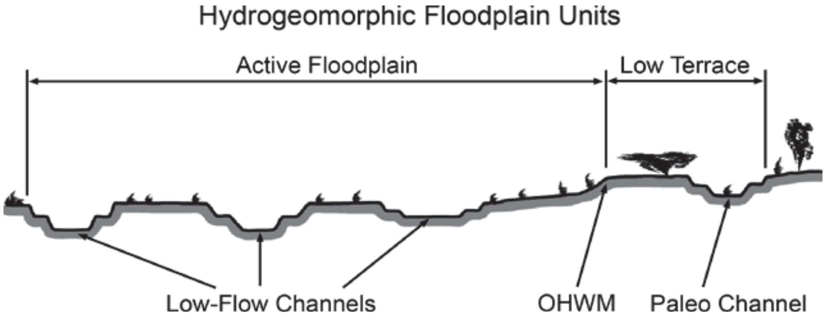
Brief site description:

located in the bottom of a canyon in a small community. Relatively undisturbed but is surrounded by manufactured slopes - full of pampas grass and ice plant.

Checklist of resources (if available):

☒ Aerial photography
Dates:
☒ Topographic maps
☐ Geologic maps
☒ Vegetation maps
☒ Soils maps
☐ Rainfall/precipitation maps
☐ Existing delineation(s) for site
☒ Global positioning system (GPS)
☐ Other studies

☐ Stream gage data
Gage number:
Period of record:
☐ History of recent effective discharges
☐ Results of flood frequency analysis
☐ Most recent shift-adjusted rating
☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

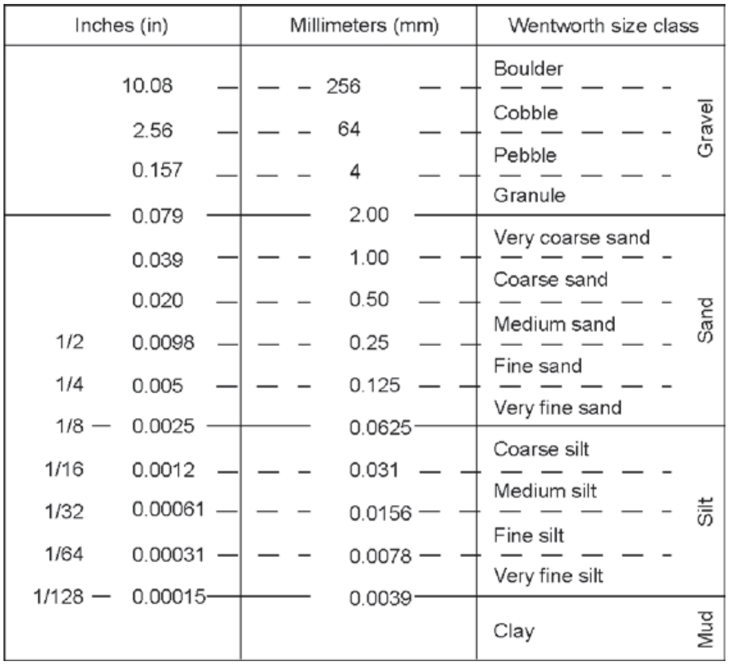


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

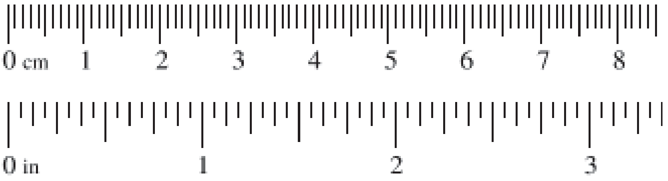
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph ☒ GPS
☐ Digitized on computer ☐ Other:

Wentworth Size Classes

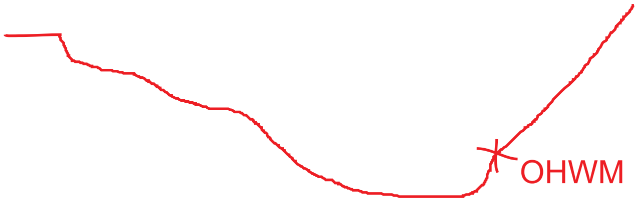


Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: **Cross section ID:** T5 **Date:** 11/8/18 **Time:** 1500

Cross section drawing:



OHWM

GPS point: T5

Indicators:

☐ Change in average sediment texture
☒ Change in vegetation species
☒ Change in vegetation cover
☒ Break in bank slope
☒ Other: water staining on rocks
☒ Other: clear line impressed on the bank

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ________________________

Characteristics of the floodplain unit:

Average sediment texture: silty
Total veg cover: 0 % Tree: _____% Shrub: _____% Herb: _____%
Community successional stage:

☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: ____________________
☐ Other: ____________________
☐ Other: ____________________

Comments:

Project ID: **Cross section ID:** T5 **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:

Average sediment texture: silty

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____________________
- ☐ Other: _____________________
- ☐ Other: _____________________

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:

Average sediment texture: ___________________

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____________________
- ☐ Other: _____________________
- ☐ Other: _____________________

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: LACDPW - Waterworks
Project Number:
Stream: Stream 10, Corral Creek
Investigator(s): M. Guerrero, K. Klinefelter

Date: 11/8/18
Town: Malibu
Photo begin file#: 24

Time: 1630
State: CA
Photo end file#: 24

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
Stream 10 - Transect 6

Projection: **Datum:**
Coordinates: 34.033593, -118.73461

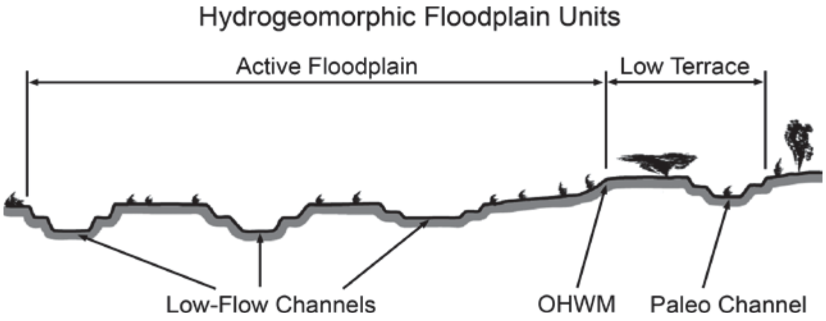
Potential anthropogenic influences on the channel system:
Survey boundary bisected by PCH. Likely receives road runoff. Scattered with debris.

Brief site description:
upstream of PCH bridge. Typical urban crossing site.

Checklist of resources (if available):

☒ Aerial photography
Dates:
☒ Topographic maps
☐ Geologic maps
☒ Vegetation maps
☒ Soils maps
☐ Rainfall/precipitation maps
☐ Existing delineation(s) for site
☒ Global positioning system (GPS)
☐ Other studies

☐ Stream gage data
Gage number:
Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

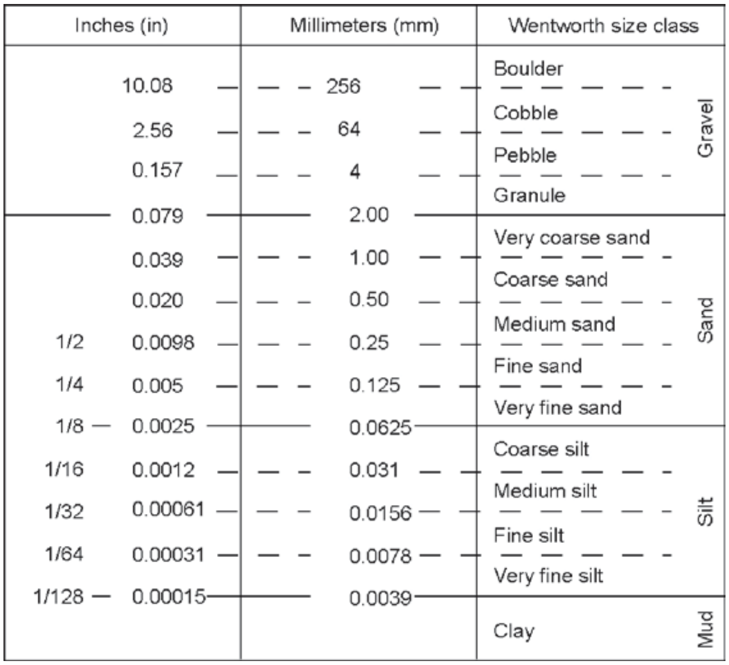


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

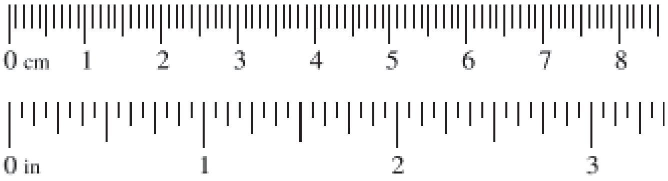
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph ☒ GPS
☐ Digitized on computer ☐ Other:

Wentworth Size Classes



Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: **Cross section ID:** T6 **Date:** 11/8/18 **Time:** 1630

Cross section drawing:

OHWM

GPS point: T6

Indicators:

☒ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover
☒ Break in bank slope
☐ Other: ____________
☐ Other: ____________

Comments:

Defined channel that lacks vegetation. Banks of the channel are vegetated salt grass and ice plant. Channel is defined by OHWM and then also contains adjacent wetlands (See Wetland Data Forms - SP 1 and SP 2).

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________

Characteristics of the floodplain unit:

Average sediment texture: silty
Total veg cover: 0 % Tree: ____% Shrub: ____% Herb: ____%
Community successional stage:

☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: ____________
☐ Other: ____________
☐ Other: ____________

Comments:

Project ID: **Cross section ID:** T6 **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:
Average sediment texture: silty
Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%
Community successional stage:
☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:
☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: ____________________
☐ Other: ____________________
☐ Other: ____________________

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:
Average sediment texture: __________________
Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%
Community successional stage:
☐ NA
☐ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:
☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches
☐ Soil development
☐ Surface relief
☐ Other: ____________________
☐ Other: ____________________
☐ Other: ____________________

Comments:

Appendix D

Arid West Wetland Determination Forms

Big Rock Bypass Improvements:
Three features (Stream 6, Stream 14, and Pacific Ocean Area 1) within the survey area were identified and mapped for potential federal, state, CCC, and CDFW jurisdiction. Approximately 0.50 acre (229 linear feet) of waters of the U.S., consisting of 0.46 acre of non-wetland navigable waters (i.e., Pacific Ocean) and 0.04 acre of non-wetland stream, "may be" subject to USACE, RWQCB, and CCC regulatory jurisdiction. Additionally, 0.10 acre (229 linear feet) of streambed occur within the survey area and would be subject to CDFW jurisdiction.

Carbon Canyon Carbon Mesa Road:
Two features (Streams 8 and 9) within the survey area were identified and mapped for potential federal, state, CCC, and CDFW jurisdiction. Approximately 0.15 acre (612 linear feet) of non-wetland waters of the U.S. "may be" subject to USACE, RWQCB, and CCC regulatory jurisdiction. Additionally, approximately 0.20 acre (612 linear feet) of streambed occur within the survey area and would be subject to CDFW jurisdiction.

Coastline Drive:
The Coastline Drive project survey area does not support any aquatic resources potentially subject to USACE, RWQCB, CCC, or CDFW jurisdiction.

District No. 29 Creek Crossing Repair Project:
Seven features (Streams 3, 4, 7, 8, 10, 11, and 14) within the survey area were identified and mapped for potential federal, state, CCC, and CDFW jurisdiction. Approximately 0.79 acre (996 linear feet) of non-wetland waters of the U.S. and 0.05 acre of wetland waters of the U.S. "may be" subject to USACE, RWQCB, and CCC regulatory jurisdiction. Additionally, approximately 1.30 acres (1,183 linear feet) of streambed and 0.50 acre of associated riparian habitat occur within the survey area and would be subject to CDFW jurisdiction.

Emergency Water Source of Water Supply Connection (Las Virgenes Connection):
Two features (Streams 1 and 2) within the survey area were identified and mapped for potential federal, state, CCC, and CDFW jurisdiction. Approximately 0.08 acre (530 linear feet) of non-wetland waters of the U.S. "may be" subject to USACE, RWQCB, and CCC regulatory jurisdiction. Additionally, approximately 0.15 acre (530 linear feet) of streambed occur within the survey area and would be subject to CDFW jurisdiction.

Fernwood Tank:
The Fernwood Tank project survey area does not support any aquatic resources potentially subject to USACE, RWQCB, CCC, or CDFW jurisdiction.

PCH & Topanga Beach Drive Waterline Improvements:
Two features (Stream 5 and Pacific Ocean Area 2) within the survey area were identified and mapped for potential federal, state, CCC, and CDFW jurisdiction. Approximately 0.06 acre (178 linear feet) of waters of the U.S., consisting of 0.03 acre of non-wetland navigable waters (i.e., Pacific Ocean) and 0.03 acre of non-wetland stream, "may be" subject to USACE, RWQCB, and CCC regulatory jurisdiction. Additionally,

approximately 0.06 acre (157 linear feet) of streambed and 0.04 acre of associated riparian habitat occur within the survey area and would be subject to CDFW jurisdiction.

PCH 8-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road):
Three features (Streams 11, 12, and 13) within the survey area were identified and mapped for potential federal, state, CCC, and CDFW jurisdiction. Approximately 0.19 acre (465 linear feet) of non-wetland waters of the U.S. “may be” subject to USACE, RWQCB, and CCC regulatory jurisdiction. Additionally, approximately 0.26 acre (465 linear feet) of streambed and 0.11 acre of associated riparian habitat occur within the survey area and would be subject to CDFW jurisdiction.

Big Rock Bypass Improvements Project

USACE	ac	LF
Stream 6	<0.01	65
Stream 14	0.04	164
Ocean Area	0.46	n/a
	0.5	**229**

CDFW		
Stream 6	<0.01	65
Stream 14	0.1	164
	0.1	**229**

Carbon Canyon Carbon Mesa Road

USACE	ac	LF
Stream 8	0.14	491
Stream 9	<0.01	121
	0.14	**612**

CDFW	ac	LF
Stream 8	0.19	491
Stream 9	<0.01	121
	0.19	**612**

District No. 29 Creek Crossing

USACE	ac	LF
Stream 4	0.36	185
Stream 7	0.2	194
Stream 8	0.08	176
Stream 10	0.07	185
Stream 14	0.02	77
Stream 11	0.11	179
	0.84	996

CDFW	ac	LF	rip
Stream 3	0.8	187	0.43
Stream 4	0.37	185	0.02
Stream 7	0.22	194	
Stream 8	0.15	176	
Stream 10	0.09	185	0.05
Stream 14	0.04	77	
Stream 11	0.13	179	
	1.8	1183	

Emergency Source of Water Supply

USACE	ac	LF
Stream 1	0.08	490
Stream 2	<0.01	40
	0.08	530

CDFW	ac	LF
Stream 1	0.14	490
Stream 2	<0.01	40
	0.14	530

PCH & Topanga Beach Drive

USACE	ac	LF
Pacific Oce	0.03	n/a
Stream 5	0.03	178
	0.06	178

CDFW		
Stream 5	0.1	157

PCH 8-inch Waterline Improvements

USACE	ac	LF
Stream 11	0.11	179
Stream 12	0.06	219
Stream 13	0.01	67
	0.18	**465**

CDFW	ac	LF
Stream 11	0.13	179
Stream 12	0.17	219
Stream 13	0.07	67
	0.37	**465**

F_NAME	Type	Acres	Project
Stream 15	USACE Non-Wetland	0.004439	Upper Encinal Staging Area
Stream 15	CDFW Streambed	0.011056	Upper Encinal Staging Area

Name	Feature	Type	Project	Length_Ft
Stream 15	USACE/RWQCB/CCC	Non-Wetla	Upper Encinal Tank Improveme	48.33
Stream 15	CDFW	CDFW Stre	Upper Encinal Tank Improveme	48.33

Appendix D

Hazardous Materials Data

Appendix D1
2019 Cortese List

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	7/6/2012	1901 CESAR CHAVEZ	SAN FRANCISCO	94124	NA	SAN FRANCISCO	201731	37.74907183	-122.3950563
ACTIVE	12/6/2018	410 E. 32ND STREET & 317 E. 33RD STREET	LOS ANGELES	90011	91-95%	LOS ANGELES	401862	34.01844379	-118.2679572
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	9/29/2014	1420 SOUTH SIGNAL DRIVE	POMONA	91766	96-100%	LOS ANGELES	300248	34.046286	-117.726905
ACTIVE	1/1/2007	2306 E. 38TH STREET	VERNON	90058	NA	LOS ANGELES	300461, 301371	34.00779331	-118.2324559
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	4/30/2012	10132 EDES AVENUE	OAKLAND	94603	96-100%	ALAMEDA	201569	37.73513165	-122.1800783
ACTIVE	10/19/2007	9100 FLAIR DRIVE	EL MONTE	91731	96-100%	LOS ANGELES	301377	34.0715	-118.0688
ACTIVE - LAND USE RESTRICTIONS	1/1/1983	HIGHWAY 50 AND AEROJET ROAD	RANCHO CORDOVA	95670	46-50%	SACRAMENTO	100002, 102230, 102360	38.6149745	-121.2067694
ACTIVE	4/19/2005	1173-1175 CAMPBELL AVENUE	SAN JOSE	95126	56-60%	SANTA CLARA	201631	37.3462716	-121.9283315
ACTIVE	4/19/1996	2775 MAIN STREET	RIVERSIDE	92501	96-100%	RIVERSIDE	400003	33.9914975	-117.3684613
CERTIFIED / OPERATION & MAINTENANCE	7/2/2013	16914 SOUTH BROADWAY	CARSON	90248	96-100%	LOS ANGELES	300353, 300464	33.8781519	-118.2776796
ACTIVE	8/26/2005	APPROXIMATELY ONE HALF MILE WEST OF ALLEN RANCH ROAD, AND TWO MILES NORTH OF STATE ROUTE 104	JACKSON	95968	51-55%	AMADOR	101767	38.38126	-120.814103
CERTIFIED / OPERATION & MAINTENANCE	12/29/1999	ALAMITOS ROAD & HICKS ROAD	SAN JOSE	95110	6-10%	SANTA CLARA	200005	37.17392044	-121.8377175
ACTIVE	2/1/2011	803 WEST STATE ST	ONTARIO	91786	96-100%	SAN BERNARDINO	401867, 510191	34.0595469	-117.6634371

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
ACTIVE	5/1/2002	1414 THIRD STREET	OAKLAND	94607	86-90%	ALAMEDA	200687	37.802839	-122.294878
ACTIVE	1/10/2003	2435 E. WASHINGTON BLVD.	LOS ANGELES	90021	91-95%	LOS ANGELES	300719	34.01915871	-118.2264626
ACTIVE	4/22/2018	8915 SORENSEN AVENUE	SANTA FE SPRINGS	90670	91-95%	LOS ANGELES	300301, 301521, 301566	33.95882191	-118.063014
ACTIVE	5/12/2015	COVERS CITY OF SAN GABRIEL, PORTIONS OF CITIES OF ALHAMBRA, ROSEMEAD, TEMPLE CITY, SAN MARINO AND SOUTH PASADENA	ALHAMBRA	91778	71-75%	LOS ANGELES	301178	34.09858579	-118.1165886
ACTIVE	2/5/1987	ARGONAUT LANE	JACKSON	95642	56-60%	AMADOR	100347	38.35251934	-120.7825435
ACTIVE	8/8/2011	2017 CHESTNUT STREET	SAN FRANCISCO	94123	1-5%	SAN FRANCISCO	201871	37.80059118	-122.4365412
ACTIVE	1/1/1984	21641 MAGNOLIA STREET	HUNTINGTON BEACH	92646	1-5%	ORANGE	400007, 400852	33.647759	-117.972925
ACTIVE	6/13/1997	3228 GIBSON ST	BAKERSFIELD	93308	81-85%	KERN	100562	35.3904494	-119.051671
ACTIVE - LAND USE RESTRICTIONS	1/1/1983	20 MILES NW OF COALINGA-LOS GATOS CK RD	COALINGA	93210	61-65%	FRESNO	100161, 101717	36.32118701	-120.5911861
ACTIVE	8/21/2017	310 EAST WALNUT AVENUE	FULLERTON	92832	86-90%	ORANGE	401687	33.868125	-117.918572
ACTIVE	10/6/2011	200 FALLS CANYON ROAD	CITY OF AVALON	90704	36-40%	LOS ANGELES	404868	33.33852386	-118.3327317
ACTIVE	10/2/1996	AVENUE A 1-1/2 MILE EAST HIGHWAY 14	ROSAMOND	93560	46-50%	KERN	101339	34.8208	-118.1392
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	9/30/1997	3180 HANOVER STREET	PALO ALTO	94304	1-5%	SANTA CLARA	200010	37.41464829	-122.145716

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
ACTIVE	5/12/2015	COVERS PORTIONS OF CITIES OF AZUSA, IRWINDALE, BALDWIN PARK AND WEST COVINA	BALDWIN PARK	91706	91-95%	LOS ANGELES	300345	34.08678666	-117.9602051
ACTIVE	1/1/1985	3031 EAST I STREET	WILMINGTON	90744	NA	LOS ANGELES	400015, 401674	33.78395545	-118.2255452
ACTIVE	3/30/2005	13 MI NW OF SAN LUIS OBISPO	BAYWOOD PARK	93402	6-10%	SAN LUIS OBISPO	101047	35.30611111	-120.8725
ACTIVE	9/30/2005	167 WEST POPLAR AVENUE	PORTERVILLE	93257	91-95%	TULARE	100019	36.050721	-119.021546
ACTIVE	8/30/2010	340 DANIELS LN	BAKERSFIELD	93307	96-100%	KERN	100020	35.34932869	-118.9979007
ACTIVE	1/12/2018	BETWEEN HWY 680 & 4TH STREET	BENICIA	94510	56-60%	SOLANO	201114	38.04597692	-122.1403076
ACTIVE	6/24/2014	750 JACKSON STREET	BENICIA	94510	56-60%	SOLANO	201993, 202181	38.047094	-122.142205
ACTIVE	6/24/2014	946 TYLER ROAD	BENICIA	94510	56-60%	SOLANO	201994, 202182	38.04582072	-122.1395441
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	12/22/1992	HIGHWAY 101 AT SPENCE ROAD	SALINAS	93908	61-65%	MONTEREY	200014	36.6125	-121.5652778
ACTIVE - LAND USE RESTRICTIONS	11/18/2004	2210 SOUTH AZUZA AVENUE	WEST COVINA	91792	71-75%	LOS ANGELES	300012, 301793	34.03630192	-117.9131699
ACTIVE	12/22/2005	AT THE FOOT OF SOUTH 51ST STREET	RICHMOND	94804	81-85%	CONTRA COSTA	200060, 202001, 202002	37.91037333	-122.3266697
ACTIVE	3/2/2011	2 MILES SOUTH OF OREGON ON ROAD 1060	ROGUE RIVER NATIONAL FOREST	0	21-25%	SISKIYOU	102152	41.95894758	-123.1072998
ACTIVE	12/16/2015		BOLINAS		6-10%	SONOMA	201818	38.31813494	-123.0666941
ACTIVE	12/19/2011	4&8 BOLINAS AVENUE & 21 SAN ANSELMO AVENUE	SAN ANSELMO	94960	1-5%	MARIN	201927	37.9696087	-122.5612357

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
ACTIVE	5/1/2006	1200 ORANGE AVENUE	ROSAMOND	93560	61-65%	KERN	100179	34.8570417	-118.1523854
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	2/19/2004	21817 SOUTH COALINGA ROAD	FIVE POINTS	93624	81-85%	FRESNO	100024	36.4158959	-120.122271
ACTIVE	3/1/1985	135 COMMERCIAL DRIVE	SHAFTER	93263	86-90%	KERN	100026, 102191	35.49884444	-119.2682806
ACTIVE	3/1/1985	600 S DERBY ST	ARVIN	93203	81-85%	KERN	100025	35.20314691	-118.8231039
ACTIVE	9/15/2006	12 MILES WEST OF PASO ROBLES, SAN LUIS OBISPO COUNTY.	PASO ROBLES	93447	46-50%	SAN LUIS OBISPO	101804	35.625899	-120.896666
ACTIVE	6/29/2017	6897 CONSOLIDATED WAY	SAN DIEGO	92121		SAN DIEGO	401788	0	0
ACTIVE	4/18/1996	20400 MAIN ST	CARSON	90745	96-100%	LOS ANGELES	400721, 401325, 401580, 401716	33.842605	-118.272333
ACTIVE	5/2/2006	825, 829, 841 31ST STREET	OAKLAND	94608	86-90%	ALAMEDA	200882	37.82086944	-122.2744684
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/30/1994	I-5 FWY BTW NORMANDIE BLV & IMPERIAL HWY	LOS ANGELES	90047	96-100%	LOS ANGELES	300203	33.92855586	-118.3017158
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	4/9/1996	NE OF INTRSECTN OF WESTERN AVE & 120 ST	ATHENS	90047	91-95%	LOS ANGELES	300202	33.92366078	-118.3086294
ACTIVE	12/8/1993	6904 EAST SLAUSON AVENUE	COMMERCE	90040	96-100%	LOS ANGELES	300546	33.980207	-118.141219
ACTIVE	7/12/2001	97.74 SQ MI; 40 MI N OF SACRAMENTO	MARYSVILLE	95901	11-15%	YUBA	101188, 101800	39.12833333	-121.2480556
ACTIVE	9/21/1998	NORTHERN PORTION OF SAN DIEGO	SAN DIEGO	92103	36-40%	SAN DIEGO	400690	32.82277778	-117.1033333

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
ACTIVE	2/16/2017	WEST AND NORTH OF THE INTERSECTION OF NANDINA AVE AND FWY 215	RIVERSIDE	92518	96-100%	RIVERSIDE	401244	33.86779878	-117.2676792
CERTIFIED / OPERATION & MAINTENANCE	1/6/2009	21 MILES NORTHWEST OF NEEDLES	NEEDLES	92363	66-70%	SAN BERNARDINO	400765	34.96694444	-114.8169444
ACTIVE	12/21/2005	7 MILES W OF SAN LUIS OBISPO/HWY 1	SAN LUIS OBISPO	93401	11-15%	SAN LUIS OBISPO	200604	35.33333333	-120.7
ACTIVE	7/14/2015	SWC OF JUNIPERO STREET AND 3RD AVENUE	CARMEL	93921	1-5%	MONTEREY	202043	36.559336	-121.919978
ACTIVE	5/8/1995	3300 NTU ROAD	CASMALIA	93429	71-75%	SANTA BARBARA	300208	34.862201	-120.546952
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/30/1998	287 WEST ATEN ROAD	EL CENTRO	92243	56-60%	IMPERIAL	400201, 401639	32.821795	-115.560022
CERTIFIED / OPERATION & MAINTENANCE	5/9/1997	800 DAVIS STREET	SAN LEANDRO	94577	71-75%	ALAMEDA	200113	37.7239684	-122.1649577
ACTIVE	8/21/2017	500 SOUTH RAYMOND BLVD.	FULLERTON	92831	86-90%	ORANGE	401684	33.86635663	-117.9058016
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	7/16/2008	OLD RIDGE ROAD AND EUREKA ROAD	SUTTER CREEK	95685	51-55%	AMADOR	100449	38.38394355	-120.8031009
ACTIVE	6/29/1998	7657 AZUSA AVE	DOS PALOS	93620	91-95%	MERCED	101085	37.04805	-120.6295944
ACTIVE	7/2/2001	8325 HINDRY AVENUE	LOS ANGELES	90045	56-60%	LOS ANGELES	300997	33.9627787	-118.3738661
ACTIVE	4/18/1996	2257 BERNARDO AVE	ESCONDIDO	92029	16-20%	SAN DIEGO	400029	33.09302716	-117.0890821
CERTIFIED / OPERATION & MAINTENANCE	11/18/2014	600 NICHOLS ROAD	BAY POINT	94565	71-75%	CONTRA COSTA	200019	38.04266168	-121.9890551
ACTIVE - LAND USE RESTRICTIONS	2/16/2010	350 SOUTH RAYMOND AVENUE	FULLERTON	92831	81-85%	ORANGE	401489, 401775, 401807	33.86774565	-117.9061264

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
ACTIVE	6/21/2004	HAGEN LANE/SKYWAY AVENUE	CHICO	95928	31-35%	BUTTE	101681	39.706646	-121.800305
ACTIVE	6/13/1997	CHICO AREA GROUNDWATER	CHICO	95926	41-45%	BUTTE	100035	39.73517821	-121.8353051
ACTIVE - LAND USE RESTRICTIONS	8/14/2003	CHICO AREA GROUNDWATER	CHICO	95926	66-70%	BUTTE	100504	39.73175552	-121.8399288
ACTIVE - LAND USE RESTRICTIONS	1/1/1985	651 AND 681 LIBERATOR STREET	CHICO	95926	21-25%	BUTTE	100036, 100187	39.79508417	-121.8477774
ACTIVE	1/31/2008	878 EAST 20TH STREET	CHICO	95928	86-90%	BUTTE	101937	39.72484983	-121.8170174
ACTIVE - LAND USE RESTRICTIONS	1/25/1999	6845 FLORENCE PL	BELL GARDENS	90201	81-85%	LOS ANGELES	300736, 301796	33.96572161	-118.14191
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	10/2/2006	777 139TH AVENUE	SAN LEANDRO	94578	51-55%	ALAMEDA	200642	37.70990676	-122.1448666
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/25/1991	AREA SE OF LUCILLE AVENUE & HWY 198	COALINGA	93210	71-75%	FRESNO	100289, 102100	36.12775	-120.37
ACTIVE	11/5/2014	STATE HIGHWAY 1	FORT BRAGG	95437		MENDOCINO	900279	39.43578863	-123.8167849
ACTIVE	4/19/2011	1701 PLACENTIA AVENUE	COSTA MESA	92627	76-80%	ORANGE	401579	33.637057	-117.933065
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/30/1994	PINE CANYON, 15 MILES NW OF COALINGA	COALINGA	93210	61-65%	FRESNO	100043	36.30962674	-120.529418
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	5/10/2011	PLANT RD & TAYLOR DR	UKIAH	95482	31-35%	MENDOCINO	200021	39.11150785	-123.1944475
CERTIFIED / OPERATION & MAINTENANCE	7/11/1996	3210 PORTER DR	PALO ALTO	94304	1-5%	SANTA CLARA	200138	37.40725141	-122.1473956
ACTIVE	6/10/2003	1250-1276, 1284 W. GRAND & 2232 POPLAR	OAKLAND	94607	76-80%	ALAMEDA	201386	37.8165492	-122.2865959
ACTIVE	4/28/1993	2940 SOUTH ELM AVENUE	FRESNO	93706	96-100%	FRESNO	100044, 100044, 102259	36.69436919	-119.7920036

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CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/27/2003	11847 UNITED STREET	MOJAVE	93501	76-80%	KERN	100175	34.9935	-118.1500417
CERTIFIED / OPERATION & MAINTENANCE	6/28/2006	139 HILL AVENUE	OAKLEY	94561	51-55%	CONTRA COSTA	200072	37.97360159	-121.6924775
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	3/7/1997	2801 GIANT ROAD	RICHMOND	94806	76-80%	CONTRA COSTA	200023	37.974819	-122.355723
ACTIVE	12/12/1996	9316 ATLANTIC AVENUE	SOUTH GATE	90280	96-100%	LOS ANGELES	300251	33.9471452	-118.1801512
ACTIVE - LAND USE RESTRICTIONS	4/14/2015	4144 GLENCOE AVENUE	MARINA DEL REY	90292	41-45%	LOS ANGELES	300040	33.98898075	-118.44116
ACTIVE	3/8/2017	RAWSON & CARONA, SE CORNER	CORNING	96021	71-75%	TEHAMA		39.92382485	-122.2149261
ACTIVE	6/1/2016	AREA BOUNDED BY MONROVIA AVENUE, PLACENTIA AVENUE, 16TH STREET AND 18TH STREET	COSTA MESA	92627	76-80%	ORANGE	401385	33.63580994	-117.9339194
ACTIVE	8/3/2018	2000 W. WHITENDALE	VISALIA	93277	51-55%	TULARE	101996	36.30593498	-119.3126982
ACTIVE	11/5/2018	ARLANZA DISTRICT	RIVERSIDE	92505	91-95%	RIVERSIDE	400509	33.94493893	-117.4585438
ACTIVE	10/16/2018	4350 TEMPLE CITY BOULEVARD	EL MONTE	91731	76-80%	LOS ANGELES	550024	34.086035	-118.055167
ACTIVE	12/23/2013	335 GARDEN HIGHWAY	YUBA CITY	95991	81-85%	SUTTER	100047, 970024	39.124472	-121.610301
ACTIVE - LAND USE RESTRICTIONS	9/6/2000	1550 NORTH BONNIE BEACH PLACE	LOS ANGELES	90063	96-100%	LOS ANGELES	300432	34.0591752	-118.1826778
ACTIVE	8/2/2018	13145 NORTH BLOOMFIELD-GRANITEVILLE ROAD	NEVADA CITY	95959	31-35%	NEVADA	102007	39.2911682	-120.9853794

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ACTIVE - LAND USE RESTRICTIONS	4/22/1996	DEL AMO BLVD & VERMONT AVE	LOS ANGELES	90020	96-100%	LOS ANGELES	400048, 400851, 401628	33.8497	-118.292
CERTIFIED / OPERATION & MAINTENANCE	9/26/2012	2650 W WASHINGTON BLVD	CRESCENT CITY	95531	21-25%	DEL NORTE	200025	41.773701	-124.231795
ACTIVE	8/4/2010	MAIN STREET AND 10TH AVENUE	DELANO	93215	66-70%	KERN	102044	35.76910534	-119.2456698
ACTIVE	10/26/2006	7335 BOLINGER ROAD	CUPERTINO	95014	16-20%	SANTA CLARA	201670	37.3125692	-122.033584
ACTIVE	6/5/2009	6 INDUSTRY ROAD	PITTSBURG	94565	76-80%	CONTRA COSTA	201333, 201981, 202208, 202209	38.02988144	-121.876072
ACTIVE	5/1/2006	DERRY LANE	MENLO PARK	94025	6-10%	SAN MATEO	201659	37.45577218	-122.1846618
ACTIVE	4/6/2010	1331 E. WARNER AVE	SANTA ANA	92705	86-90%	ORANGE	401519, 401607, 401723	33.71630537	-117.8531861
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	1/30/1990	1156 CASTRO STREET	RICHMOND	94804	66-70%	CONTRA COSTA	200026	37.949694	-122.367886
ACTIVE	7/1/2012	53 MILES NORTHWEST OF THE CITY OF VENTURA	DRY CANYON	93222	31-35%	VENTURA	301338	34.75	-119.2419444
ACTIVE	4/14/2014	2811 E. LINCOLN AVENUE	ANAHEIM	92806	96-100%	ORANGE	401668	33.837224	-117.871
ACTIVE	2/1/2016	29082 MAIN STREET	DUNNIGAN	95937	56-60%	YOLO	102293	38.884986	-121.9699142
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	12/18/2008	4825 SAN LEANDRO STREET	OAKLAND	94601	91-95%	ALAMEDA	201426	37.76650262	-122.21417
ACTIVE	12/31/1999	SAN LEANDRO (GROUNDWATER CONTAMINATION)	SAN LEANDRO	94578	61-65%	ALAMEDA	200327	37.7089751	-122.1433914

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
ACTIVE	4/21/2017	715 4TH STREET	OAKLAND	94607	NA	ALAMEDA	202138	37.799736	-122.282033
ACTIVE	5/1/1986	930 SHILOH RD	WINDSOR	95492	46-50%	SONOMA	200028	38.52134885	-122.7937044
ACTIVE	6/16/1999	1053 NORTHWESTERN AVE	FORTUNA	95540	41-45%	HUMBOLDT	200757, 202170	40.51468937	-124.1240526
ACTIVE	6/16/2015	COVERS PORTIONS OF CITIES OF EL MONTE, ROSEMEAD, AND TEMPLE CITY	EL MONTE	91732	76-80%	LOS ANGELES	301369, 301370	34.08010449	-118.0405426
ACTIVE	5/2/2006	130 NEVIN AVENUE	RICHMOND	94801	91-95%	CONTRA COSTA	201414	37.93657778	-122.36785
ACTIVE	9/27/2018	649 ALDERTON AVENUE	CITY OF INDUSTRY	91744		LOS ANGELES	301838	0	0
ACTIVE	11/1/2005	10791 E EMPIRE ST	GRASS VALLEY	95945	66-70%	NEVADA	100235	39.20776111	-121.0432139
ACTIVE	4/28/1999	1224 E. POMONA STREET	SANTA ANA	92707	86-90%	ORANGE	401052	33.7254409	-117.855238
ACTIVE	7/1/1994	ROUND MOUNTAIN ROAD	BAKERSFIELD	93301	76-80%	KERN	100054	35.46212633	-118.898912
ACTIVE	2/7/2011	164 E 2ND AVE	CHICO	95926	41-45%	BUTTE	100263	39.73946069	-121.8458742
ACTIVE	8/20/2018	VARIOUS LOCATIONS IN THE COUNTY OF LOS ANGELES	VARIOUS	90058	NA	LOS ANGELES	900316, 900320	34.00580184	-118.1943079
ACTIVE	11/9/2015	VARIOUS LOCATIONS IN THE COUNTY OF LOS ANGELES	VARIOUS	90058	NA	LOS ANGELES	900291, NEWEXI	34.00580184	-118.1943079
ACTIVE	11/25/2009	709 & 711 CENTER BOULEVARD	FAIRFAX	94930	1-5%	MARIN	201866	37.98577935	-122.5835395
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	11/6/2012	818 W. GERTRUDE AVENUE	RICHMOND	94801	91-95%	CONTRA COSTA	200037	37.9544852	-122.3775673
ACTIVE - LAND USE RESTRICTIONS	4/19/1996	8440 ALAMEDA STREET	SOUTH GATE	90280	96-100%	LOS ANGELES	301249	33.96035827	-118.230325
ACTIVE	4/19/1996	2323 FIRESTONE BLVD	SOUTH GATE	90280	96-100%	LOS ANGELES	300341	33.958516	-118.229434
ACTIVE	6/26/2003	1082 EAST 1ST AVENUE	CHICO	95927	26-30%	BUTTE	100264	39.746039	-121.830673
ACTIVE	7/26/2010	660 MANGROVE AVE	CHICO	95926	41-45%	BUTTE	100185	39.735	-121.8352778

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
ACTIVE	3/4/2014	844 BROADWAY STREET, APN 004-285-002-000	CHICO	95928	66-70%	BUTTE	102237	39.72509174	-121.8362474
ACTIVE	1/1/1985	2501 SOUTH SUNLAND AVENUE	FRESNO	93725	96-100%	FRESNO	100056	36.71260989	-119.7695504
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	5/29/1992	855 PARR BLVD	RICHMOND	94801	76-80%	CONTRA COSTA	200033	37.96783041	-122.3570449
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	8/16/2005	N OF FOLSOM CITY; ADJ TO AMERICAN RIVER	REPRESA	95671	NA	SACRAMENTO	100058	38.69394255	-121.1567284
ACTIVE	6/16/2006	5977 W. WASHINGTON BLVD.	CULVER CITY	90232	61-65%	LOS ANGELES	301290	34.03210547	-118.376106
ACTIVE	12/20/2001	3090 E CHURCH AVE	FRESNO	93721	96-100%	FRESNO	101503	36.71417778	-119.7727472
ACTIVE	11/1/2009	4032 GAGE AVENUE	BELL	90201	96-100%	LOS ANGELES	301486	33.97874519	-118.195136
ACTIVE	1/31/2007	1102 WEST ISABEL STREET	BURBANK	91506	76-80%	LOS ANGELES	301328	34.18210873	-118.3233487
ACTIVE	10/26/2005	2189, 2199, 2201, 2229 CLEMENT AVENUE	ALAMEDA	94501	66-70%	ALAMEDA	201525, 201575, 201575, 201632, 201790, 202134	37.77372484	-122.2421722
ACTIVE	11/19/2015	811 11TH AVENUE	DELANO	93215	66-70%	KERN	102277	35.77050449	-119.2467551
ACTIVE	11/22/2010	1438 EL CAMINO REAL	MENLO PARK	94025	6-10%	SAN MATEO	201888, 202123	37.45648766	-122.1884367
ACTIVE	8/3/2018	2615 S. MOONEY BLVD.	VISALIA	93277	71-75%	TULARE	101999	36.3069829	-119.3138859
ACTIVE	9/1/2010	4634 W. MINERAL KING AVENUE	VISALIA	93291	61-65%	TULARE	102107	36.328	-119.342

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CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	12/30/1994	2901 LOS FELIZ BOULEVARD	LOS ANGELES	90039	96-100%	LOS ANGELES	300065, 300647, 301628	34.12656111	-118.2629333
ACTIVE	2/29/2008	2040 ARTESIA BOULEVARD	TORRANCE	90504	66-70%	LOS ANGELES	401377	33.87166164	-118.3148182
ACTIVE	1/1/1990	MCKINLEY AND CLOVIS AVENUES	FRESNO	93727	61-65%	FRESNO	100242, 100243, 102182	36.76611111	-119.7102778
ACTIVE - LAND USE RESTRICTIONS	1/1/1989	SW CORNER OF JENSEN & WEST AVENUES	FRESNO	93706	96-100%	FRESNO	100246	36.70388889	-119.8269444
ACTIVE - LAND USE RESTRICTIONS	4/1/1985	SECOND STREET/BTWN PENA & MACE BLVD.	DAVIS	95616	6-10%	YOLO	100060	38.55251176	-121.7032063
ACTIVE	1/27/2005	307 FULTON SHIPYARD ROAD	ANTIOCH	94509	81-85%	CONTRA COSTA	201495	38.016587	-121.801043
ACTIVE - LAND USE RESTRICTIONS	10/13/2009	1230 E SAINT GERTRUDE PL	SANTA ANA	92707	86-90%	ORANGE	400236, 401808, 401855	33.71926	-117.854722
ACTIVE	9/25/1995	1450 WEST ARTESIA BOULEVARD (AT NORMANDIE)	GARDENA	90247	86-90%	LOS ANGELES	300067, 301801, 400067, 401218	33.87235301	-118.30025
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	5/28/2002	208 EAST 22ND STREET	SAN PEDRO	90731	NA	LOS ANGELES	400066, 401665	33.726803	-118.277544
ACTIVE - LAND USE RESTRICTIONS	1/1/1988	SOMERVILLE RD & JAMES DONLON BLVD	ANTIOCH	94509	61-65%	CONTRA COSTA	200041	37.98815342	-121.8468607
ACTIVE	10/24/2013	2264 E. AVION PLACE	ONTARIO	91761	96-100%	SAN BERNARDINO	400070	34.047733	-117.600908
ACTIVE - LAND USE RESTRICTIONS	6/25/1997	5441 EAST 14TH STREET	OAKLAND	94601	91-95%	ALAMEDA	200135	37.7653202	-122.205937
ACTIVE - LAND USE RESTRICTIONS	8/1/2006	90 WEST REDWOOD AVENUE	FORT BRAGG	95437	46-50%	MENDOCINO	200402	39.44390208	-123.8083391

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ACTIVE	12/13/2017	35 MILES WEST OF NEEDLES	GOFFS	92363	76-80%	SAN BERNARDINO	401352	34.925	-115.0625
ACTIVE - LAND USE RESTRICTIONS	10/13/2014	21000 SOUTH FIGUEROA STREET	CARSON	90745	86-90%	LOS ANGELES	400072	33.8407368	-118.2828067
ACTIVE	8/21/2017	1850 EAST ORANGETHORPE AVENUE	FULLERTON	92831	86-90%	ORANGE	401696	33.859622	-117.897475
ACTIVE	10/17/2017	1085 SOUTH UNION ROAD	MANTECA	95336	86-90%	SAN JOAQUIN	101924	37.78831044	-121.2355002
ACTIVE	5/1/1986	6941 AND 6707 WEST GOSHEN AVENUE	VISALIA	93291	56-60%	TULARE	100022	36.3411	-119.3667
ACTIVE	5/5/2014	BETTY DRIVE	GOSHEN	93227	86-90%	TULARE	102240	36.355714	-119.422651
ACTIVE	12/1/2015	4600 FIRESTONE BOULEVARD	SOUTH GATE	90280	96-100%	LOS ANGELES	301731	33.952189	-118.188818
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	2/7/1997	INTERSECTION OF MARIE AVE & W 15TH ST	ROSAMOND	93560	61-65%	KERN	100184	34.84956038	-118.1589235
ACTIVE - LAND USE RESTRICTIONS	1/1/1984	5404 SOUTH DEL REY AVENUE	DEL REY	93616	91-95%	FRESNO	100101, 102185	36.657467	-119.590438
ACTIVE	3/28/2007	6200 PERKINS ROAD	OXNARD	93033	81-85%	VENTURA	300075, 301331	34.13919493	-119.1830134
ACTIVE	7/20/1999	HIGHWAY 101; 3 MI N OF LUCAS VALLEY ROAD	NOVATO	94947	36-40%	MARIN	200714	38.06444444	-122.4922222
ACTIVE	7/1/2005	MEADE SOUTH 49TH EAST MONTGOMERY	RICHMOND	94804	81-85%	CONTRA COSTA	201734	37.9123439	-122.3281288
ACTIVE	10/15/2007	738 HARBOUR WAY SOUTH	RICHMOND	94804	81-85%	CONTRA COSTA	200043	37.92172559	-122.3598077
ACTIVE	4/30/2003	750 107TH AVENUE	OAKLAND	94603	81-85%	ALAMEDA	201529	37.732533	-122.175048
ACTIVE	7/1/2001	617 EAST 56TH STREET	LOS ANGELES	90011	96-100%	LOS ANGELES	300457, 308400, 908400	33.99183625	-118.2643676
ACTIVE	5/1/1985	1494 SOUTH AIRPORT DRIVE	PIXLEY	93256	91-95%	TULARE	100073	35.96152525	-119.304185

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ACTIVE	6/16/2000	2801 MARTIN LUTHER KING JR. WAY	OAKLAND	94609	86-90%	ALAMEDA	201253	37.81812886	-122.2716659
ACTIVE	7/20/2017		TORRANCE		96-100%	LOS ANGELES		33.85555556	-118.3083333
ACTIVE	1/22/2015	20301 SKYWEST DR	HAYWARD	94541	76-80%	ALAMEDA	200635, 900196	37.66279444	-122.1204528
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	11/25/1992	CORNER OF SAN PABLO & SYCAMORE AVENUE	HERCULES	94547	31-35%	CONTRA COSTA	200044	38.01340861	-122.2803426
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/9/1997	560 RAILROAD AVENUE	HERCULES	94547		CONTRA COSTA	200045, 201950	38.020712	-122.288518
CERTIFIED / OPERATION & MAINTENANCE	7/31/1995	3215 PORTER DRIVE	PALO ALTO	94304	1-5%	SANTA CLARA	200119	37.40897956	-122.1480903
CERTIFIED / OPERATION & MAINTENANCE	6/30/1995	CORNER OF PAGE MILL RD AND PORTER DRIVE	PALO ALTO	94304	1-5%	SANTA CLARA	200142	37.40970952	-122.1520673
CERTIFIED / OPERATION & MAINTENANCE	6/30/1997	HILLVIEW AVENUE AND PORTER DRIVE	PALO ALTO	94304	1-5%	SANTA CLARA	200048	37.40777778	-122.1497222
ACTIVE	5/13/1997	13546 DESMOND STREET	PACOIMA	91331	96-100%	LOS ANGELES	300593	34.27496191	-118.4271708
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	11/4/2004	EMBARCADERO WEST AND MARKET STREETS	OAKLAND	94604	NA	ALAMEDA	201089, 202223	37.79722222	-122.2825
ACTIVE	5/1/2007	2702 MOUNTAIN VIEW ROAD	EL MONTE	91732	96-100%	LOS ANGELES	301319, 900308	34.05952302	-118.0245687
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	9/19/2000	4300 EASTSHORE HIGHWAY	EMERYVILLE	94608	81-85%	ALAMEDA	200312, 201062	37.829503	-122.291812
ACTIVE	9/30/2013	17109 SOUTH MAIN STREET	GARDENA	90248	96-100%	LOS ANGELES	301601	33.876241	-118.276502
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	12/30/2007	2182 EAST 11TH STREET	LOS ANGELES	90021	91-95%	LOS ANGELES	300591	34.02421476	-118.2338372

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ACTIVE	1/1/1983	OFF HWY 299 - 9 MI NW OF REDDING	REDDING	96001	36-40%	SHASTA	100077	40.67083333	-122.5277778
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	5/14/2007	422 MILL STREET	WEED	96094	61-65%	SISKIYOU	100016	41.432877	-122.369637
ACTIVE - LAND USE RESTRICTIONS	5/1/1986	430 PEPPER DRIVE	EDISON	93220	81-85%	KERN	100133	35.35147831	-118.8778
ACTIVE - LAND USE RESTRICTIONS	8/15/1995	6863 FLORENCE PL	BELL GARDENS	90201	81-85%	LOS ANGELES	300255, 301734	33.96564596	-118.1411438
ACTIVE	9/13/2014	9301 RAYO AVE.	SOUTH GATE	90280	96-100%	LOS ANGELES	301286	33.94963754	-118.1776468
ACTIVE	9/20/1993	4800 OAK GROVE DRIVE	PASADENA	91109	6-10%	LOS ANGELES	300318	34.198649	-118.174585
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	3/7/2003	1753 SIERRA HIGHWAY	ROSAMOND	93560	61-65%	KERN	100006	34.84571914	-118.1601906
ACTIVE	6/29/1998	600 SOUTH UNION AVENUE	BAKERSFIELD	93307	96-100%	KERN	101086	35.34895145	-119.002306
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	1/25/2013	880 DOOLITTLE DRIVE	SAN LEANDRO	94577	81-85%	ALAMEDA	200559	37.72002842	-122.1880666
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/26/2009	11878 AVENUE 328	VISALIA	93291	86-90%	TULARE	102187	36.387335	-119.306976
ACTIVE	9/14/2010	1816 21ST STREET	SACRAMENTO	95814	86-90%	SACRAMENTO	101737	38.56694381	-121.4829226
ACTIVE	9/28/2017	790 GREENFIELD DR.	EL CAJON	92021	66-70%	SAN DIEGO	400433	32.81465859	-116.9527216
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	2/14/2004	BAGGETT-MARYSVILLE ROAD	OROVILLE	95965	66-70%	BUTTE	100084	39.46949237	-121.5620889
ACTIVE	4/11/2018	650 NORTH HARBOR BOULEVARD	LA HABRE	90631		ORANGE	401826	0	0
ACTIVE	11/8/2010	2911 S. MOONEY BLVD.	VISALIA	93277	71-75%	TULARE	102000	36.30492014	-119.3142942

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ACTIVE	3/15/2007	2942 SAN PABLO AVENUE	OAKLAND	94608	86-90%	ALAMEDA	201736	37.82015182	-122.2759637
ACTIVE	11/25/1996	14501 LAVA CAP MINE ROAD	NEVADA CITY	95959	41-45%	NEVADA	100337, 102145	39.228673	-120.972432
ACTIVE - LAND USE RESTRICTIONS	6/13/2013	HOFFMAN BLVD & S 47TH ST	RICHMOND	94804	81-85%	CONTRA COSTA	200060	37.91010922	-122.3235369
CERTIFIED / OPERATION & MAINTENANCE	4/30/1997	3170 PORTER DRIVE	PALO ALTO	94304	1-5%	SANTA CLARA	200139, 202162, 202238	37.40690493	-122.151627
ACTIVE	5/13/2008	HIGHLAND SPRINGS ROAD	BEAUMONT	92223	61-65%	RIVERSIDE	400200	33.8638	-116.9326
ACTIVE	12/15/2006	JACK RABBIT TRAIL	BEAUMONT	92223	61-65%	RIVERSIDE	400261	33.93	-117.0311111
ACTIVE - LAND USE RESTRICTIONS	1/1/1985	1507 SOUTH 10TH STREET	SAN JOSE	95112	86-90%	SANTA CLARA	200061	37.31864479	-121.8655467
ACTIVE	11/26/2018	392 1ST STREET	LOS ALTOS	94022	1-5%	SANTA CLARA		37.37550865	-122.1161593
ACTIVE	12/16/2016	AREA BOUNDED BY KNOTT ST, CHAPMAN AVE, WESTERN AVE, AND STANTON STORM CHANNEL	GARDEN GROVE	92841	81-85%	ORANGE	900196	33.79350965	-118.0065381
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/29/1999	WEST 16TH STREET	CHICO	95926	71-75%	BUTTE	100186	39.71579431	-121.8320385
ACTIVE	2/14/2012	12500 LANG STATION ROAD	CANYON COUNTRY	91350	36-40%	LOS ANGELES	300087, 301830	34.4323	-118.369951
ACTIVE - LAND USE RESTRICTIONS	8/1/1985	11272 ROAD 32	MADERA	93639	86-90%	MADERA	100098	36.913662	-119.9648076
ACTIVE	10/19/2010	SOUTH C STREET AND 7TH STREET	MADERA	93638	86-90%	MADERA	102045	36.9583	-120.0556
CERTIFIED / OPERATION & MAINTENANCE	11/15/1996	4101 LICK MILL BOULEVARD	SANTA CLARA	95054	26-30%	SANTA CLARA	200117	37.39924093	-121.9443848
ACTIVE	2/7/2012	5679 HORTON STREET	EMERYVILLE	94608	51-55%	ALAMEDA	201929, 202142	37.83741159	-122.291007

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CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	2/11/2002	150 N SINCLAIR AVE	STOCKTON	95215	96-100%	SAN JOAQUIN	100102	37.96771066	-121.2335835
ACTIVE	12/26/2017	20457 REDWOOD ROAD	CASTRO VALLEY	94546	51-55%	ALAMEDA	201654	37.69689944	-122.0744783
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	8/26/2014	ROSECRANS & SUNNY RIDGE	FULLERTON	92633	51-55%	ORANGE	300093, 400093, 400334	33.89512876	-117.9706482
ACTIVE - LAND USE RESTRICTIONS	5/1/1986	1214 W. WASHINGTON STREET	STOCKTON	95203	96-100%	SAN JOAQUIN	100108	37.94860306	-121.3065083
ACTIVE - LAND USE RESTRICTIONS	1/12/1988	11505 DOUGLAS RD	RANCHO CORDOVA	95742	46-50%	SACRAMENTO	100295, 102127	38.561601	-121.211306
ACTIVE	4/19/1996	9005 SORENSEN AVENUE	SANTA FE SPRINGS	90670	91-95%	LOS ANGELES	300094	33.95795966	-118.0634653
ACTIVE - LAND USE RESTRICTIONS	1/2/2019	1619 GLENDALE DRIVE	ARCATA	95521	21-25%	HUMBOLDT	200066	40.90077154	-124.0191305
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	5/13/2003	47 MIDWAY DRIVE	DALY CITY	94014	66-70%	SAN MATEO	200212, 202203	37.70212415	-122.4141741
ACTIVE	12/10/2015	2235 W. WHITENDALE AVENUE	VISALIA	93277	71-75%	TULARE	102001	36.30562156	-119.3156862
ACTIVE	9/15/2008	520 E. MINERAL KING AVENUE	VISALIA	93292	81-85%	TULARE	102051	36.3277378	-119.2869442
ACTIVE	6/29/1998	UNITED STREET & REED ROAD	MOJAVE	93501	76-80%	KERN	100188	34.98296379	-118.1507492
ACTIVE	5/6/2010	609 WALNUT STREET	RED BLUFF	96080	51-55%	TEHAMA	102020	40.17663544	-122.238822
ACTIVE - LAND USE RESTRICTIONS	1/1/1989	MCHENRY AVE., SOUTH OF ORANGEBURG AVE. (BEHIND HALFORD'S CLEANERS AT 941 MCHENRY AVE.)	MODESTO	95351	81-85%	STANISLAUS	100111, 100309	37.6566704	-120.9941804
ACTIVE	9/14/2006	2 MILE SW OF 21000 HACIENDA BLVD	MOJAVE	93505	41-45%	KERN	101450	35.075808	-117.998142
ACTIVE	8/18/2015	1918 ARTESIA BOULEVARD	TORRANCE	90504	66-70%	LOS ANGELES	401470	33.8727	-118.312

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ACTIVE	4/23/1996	2100 EAST 223RD STREET	CARSON	90810	NA	LOS ANGELES	400266	33.82291974	-118.2383829
ACTIVE	4/22/1996	20201 NORMANDIE AVENUE	TORRANCE	90502	96-100%	LOS ANGELES	400100, 401297, 401298, 401628, 401840	33.84769546	-118.3019521
ACTIVE	5/20/2008	APPROXIMATELY 6 MILES NORTHEAST OF CLOVIS	CLOVIS	93911	31-35%	FRESNO	101191, 101947	36.889506	-119.628067
ACTIVE	5/17/2012	1300,1310, 1336 OLD BAYSHORE HWY	SAN JOSE	95112	86-90%	SANTA CLARA	201936, 202226	37.36630382	-121.8982414
ACTIVE	3/31/2003	6555 JACKSON VALLEY ROAD	IONE	95640	56-60%	AMADOR	101568	38.30762561	-120.9020184
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	5/11/2001	4500 SHELLMOUND STREET	EMERYVILLE	94608	66-70%	ALAMEDA	200144	37.83300833	-122.2926889
ACTIVE	10/14/2015	3202 E FOOTHILL BLVD	PASADENA	91107	36-40%	LOS ANGELES	300702, 301335, 301355, 301622	34.14922062	-118.0849118
ACTIVE	6/14/2018	799 N L STREET	NEEDLES	92363	66-70%	LOS ANGELES	401813	34.85	-114.6093
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	4/21/2006	12800 IMPERIAL HWY	SANTA FE SPRINGS	90670	NA	LOS ANGELES	300102	33.91649653	-118.0590309
ACTIVE	5/28/2013	4548 BEACH BOULEVARD	BUENA PARK	90621	56-60%	ORANGE	401649	33.8951491	-117.987385
ACTIVE	4/14/2015	6141 TO 6241 RANDOLPH STREET	COMMERCE	90040	96-100%	LOS ANGELES	301321	33.97852759	-118.1534207
ACTIVE - LAND USE RESTRICTIONS	4/22/1996	BUNKER HILL GROUND WATER BASIN	SAN BERNARDINO	92408	76-80%	SAN BERNARDINO	400259	34.1821	-117.3454
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	2/14/2006	254 EAST FIRST STREET	CHICO	95926	66-70%	BUTTE	101168	39.731577	-121.839782

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ACTIVE	7/1/1995	801 EAST AVENUE	CHICO	95926	31-35%	BUTTE	100506	39.758121	-121.846152
ACTIVE	8/21/2017	1401 EAST ORANGETHORPE AVENUE	FULLERTON	92831	86-90%	ORANGE	401686	33.860424	-117.904038
ACTIVE - LAND USE RESTRICTIONS	5/27/2014	1218 24TH STREET	OAKLAND	94607	76-80%	ALAMEDA	201574, 201574, 201975	37.81774596	-122.2849169
ACTIVE	10/3/2014	1085 SOUTH UNION ROAD	MANTECA	95337	86-90%	SAN JOAQUIN	102257	37.7884395	-121.2360203
ACTIVE	11/19/2015	910 MAIN STREET	DELANO	93215	66-70%	KERN	102275	35.76822348	-119.2452531
ACTIVE	11/19/2015	920 MAIN STREET	DELANO	93215	66-70%	KERN	102276	35.76863044	-119.2453879
ACTIVE	6/12/2011	23357 LYONS AVENUE	SANTA CLARITA	91355	16-20%	LOS ANGELES	301525	34.380935	-118.542416
ACTIVE	11/23/1993	12504 WHITTIER BLVD	WHITTIER	90602	91-95%	LOS ANGELES	300223, 301227	33.96957301	-118.0438266
ACTIVE	7/1/2018	2106 MOUNTAIN VIEW ROAD	SOUTH EL MONTE	91733	96-100%	LOS ANGELES		34.052222	-118.033888
ACTIVE	10/31/2008	717 WEST MAIN STREET	VISALIA	93291	76-80%	TULARE	102049	36.329928	-119.299603
CERTIFIED / OPERATION & MAINTENANCE	8/2/2012	900 POTRERO GRANDE DR	MONTEREY PARK	91755	71-75%	LOS ANGELES	300110, 300284, 300604	34.03649751	-118.1040144
ACTIVE	8/1/2007	ASSESSOR'S PARCEL NUMBERS (APNS)078-010-006, 078-010-038	OROVILLE	95965	66-70%	BUTTE	101886	39.46655743	-121.5708639
ACTIVE	12/20/2007	1711 E. KIMBERLY AVENUE	FULLERTON	92831	86-90%	ORANGE	401605, 550458	33.8631939	-117.8969409
CERTIFIED / OPERATION & MAINTENANCE	10/23/2013	726 FIFTH STREET	ORLAND	95963	46-50%	GLENN	100348	39.74654654	-122.1958423
ACTIVE	12/27/2017	2001 15TH STREET, WEST	ROSAMOND	93560	61-65%	KERN	100257	34.85190888	-118.158313
ACTIVE	6/2/1994	60TH STREET WEST T9N, R13W, S10 SE CORNER	ROSAMOND	93560	56-60%	KERN	101534	34.88333333	-118.2333333
ACTIVE	5/17/2016	153 WEBSTER STREET	MONTEREY	93940	21-25%	MONTEREY	202095	36.596151	-121.894531

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
ACTIVE - LAND USE RESTRICTIONS	7/12/2012	67 EAST TELEGRAPH ROAD	FILLMORE	93015	61-65%	VENTURA	300156	34.40436031	-118.9047718
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	9/22/2006	35124 ALVARADO-NILES ROAD	UNION CITY	94587	46-50%	ALAMEDA	200073, 202135	37.58439561	-122.0096788
ACTIVE	6/2/2014	201 SOUTH GLENDALE AVENUE	GLENDALE	91205	86-90%	LOS ANGELES	301655	34.144311	-118.2486108
ACTIVE	7/13/2018	710 EAST 29TH STREET	LOS ANGELES	90011	91-95%	LOS ANGELES	301391	34.01844918	-118.2626672
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	4/13/1999	25706 HAWTHORNE BLVD.	ROLLING HILLS ESTATES	90274	1-5%	LOS ANGELES	400116, 401798	33.784775	-118.348361
ACTIVE	2/26/1999	PACIFIC OCEAN - WHITE POINT OUTFALL	PALOS VERDES	90000		LOS ANGELES	400645	33.7105	-118.3219
ACTIVE	10/31/2008	119 SOUTH WILLIS STREET	VISALIA	93291	76-80%	TULARE	102050	36.329547	-119.297814
ACTIVE	3/22/2013		DUBLIN		36-40%	ALAMEDA	202107	37.70305556	-121.8922222
ACTIVE	7/20/2018	13133 AVENUE 416	OROSI	93647	86-90%	TULARE	100167, 100275	36.54472222	-119.2791667
ACTIVE	6/27/2007	1726 E. ROSSLYNN AVENUE	FULLERTON	92831	86-90%	ORANGE	102224, 401614, 500240	33.863975	-117.897075
ACTIVE	10/27/2009	3200 FRUITLAND AVENUE	VERNON	90058	NA	LOS ANGELES	301396, 301732, 301736	33.996665	-118.210832
ACTIVE	7/1/2001	5040-5050 SLAUSON BLVD.	MAYWOOD	90270	91-95%	LOS ANGELES	300705	33.9855919	-118.172289
ACTIVE	9/8/2008	2231 MENDOCINO AVENUE	SANTA ROSA	95403	51-55%	SONOMA	201825	38.461806	-122.717896
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	5/4/1995	731 SCHWERIN STREET	DALY CITY	94014	66-70%	SAN MATEO	200075, 900243	37.704807	-122.412286
CERTIFIED / OPERATION &	6/30/2003	731 SCHWERIN STREET	DALY CITY	94014	71-75%	SAN MATEO	200075	37.702871	-122.409754

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MAINTENANCE - LAND USE RESTRICTIONS									
ACTIVE - LAND USE RESTRICTIONS	1/1/1987	2000 FRONT STREET	SACRAMENTO	95818	86-90%	SACRAMENTO	100160	38.57219285	-121.5114211
CERTIFIED / OPERATION & MAINTENANCE	6/28/2007	2274 MORA DRIVE	MOUNTAIN VIEW	94040	36-40%	SANTA CLARA	200080, 200080	37.40324211	-122.1014845
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	1/6/2009	PALOS VERDES DR. AND HAWTHORNE BLVD.,	RANCHO PALOS VER	90275	1-5%	LOS ANGELES	400953, 400953	33.74471779	-118.4114135
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	3/28/1997	DENNISON AND EMBARCADERO STREETS	OAKLAND	94606	86-90%	ALAMEDA	200083	37.7797739	-122.2432444
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	9/20/2011	2500 7TH STREET	OAKLAND	94607	81-85%	ALAMEDA	201392	37.810869	-122.32152
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	9/22/2006	1312 CANAL BLVD	RICHMOND	94804	66-70%	CONTRA COSTA	200084, 201232	37.90776886	-122.3681541
ACTIVE	5/20/2014	309 S. MAIN STREET	PORTERVILLE	93257	81-85%	TULARE	102238	36.05991839	-119.0165198
ACTIVE	12/13/2011	865 AND 869 WEST 17TH STREET	COSTA MESA	92627	76-80%	ORANGE	401409	33.6360809	-117.9346999
ACTIVE	10/23/2013	COVERS MOST OF CITY OF INDUSTRY, PORTIONS OF THE CITY OF LA PUENTE AND UNINCORPORATED LOS ANGELES COUNTY	CITY OF INDUSTRY	91744	86-90%	LOS ANGELES	301404, 301425, 301502	34.02933124	-117.9674149
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	2/28/1997	12901 UNITED ROAD	MOJAVE	93501	76-80%	KERN	100176, 101671	35.009294	-118.154627
ACTIVE	3/25/2004	1025 RIVER DRIVE	BRAWLEY	92227	86-90%	IMPERIAL	401121	32.9881438	-115.525568
ACTIVE	10/1/1990	6991 NEVADA AVENUE	CORCORAN	93212	86-90%	KINGS	100274	36.137	-119.5812

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/30/2014	WHITE ROCK ROAD & KILGORE ROAD	RANCHO CORDOVA	95670	36-40%	SACRAMENTO	100123	38.58937285	-121.2694824
ACTIVE	1/1/1985	3265 SOUTH MAPLE AVENUE	MALAGA	93726	96-100%	FRESNO	100122	36.68732217	-119.746381
ACTIVE	11/7/1996	840 MORTON AVENUE	RICHMOND	94806	76-80%	CONTRA COSTA	200599	37.98192026	-122.3565367
ACTIVE	5/16/2016	89 PEKING STREET	VENTURA	93001	76-80%	VENTURA	301405	34.2833	-119.30583
ACTIVE	9/14/2011	24306 HIGHWAY 166	MARICOPA	93252	56-60%	KERN	101650	35.05835	-119.356842
ACTIVE	9/19/2013	538 WEST 5TH STREET	SAN PEDRO	90731	91-95%	LOS ANGELES	401317	33.73992073	-118.2888496
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/19/2002	2887 AND 2989 PULLMAN AVENUE	RICHMOND	94804	81-85%	CONTRA COSTA	201508	37.92861695	-122.3407086
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	1/19/2010	8226 E. WHITTIER BLVD.	PICO RIVERA	90660	76-80%	LOS ANGELES	300369, 301279	34.00580267	-118.0957422
ACTIVE	6/29/1998	2021 WEST 15TH STREET	ROSAMOND	93560	61-65%	KERN	100183	34.85037831	-118.158775
ACTIVE	6/12/1997	2809 S STREET	SACRAMENTO	95816	61-65%	SACRAMENTO	100247	38.56410628	-121.4727616
ACTIVE	5/15/1996	NORTH HOLLYWOOD WELLFIELD AREA	LOS ANGELES	91601	96-100%	LOS ANGELES	300126, 300173	34.1875	-118.3838889
ACTIVE	1/1/1984	CRYSTAL SPRINGS WELLFIELD AREA	GLENDALE	91209	96-100%	LOS ANGELES	300127	34.1575	-118.2847222
CERTIFIED / OPERATION & MAINTENANCE	1/1/1999	POLLOCK WELLFIELD	LOS ANGELES	90086	96-100%	LOS ANGELES	300129	34.12944444	-118.2641667

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ACTIVE	5/12/2015	10-20 MI E OF L.A. ON HWY 10 IN AZUSA	EL MONTE	91732	91-95%	LOS ANGELES	300132, 300345, 300347, 301178, 301369, 301370, 301404, 301425, 301502	34.07239518	-118.0325
ACTIVE	9/1/2010	3930 GILMORE AVENUE	BAKERSFIELD	93308	81-85%	KERN	100128, 101658, 101704, 101955, 102099	35.38970158	-119.0517528
ACTIVE	9/14/2018	LOS OSOS VALLEY ROAD AND HWY. 101	SAN LUIS OBISPO	93401	16-20%	SAN LUIS OBISPO	102043	35.244	-120.682
ACTIVE	4/1/2005	PORT OF LOS ANGELES BERTHS 44-45	SAN PEDRO	90731	NA	LOS ANGELES	401270, 900255	33.715	-118.2752777
ACTIVE - LAND USE RESTRICTIONS	4/30/1994	BAYSHORE BLVD AND SUNNYDALE AVE.	SAN FRANCISCO	94134	66-70%	SAN FRANCISCO	201789	37.71056479	-122.4031448
ACTIVE	9/13/2014	5211 SOUTHERN AVE.	SOUTH GATE	90280	96-100%	LOS ANGELES	301128	33.9462346	-118.1776926
ACTIVE	1/1/1983	SHORELINE&MARSH ADJ. TO CARQUINEZ STRAIT	SELBY	94802	81-85%	CONTRA COSTA	200009, 201959	38.05383569	-122.2490918
ACTIVE - LAND USE RESTRICTIONS	1/1/1983	1735 DOCKERY AVE & ADJOINING	SELMA	93662	96-100%	FRESNO	100129	36.557233	-119.6047166
ACTIVE	4/1/2015	1855 EAST 62ND STREET	LOS ANGELES	90001	96-100%	LOS ANGELES	301695, 301695	33.98385174	-118.2391685
CERTIFIED / OPERATION &	2/7/1992	LERDO HIGHWAY AT HIGHWAY 99	SHAFTER	93263	NA	KERN	100130	35.5003	-119.1829

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MAINTENANCE - LAND USE RESTRICTIONS									
ACTIVE - LAND USE RESTRICTIONS	4/19/1996	14730 HIGHWAY 101	GOLETA	93117	21-25%	SANTA BARBARA	300138	34.4764341	-120.1345706
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	1/23/2013	1450 SHERWIN AVENUE	EMERYVILLE	94608	76-80%	ALAMEDA	200956, 202067, 202179	37.83294587	-122.2897931
ACTIVE	2/24/2011	407 N. WASHINGTON STREET	SONORA	95370	26-30%	TUOLUMNE	102061	37.991237	-120.384755
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/30/2006	BACK LOT AT 11847 UNITED STREET	MOJAVE	93501	76-80%	KERN	100273	34.99468216	-118.1524501
ACTIVE	10/30/2004	130 NORTH 12 STREET; AT INTERSECTION OF NORTH B STREETS	SACRAMENTO	95814	96-100%	SACRAMENTO	101762	38.59030652	-121.4876878
CERTIFIED / OPERATION & MAINTENANCE	4/28/2003	2350 AND 2450 WASHINGTON AVENUE	SAN LEANDRO	94577	51-55%	ALAMEDA	200251	37.715942	-122.148678
CERTIFIED / OPERATION & MAINTENANCE	4/29/1996	3400 HILLVIEW AVENUE	PALO ALTO	94304	1-5%	SANTA CLARA	200118	37.40406129	-122.148765
ACTIVE	5/1/1986	216 S O ST	DINUBA	93618	91-95%	TULARE	100050	36.53751913	-119.3915901
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	7/18/1994	630 EAST MONTECITO STREET	SANTA BARBARA	93103	66-70%	SANTA BARBARA	300174	34.42197222	-119.6853861
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/25/1998	300 NORTH TIPTON STREET	VISALIA	93277	81-85%	TULARE	100277	36.33242651	-119.285175
ACTIVE	4/1/2014	1341 MAYWOOD AVENUE	SANTA ANA	92705	86-90%	ORANGE	401671	33.71695079	-117.8527021
ACTIVE	9/10/2014	13002 LOS NIETOS ROAD	SANTA FE SPRINGS	90670	96-100%	LOS ANGELES	301179	33.946048	-118.0549133
ACTIVE - LAND USE RESTRICTIONS	1/1/1985	FT OF LIBERTY ST GUADALUPE RIV	SAN JOSE	95002	81-85%	SANTA CLARA	200091	37.44105833	-121.9825444

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ACTIVE	6/16/2015	COVERS ALL OF CITY OF SOUTH EL MONTE AND PORTIONS OF EL MONTE AND ROSEMEAD	SOUTH EL MONTE	91733	96-100%	LOS ANGELES	300347	34.05337055	-118.0420876
ACTIVE	10/17/2003	2376 S. RAILROAD AVENUE	FRESNO	93721	96-100%	FRESNO	101591	36.71497861	-119.7754383
ACTIVE	11/26/2002	NORTH OF CHURCH AVENUE AT SOUTH EAST AVE	FRESNO	93721	96-100%	FRESNO	101491, 101569, 101569, 101595	36.71850241	-119.7725
ACTIVE	1/5/2012	1680 MONROVIA AVENUE	COSTA MESA	92627	76-80%	ORANGE	401558	33.635403	-117.936194
ACTIVE	5/13/2014	GENEVA AVENUE AND BAYSHORE BOULEVARD	BRISBANE	94005	71-75%	SAN MATEO	200093	37.70591748	-122.4039433
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	5/28/2009	CYPRESS CORRIDOR	OAKLAND	94607	86-90%	ALAMEDA	200486	37.80305556	-122.2994444
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	8/25/1998	END OF CHADBORNE RD, SUISUN MARSH	FAIRFIELD	94585	41-45%	SOLANO	200444	38.17333333	-122.0788889
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	8/16/2002	5619-5621 RANDOLPH STREET	COMMERCE	90040	96-100%	LOS ANGELES	300148	33.97994717	-118.1651623
ACTIVE	11/5/2008	985 SEASIDE AVENUE	SAN PEDRO	90731	NA	LOS ANGELES	401456	33.73449	-118.26963
ACTIVE	1/1/1983	SP ROSEVILLE RAILYARD	ROSEVILLE	95678	56-60%	PLACER	100138	38.7291	-121.3083
ACTIVE	10/1/1990	SP ROSEVILLE RAILYARD	ROSEVILLE	95678	56-60%	PLACER	100138	38.7473	-121.2883
ACTIVE	5/5/2006	7047-7051 NORTH FIGUEROA STREET	LOS ANGELES	90042	51-55%	LOS ANGELES	301285	34.130497	-118.188914
ACTIVE - LAND USE RESTRICTIONS	6/4/2004	811,817/819, 825 & 826 E. 62ND STREET	LOS ANGELES	90001	96-100%	LOS ANGELES	300683, 308401	33.982915	-118.260409

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ACTIVE - LAND USE RESTRICTIONS	4/25/1996	2112 EAST 223RD STREET	CARSON	90745	NA	LOS ANGELES	400264	33.82323486	-118.2356228
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/1/2016	3450 PYRITE STREET	RIVERSIDE	92509	96-100%	RIVERSIDE	400152	34.02943794	-117.4544692
CERTIFIED / OPERATION & MAINTENANCE	6/1/2016	3450 PYRITE STREET	RIVERSIDE	92509	96-100%	RIVERSIDE	400152	34.029438	-117.454469
ACTIVE	1/1/1984	SULPHUR BANK ROAD	CLEARLAKE	95422	31-35%	LAKE	100142	39.00388889	-122.6647222
ACTIVE	7/24/1998	9755 DISTRIBUTION AVENUE	SAN DIEGO	92121	36-40%	SAN DIEGO	400700	32.8844915	-117.1622173
ACTIVE	2/25/2013	14540 CAMDEN AVENUE	SAN JOSE	95124	21-25%	SANTA CLARA	201961	37.261264	-121.923095
CERTIFIED / OPERATION & MAINTENANCE	5/28/1996	3300 HILLVIEW AVE	PALO ALTO	94304	1-5%	SANTA CLARA	200141	37.40687887	-122.1459461
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	1/12/2006	7183 EAST MCKINLEY AVENUE	FRESNO	93727	31-35%	FRESNO	100146	36.76415648	-119.6598411
ACTIVE	9/14/2007	2007 LAURA AVENUE	HUNTINGTON PARK	90255	96-100%	LOS ANGELES	301368	33.98844513	-118.2356799
CERTIFIED / OPERATION & MAINTENANCE	12/15/1997	420 N HENRY FORD AVE	WILMINGTON	90744	NA	LOS ANGELES	400431	33.77495833	-118.2411917
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	8/2/1995	420 N HENRY FORD AVE	WILMINGTON	90744	NA	LOS ANGELES	400154	33.77495833	-118.2411917
CERTIFIED / OPERATION & MAINTENANCE	9/12/1995	3165 PORTER DR	PALO ALTO	94304	1-5%	SANTA CLARA	200140	37.40901974	-122.1495288
CERTIFIED / OPERATION & MAINTENANCE	7/31/1995	3176 PORTER DRIVE	PALO ALTO	94304	1-5%	SANTA CLARA	200096	37.40684476	-122.1492821
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	5/22/2013	S OF PALISADES DR, W OF SERFAS CLUB DR	CORONA	91720	66-70%	RIVERSIDE	400158	33.88022048	-117.614275
CERTIFIED / OPERATION &	3/23/2005	2980 & 3030 STEVENS CREEK BOULEVARD	SAN JOSE	95113	41-45%	SANTA CLARA	200916	37.31985057	-121.9489848

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MAINTENANCE - LAND USE RESTRICTIONS									
ACTIVE - LAND USE RESTRICTIONS	5/1/1986	915 TENTH STREET	FIREBAUGH	93622	81-85%	FRESNO	100149, 102192	36.85669471	-120.4638916
ACTIVE	2/19/2019	1307 SOUTH COAST HIGHWAY	OCEANSIDE	92054	66-70%	SAN DIEGO	401562, 530034	33.18235503	-117.3685028
ACTIVE	7/13/2016	12 MILES NORTH OF SAN DIEGO	LA JOLLA	92103	11-15%	SAN DIEGO	401221	32.89167	-117.24084
ACTIVE	4/10/2018	2300 VICHY SPRINGS ROAD	UKIAH	95482	31-35%	MENDOCINO	202183	39.16339774	-123.1670613
ACTIVE	4/4/2002	700 73RD AVENUE	OAKLAND	94621	86-90%	ALAMEDA	201420	37.75222278	-122.1976499
ACTIVE - LAND USE RESTRICTIONS	1/1/1987	3675 WESTERN PACIFIC AVENUE	SACRAMENTO	95818	11-15%	SACRAMENTO	100151, 102014, 102015	38.54017336	-121.4826086
ACTIVE - LAND USE RESTRICTIONS	1/1/1983	8TH & WRIGHT	RICHMOND	94804	66-70%	CONTRA COSTA	200059	37.92097303	-122.3665786
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/1/1995	12433 UNITED STREET	MOJAVE	93501	76-80%	KERN	100177	35.00248502	-118.1520432
ACTIVE	7/20/2005	1301 SOUTH 46TH STREET	RICHMOND	94804	81-85%	CONTRA COSTA	201605	37.91536352	-122.3346847
ACTIVE	1/1/1983	401 I STREET	SACRAMENTO	95814	96-100%	SACRAMENTO	100139	38.58585566	-121.5016222
ACTIVE - LAND USE RESTRICTIONS	6/3/1992	401 I STREET	SACRAMENTO	95814	96-100%	SACRAMENTO	100139	38.589504	-121.496859
ACTIVE	10/1/2004	400 I STREET	SACRAMENTO	95814	96-100%	SACRAMENTO	100139	38.587225	-121.504276
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	1/12/1996	401 I STREET	SACRAMENTO	95814	96-100%	SACRAMENTO	100139	38.588497	-121.499434
ACTIVE	1/8/2014	401 I STREET	SACRAMENTO	95814	96-100%	SACRAMENTO	100139	38.584224	-121.500388
ACTIVE	5/16/2011	2510 SOUTH EAST AVENUE	FRESNO	93717	96-100%	FRESNO	101585	36.70973859	-119.7750365
CERTIFIED / OPERATION &	6/30/2012	3872 EL CAJON	SHASTA LAKE	96019	31-35%	SHASTA	100152	40.67722222	-122.3774444

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MAINTENANCE - LAND USE RESTRICTIONS									
ACTIVE - LAND USE RESTRICTIONS	1/1/1983	2237 SOUTH GOLDEN STATE BLVD	TURLOCK	95380	96-100%	STANISLAUS	100153	37.47216573	-120.8243721
CERTIFIED / OPERATION & MAINTENANCE	8/21/1997	611 HANSEN WAY	PALO ALTO	94304	1-5%	SANTA CLARA	200122	37.41999036	-122.1371564
ACTIVE	10/1/1990	7209 NORTH INGRAM AVENUE	PINEDALE	93650	66-70%	FRESNO	100249	36.84161	-119.806198
ACTIVE	12/13/2016	SACO ST	VERNON	90058	NA	LOS ANGELES	301371	34.0102989	-118.23405
ACTIVE - LAND USE RESTRICTIONS	10/1/1990	365 E 20TH ST	CHICO	95928	86-90%	BUTTE	100178	39.72090827	-121.8212429
ACTIVE	6/9/2006	340 EAST 192ND STREET	CARSON	90746	96-100%	LOS ANGELES	400579, 401765, 401781, 401820	33.85288877	-118.269876
ACTIVE	8/4/2006	CENTRAL CITY AREA	VISALIA	93277	76-80%	TULARE	101808	36.330278	-119.291111
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	9/14/2006	12731 LOS NIETOS RD	SANTA FE SPRINGS	90670	96-100%	LOS ANGELES	300166	33.94860449	-118.0575585
CERTIFIED / OPERATION & MAINTENANCE	8/30/1996	3333 HILLVIEW AVENUE	PALO ALTO	94304	1-5%	SANTA CLARA	200137	37.40808616	-122.1432596
ACTIVE	2/12/2016	VARIOUS ADDRESSES NEAR ALAMEDA STREET AND EAST 97TH STREET	LOS ANGELES	90002	96-100%	LOS ANGELES	900272, 900313	33.9487635	-118.2298932
CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS	6/11/2015	2494 SOUTH RAILROAD AVENUE, P.O. BOX 164	FRESNO	93707	96-100%	FRESNO	101163, 102279	36.70778551	-119.7707781
ACTIVE	7/20/2017		SANTA ANA		66-70%	ORANGE		33.75138889	-117.8833333
ACTIVE	9/30/2014	4530 E PACIFIC WAY	COMMERCE	90040	96-100%	LOS ANGELES	300590, 301145	34.00564486	-118.1773367

STATUS	STATUS DATE	ADDRESS DESCRIPTION	CITY	ZIP	CALENVIRO-SCREEN SCORE	COUNTY	SITE CODE	LATITUDE	LONGITUDE
ACTIVE	1/12/1988	WHITE ROCK DUMPS (WRD) 1 AND 2 ARE LOCATED ON AEROJET PROPERTY.WRD 1, SOUTH OF WHITE ROCK ROAD ON THE INACTIVE RANCHO CORDOVA TEST SITE (IRCTS). WRD 2, NORTH SIDE OF WHITE ROCK ROAD.	RANCHO CORDOVA	95742	46-50%	SACRAMENTO	102127	38.60124228	-121.1931373
ACTIVE	4/14/1995	22116 SOLEDAD CANYON RD	SANTA CLARITA	91350	21-25%	LOS ANGELES	300245, 301836	34.41410049	-118.5231964
ACTIVE	5/12/2015	BETWEEN HIGHWAY 60 AND THE MONTEBELLO FOREBAY (NEAR WHITTIER NARROWS DAM)	SOUTH EL MONTE	91733	86-90%	LOS ANGELES	300132	34.03045157	-118.0588031
ACTIVE - LAND USE RESTRICTIONS	3/11/1996	INTERSECTION OF HOLDENER & A STREETS	ELMIRA	95625	61-65%	SOLANO	100164	38.35235422	-121.907325
ACTIVE - LAND USE RESTRICTIONS	10/5/2001	1300 CARDINAL STREET	LOS ANGELES	90012	96-100%	LOS ANGELES	300545, 300855, 301015	34.06318	-118.229891
ACTIVE	7/6/2017	518-530 NORTH MCFARLAND AVENUE/805-829 EAST "E" STREET	LOS ANGELES	90744	96-100%	LOS ANGELES	401789	33.776486	-118.252623
ACTIVE - LAND USE RESTRICTIONS	10/3/2004	1841 HILLSIDE AVENUE	NORCO	92860	56-60%	RIVERSIDE	401144	33.91046077	-117.5416442
ACTIVE - LAND USE RESTRICTIONS	11/6/2004	1415 SOUTH 47TH STREET	RICHMOND	94804	81-85%	CONTRA COSTA	201567, 201621, 201622, 201623, 201624, 201955	37.91244	-122.331214

Appendix D2
Preliminary Environmental Site Screening

November 4, 2019

TO: Adam Ariki
Waterworks Division

Attention Eduardo Maguino

FROM: Greg Kelley Greg Kelley
Geotechnical and Materials Engineering Division

PRELIMINARY ENVIRONMENTAL SITE SCREENING
DISTRICT 29 CAPITAL IMPROVEMENT PROGRAM
PROJECT ID WWD2900083 (PROJECT NO. Y5292277)

In response to your request dated September 18, 2019, a Preliminary Environmental Site Screening (PESS) was completed for the subject project. It is our understanding that the project consists of various Waterworks District 29 infrastructure improvements in the Malibu community. The project consists of replacing approximately 17,980 feet of waterlines along Pacific Coast Highway, 7,000 feet of waterlines along Carbon Canyon and Carbon Mesa Road, and 4,500 feet of waterlines along Encinal Canyon Road and vicinity. Also, the 70,000-gallon upper encinal water tank will be replaced with a 300,000-gallon water tank.

Our PESS included a site reconnaissance conducted on October 21, 2019, review of available aerial photographs and topographic maps, and searches of publicly available regulatory databases. Based on available information, the site conditions observed, and the proposed scope of work the results of our PESS did not identify environmental conditions affecting the project. At this time, no further assessment is warranted.

Note that our PESS of the site conditions does not preclude that contamination may exist in subsurface soils at the site in areas that have not been identified as environmental concerns because: (1) contamination releases may not have been reported to the authorities, (2) contamination releases were not known to have occurred, or (3) data gaps exist in the referenced databases, historical photographs, or maps. There is also the possibility that site contamination may occur subsequent to our review. Additionally, if impacted soils are encountered during construction, the project contractor should implement proper health and safety measures and appropriate contaminated material handling and disposal procedures. This PESS is considered applicable for a period of 180 days from the date of this memorandum and is recommended to be updated thereafter as needed.

If you have any questions regarding this matter, please contact Benjamin Osias or Gregory Sena at Extension 4923. To provide feedback on our services please access http://dpw.lacounty.gov/go/gmedsurvey to complete a Customer Service Survey.

BO GS

BO:GS:mc
GME-3\P:\gmepub\Secretarial\GeoInv\PESS\2019\District 29 Project EIR.doc

cc: Construction (Enriquez)
Waterworks (Siongco)

Appendix E

Noise Data

FIELD NOISE MEASUREMENT DATA

PROJECT: LA CDPW waterworks Dist. 29 PROJ. # 00489.16

SITE IDENTIFICATION: LT1
OBSERVER(S): Jakob R.
ADDRESS:
START DATE / TIME: ~~4:00Am~~ 6:00AM 4/1/2019
END DATE / TIME: 11:42 AM 4/3/19

METEROLOGICAL CONDITIONS:
TEMP: ______ °F HUMIDITY: ______ %R.H.
WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: ______ MPH DIR: N NE E SE S SW W NW
STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

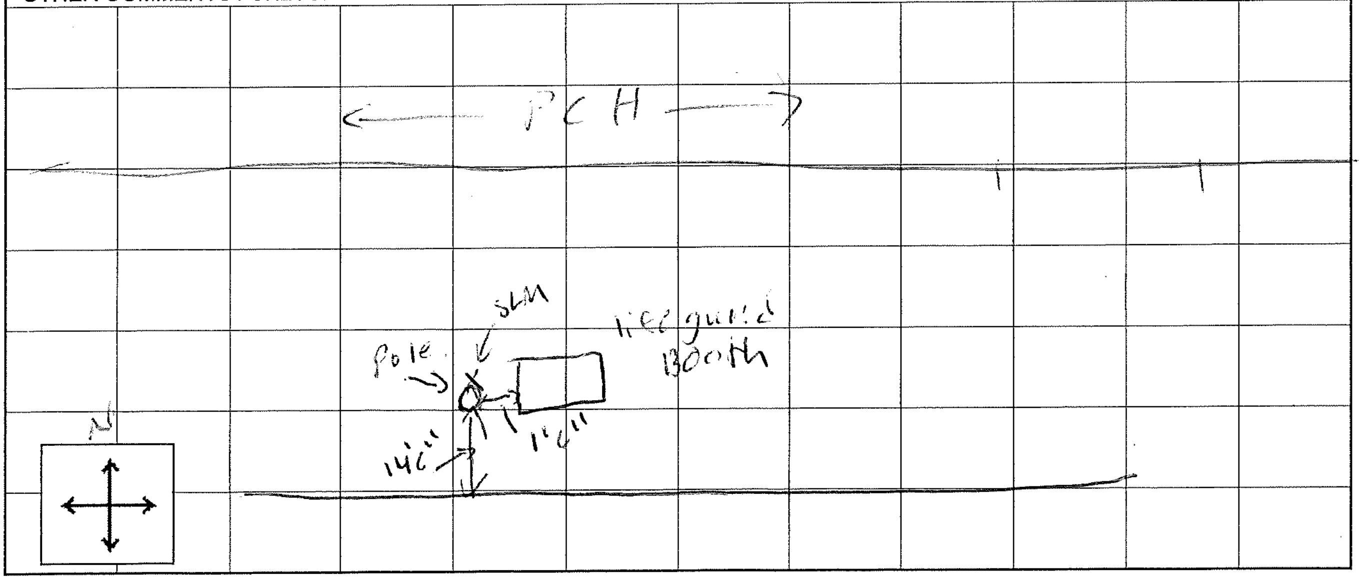
ACOUSTIC MEASUREMENTS:
INSTRUMENT: pic. #4
TYPE: 1 [✓ 2]
SERIAL #: 150320014
CALIBRATOR: CAL 200
SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 94 AFTER 93.7
WINDSCREEN X
SETTINGS: [✓ A-WEIGHTED] [✓ SLOW] FAST FRONTAL [✓ RANDOM] [✓ ANSI] OTHER: ______

FILE / MEAS #	START TIME	END TIME	L_{eq}	max	L 1.67	8.33	25	50	90	99	min
	~~4:00Am~~										
	6:00Am	11:42Am									

COMMENTS: Arrived @ 8:40Am, Mounted 8:57 AM
4/1 - Cleared: 8:58
4/3- Arrived 11:36Am, Cleared 11:45

NOISE SOURCE INFO:
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: ______
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:
TERRAIN: [✓ HARD] SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



Measurement: LT1 Data

	Slow Response		dBA weighting		1.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L25%
4/2/2019 7:00	1.0 hour	75.9	111.5	84.8	48.7	80	79	78	75	65	60	55	75	73.2	5.68	80	79	77
4/2/2019 8:00	1.0 hour	75.3	110.9	84.4	49.1	80	78	78	74	67	63	55	74	73.2	4.83	79	78	76
4/2/2019 9:00	1.0 hour	74	109.6	83.1	51.6	78	77	77	73	65	61	56	73	71.8	4.87	78	77	75
4/2/2019 10:00	1.0 hour	73.5	109.1	87.2	58.5	78	77	76	72	66	63	62	72	71.6	3.89	77	76	74
4/2/2019 11:00	1.0 hour	72.7	108.3	80	58	77	76	75	72	67	65	62	72	71.3	3.29	76	75	74
4/2/2019 12:00	1.0 hour	72.9	108.5	84.8	50.5	77	76	75	72	65	63	57	72	71	4.21	77	76	74
4/2/2019 13:00	1.0 hour	72.7	108.3	86.9	55.8	77	76	75	72	66	63	59	72	70.9	3.8	77	75	73
4/2/2019 14:00	1.0 hour	74.2	109.8	99.6	59.8	78	76	75	72	68	67	63	72	71.9	3.07	77	75	74
4/2/2019 15:00	1.0 hour	73.7	109.3	88.1	60.3	77	76	75	73	69	68	64	73	72.4	2.71	77	76	74
4/2/2019 16:00	1.0 hour	74.2	109.8	90.3	67.1	79	76	75	73	70	69	68	73	73.2	2.15	77	76	75
4/2/2019 17:00	1.0 hour	74.3	109.9	86.4	61.7	78	77	76	74	70	69	66	74	73.3	2.35	77	76	75
4/2/2019 18:00	1.0 hour	74.5	110.1	86.8	59.4	79	77	77	73	69	68	64	73	73.1	3.03	78	77	75
4/2/2019 19:00	1.0 hour	74.4	110	85.9	56	79	78	77	73	67	64	59	73	72.4	4.18	78	77	75
4/2/2019 20:00	1.0 hour	72.8	108.4	87	54.6	79	77	76	71	63	60	57	71	70.1	4.93	78	76	74
4/2/2019 21:00	1.0 hour	71.9	107.5	89	50.7	79	76	75	69	60	57	54	69	68.2	5.84	78	75	72
4/2/2019 22:00	1.0 hour	71.8	107.4	82.5	50.9	77	75	75	71	61	58	53	71	69.1	5.38	77	75	73
4/2/2019 23:00	1.0 hour	72.2	107.8	82	69.2	77	75	74	71	69	69	69	71	71.2	1.95	76	74	72
4/3/2019 0:00	1.0 hour	68.9	104.5	89.9	52.1	76	73	72	65	57	56	54	65	64.8	5.49	75	72	69
4/3/2019 1:00	1.0 hour	65.4	101	80.8	53.2	74	71	68	62	57	56	54	62	62.4	4.51	73	69	65
4/3/2019 2:00	1.0 hour	64.4	100	79.5	52.4	72	69	67	62	56	55	54	62	61.7	4.17	71	68	65
4/3/2019 3:00	1.0 hour	65	100.6	79.6	52.1	72	70	68	62	57	56	54	62	62.4	4.13	71	69	65
4/3/2019 4:00	1.0 hour	67.4	103	79.8	52.7	76	73	71	63	57	56	54	63	63.7	5.26	75	72	67
4/3/2019 5:00	1.0 hour	72.6	108.2	85.1	53	79	77	76	70	62	59	56	70	69.6	5.39	78	76	74
4/3/2019 6:00	1.0 hour	76	111.6	83.9	53.8	80	79	79	75	68	65	60	75	74.1	4.33	80	79	77

Daytime	75.9	71.9
Nighttime	76	64.4

FIELD NOISE MEASUREMENT DATA

PROJECT: LA CDPW waterworks Dist. 29 PROJ. # 00489.16

SITE IDENTIFICATION: LT 2 OBSERVER(S): Jakob R
ADDRESS:
START DATE / TIME: ~~10~~ 6:00 Am 4/1/2019 END DATE / TIME: 10:38 4/1/19

METEROLOGICAL CONDITIONS:
TEMP: ______ °F HUMIDITY: ______ %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: ______ MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

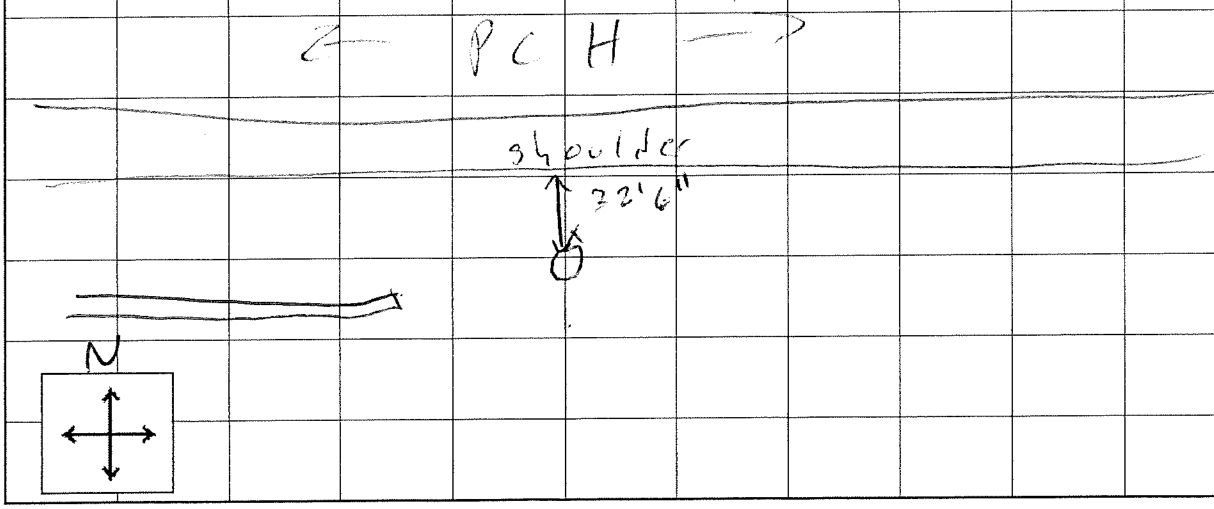
ACOUSTIC MEASUREMENTS:
INSTRUMENT: PIC #6 TYPE: 1 [✓ 2] SERIAL #: 150320016
CALIBRATOR: SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 94.0 AFTER 93.8 WINDSCREEN X
SETTINGS: [✓ A-WEIGHTED] [✓ SLOW] FAST FRONTAL [✓ RANDOM] [✓ ANSI] OTHER: ______

FILE / MEAS #	START TIME	END TIME	L_{eq}	L max	1.67	8.33	25	50	90	99	min

COMMENTS: Arrived 9:40Am mounted 9:56 Am, cleared 10:00 Am
Arrived 10:20Am, cleared 10:35

NOISE SOURCE INFO:
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: ______
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:
TERRAIN: HARD SOFT [✓ MIXED] FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



Measurement: LT2 Data

	Slow Response		dBA weighting		1.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L25%
4/2/2019 7:00	1.0 hour	77.7	113.3	89.7	52.5	85	82	81	75	63	60	56	75	73.6	6.88	84	81	79
4/2/2019 8:00	1.0 hour	76.6	112.2	89.3	51.2	84	81	80	75	62	59	55	75	72.6	6.78	82	80	78
4/2/2019 9:00	1.0 hour	76.3	111.9	104.2	55.7	82	80	78	73	61	59	57	73	71.4	6.42	81	79	76
4/2/2019 10:00	1.0 hour	74.2	109.8	87.4	54.1	82	79	78	72	60	58	55	72	69.9	6.76	80	78	75
4/2/2019 11:00	1.0 hour	74.7	110.3	91.3	54	82	79	78	72	59	57	55	72	70.4	6.96	80	78	76
4/2/2019 12:00	1.0 hour	75.3	110.9	90.1	49.6	83	80	78	73	59	55	53	73	70.9	7.36	81	79	76
4/2/2019 13:00	1.0 hour	75.2	110.8	91.7	52.7	82	79	78	73	59	56	54	73	70.8	7.11	81	79	76
4/2/2019 14:00	1.0 hour	75.8	111.4	91.8	53.9	83	80	79	74	61	58	55	74	71.8	6.74	81	79	77
4/2/2019 15:00	1.0 hour	77	112.6	87.1	54.8	83	81	80	75	63	60	56	75	73.4	6.55	82	80	78
4/2/2019 16:00	1.0 hour	77.4	113	92.6	56.4	83	81	80	76	64	62	58	76	74.1	6.08	82	81	79
4/2/2019 17:00	1.0 hour	77.1	112.7	91.3	56.8	83	81	80	75	63	61	58	75	73.5	6.34	82	80	78
4/2/2019 18:00	1.0 hour	76	111.6	87.8	55.2	82	80	79	74	62	59	56	74	72.2	6.64	81	80	77
4/2/2019 19:00	1.0 hour	75.2	110.8	89.3	53.5	82	80	79	72	61	59	56	72	70.7	6.84	81	79	76
4/2/2019 20:00	1.0 hour	72.8	108.4	93.7	50.5	81	78	77	66	56	55	53	66	66.1	7.94	80	77	73
4/2/2019 21:00	1.0 hour	70.3	105.9	88.5	50.3	79	77	75	60	55	54	52	60	62.8	7.73	78	76	69
4/2/2019 22:00	1.0 hour	68.1	103.7	83.4	50.9	79	75	73	58	55	54	53	58	61.1	6.67	77	74	64
4/2/2019 23:00	1.0 hour	66.2	101.8	82.7	52.5	77	74	70	57	55	54	53	57	59.4	5.88	76	72	60
4/3/2019 0:00	1.0 hour	65.2	100.8	89.9	52.4	76	71	64	57	55	54	53	57	58.2	4.86	75	67	58
4/3/2019 1:00	1.0 hour	62.6	98.2	81.4	53.6	75	66	60	57	55	55	54	57	58	3.78	73	61	58
4/3/2019 2:00	1.0 hour	61.7	97.3	80	53.3	74	63	60	57	55	55	54	57	57.6	3.36	72	60	58
4/3/2019 3:00	1.0 hour	62	97.6	81.6	53.8	75	62	59	57	55	55	54	57	57.5	3.32	71	60	58
4/3/2019 4:00	1.0 hour	68.1	103.7	93.8	53.4	79	75	69	58	55	55	54	58	59.6	5.78	77	71	60
4/3/2019 5:00	1.0 hour	73.8	109.4	88.8	53.8	83	80	78	64	57	56	55	64	66.3	8.17	82	79	74
4/3/2019 6:00	1.0 hour	77.5	113.1	90.4	56.3	85	82	81	74	61	60	58	74	72.7	7.27	84	81	79

daytime	77.7	70.3
nighttime	77.5	61.7

FIELD NOISE MEASUREMENT DATA

PROJECT: LACDPW waterworks Dist. 29 PROJ. # .00489.16

SITE IDENTIFICATION: ST 1
OBSERVER(S): Jakob R
ADDRESS: open space near Bainum Dr / Fernwood pacific Dr.
START DATE / TIME: 12:33 - 4/1/19
END DATE / TIME: 4/1/19 - 12:53

METEROLOGICAL CONDITIONS:
TEMP: 61. °F
HUMIDITY: 49 %R.H.
WIND: CALM [✓ LIGHT] MODERATE VARIABLE
WINDSPEED: 2-3 MPH
DIR: N NE E SE [✓ S] SW W NW
STEADY GUSTY
SKY: [✓ SUNNY] CLEAR OVRCST PRTLY CLOUDY FOG RAIN
OTHER:

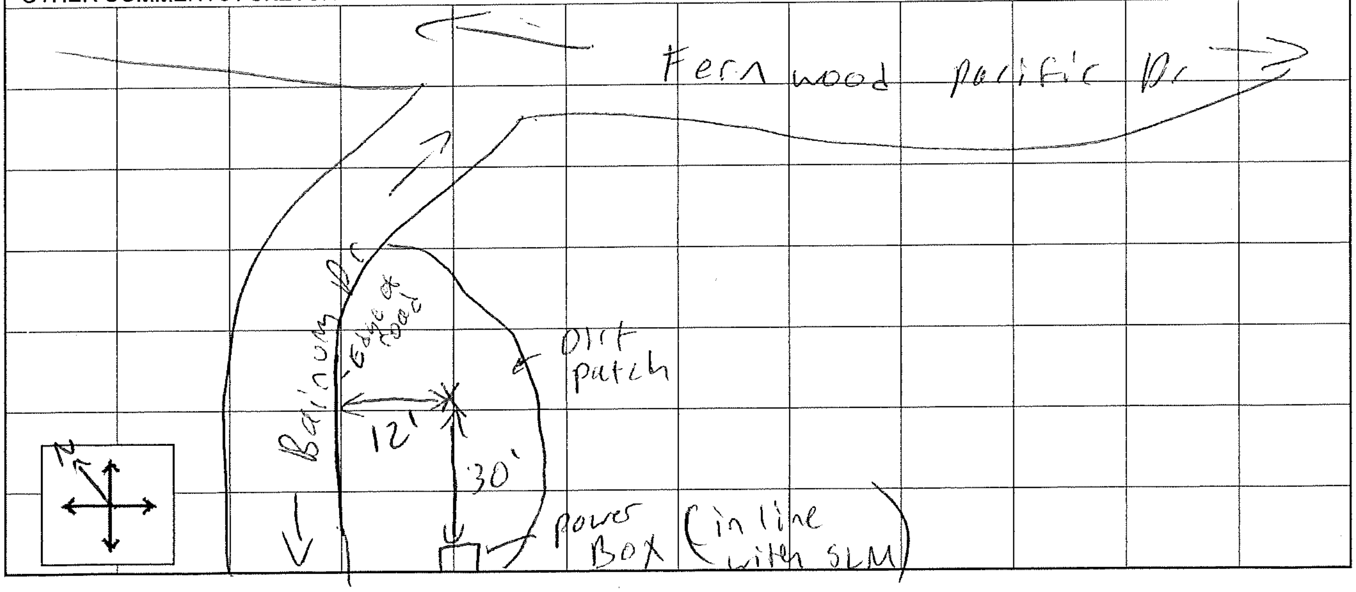
ACOUSTIC MEASUREMENTS:
INSTRUMENT: LD831
TYPE: [✓ 1] 2
SERIAL #: 3786
CALIBRATOR: CAL 200
SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER 113.97
WINDSCREEN X
SETTINGS: [✓ A-WEIGHTED] [✓ SLOW] FAST FRONTAL [✓ RANDOM] [✓ ANSI]
OTHER:

FILE / MEAS #	START TIME	END TIME	L_{eq}	max	L 1.67	L 8.33	L 25	L 50	L 90	L 99	min
.743	12:33	12:53	43.5	58.7	52.6	47.8	42.8	39.5	35.9	34.3	33.7

COMMENTS: paused out conversation w/ pedestrian.

NOISE SOURCE INFO:
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL [✓ AMBIENT] OTHER:
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / [✓ RUSTLING LEAVES] / DIST. BARKING DOGS / [✓ BIRDS] / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / [✓ DIST. LANDSCAPING ACTIVITIES] / OTHER:

DESCRIPTION / SKETCH:
TERRAIN: HARD [✓ SOFT] MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



FIELD NOISE MEASUREMENT DATA

PROJECT: LACDPW waterworks Dist. 29 PROJ. # 00489.16

SITE IDENTIFICATION: ST2
OBSERVER(S): Jakob R
ADDRESS: Coastline Dr.
START DATE / TIME: 4/3/19 - 2:24
END DATE / TIME: 4/3/19 2:44

METEROLOGICAL CONDITIONS:
TEMP: 64 °F HUMIDITY: 63 %R.H.
WIND: CALM [✓ LIGHT] MODERATE VARIABLE
WINDSPEED: 2-3 MPH DIR: N NE E SE S [✓ SW] W NW STEADY GUSTY
SKY: [✓ SUNNY] CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

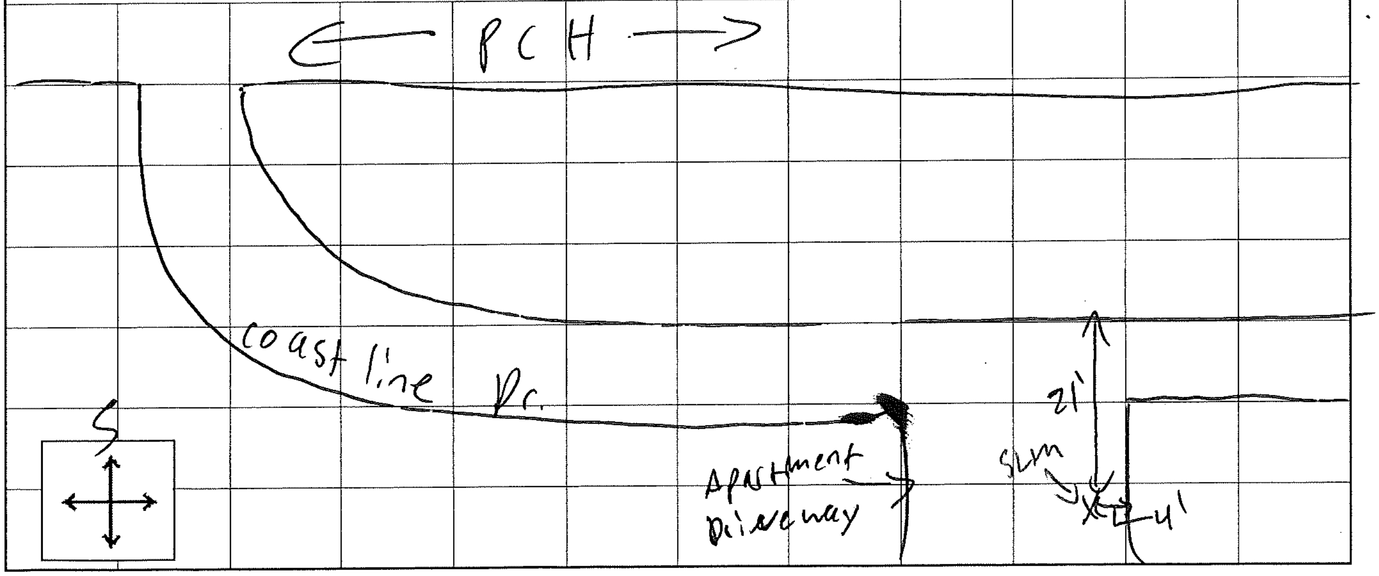
ACOUSTIC MEASUREMENTS:
INSTRUMENT: LD 831 TYPE: [✓ 1] 2 SERIAL #: 3786
CALIBRATOR: CAL 200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER ______ WINDSCREEN X
SETTINGS: [✓ A-WEIGHTED] [✓ SLOW] FAST FRONTAL [✓ RANDOM] [✓ ANSI] OTHER: ______

FILE / MEAS #	START TIME	END TIME	L_{eq}	max	L 1.67	L 8.33	L 25	L 50	L 90	L 99	min
.743	2:24	2:44	56.3	70.0	65.4	61.6	56.3	47.5	42.5	39.6	36.9

COMMENTS: Paused out landscaping activity

NOISE SOURCE INFO:
PRIMARY NOISE SOURCE: [✓ TRAFFIC] AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: ______
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / [✓ BIRDS] / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / [✓ DIST. LANDSCAPING ACTIVITIES] / OTHER:

DESCRIPTION / SKETCH:
TERRAIN: [✓ HARD] SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



FIELD NOISE MEASUREMENT DATA

PROJECT: LACDPW waterworks Dist. 29 PROJ. # 00489.16

SITE IDENTIFICATION: ST 3
OBSERVER(S): Jakob R.
ADDRESS: Open Area near Carbon Mesa Rd
START DATE / TIME: ~~[illegible]~~ 4/1/14 - 1:40pm
END DATE / TIME: 4/1/14 - 2:00pm

METEROLOGICAL CONDITIONS:
TEMP: 76 °F HUMIDITY: 34% %R.H.
WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 2-3 MPH DIR: N NE E SE S SW [✓ W] NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

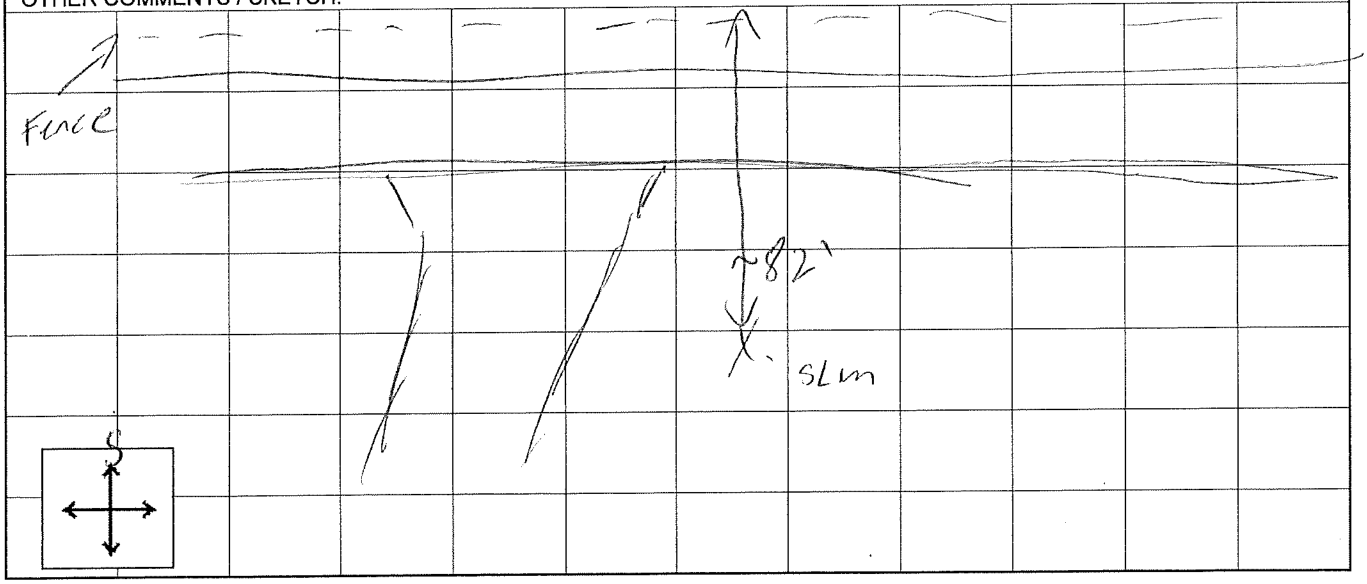
ACOUSTIC MEASUREMENTS:
INSTRUMENT: LD 831 TYPE: [✓ 1] 2 SERIAL #: 3786
CALIBRATOR: CAL 200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER 114.0 WINDSCREEN X
SETTINGS: [✓ A-WEIGHTED] [✓ SLOW] FAST FRONTAL [✓ RANDOM] [✓ ANSI] OTHER:

FILE / MEAS #	START TIME	END TIME	L_{eq}	L max	L 1.67	L 8.33	L 25	L 50	L 90	L 99	L min
716	1:40	2:00	44.7	65.3	52.8	47.7	44.1	41.6	36.2	34.3	33.4

COMMENTS:

NOISE SOURCE INFO:
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL [✓ AMBIENT] OTHER:
ROADWAY TYPE:
OTHER SOURCES: [✓ DIST. AIRCRAFT] / RUSTLING LEAVES / DIST. BARKING DOGS / [✓ BIRDS] / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. [✓ LANDSCAPING] ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:
TERRAIN: HARD SOFT [✓ MIXED] FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



FIELD NOISE MEASUREMENT DATA

PROJECT: LACDPW Waterworks Dist. 29 PROJ. # 00489.16

SITE IDENTIFICATION: ST 4 OBSERVER(S): Jakob R.

ADDRESS: parking lot off PCH

START DATE / TIME: 4/1/19 - 11:18 AM END DATE / TIME: 4/1/19 - 11:38AM

METEROLOGICAL CONDITIONS:

TEMP: 77 °F HUMIDITY: 36 %R.H. WIND: CALM [✓ LIGHT] MODERATE VARIABLE

WINDSPEED: 1-2 MPH DIR: N NE [✓ E] SE S SW W NW STEADY GUSTY

SKY: [✓ SUNNY] [✓ CLEAR] OVRCST PRTLY CLOUDY FOG RAIN OTHER:

ACOUSTIC MEASUREMENTS:

INSTRUMENT: LD 831 TYPE: [✓ 1] 2 SERIAL #: 3786

CALIBRATOR: CAL 200 SERIAL #: 6645

CALIBRATION CHECK, BEFORE: 114.0 AFTER 113.93 WINDSCREEN X

SETTINGS: [✓ A-WEIGHTED] [✓ SLOW] FAST FRONTAL [✓ RANDOM] [✓ ANSI] OTHER:

FILE / MEAS #	START TIME	END TIME	Leq	max	L 1.67	L 8.33	L 25	L 50	L 90	L 99	min
.714	11:18AM	11:38AM	59.0	64.5	64.5	61.8	60.1	58.1	52.8	48.5	47.2

COMMENTS: - paused for parking lot activity

NOISE SOURCE INFO:

PRIMARY NOISE SOURCE: [✓ TRAFFIC] AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:

ROADWAY TYPE:

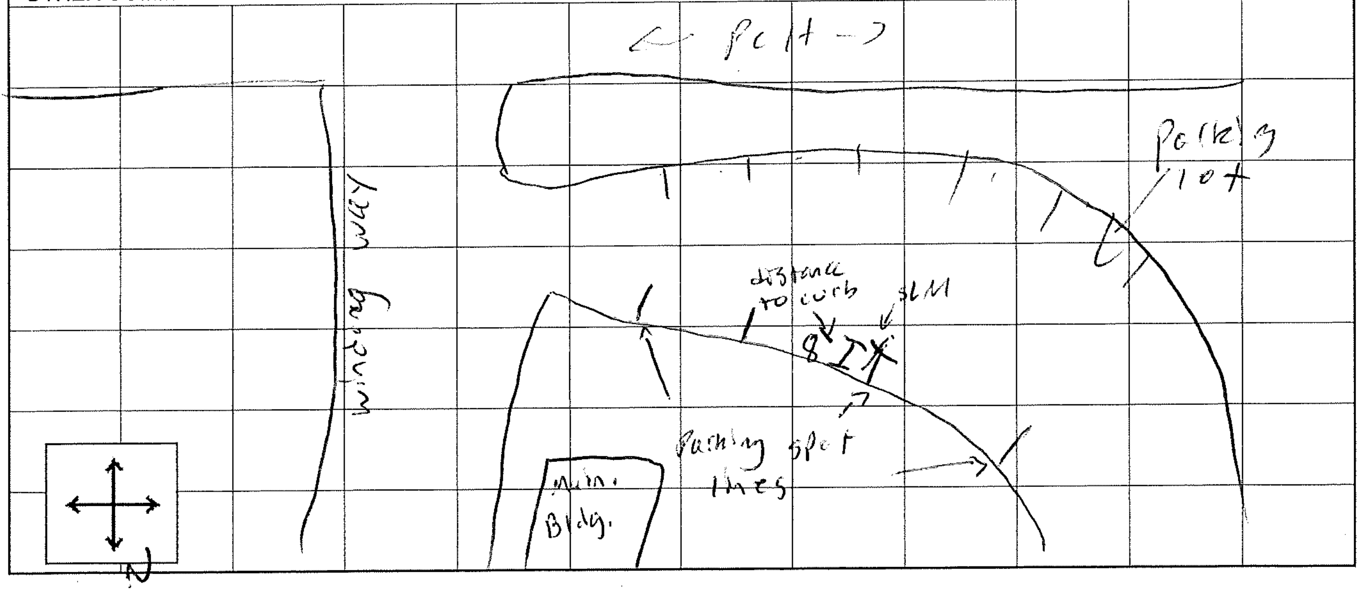
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / [✓ BIRDS] / DIST. INDUSTRIAL DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:

TERRAIN: HARD SOFT [✓ MIXED] FLAT OTHER:

PHOTOS:

OTHER COMMENTS / SKETCH:



FIELD NOISE MEASUREMENT DATA

PROJECT: LACDPW waterworks Dist.29 PROJ. # 00489.16

SITE IDENTIFICATION: ST 5 OBSERVER(S): Jakob R
ADDRESS: Across from 18436 Pacific coast Highway
START DATE / TIME: ~~[illegible]~~ 4/3/19 1:37 pm END DATE / TIME: 4/3/19 1:57 pm

METEROLOGICAL CONDITIONS:
TEMP: ~~M~~64 °F HUMIDITY: 47 %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 1-2 MPH DIR: N NE E SE S [✓ SW] [✓ W] NW STEADY GUSTY
SKY: [✓ SUNNY] CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

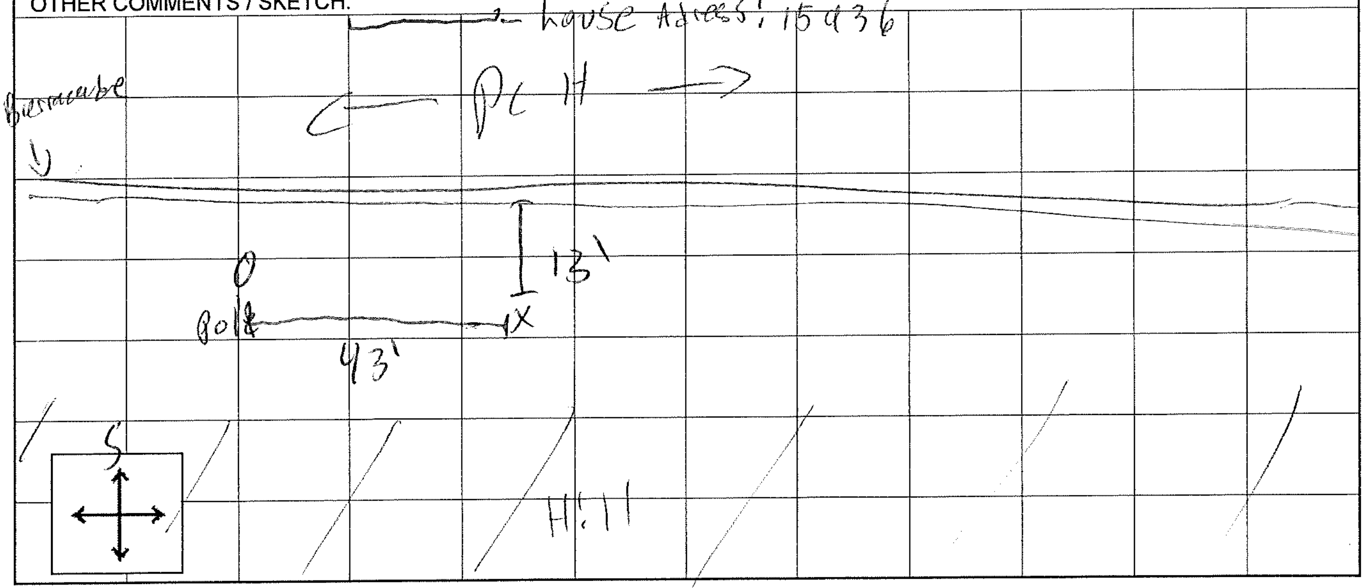
ACOUSTIC MEASUREMENTS:
INSTRUMENT: LD 831 TYPE: [✓ 1] 2 SERIAL #: 3786
CALIBRATOR: CAL200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER 113.95 WINDSCREEN X
SETTINGS: [✓ A-WEIGHTED] [✓ SLOW] FAST FRONTAL [✓ RANDOM] [✓ ANSI] OTHER:

FILE / MEAS #	START TIME	END TIME	L_{eq}	L max	L 1.67	L 8.33	L 25	L 50	L 90	L 99	L min
.744	1:37	1:57	69.7	79.0	74.2	72.7	71.0	68.8	64.1	51.2	49.3

COMMENTS:

NOISE SOURCE INFO:
PRIMARY NOISE SOURCE: [✓ TRAFFIC] AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:
TERRAIN: HARD SOFT [✓ MIXED] FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



FIELD NOISE MEASUREMENT DATA

PROJECT: ____________ PROJ. # ____________

SITE IDENTIFICATION: ST 6
OBSERVER(S): Jakob R.
ADDRESS:
START DATE / TIME: 4/1/19 - 10:27AM
END DATE / TIME: 4/1/19 - 10:47AM

METEROLOGICAL CONDITIONS:
TEMP: 74 °F
HUMIDITY: 38 %R.H.
WIND: CALM [✓ LIGHT] MODERATE VARIABLE
WINDSPEED: 4-5 MPH
DIR: N NE E SE [✓ S] SW W NW
STEADY GUSTY
SKY: SUNNY CLEAR [✓ OVRCST] PRTLY CLOUDY FOG RAIN
OTHER:

ACOUSTIC MEASUREMENTS:
INSTRUMENT: LD 831
TYPE: [✓ 1] 2
SERIAL #:
CALIBRATOR: CAL 200
SERIAL #:
CALIBRATION CHECK, BEFORE: 114.0 AFTER 113.93 WINDSCREEN X

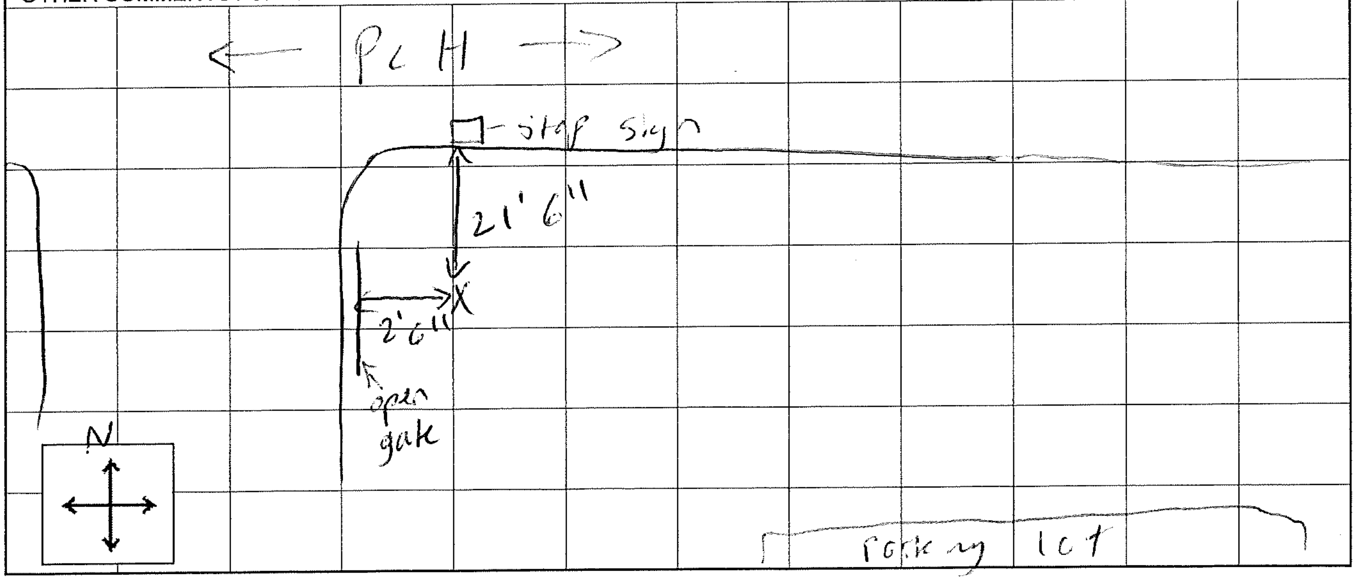
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: ______

FILE / MEAS #	START TIME	END TIME	L_{eq}	L max	1.67	8.33	25	50	90	99	min
713	10:27	10:47	67.8	78.9	75.0	72.5	69.3	64.7	52.2	47.6	46.4

COMMENTS: paused out heavy truck
paused out veh. playing loud music.

NOISE SOURCE INFO:
PRIMARY NOISE SOURCE: [✓ TRAFFIC] AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: ______
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:
TERRAIN: HARD SOFT [✓ MIXED] FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



FIELD NOISE MEASUREMENT DATA

PROJECT: LACDPW Waterworks Dist. 29 PROJ. # 00489.16

SITE IDENTIFICATION: ST 7 OBSERVER(S): Jakob R
ADDRESS: PCH across from 21934 Pacific coast Highway
START DATE / TIME: 4/1/19 - 12:57 END DATE / TIME: 4/1/19 - 1:17

METEROLOGICAL CONDITIONS:
TEMP: 77 °F HUMIDITY: 34 %R.H. WIND: CALM [✓ LIGHT] MODERATE VARIABLE
WINDSPEED: 1-2 MPH DIR: N NE E SE [✓ S] SW W NW STEADY GUSTY
SKY: [✓ SUNNY] [✓ CLEAR] OVRCST PRTLY CLOUDY FOG RAIN OTHER:

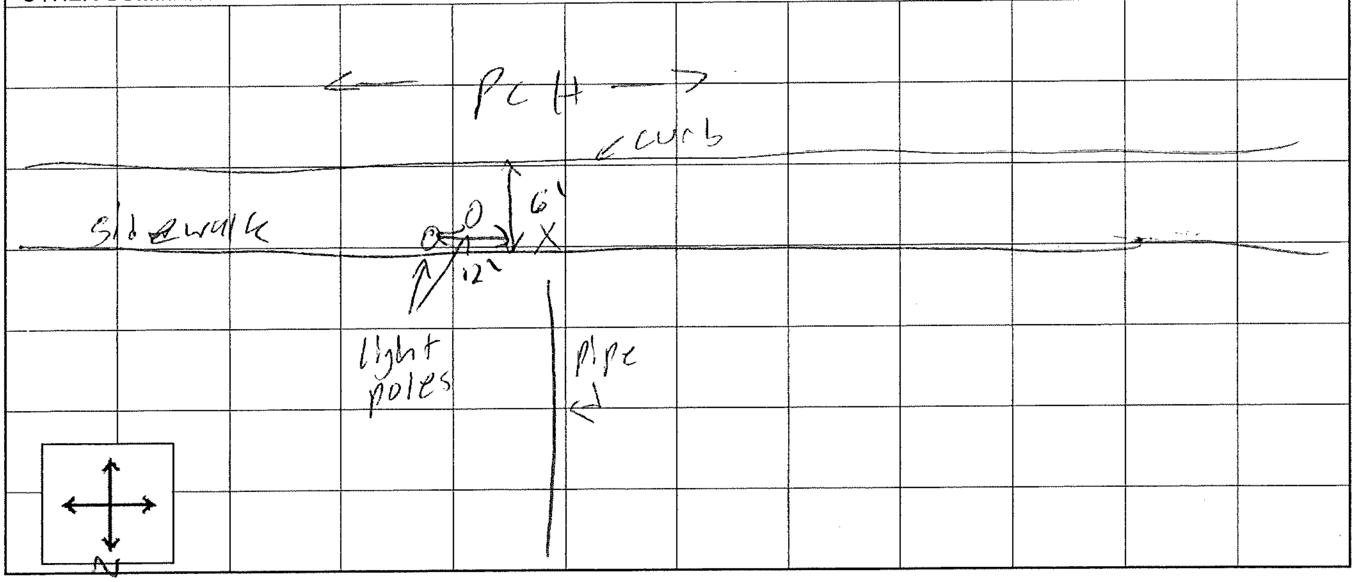
ACOUSTIC MEASUREMENTS:
INSTRUMENT: LD 831 TYPE: [✓ 1] 2 SERIAL #: 3786
CALIBRATOR: CAL 200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER 113.92 WINDSCREEN X
SETTINGS: [✓ A-WEIGHTED] [✓ SLOW] FAST FRONTAL [✓ RANDOM] [✓ ANSI] OTHER:

FILE / MEAS #	START TIME	END TIME	L_{eq}	max	L 1.67	L 8.33	L 25	L 50	L 90	L 99	L min
.715	12:57	1:17	70.7	81.8	76.2	74.1	72.2	69.5	63.1	55.2	51.4

COMMENTS: - grassy Area overgown and steep. Took measurement on side walk.

NOISE SOURCE INFO:
PRIMARY NOISE SOURCE: [✓ TRAFFIC] AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:
TERRAIN: [✓ HARD] SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



Construction Noise Analysis - Projects 1, 2, 6, 7, and 8

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
23	Grader	85	0.4	1	50	hard	0	81	85
13	Dozer	81.7	0.4	1	50	hard	0	78	82
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
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				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
	Combined Equipment							***83***	***85***

1. Obtained or estimated from:
FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or
"Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
"Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

Construction Noise Analysis - Projects 3 and 5

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
13	Dozer	81.7	0.4	1	50	hard	0	78	82
20	Generator	80.6	0.5	1	50	hard	0	78	81
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
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				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
	Combined Equipment							***81***	***82***

1. Obtained or estimated from:
   FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or
   "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
   "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

Construction Noise Analysis - Projects 4 and 9

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
23	Grader	85	0.4	1	50	hard	0	81	85
13	Dozer	81.7	0.4	1	50	hard	0	78	82
20	Generator	80.6	0.5	1	50	hard	0	78	81
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
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				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
				1	50	hard	0		
	Combined Equipment							***84***	***85***

1. Obtained or estimated from:
   FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or
   "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
   "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

Construction Noise Analysis - County of LA Sensitive Receptors

Dist. Attenuation Coefficient: 20

						Construction Noise Level	
Receiver	**Construction Activities within Unincorporated LA County**	**Acoustical Average Distance**	**Ref. Leq(h) dBA @ 50ft.**	**Ref. Lmax dBA at 50ft.**	**Dist. Excess Attenuation**	**Leq, dBA**	**Lmax, dBA**
Residential	Project 4: Fernwood Tank Improvement	21	84	85	0	91.5	92.5
Residential	Project #2: Coastline Drive 12-inch Waterline Improvement	40	83	85	0	84.9	86.9
Business	Project 3: Creek Crossing Repairs - Topanga Canyon Creek	45	81	82	0	81.9	82.9
Motel		140	81	82	0	72.1	73.1

Construction Vibration Analysis - Potential Building Damage, Distance to Criteria

Vibration attenuation constant (n):		1.1						
		Building Category:	Extremely fragile historic buildings, ruins, ancient monuments	Fragile buildings	Historic and some old buildings	Older residential structures	New residential structures	Modern industrial/ commercial buildings
Equipment Item	**Reference PPV at 25 feet, in/s** [a]	**Vibration Damage Impact Criteria, PPV, in/s:**	**0.08**	**0.1**	**0.25**	**0.3**	**0.5**	**0.5**
Large bulldozer[b]	0.089	Distance to Impact Criteria, feet:	28	23	10	9	6	6
Small bulldozer[c]	0.003		2	2	1	1	1	1

[a] Obtained from "Transportation and Construction Vibration Guidance Manual", Caltrans 2013

[b] Considered representative of other heavy earthmoving equipment such as excavators, graders, backhoes, etc.

[c] Considered representative of smaller equipment such as mini excavators.

Construction Vibration Analysis - Human Response, Distance to Criteria

Vibration attenuation constant (n):		1.1				
		Perceptibility:	**Barely perceptible**	**Distinctly perceptible**	**Strongly perceptible**	**Severe**
Equipment Item	**Reference PPV at 25 feet, in/s** [a]	**Vibration Damage Impact Criteria, PPV, in/s:**	**0.01**	**0.04**	**0.1**	**0.4**
Large bulldozer[b]	0.089	Distance to Impact Criteria, feet:	183	52	23	7
Small bulldozer[c]	0.003		9	3	2	1

[a] Obtained from "Transportation and Construction Vibration Guidance Manual", Caltrans 2013

[b] Considered representative of any full size/large excavator, dozer, backhoe, etc.

[c] Considered representative of any small excavator, dozer, backhoe, etc.

Appendix F

Traffic Analysis Report

Traffic Analysis Report for Waterworks District 29

Malibu, CA

PREPARED FOR:

ICF

PREPARED BY:

JMDiaz, Inc.
18645 East Gale Avenue, Suite 212
City of Industry, CA 91748-1363

November 5, 2019

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APPENDICES

1. INTRODUCTION

The purpose of this traffic analysis report is to examine the traffic operations of key intersections, midblock and creek crossing locations along Pacific Coast Highway through the City of Malibu and provide the impacts during the construction period of the improvements associated with the Malibu Water Master Plan (Project).

The projects are expected to be constructed during upcoming years ranging from 2020 to 2026. The project study area, as defined through consultation with the City of Malibu, encompasses eight projects including seventeen (17) roadway intersections (eight signalized intersections and nine stop controlled intersections) and four roadway midblock segments and eight creek crossing locations. Traffic operations at the study intersections were analyzed utilizing weekday a.m. and p.m. peak periods and the midblock traffic and traffic of creek crossing location were analyzed based on volume to capacity ratios

Key tasks undertaken for this traffic analysis include: 1) definition of study approach, 2) determination of current traffic conditions, 3) assessment of traffic conditions in future years without construction of the projects, 4) evaluation of traffic operations in future years with construction of the projects and, 5) provide mitigation at affected intersections, midblocks and creek crossing locations. This report follows the guidelines defined within the Congestion Management Program (CMP) for Los Angeles County.

A. Study Area

The study area includes the following eight projects. The locations of these projects are shown in Figure 1.

Project 1, Carbon Canyon Road and Carbon Mesa Road Waterline Improvements
1. Roadway Segment
    a. Midblock from 3873 Carbon Canyon Rd to 22576 Carbon Mesa Rd.

Project 2, Coastline Drive twelve-inch Waterline Improvements
1. Signalized Intersection
    a. Coastline Dr/PCH (Caltrans/County of Los Angeles)
2. Stop Controlled Intersections
    a. S. Surfview Dr/Coastline Dr (County of Los Angeles)
    b. Coastline Dr/Castlerock Rd (County of Los Angeles)

Project 3, Waterworks District No. 29 Creek Crossing Repair Project
1. Creek Crossing Locations
    a. 18788 PCH, Malibu, 90265
    b. 19399 PCH, Malibu, 90265
    c. 21203 PCH, Malibu, 90265
    d. 21857 PCH, Malibu, 90265
    e. 25712 PCH, Malibu, 90265
    f. 27519 PCH, Malibu, 90265
    g. 29497 PCH, Malibu, 90265
    h. 30626 PCH, Malibu, 90265

Project 4, Fernwood Tank Improvement

1. Roadway Segment
    a. Fernwood Tank midblock on Horseshoe Drive

Project 5, PCH Eight-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)

1. Signalized Intersections
    a. Zumirez Dr/PCH
    b. Paradise Cove Rd/PCH
2. Stop Controlled Intersections
    a. Pacific Coast Hwy/Meadows Ct
    b. Pacific Coast Hwy/Winding Way
    c. Pacific Coast Hwy/W Winding Way
    d. Pacific Coast Hwy/Zuma View Pl
    e. Pacific Coast Hwy/Ramirez Mesa Rd

Project 6, PCH and Topanga Beach Drive Waterline Improvements

1. Signalized Intersections
    a. Carbon Canyon Rd/PCH
    b. Signal (Unnamed U-Turn) (22725 PCH)
    c. Las Flores/PCH
    d. Rambla Pacifico/PCH
    e. Carbon Beach Estates/PCH (Unnamed U-turn) (22333 PCH)
2. Stop Controlled Intersections
    a. Pacific Coast Hwy/Tuna Canyon Rd
    b. 2 Locations - Pacific Coast Hwy/Rambla Vista

Project 7, Emergency Source of Water Supply Connection (Las Virgenes Connection)

1. Roadway Segment
    a. Midblock from 3525 to 4400 Encinal Canyon Road

Project 8, Big Rock Bypass Improvements

1. Roadway Segment
    a. Midblock from 19562 to 19742 PCH

Project 9, Upper Encinal Tank Improvement

1. Roadway Segment
    a. Midblock from 3525 to 4400 Encinal Canyon Road

LEGEND:

PROJECT 1
N.T.S.

▬ = Study Site

N.T.S.

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CARBON CANYON ROAD AND CARBON MESA ROAD WATERLINE IMPROVEMENTS

FIGURE 1-1

PROJECT 1

LEGEND:

Ⓧ = Study Site

PROJECT 2
N.T.S.

N.T.S.

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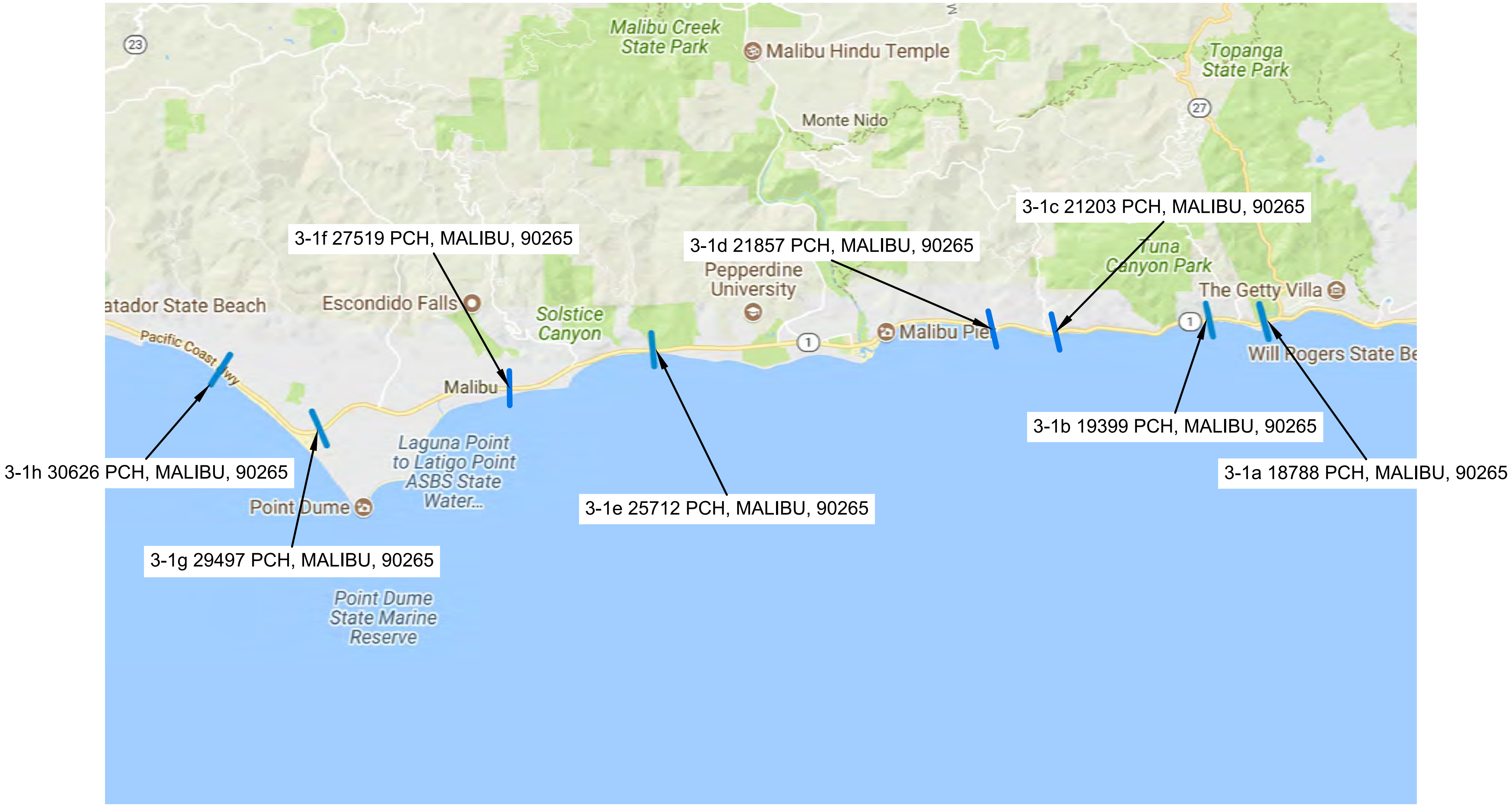
COASTLINE DRIVE 12-INCH WATERLINE IMPROVEMENTS

FIGURE 1-2

PROJECT 2



LEGEND:

▬ = Study Site

PROJECT 3
N.T.S.

N.T.S.

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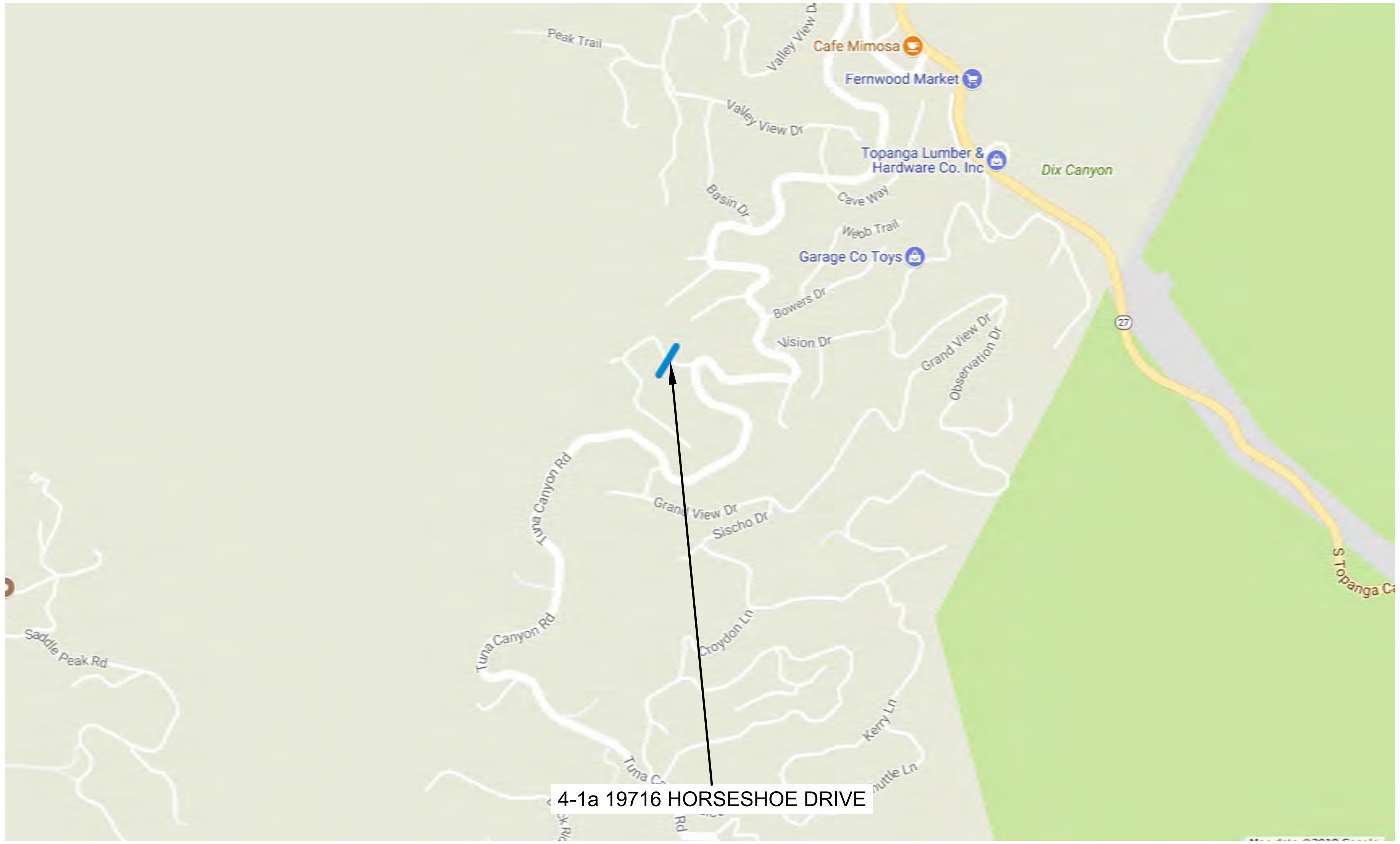
WATERWORKS DISTRICT NO. 29 CREEK CROSSING REPAIR PROJECT
FIGURE 1-3

PROJECT 3
p. 5



4-1a 19716 HORSESHOE DRIVE

PROJECT 4
N.T.S.

LEGEND:

▬ = Study Site

N.T.S.

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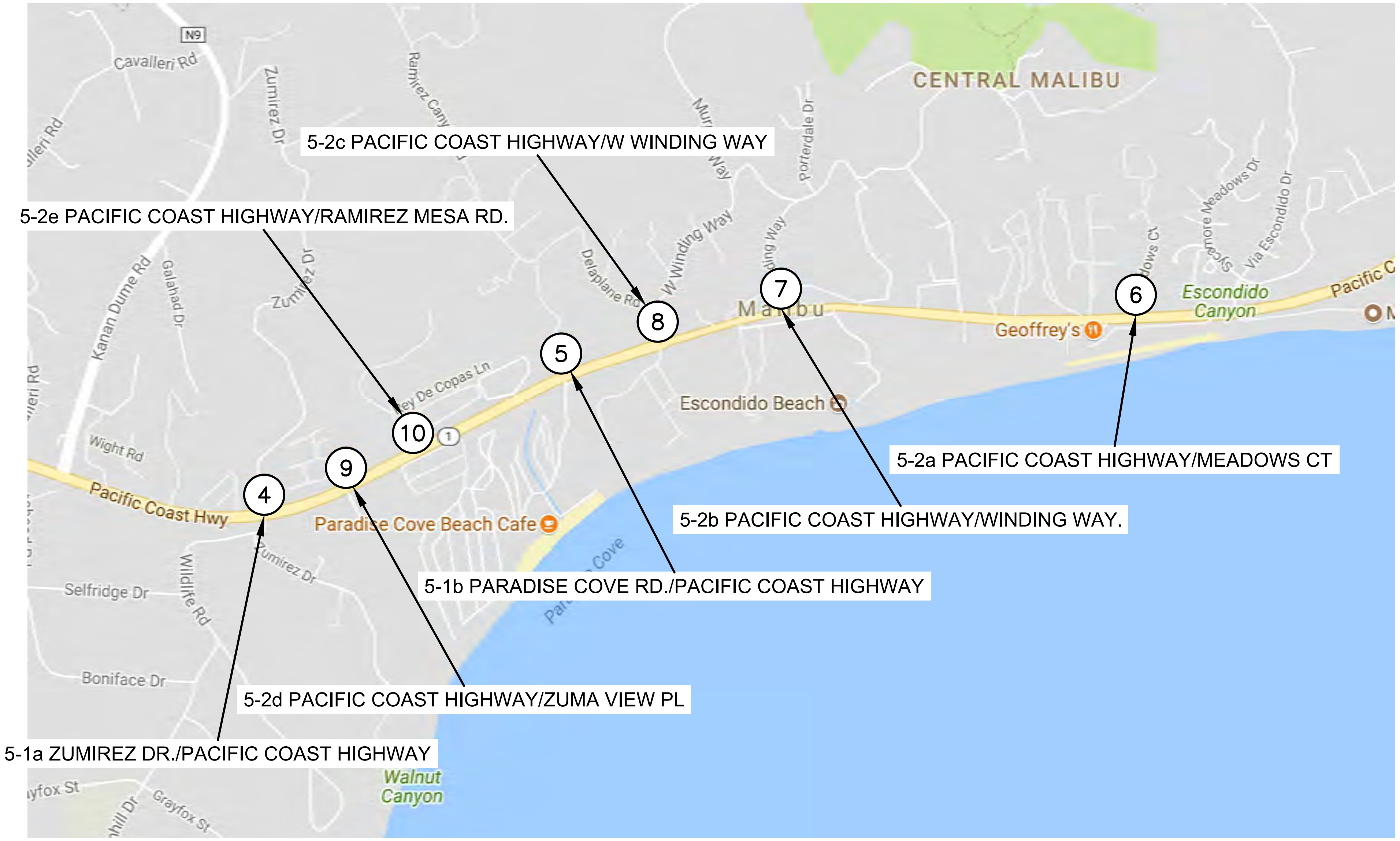
FERNWOOD TANK IMPROVEMENT
FIGURE 1-4

PROJECT 4
p. 6



PROJECT 5
N.T.S.

LEGEND:

ⓧ = Study Site

N.T.S.

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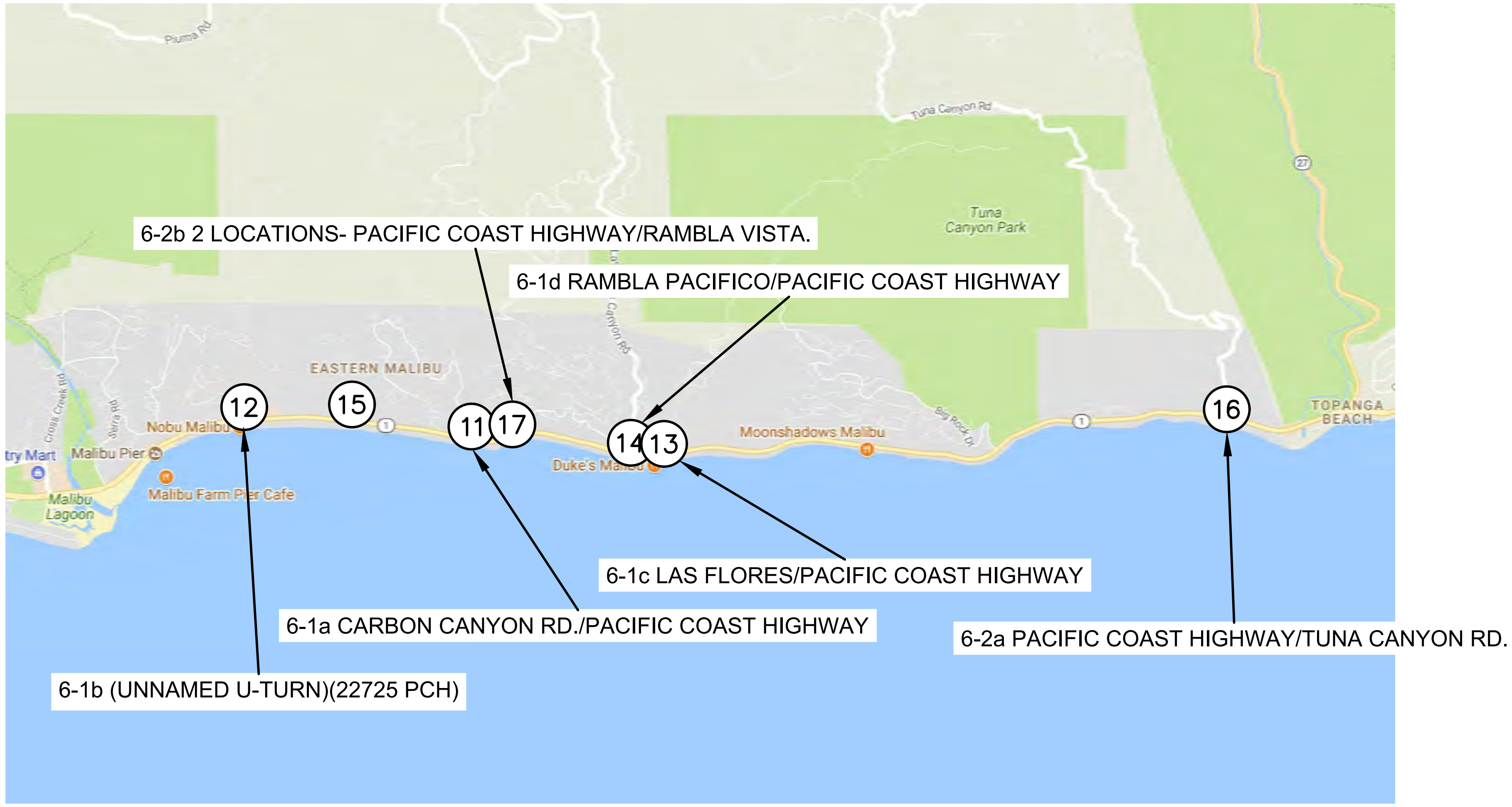
PCH 8-INCH WATERLINE IMPROVEMENTS (ZUMIREZ DRIVE TO ESCONDIDO BEACH ROAD)

FIGURE 1-5

PROJECT 5
p. 7



PROJECT 6
N.T.S.

LEGEND:

Ⓧ = Study Site

N.T.S.

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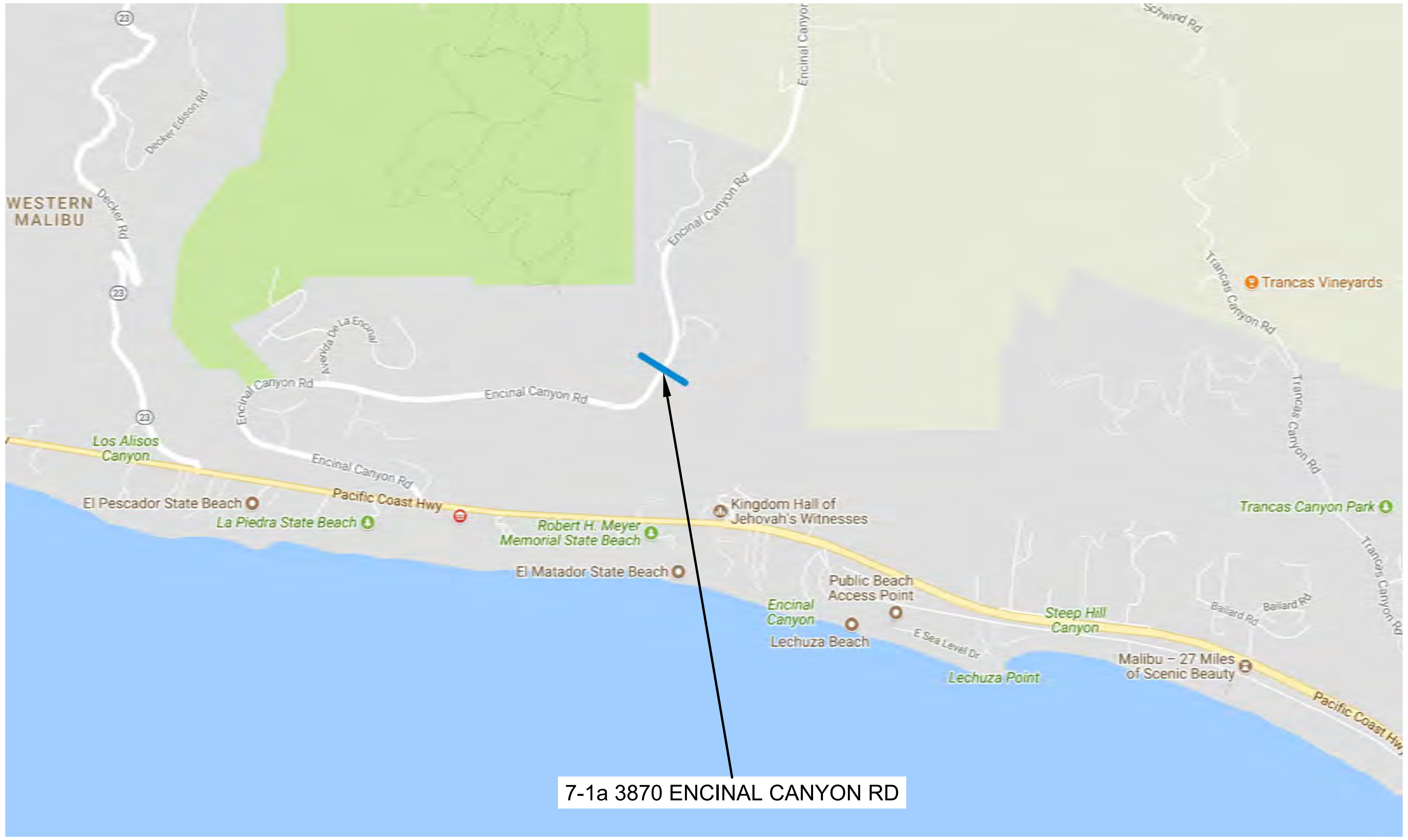
PCH AND TOPANGA BEACH DRIVE WATERLINE IMPROVEMENTS
FIGURE 1-6

PROJECT 6
p. 8



LEGEND:

PROJECT 7
N.T.S.

▬ = Study Site

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EMERGENCY SOURCE OF WATER SUPPLY CONNECTION (LAS VIRGENES CONNECTION)

FIGURE 1-7

PROJECT 7

8-1a 19700 PCH

LEGEND:

▬ = Study Site

PROJECT 8
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BIG ROCK BYPASS IMPROVEMENTS
FIGURE 1-8

PROJECT 8
p. 10

B. Analysis Methodology

The analysis of peak hour intersection Level of Service (LOS) is the primary indicator of circulation system performance. This study is based on the Intersection Capacity Utilization (ICU) methodology, which provides an output value that represents a volume-to-capacity ratio.

For the two-way stop controlled intersections, LOS was evaluated using stop-controlled methodologies from the *2010 Highway Capacity Manual* as published by the Transportation Research Board (TRB). For this methodology, conditions are based upon intersection delay, defined as the average delay experienced by users of the intersection who must stop or yield to free-flow through traffic. This method uses a "gap acceptance" technique to predict driver delay. This methodology is applicable to unsignalized intersections on major streets where there is potential for crossing difficulty from the minor approaches due to heavy traffic volumes on the major approaches.

LOS values range from LOS A to LOS F. LOS A indicates excellent operating conditions with little delay to motorists, whereas LOS F represents congested conditions with excessive vehicle delay. LOS E is typically defined as the operating "capacity" of a roadway. Generally, LOS D is the lowest acceptable operating condition. Appendix A of this report provides information regarding traffic analysis methodology and LOS definitions for both signalized and unsignalized roadway intersections.

The following further describes the methodology utilized for the traffic analysis report.

Study Scenarios

Peak hour traffic operations were evaluated for Projects 1-8 using each of the following traffic scenarios:

- Existing
- Existing + Project (Construction)
- Existing + Project (Construction) + Mitigation

Existing (2018) Conditions

In order to define existing traffic conditions at the study intersections, peak hour turning movement counts at the study intersections during the following periods were used:

- AM period: 7:00 a.m. to 9:00 a.m.
- PM period: 4:30 p.m. to 6:30 p.m.

In addition, peak hour volumes and average daily traffic (ADT) volumes were obtained for the midblock segments. Field reviews within project study areas were conducted to identify the conditions of major roadways, traffic control and approach lane configurations at each study area.

Existing + Project (Construction)

In order to define regional traffic growth that would affect operations at the study intersections during the various construction years, JMD utilized traffic growth factors from the Congestion Management Program (CMP) for Los Angeles County. Based on the CMP, the City of Malibu falls under Regional Statistical Area (RSA) 15. The growth factor for this region is 0.05% per year. The operations of the study intersections and roadway segments for the Construction Year scenarios are discussed in Sections 2 to 9 of this report. These conditions examined the traffic operations with necessary lane closures to accommodate construction of the projects.

Existing + Project (Construction) + Mitigation

In order to define the traffic during various construction years with mitigation, JMD utilized off hour construction. JMD recommends implementation of lane closures outside of the AM and PM peak periods. Possible lane closures could occur off peak (10AM-3PM) or at night (9PM-5AM). During non-construction periods, all travel lanes should be opened to through traffic

2. PROJECT 1 - CARBON CANYON ROAD AND CARBON MESA ROAD WATERLINE IMPROVEMENTS

A. Existing Roadway System

22042 Carbon Mesa Rd: is at a two lane road that provides access to residential areas north of PCH.

B. Existing LOS

This section provides a summary of the Existing 2018 traffic conditions at the study roadway segments within the scope of Project 1. The project consists of replacing 7,000 feet of waterlines.

LOS was determined for all of the study area roadway segments. Roadway Segment Analysis data is provided in Appendix J

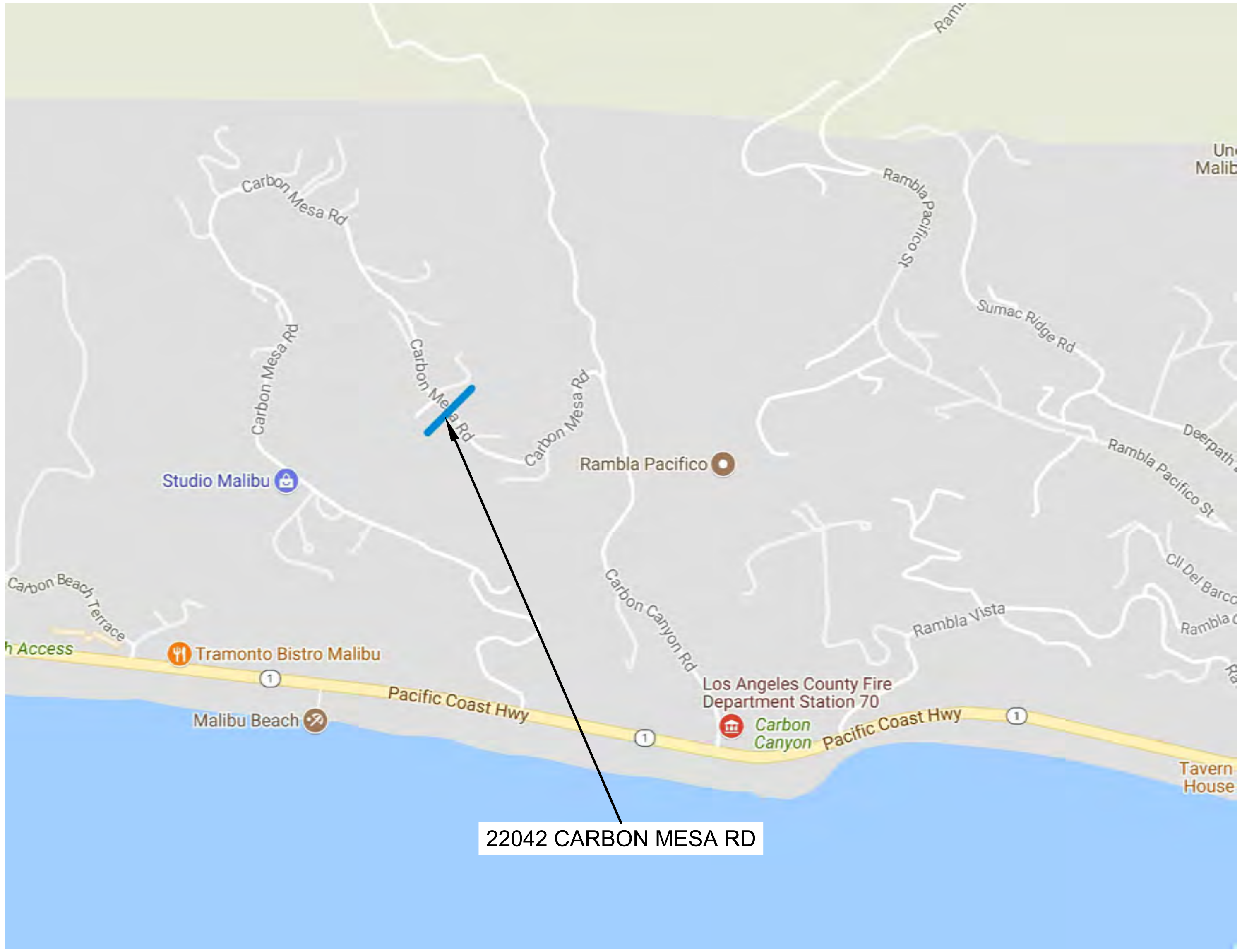
Table 1-1 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2018) CONDITIONS - PROJECT 1

TABLE 1-1
SUMMARY OF ROADWAY SEGMENT OPERATION
EXISTING CONDITIONS (2018)

Project	Segment	AM			PM		
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol
1	22042 Carbon Mesa Rd	1.1	A	28	1.1	A	29

Table 1-1 shows that the effected roadway segment within the scope of Project 1 is currently operating at an acceptable level of service. See appendix A for critical V/C ratio interpretations.

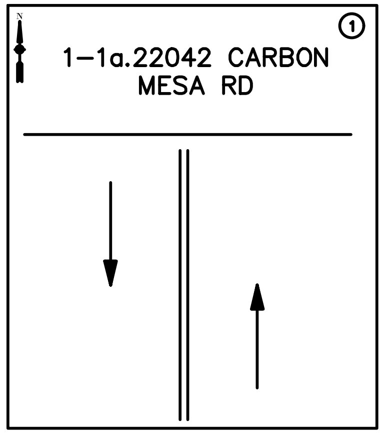


PROJECT 1
N.T.S.

LEGEND:

▬ = Study Site

→ = Through Lane



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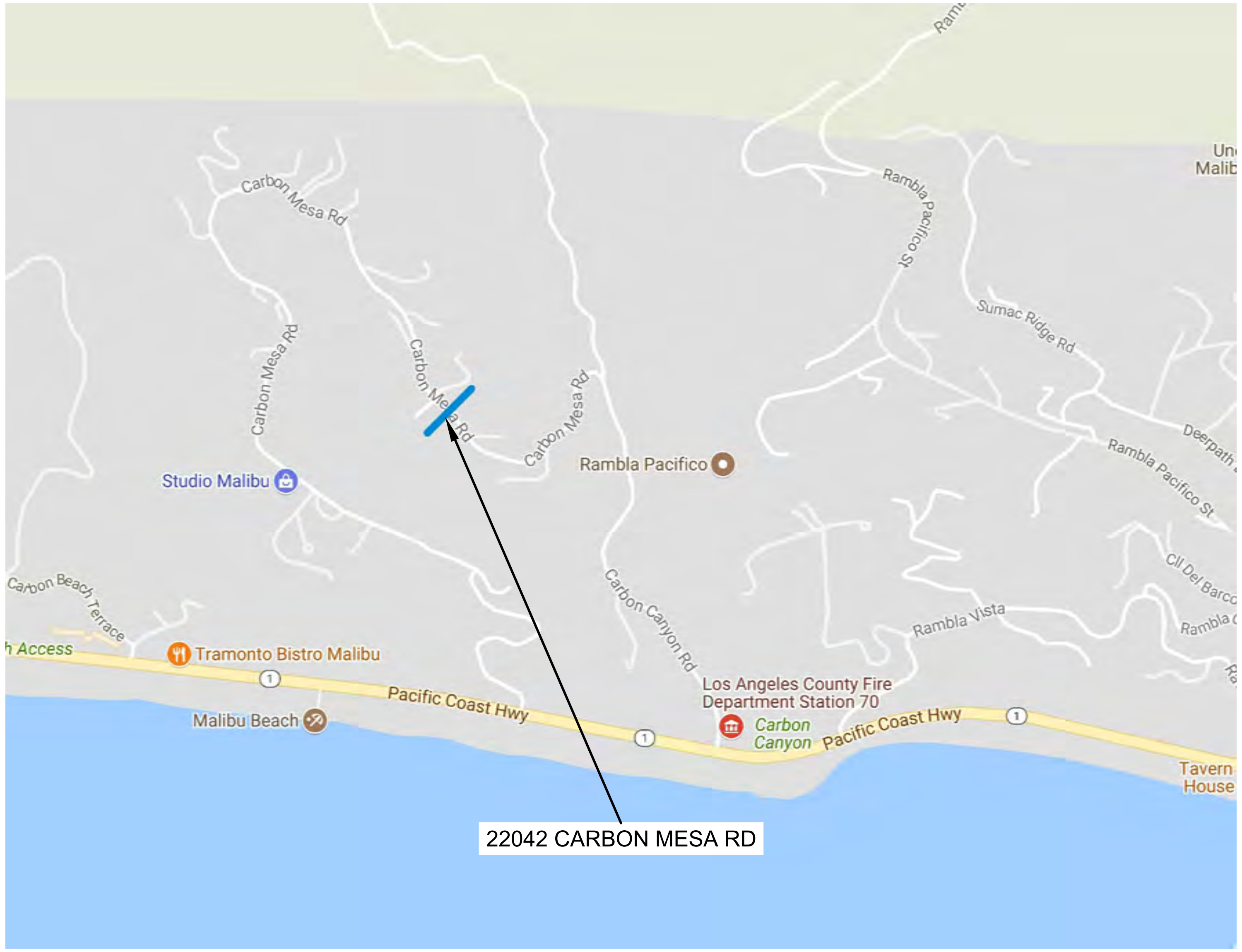
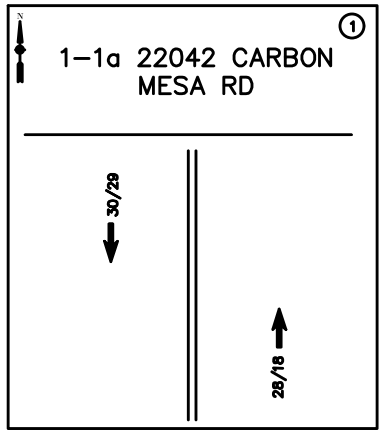
EXISTING ROADWAY SEGMENT CONFIGURATIONS

FIGURE 2-1

PROJECT 1





LEGEND:

PROJECT 1
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▬ = Study Site
XX/YY = AM/PM Peak Hour Volumes

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EXISTING YEAR (2018) AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 2-2

PROJECT 1

C. Existing + Project (Construction) LOS

This section provides a summary of the Existing 2021 traffic conditions at the study intersections with construction of Project 1. The year 2021 was selected for analysis based on the anticipated implementation date of the proposed project. The project consists of replacing 7,000 feet of waterlines. Lane closure details have not been finalized. However, it is assumed for analysis that one westbound lane will be closed for construction. Once detailed construction methods, schedules, and construction vehicle volumes are available, a qualified traffic consultant will validate the assumptions and findings of the traffic study for the EIR. If the report is validated, the project can proceed without additional analysis or mitigation. If the validation shows that the assumptions were not accurate, further environmental documentation may be required. Construction is scheduled to begin in 2021 with an approximate one-year duration.

To analyze Existing 2021 conditions, intersection turn volumes were developed based on the Los Angeles County CMP growth factors for the region and area development projects provided by the City of Malibu.

In order to define regional traffic growth that would affect operations at the study areas during Year 2021 JMD utilized traffic growth factors from the Congestion Management Program for Los Angeles County. The City of Malibu falls under Regional Statistical Area (RSA) 15 resulting in an annual growth factor of 1.005. Applying this growth factor to a gap of 3 years results in a total growth factor of 1.015 from Year 2018 to Year 2021.

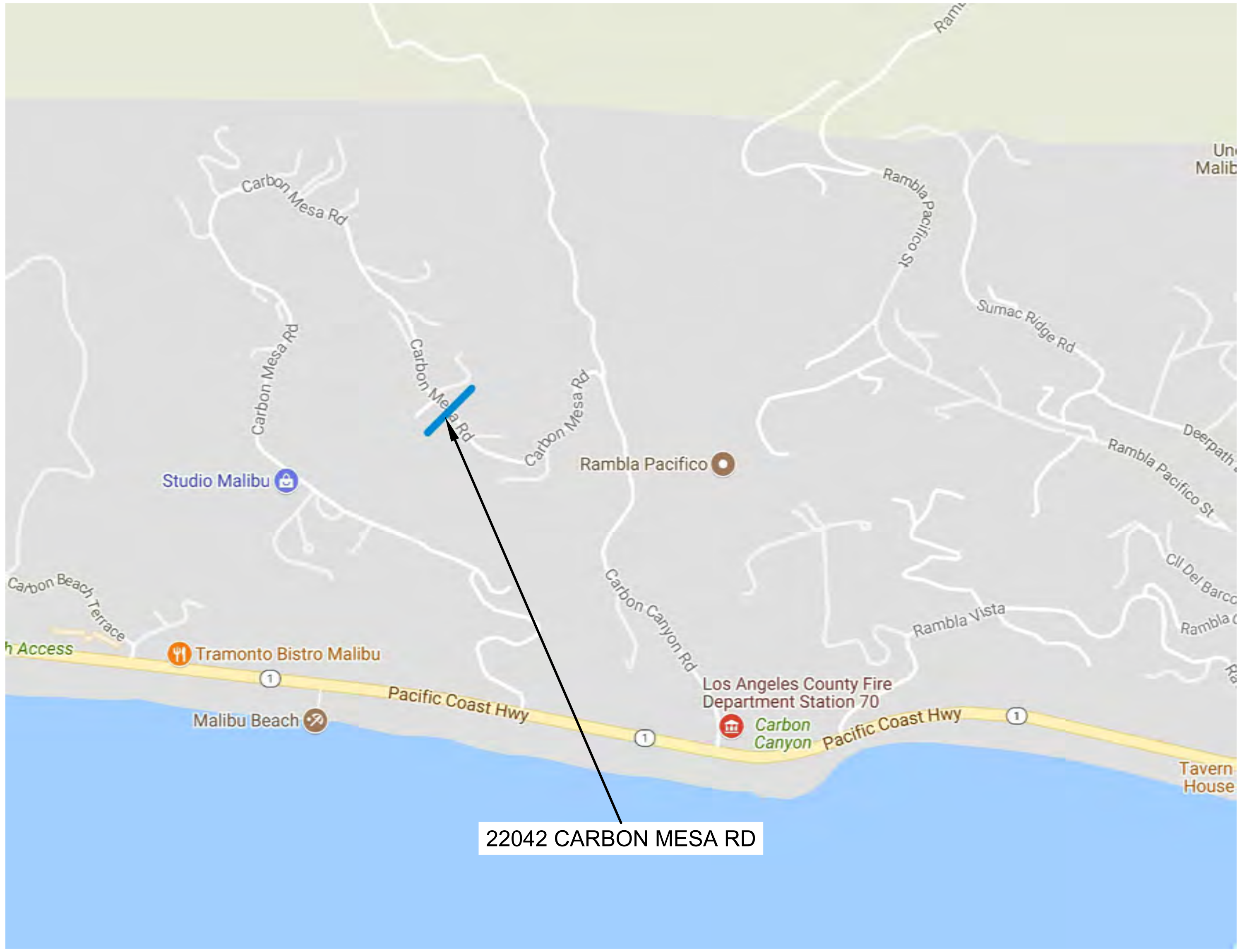
Table 1-2 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2021) + PROJECT CONSTRUCTION - PROJECT 1

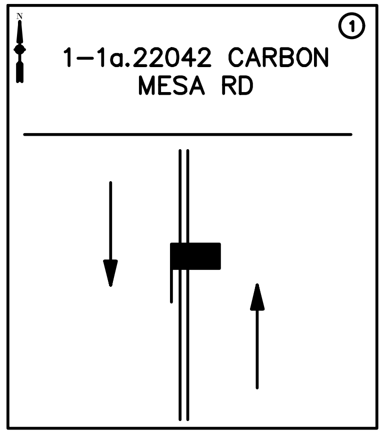
TABLE 1-2
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION (2021)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
1	22042 Carbon Mesa Rd	2.2	A	28	2.3	A	29	102%	No

Table 1-2 shows that Project 1 will not have a significant impact on the effected roadway segment.



PROJECT 1
N.T.S.


1–1a.22042 CARBON MESA RD ①

LEGEND:

— = Study Site

→ = Through Lane

⚑ = Flagger

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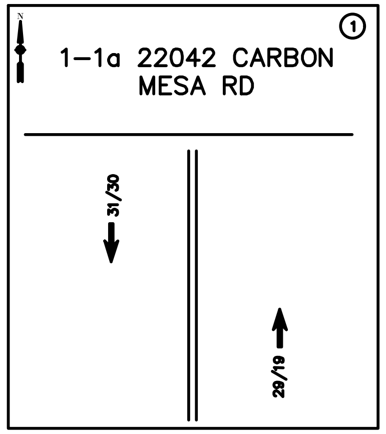
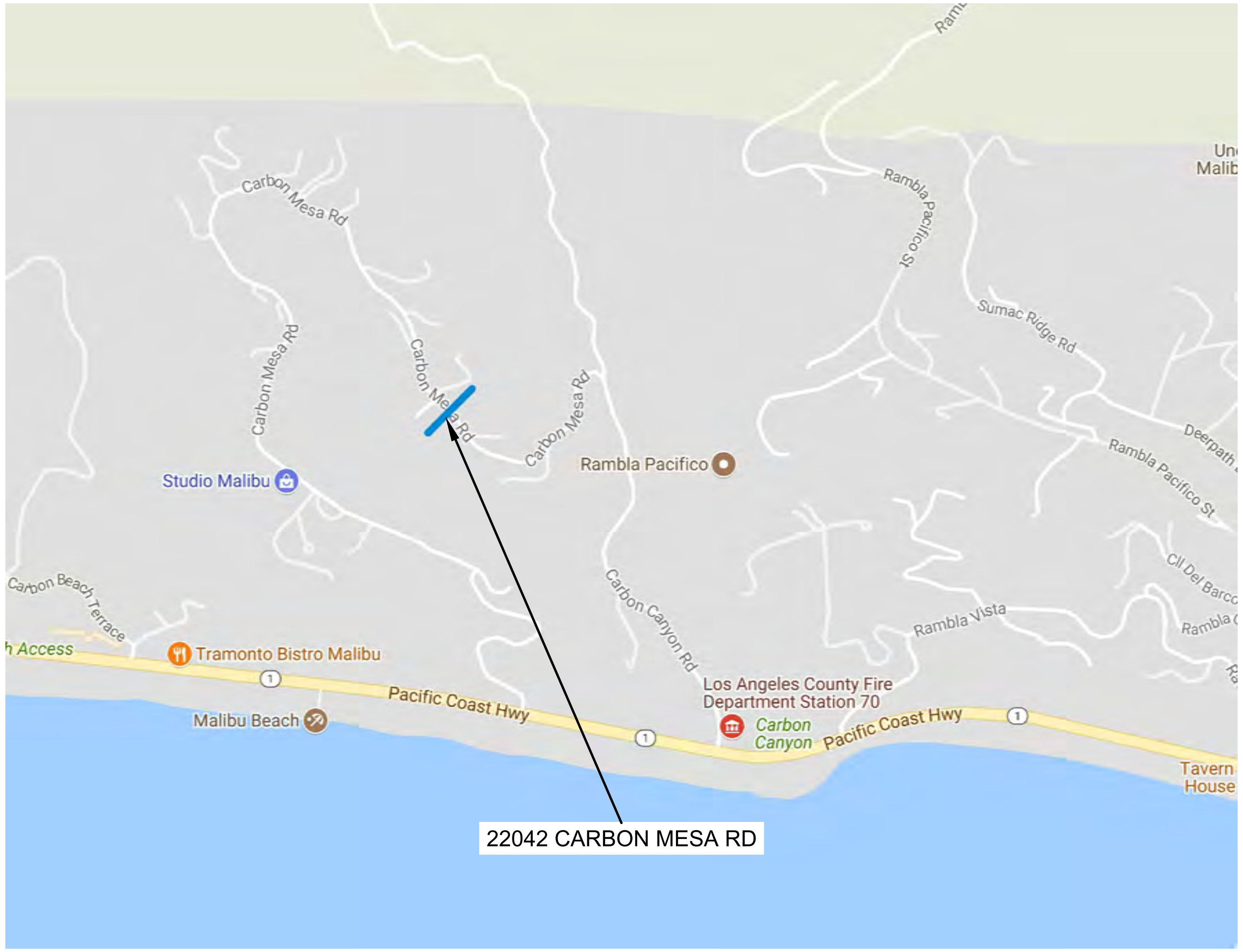
(2021) WITH CONSTRUCTION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 2-3





LEGEND:

PROJECT 1
N.T.S.

▬ = Study Site
XX/YY = AM/PM Peak Hour Volumes

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(2021) WITH CONSTRUCTION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 2-4

PROJECT 1

D. Existing + Project (Construction) + Mitigation LOS

The project location at 22042 Carbon Mesa Road is a two-lane residential street. Due to the very low volumes along this street segment, mitigation is not required during the AM and PM peak periods. However, to avoid disruptions within this residential street, work hours should be limited between 9AM-4PM. Lane closures during construction should include proper flagging procedures. During non-construction periods, all travel lanes should be opened to through traffic.

This section provides a summary of the Existing 2021 traffic conditions at the study intersections with construction of Project 1 during non-peak hours. The year 2021 was selected for analysis based on the anticipated implementation date of the proposed project.

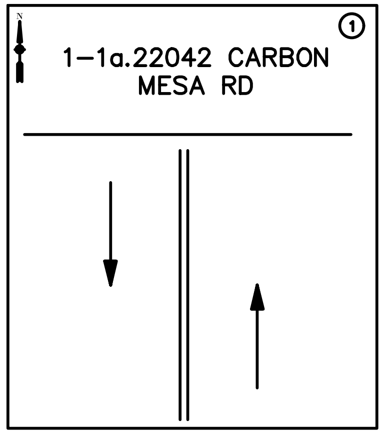
Table 1-3 summarizes the density (for roadway segments). LOS values for each study area are given.

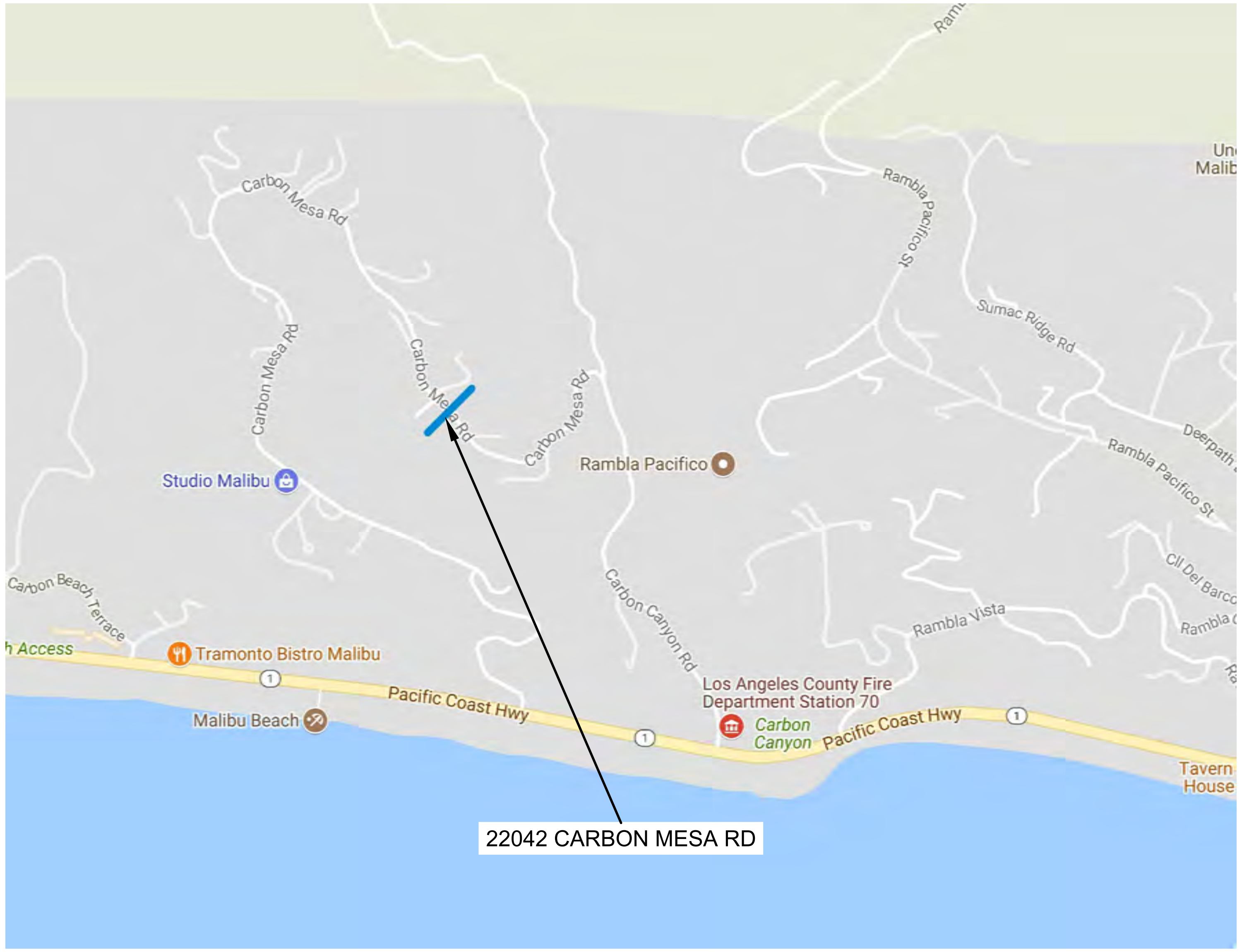
EXISTING (2021) + PROJECT CONSTRUCTION + MITIGATION - PROJECT 1

TABLE 1-3
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION AND MITIGATION (2021)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
1	22042 Carbon Mesa Rd	1.1	A	28	1.2	A	29	1%	No

Table 1-3 shows that Project 1 with Mitigation will not have a significant impact on the effected roadway segment.





LEGEND:

PROJECT 1
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- = Study Site
→ = Through Lane

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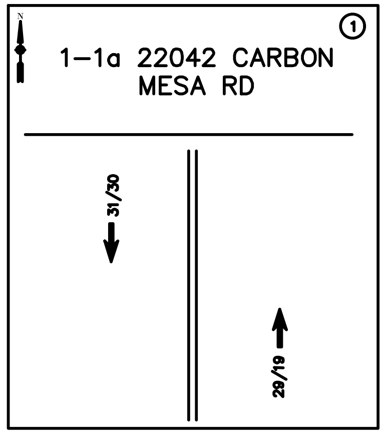
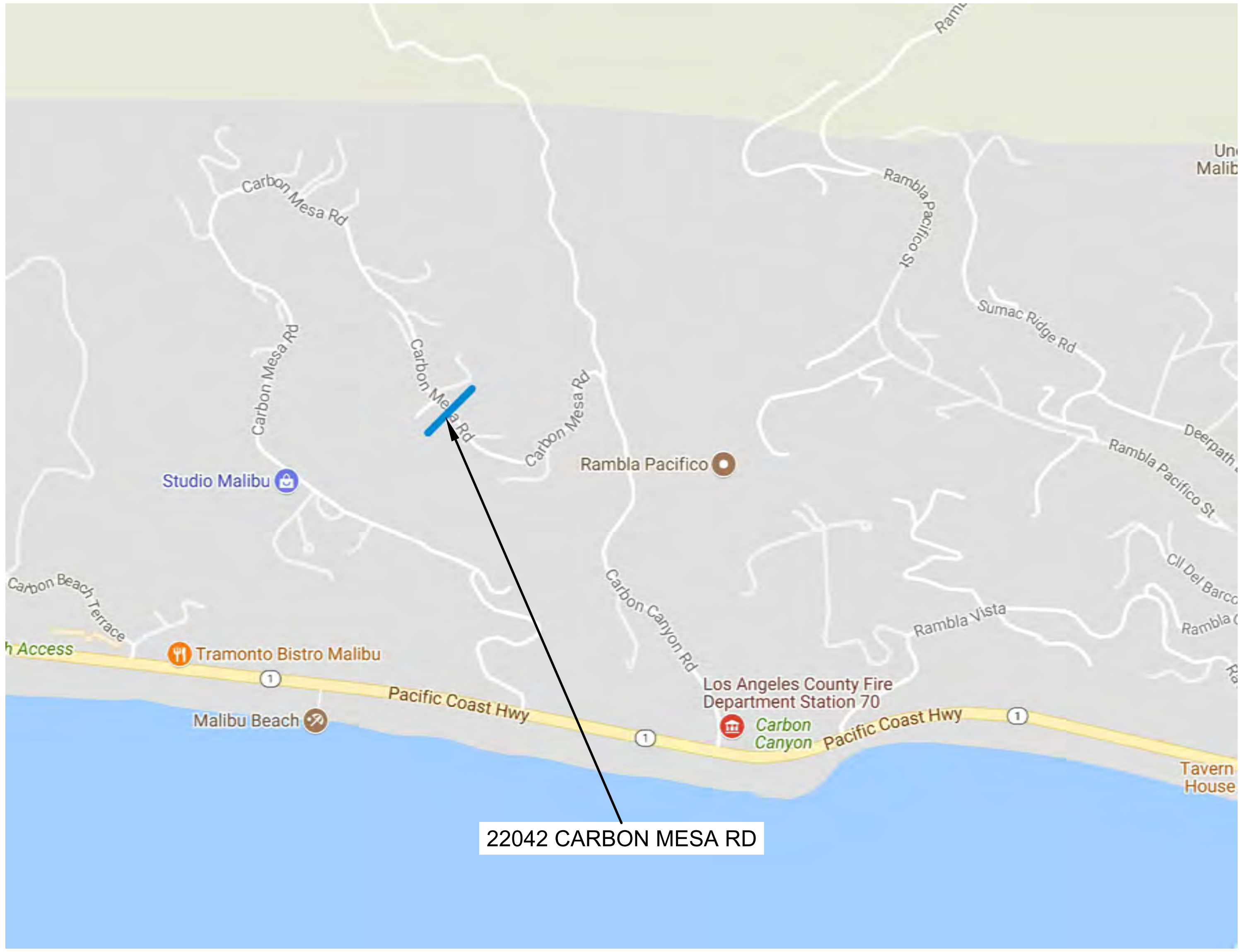
(2021) WITH CONSTRUCTION AND MITIGATION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 2-5

PROJECT 1
p. 20





PROJECT 1
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LEGEND:

▬ = Study Site

XX/YY= AM/PM Peak Hour Volumes

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(2021) WITH CONSTRUCTION AND MITIGATION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 2-6

PROJECT 1

3. PROJECT 2 - COASTLINE DRIVE TWELVE-INCH WATERLINE IMPROVEMENTS

A. Existing Roadway System

Pacific Coast Highway (PCH) is a major east-west four lane arterial running through the City of Malibu.

Coastline Drive: is an east – west two lane road that provides access to residential areas north of PCH and is a signalized intersection at PCH.

Surfview Drive: is a north – south two lane road that provides access to residential areas north of PCH and is stop controlled at Coastline Drive.

B. Existing LOS

This section provides a summary of the Existing 2018 traffic conditions at the study intersections within the scope of Project 2. The project consists of replacing a twelve-inch waterline running along Coastline Drive from PCH to just past Castlerock Rd.

LOS was determined for all of the study area intersections. Traffic counts are provided in Appendix B and Analysis Sheets are provided in Appendix C.

Table 2-1 provides the Intersection Capacity Utilization for signalized intersections and Table 2-2 provides the same for stop controlled intersections. LOS values for each study intersection are included in each table.

EXISTING (2018) CONDITIONS - PROJECT 2

TABLE 2-1
SUMMARY OF SIGNALIZED INTERSECTION OPERATION
EXISTING CONDITIONS (2018)

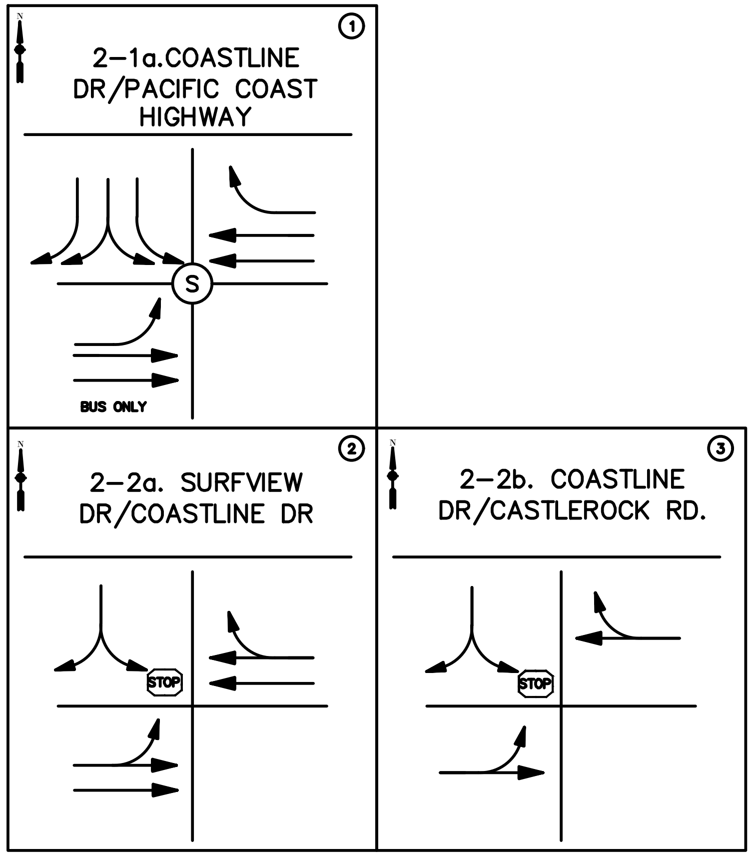
Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Coastline Dr	0.95	**E**	1.00	**F**

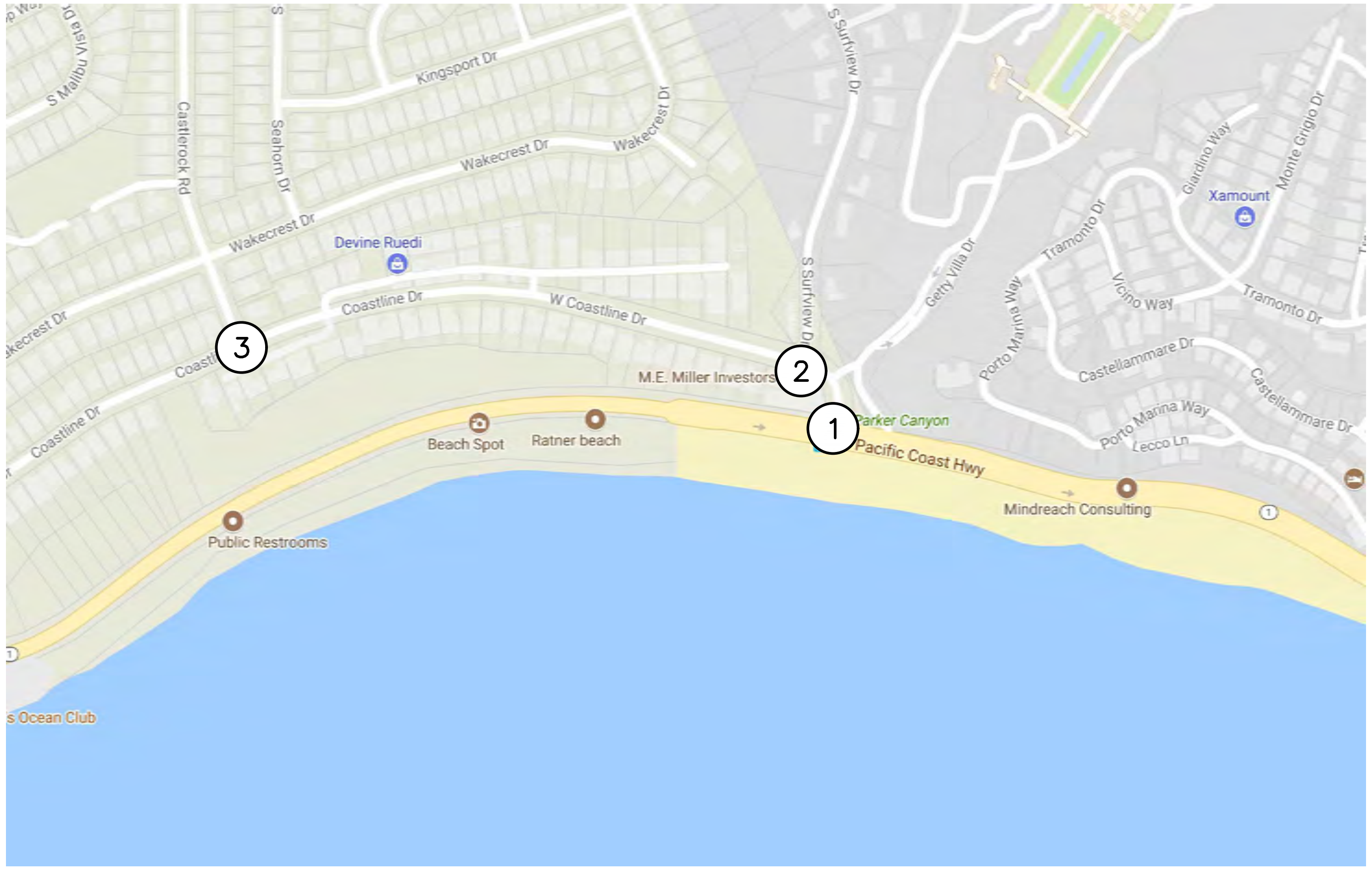
Table 2-1 shows that the intersection of Pacific Coast Hwy & Coastline Dr is currently functioning at an unacceptable level. See appendix A for critical V/C ratio interpretations.

TABLE 2-2
SUMMARY OF STOP CONTROLLED INTERSECTION OPERATION
EXISTING CONDITIONS (2018)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Coastline Dr & Surfview Dr	0.18	A	0.17	A
Coastline Dr & Castlerock Rd	0.23	A	0.20	A

Table 2-2 shows that all stop-controlled intersections within the scope of Project 2 are currently operating at an acceptable level of service.





PROJECT 2
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LEGEND:

Ⓧ = Study Site

STOP = Stop Sign

Ⓢ = Traffic Signal

→ = Through Lane

⤙ = Turn Lanes

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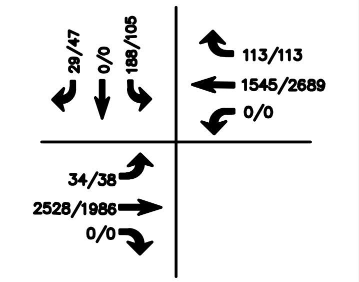
EXISTING INTERSECTION APPROACH CONFIGURATIONS

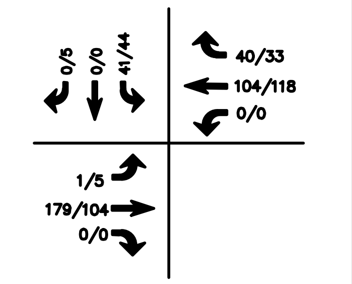
FIGURE 3-1

PROJECT 2

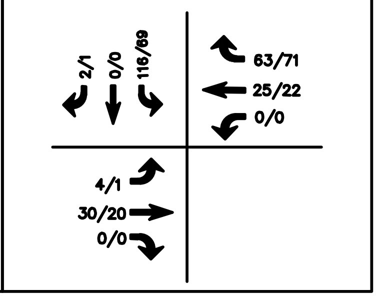
① 2–1a.COASTLINE DR/PACIFIC COAST HIGHWAY

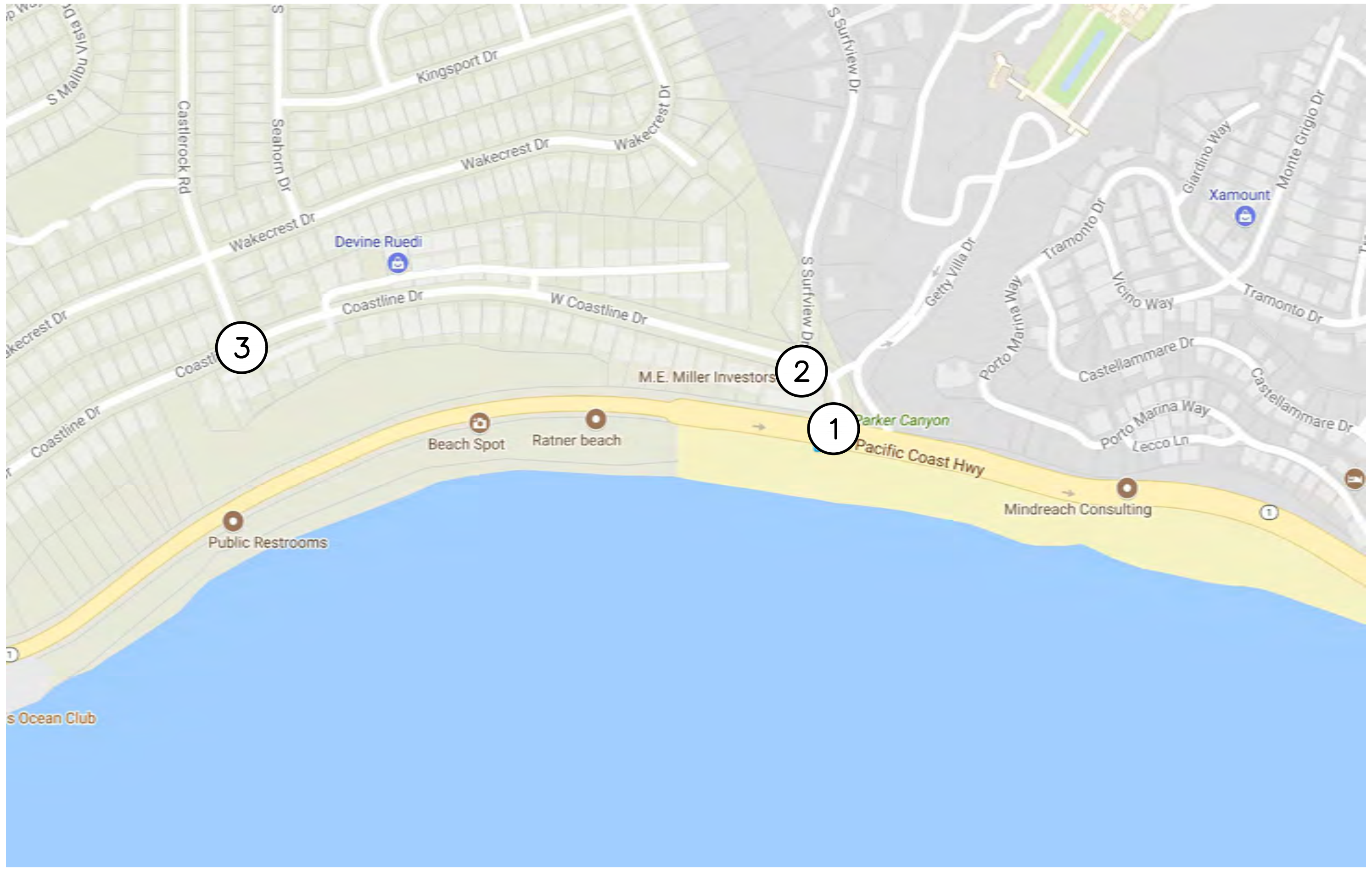


② 2–2a. SURFVIEW DR/COASTLINE DR



③ 2–2b. COASTLINE DR/CASTLEROCK RD.





PROJECT 2
N.T.S.

LEGEND:

Ⓧ	=	Study Intersection
XX/YY	=	AM/PM Peak Hour Turning Movement Volumes

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EXISTING YEAR (2018) AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 3-2

PROJECT 2

C. Existing + Project (Construction) LOS

This section provides a summary of the Existing 2021 traffic conditions at the study intersections with construction of Project 2. The year 2021 was selected for analysis based on the anticipated implementation date of the proposed project. The project consists of replacing a twelve-inch waterline running along Coastline Drive from PCH to just past Castlerock Rd. Lane closure details have not been finalized. However, it is assumed for analysis that one westbound lane will be closed for construction. Once detailed construction methods, schedules, and construction vehicle volumes are available, a qualified traffic consultant will validate the assumptions and findings of the traffic study for the EIR. If the report is validated, the project can proceed without additional analysis or mitigation. If the validation shows that the assumptions were not accurate, further environmental documentation may be required. Construction is scheduled to begin in 2021 with an approximate one-year duration.

To analyze Existing 2021 conditions, intersection turn volumes were developed based on the Los Angeles County CMP growth factors for the region and area development projects provided by the City of Malibu.

In order to define regional traffic growth that would affect operations at the study areas during Year 2021 JMD utilized traffic growth factors from the Congestion Management Program for Los Angeles County. The City of Malibu falls under Regional Statistical Area (RSA) 15 resulting in an annual growth factor of 1.005. Applying this growth factor to a gap of 3 years results in a total growth factor of 1.015 from Year 2018 to Year 2021.

Table 2-3 provides the Intersection Capacity Utilization (ICU) for signalized intersections and Table 2-4 provides the same details for stop controlled intersections. LOS values for each study intersection are included in each table.

EXISTING (2021) + PROJECT CONSTRUCTION - PROJECT 2

TABLE 2-3
SUMMARY OF SIGNALIZED INTERSECTION OPERATION
WITH CONSTRUCTION (2021)

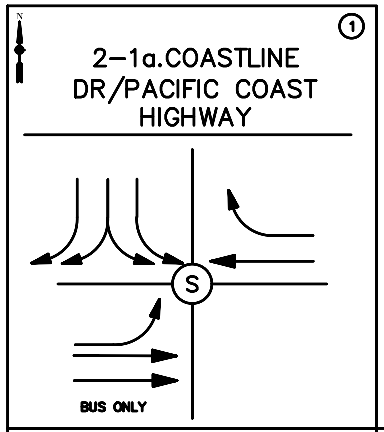
Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Coastline Dr	1.02	F	1.05	F

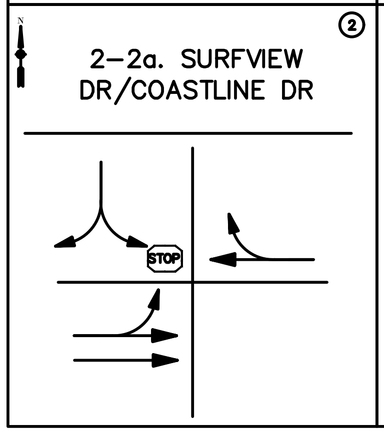
Table 2-3 shows that Project 2 will cause the intersection of Pacific Coast Hwy & Coastline Dr to continue to function at unacceptable levels.

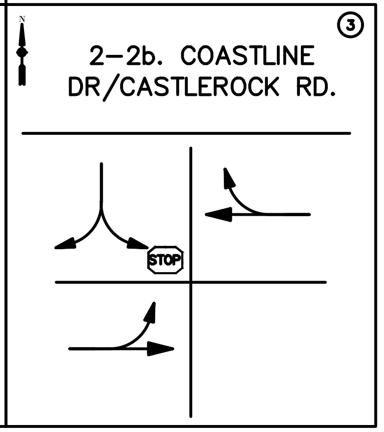
TABLE 2-4
SUMMARY OF STOP CONTROLLED INTERSECTION OPERATION WITH CONSTRUCTION (2021)

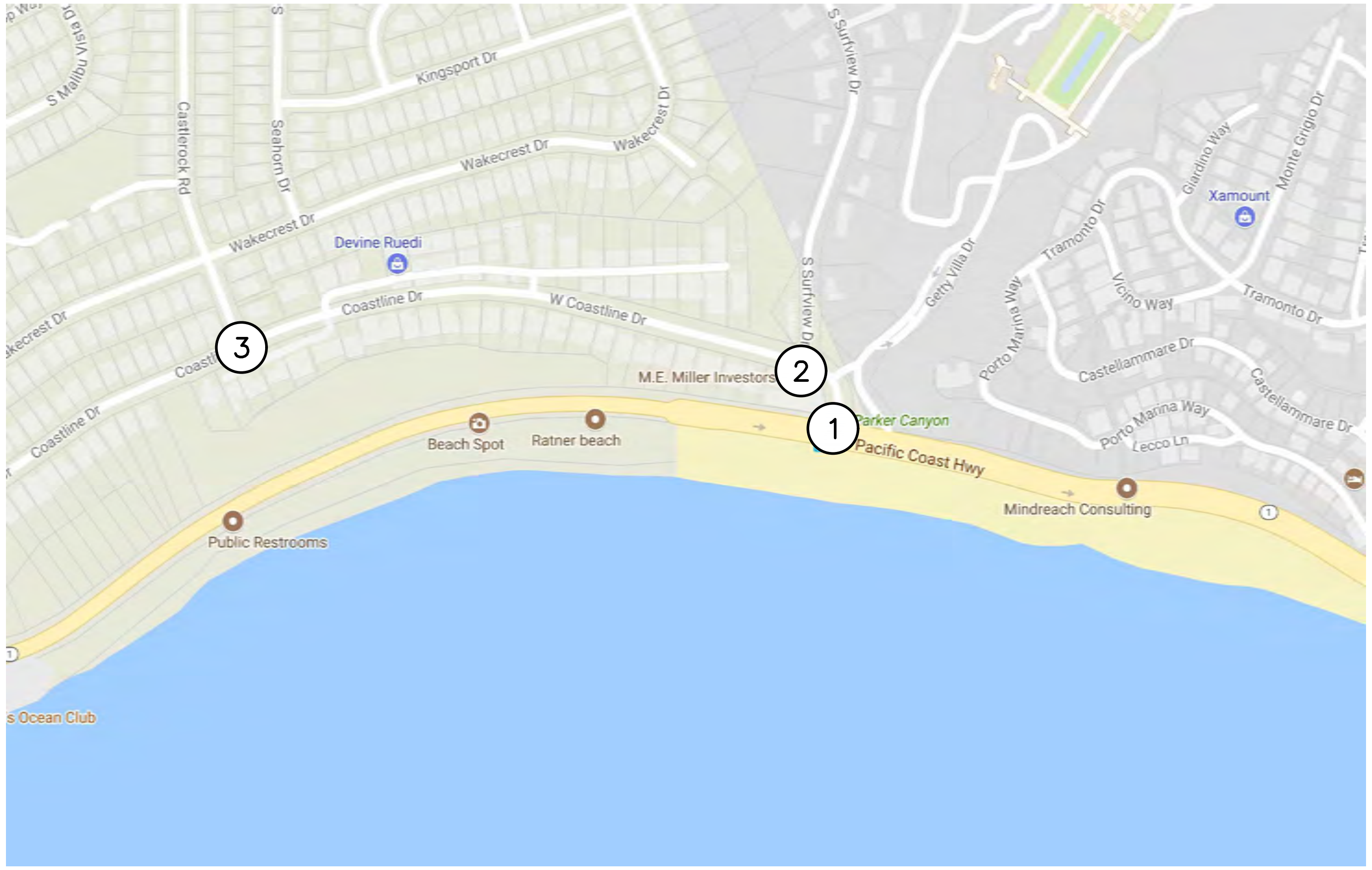
Intersection	AM Peak Hour		PM Peak Hour	
	ICU	**LOS**	**ICU**	**LOS**
Coastline Dr & Surfview Dr	0.24	A	0.22	A
Coastline Dr & Castlerock Rd	0.23	A	0.21	A

Table 2-4 shows that Project 2 will not cause any stop controlled intersections to function at unacceptable levels.









LEGEND:

Ⓧ = Study Site

STOP = Stop Sign

Ⓢ = Traffic Signal

→ = Through Lane

⤙ = Turn Lanes

PROJECT 2
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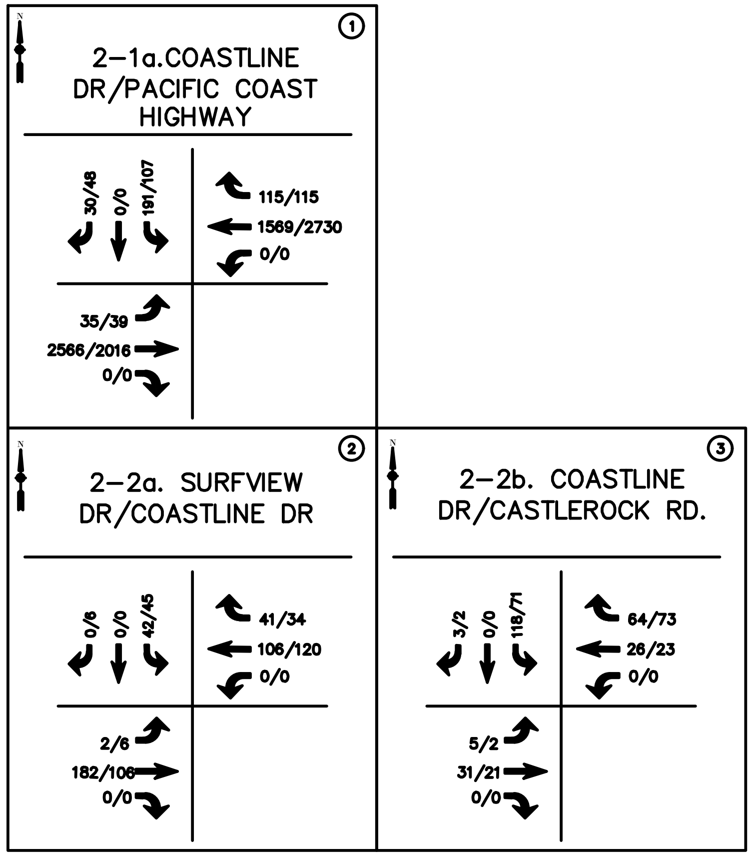
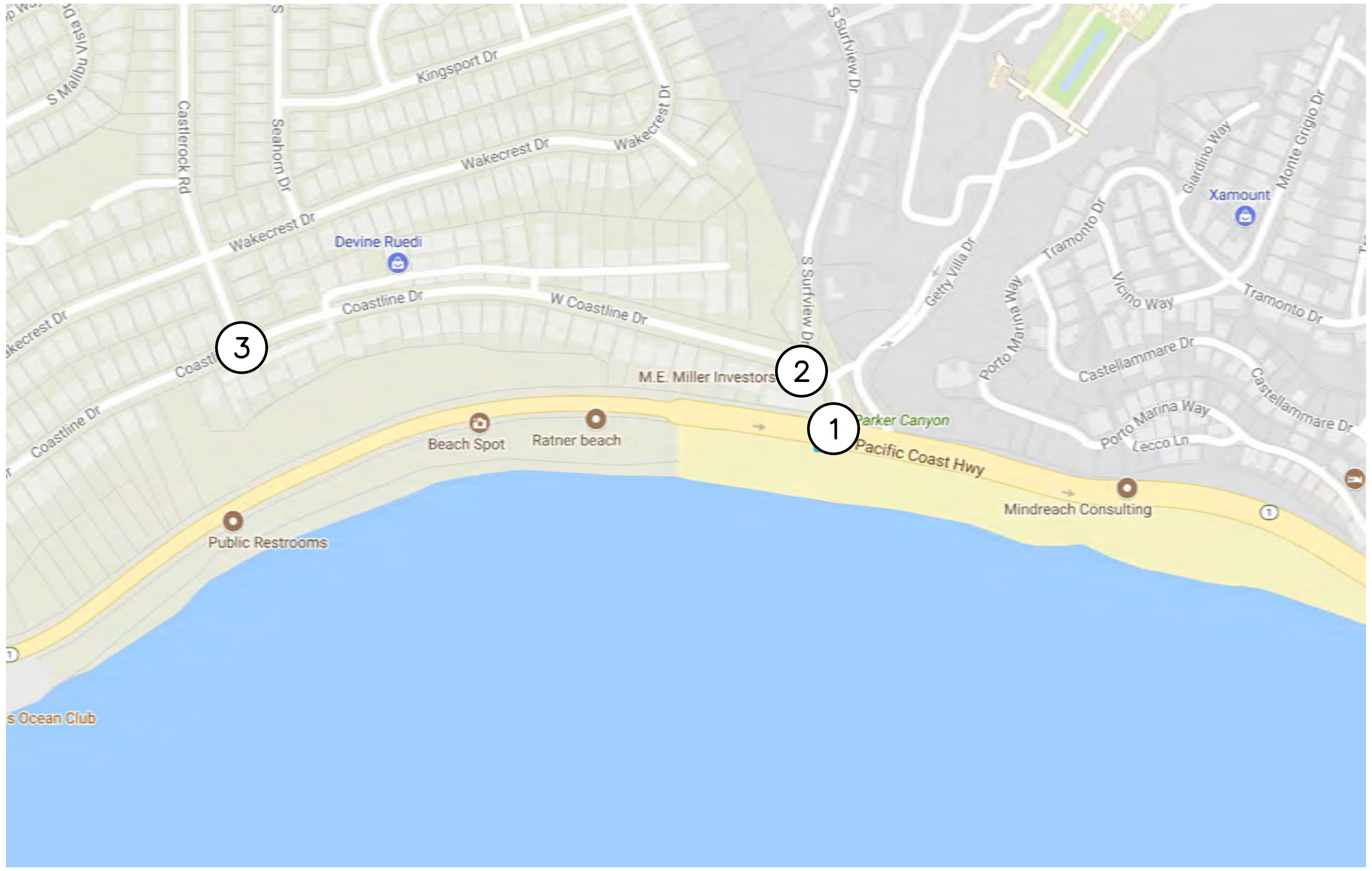
(2021) WITH CONSTRUCTION INTERSECTION APPROACH CONFIGURATIONS

FIGURE 3-3

PROJECT 2





PROJECT 2
N.T.S.

LEGEND:

Ⓧ = Study Intersection

XX/YY = AM/PM Peak Hour Turning Movement Volumes

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(2021) WITH CONSTRUCTION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 3-4

PROJECT 2

D. Existing + Project (Construction) + Mitigation LOS

This project includes the signalized intersection at Coastline Drive/PCH. It also includes the stop-controlled intersections at S. Surfview Drive/Coastline Drive and Coastline Drive/Castlerock Road. Although the stop-controlled intersections operate at acceptable levels during the AM and PM peak periods, the signalized intersection at Coastline Drive/PDH will continue to operate at LOS E after mitigation. Thus, in order to avoid the peak hour level of service impacts at the affected location, it is recommended to implement the lane closures outside of the AM and PM peak periods. Possible lane closures could occur off peak (10AM-3PM) or at night (9PM-5AM). During non-construction periods, all travel lanes should be opened to through traffic.

This section provides a summary of the Existing 2021 traffic conditions at the study intersections with construction of Project 2 during non-peak hours. The year 2021 was selected for analysis based on the anticipated implementation date of the proposed project.

Table 2-5 provides the Intersection Capacity Utilization (ICU) for signalized intersections and Table 2-6 provides the same for stop controlled intersections. LOS values for each study intersection are included in each table.

EXISTING (2021) + PROJECT CONSTRUCTION + MITIGATION - PROJECT 2

TABLE 2-5
SUMMARY OF SIGNALIZED INTERSECTION OPERATION
WITH CONSTRUCTION AND MITIGATION (2021)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Coastline Dr	0.96	**E**	1.02	**F**

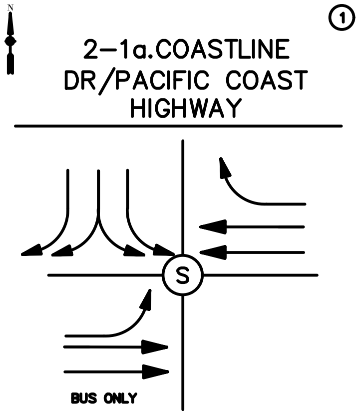
Table 2-5 shows that the intersection of Pacific Coast Hwy & Coastline Dr will continue to function at unacceptable levels.

TABLE 2-6
SUMMARY OF STOP CONTROLLED INTERSECTION OPERATION
WITH CONSTRUCTION AND MITIGATION (2021)

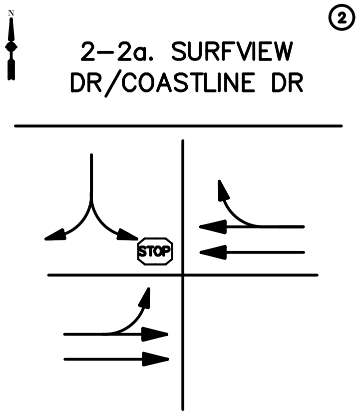
Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Coastline Dr & Surfview Dr	0.18	A	0.18	A
Coastline Dr & Castlerock Rd	0.23	A	0.21	A

Table 2-6 shows that Project 2 with Mitigation will not cause any stop controlled intersections to function at unacceptable levels.

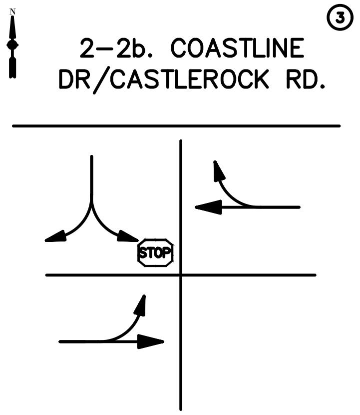
① 2–1a.COASTLINE DR/PACIFIC COAST HIGHWAY

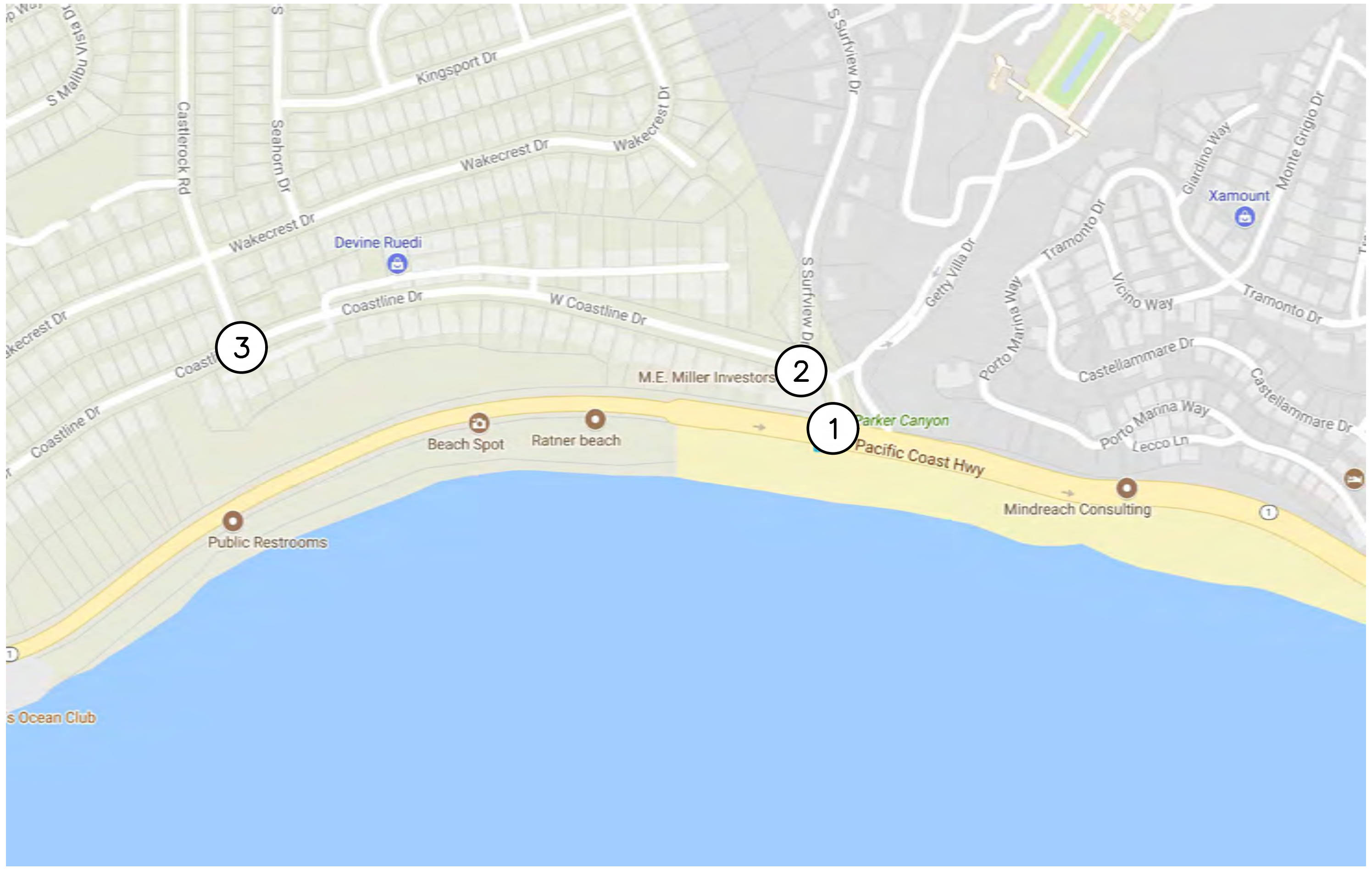


② 2–2a. SURFVIEW DR/COASTLINE DR



③ 2–2b. COASTLINE DR/CASTLEROCK RD.





LEGEND:

PROJECT 2
N.T.S.

Ⓧ = Study Site
STOP = Stop Sign
Ⓢ = Traffic Signal
→ = Through Lane
↰ = Turn Lanes

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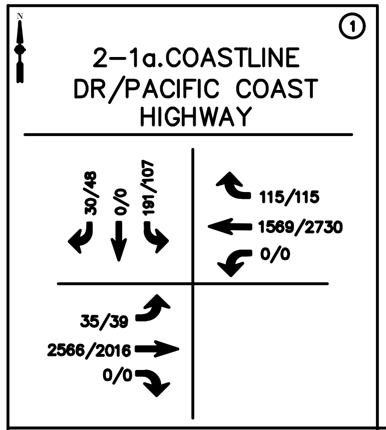
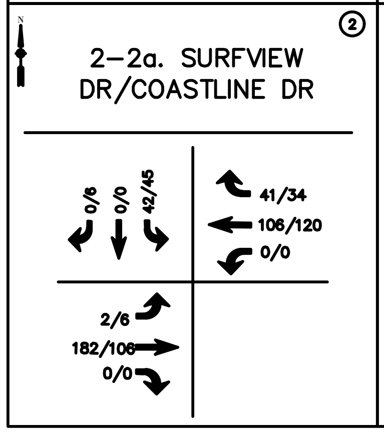
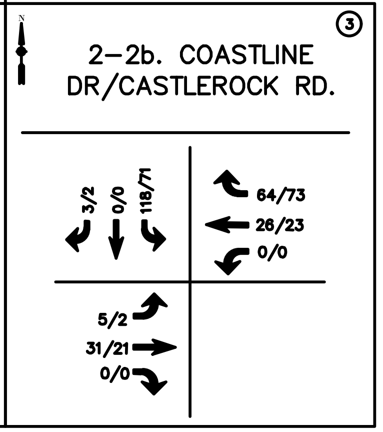
(2021) WITH CONSTRUCTION AND MITIGATION INTERSECTION APPROACH CONFIGURATIONS

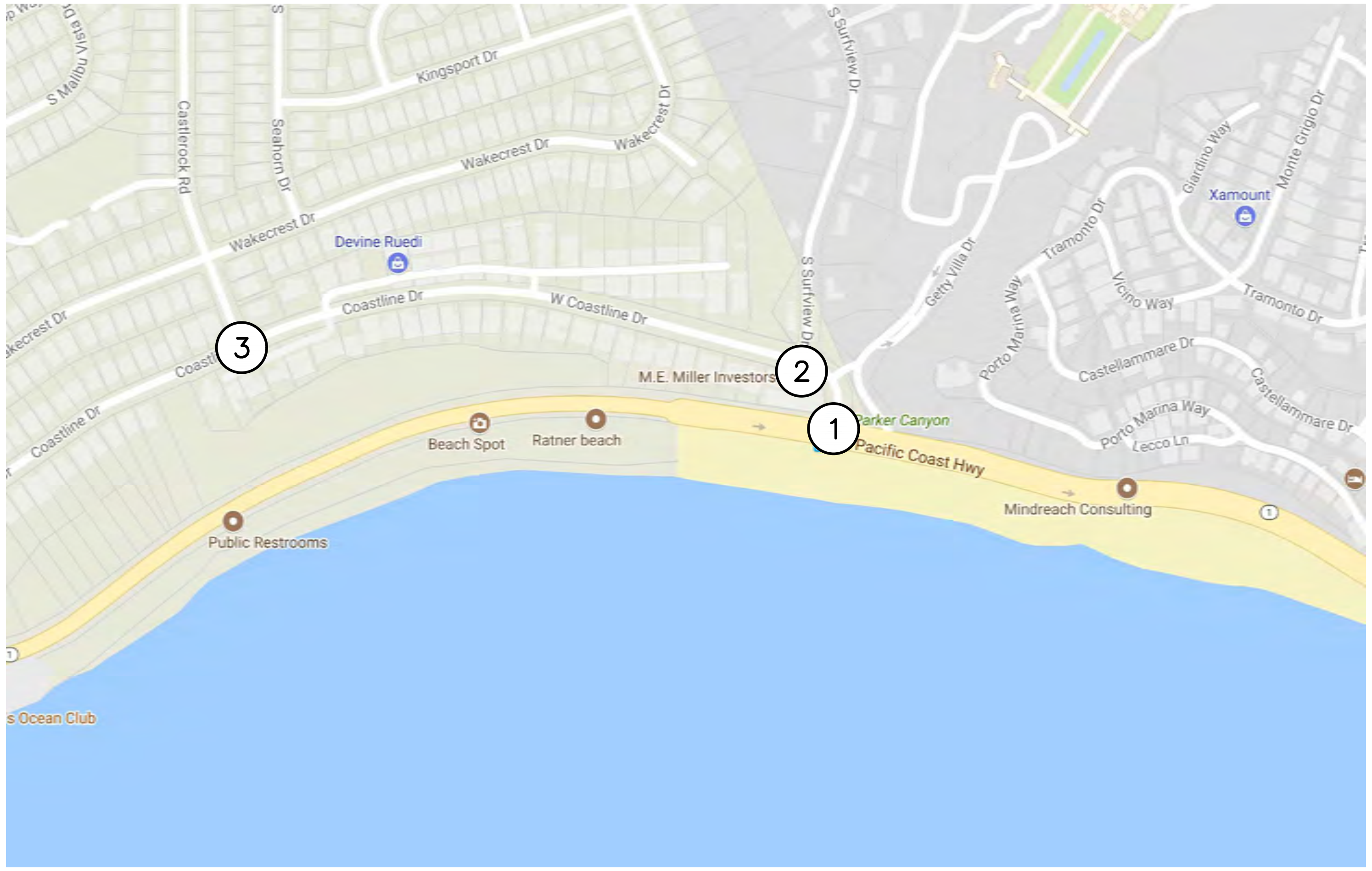
FIGURE 3-5

PROJECT 2









PROJECT 2
N.T.S.

LEGEND:

Ⓧ = Study Intersection

XX/YY= AM/PM Peak Hour Turning Movement Volumes

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(2021) WITH CONSTRUCTION AND MITIGATION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 3-6

PROJECT 2

4. PROJECT 3 - WATERWORKS DISTRICT NO. 29 CREEK CROSSING REPAIR PROJECT

A. Existing Roadway System

18788 PCH: is at a four lane arterial east – west creek crossing near Topanga Creek, west of Topanga Canyon Ln.

19399 PCH: is at a four lane arterial east – west creek crossing near Pena Canyon Creek, west of Pena Rd.

21203 PCH: is at a four lane arterial east – west creek crossing east of Rambla Pacifico Street.

21857 PCH: is at a four lane arterial east – west creek crossing east of Carbon Canyon Rd

25712 PCH: is at a four lane arterial east – west creek crossing west of Malibu road and east of Seafood Restaurant Dwy

27519 PCH: is at a four lane arterial east – west creek crossing west of Escondido Beach road

29494 PCH: is at a four lane arterial east – west creek crossing west of Western Beach road

30626 PCH: is at a four lane arterial east – west creek crossing east of Trancas canyon road

B. Existing LOS

This section provides a summary of the Existing 2018 traffic conditions at the study roadway segments within the scope of Project 3. The project consists of repairing water main at creek crossings along PCH.

LOS was determined for all of the study area roadway segments. Roadway Segment Analysis data is provided in Appendix J

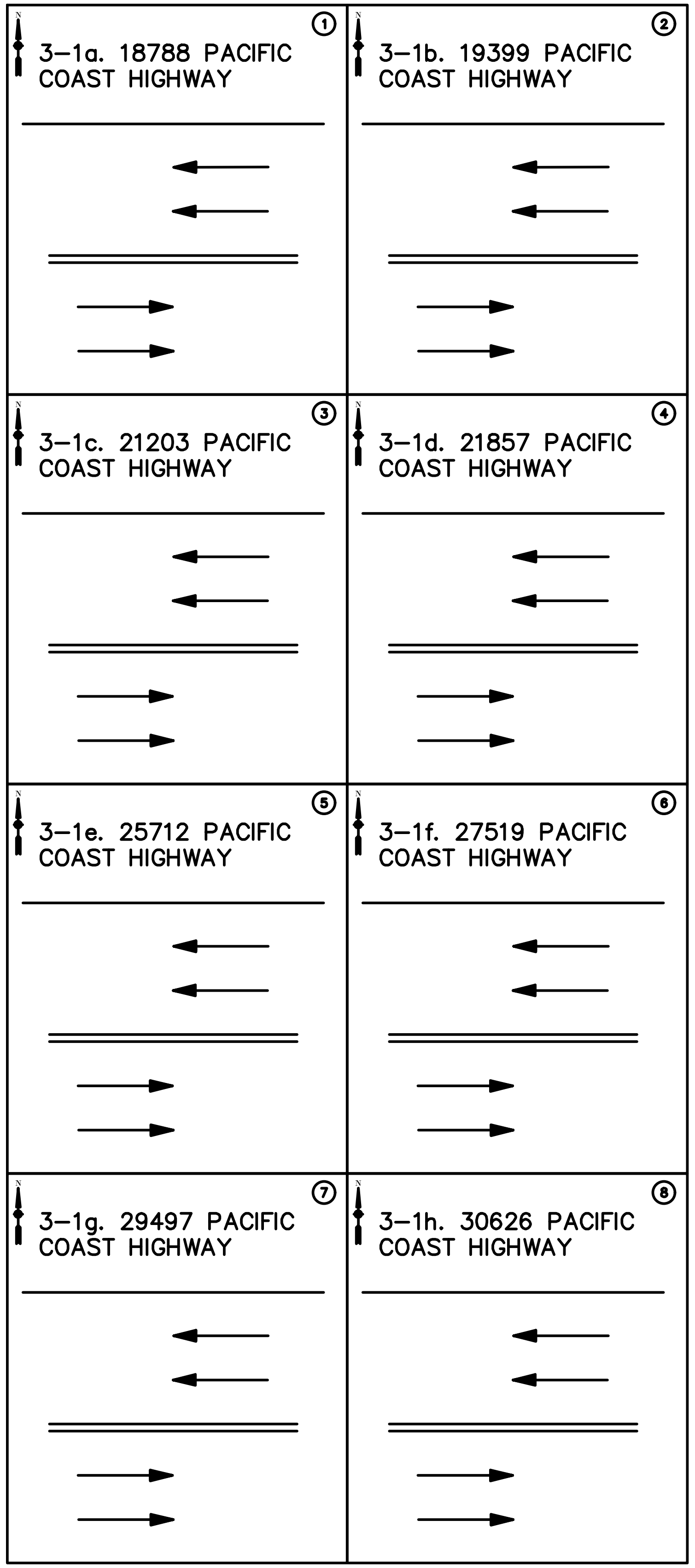
Table 3-1 summarizes the density (for roadway segments). LOS values for each study area are given. See appendix A for critical V/C ratio interpretations.

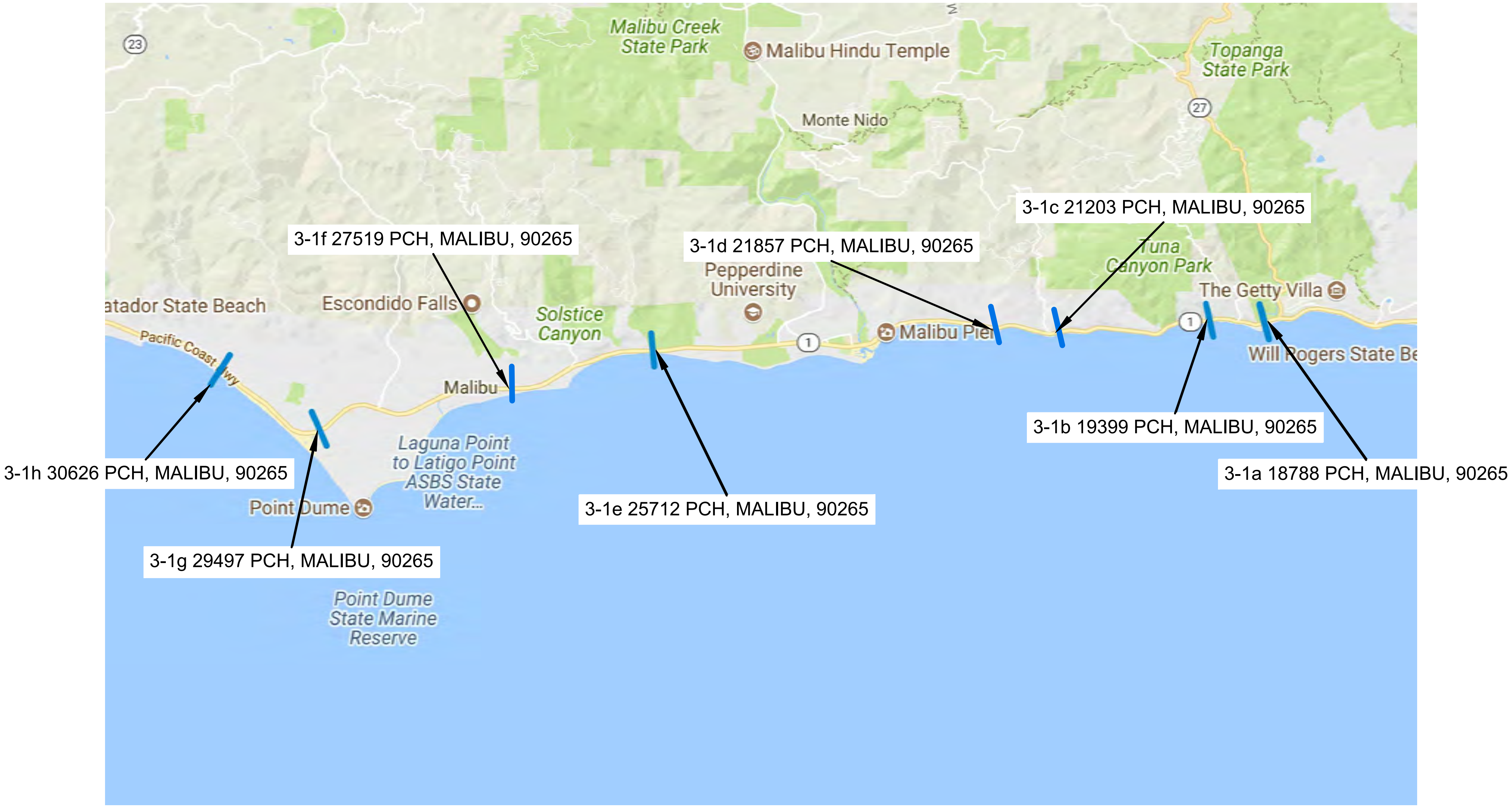
EXISTING (2018) CONDITIONS - PROJECT 3

TABLE 3-1
SUMMARY OF ROADWAY SEGMENT OPERATION
EXISTING CONDITIONS (2018)

Project	Segment	AM			PM		
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol
3	18788 PCH	25.0	C	1,676	31.8	D	2,137
3	19399 PCH	24.1	C	1,844	27.5	D	2,106
3	21203 PCH	31.7	D	1,826	35.9	**E**	2,037
3	21857 PCH	22.6	C	1,772	26.2	D	2,050
3	25712 PCH	17.1	B	1,243	26.4	D	2,046
3	27519 PCH	16.8	B	1,212	27.3	D	1,987
3	29497 PCH	12.8	B	1,113	16.4	B	1,532
3	30626 PCH	11.0	A	972	14.7	B	1,427

Table 3-1 shows that 21203 PCH is currently operating at an unacceptable level of service during PM peak hours.





PROJECT 3
N.T.S.

LEGEND:

▬ = Study Site
→ = Through Lane

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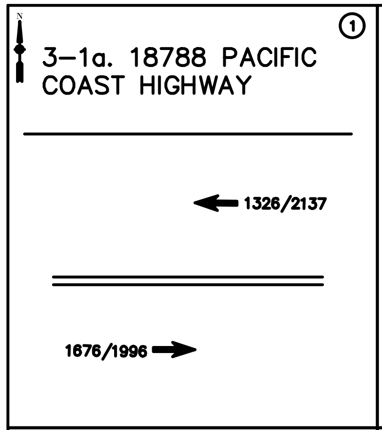
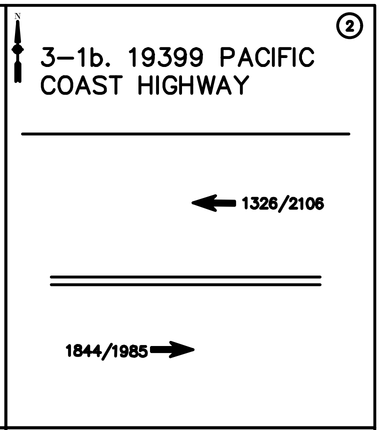
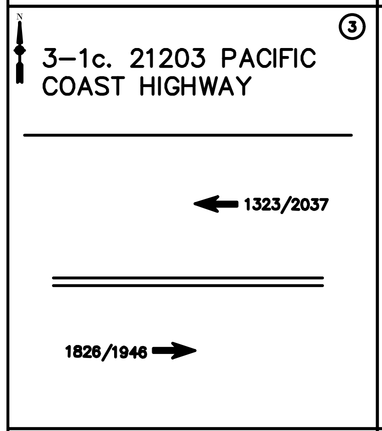
EXISTING ROADWAY SEGMENT CONFIGURATIONS

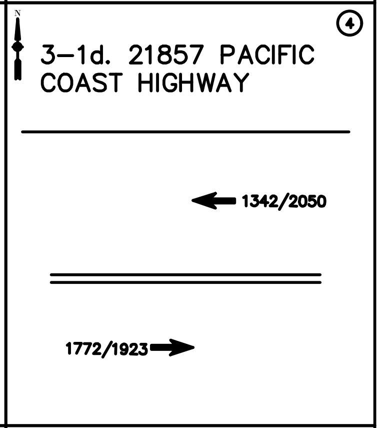
FIGURE 4-1

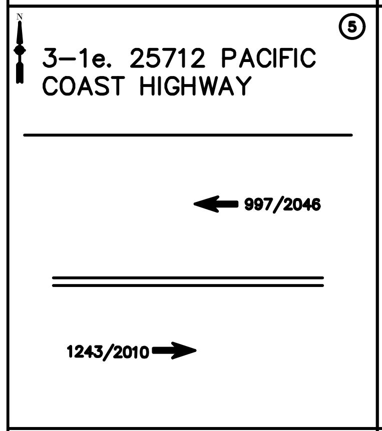
PROJECT 3

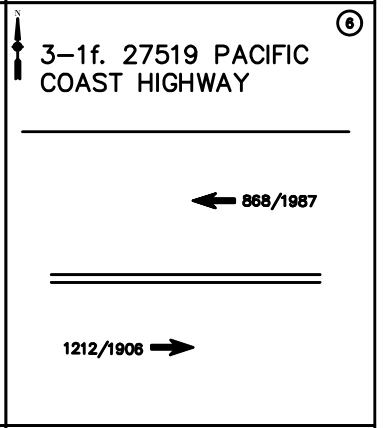


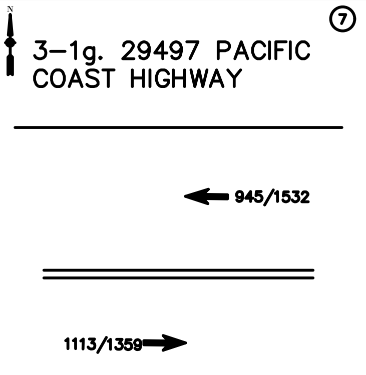


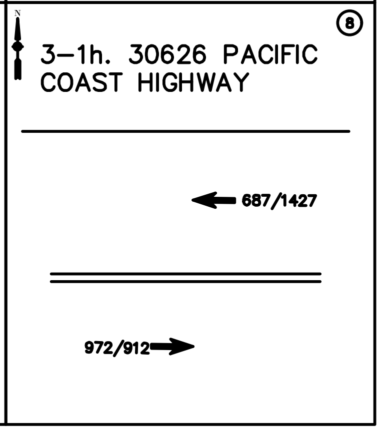


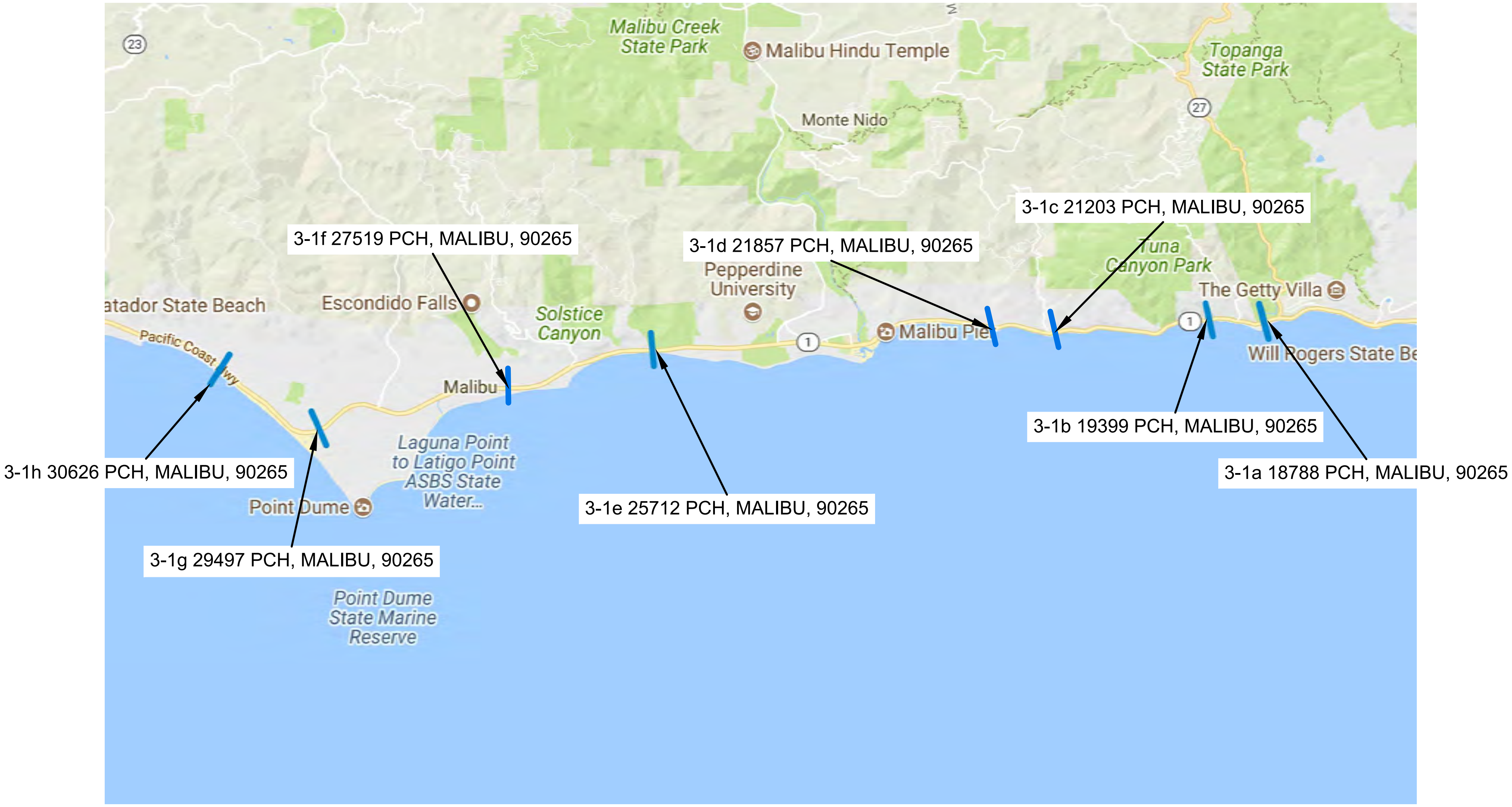












LEGEND:

PROJECT 3
N.T.S.

▬ = Study Site

XX/YY= AM/PM Peak Hour Volumes

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EXISTING YEAR (2018) AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 4-2

C. Existing + Project (Construction) LOS

This section provides a summary of the Existing 2020 traffic conditions at the study intersections with construction of Project 3. The year 2020 was selected for analysis based on the anticipated implementation date of the proposed project. The project consists of repairing water main at creek crossings along PCH. Lane closure details have not been finalized. However, it is assumed for analysis that one westbound lane will be closed for construction. Once detailed construction methods, schedules, and construction vehicle volumes are available, a qualified traffic consultant will validate the assumptions and findings of the traffic study for the EIR. If the report is validated, the project can proceed without additional analysis or mitigation. If the validation shows that the assumptions were not accurate, further environmental documentation may be required. Construction is scheduled to begin in 2020 with an approximate one-year duration.

In order to define regional traffic growth that would affect operations at the study areas during Year 2020 JMD utilized traffic growth factors from the Congestion Management Program for Los Angeles County. The City of Malibu falls under Regional Statistical Area (RSA) 15 resulting in an annual growth factor of 1.005. Applying this growth factor to a gap of 2 years results in a total growth factor of 1.01 from Year 2018 to Year 2020.

Table 3-2 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2020) + PROJECT CONSTRUCTION - PROJECT 3

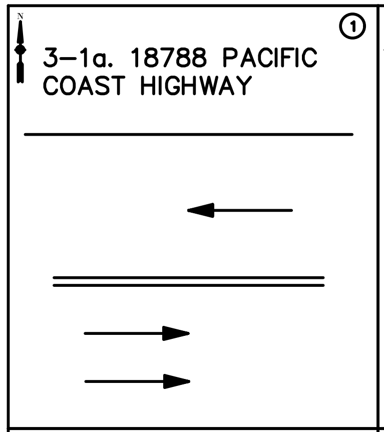
TABLE 3-2
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION (2020)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
3	18788 PCH	58.5	F	1,684	74.5	F	2,148	135%	Yes
3	19399 PCH	55.3	F	1,853	63.3	F	2,117	130%	Yes
3	21203 PCH	63.7	F	1,835	72.1	F	2,047	101%	Yes
3	21857 PCH	45.3	F	1,781	52.7	F	2,060	101%	Yes
3	25712 PCH	34.3	D	1,249	53.2	F	2,056	101%	Yes

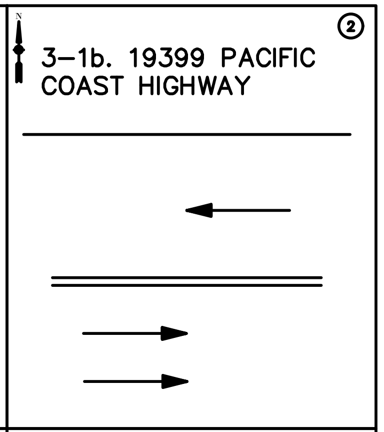
3	27519 PCH	33.8	D	1,218	54.9	**F**	1,997	101%	Yes
3	29497 PCH	25.7	C	1,119	32.9	D	1,540	101%	No
3	30626 PCH	22.2	C	977	29.5	D	1,434	101%	No

Table 3-2 shows that Project 3 will have significant impacts on several of the roadway segments along Pacific Coast Highway.

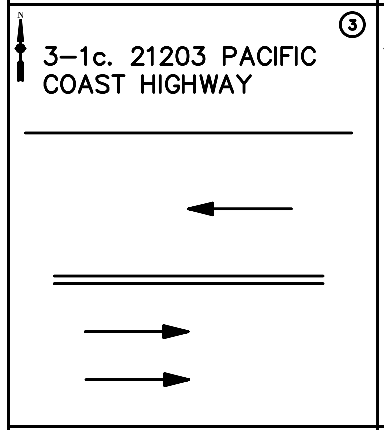
① 3–1a. 18788 PACIFIC COAST HIGHWAY



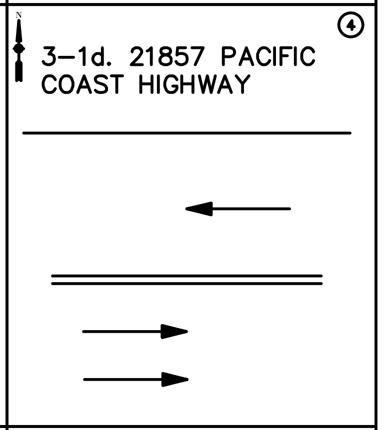
② 3–1b. 19399 PACIFIC COAST HIGHWAY



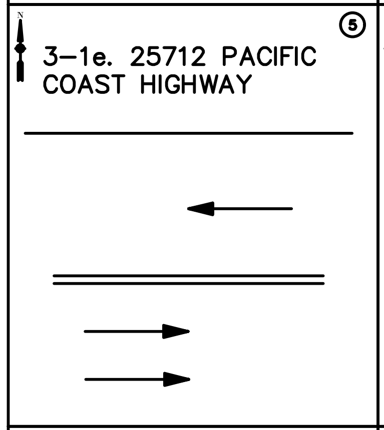
③ 3–1c. 21203 PACIFIC COAST HIGHWAY



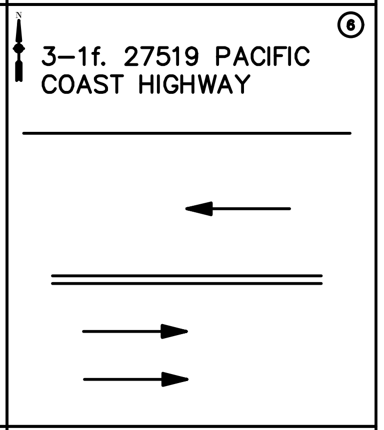
④ 3–1d. 21857 PACIFIC COAST HIGHWAY



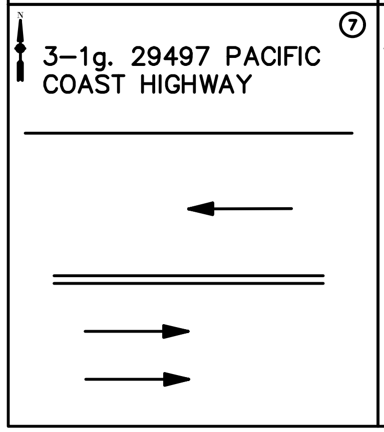
⑤ 3–1e. 25712 PACIFIC COAST HIGHWAY



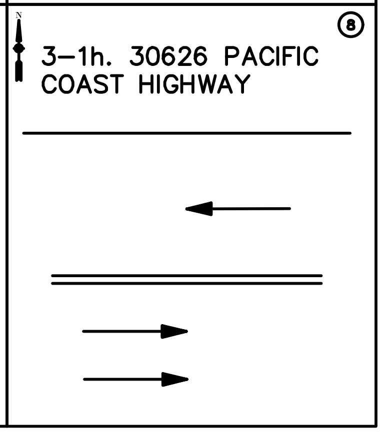
⑥ 3–1f. 27519 PACIFIC COAST HIGHWAY

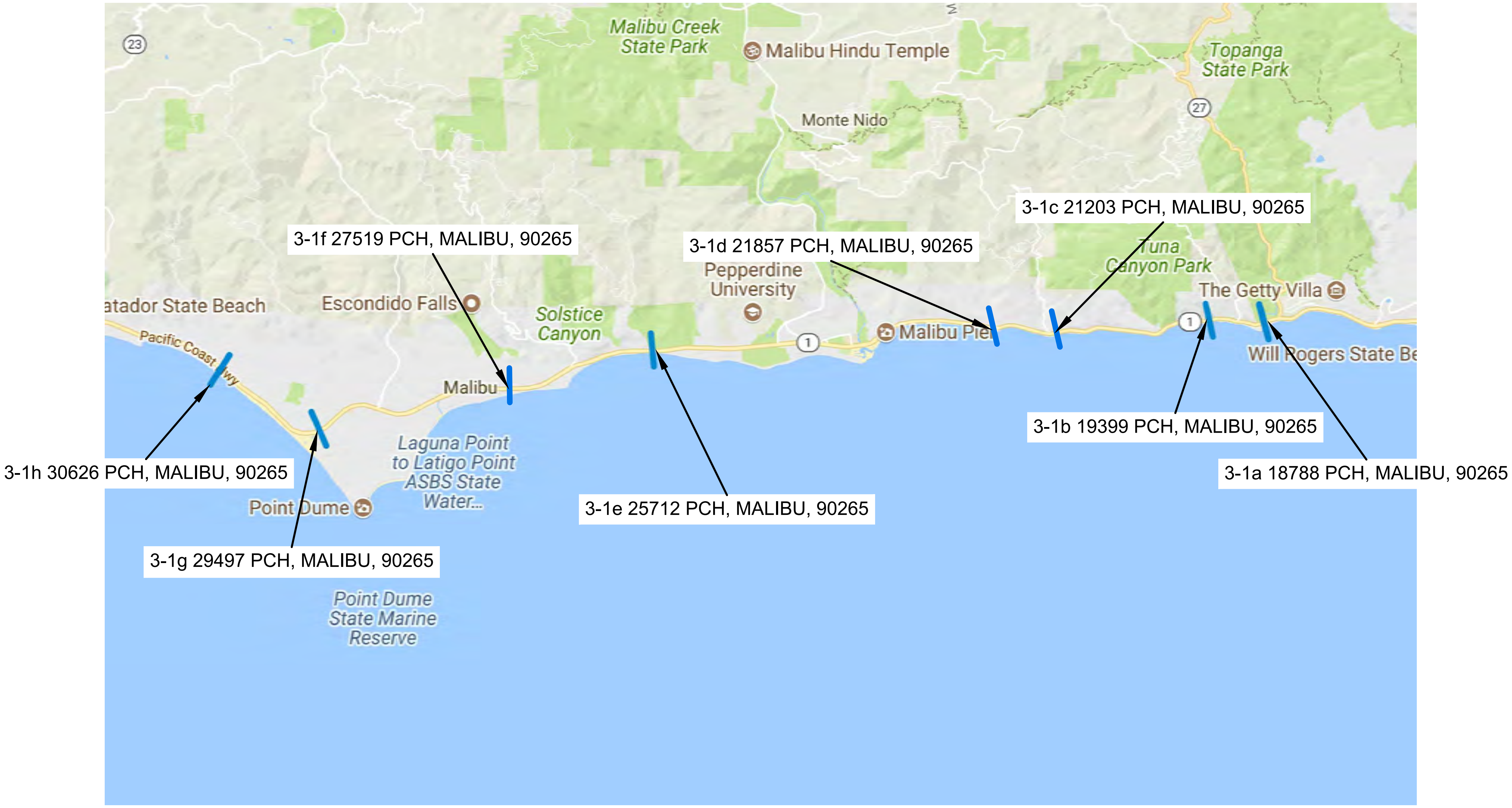


⑦ 3–1g. 29497 PACIFIC COAST HIGHWAY



⑧ 3–1h. 30626 PACIFIC COAST HIGHWAY





PROJECT 3
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LEGEND:

▬ = Study Site
→ = Through Lane
⚑ = Flagger

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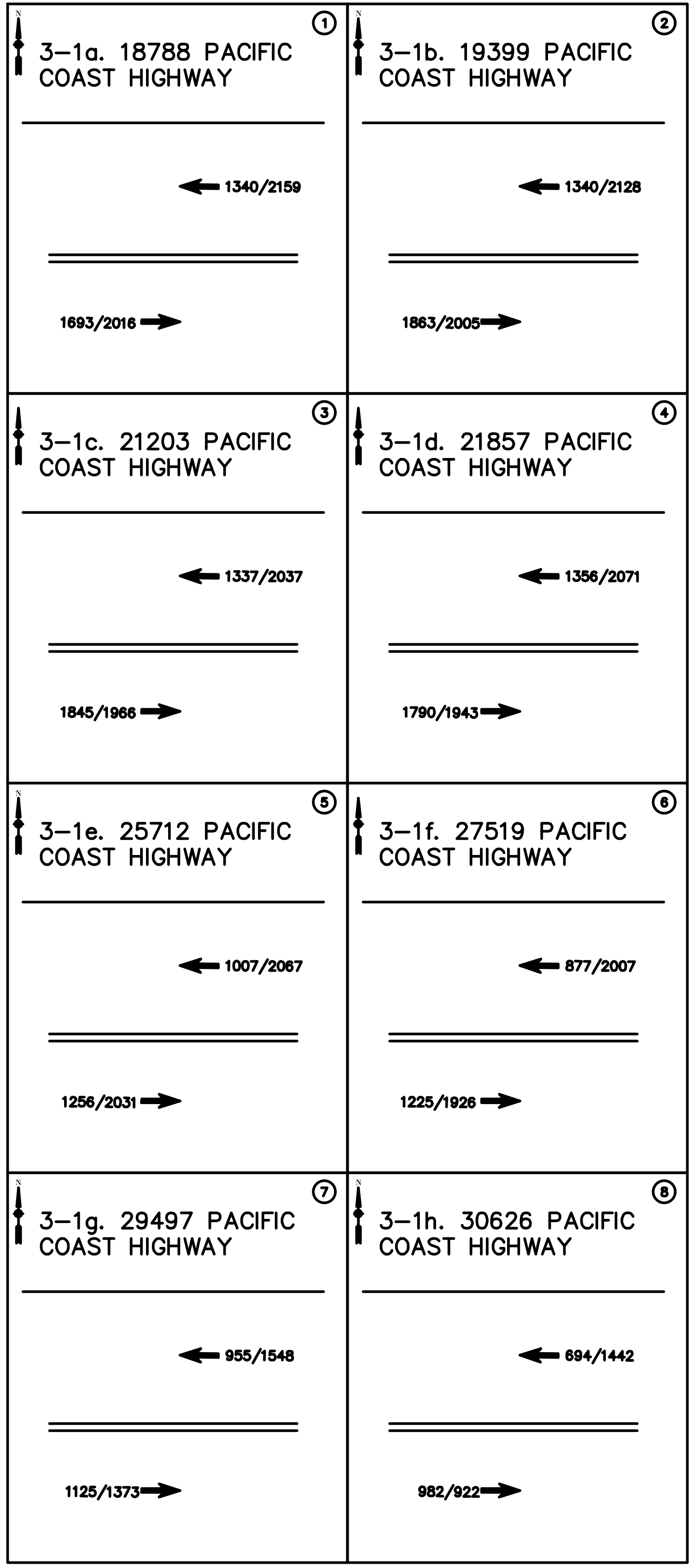
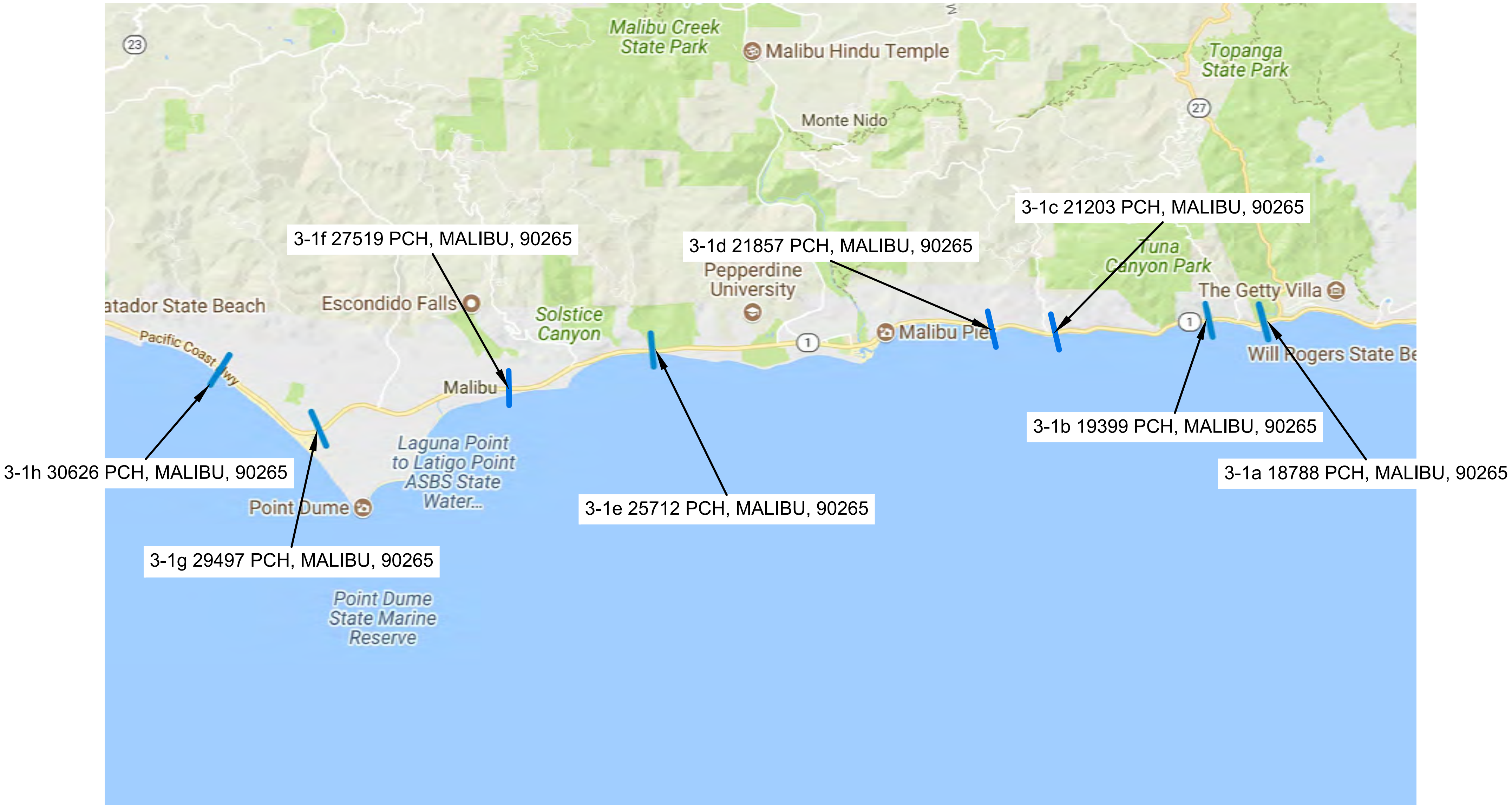
(2020) WITH CONSTRUCTION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 4-3

PROJECT 3





PROJECT 3
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LEGEND:

▬ =	Study Site
XX/YY =	AM/PM Peak Hour Volumes

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(2020) WITH CONSTRUCTION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 4-4

PROJECT 3

D. Existing + Project (Construction) + Mitigation LOS

This project includes multiple roadway segments along PCH, east of Encinal Canyon Rd to west of Topanga Canyon Blvd. All but one segment operates at an acceptable level of service. However, with construction 6 of the 8 segments downgrade to unacceptable levels of service during peak hours. Thus, in order to avoid the peak hour level of service impacts at the affected location, it is recommended to implement the lane closures outside of the AM and PM peak periods. Possible lane closures could occur off peak (10AM-3PM) or at night (9PM-5AM). During non-construction periods, all travel lanes should be opened to through traffic.

This section provides a summary of the Existing 2020 traffic conditions at the study intersections with construction of Project 3 during non-peak hours. The year 2020 was selected for analysis based on the anticipated implementation date of the proposed project.

Table 3-3 summarizes the density (for roadway segments). LOS values for each study area are given.

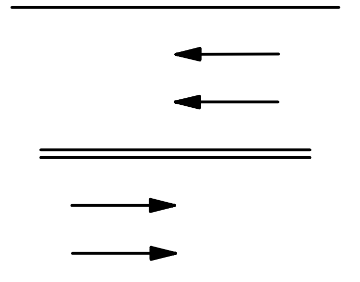
EXISTING (2020) + PROJECT CONSTRUCTION + MITIGATION - PROJECT 3

**TABLE 3-3
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION AND MITIGATION (2020)**

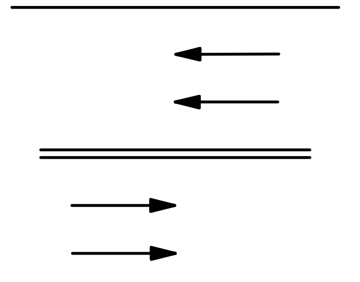
Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
3	18788 PCH	29.3	D	1,684	37.2	**E**	2,148	17%	No
3	19399 PCH	27.6	D	1,853	31.6	D	2,117	15%	No
3	21203 PCH	31.8	D	1,835	36.0	**E**	2,047	0%	No
3	21857 PCH	22.7	C	1,781	26.3	D	2,060	0%	No
3	25712 PCH	17.1	B	1,249	26.6	D	2,056	1%	No
3	27519 PCH	16.9	B	1,218	27.4	D	1,997	0%	No
3	29497 PCH	12.8	B	1,119	16.4	B	1,540	0%	No
3	30626 PCH	11.1	B	977	14.8	B	1,434	0%	No

Table 3-3 shows that Project 3 will with Mitigation have no significant impacts on the roadway segments along Pacific Coast Highway.

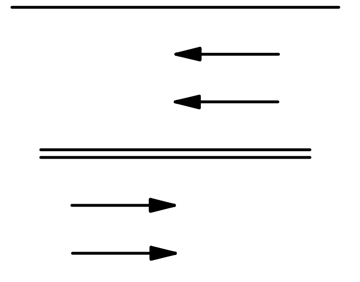
① 3–1a. 18788 PACIFIC COAST HIGHWAY



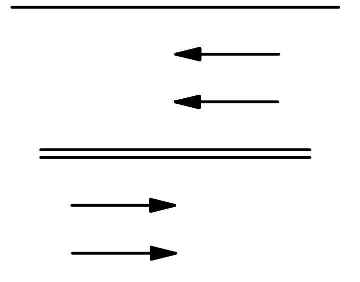
② 3–1b. 19399 PACIFIC COAST HIGHWAY



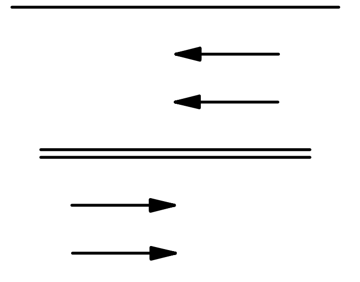
③ 3–1c. 21203 PACIFIC COAST HIGHWAY



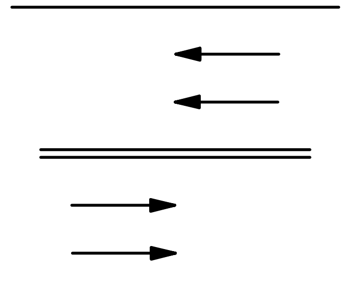
④ 3–1d. 21857 PACIFIC COAST HIGHWAY



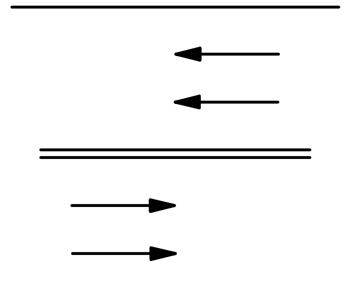
⑤ 3–1e. 25712 PACIFIC COAST HIGHWAY



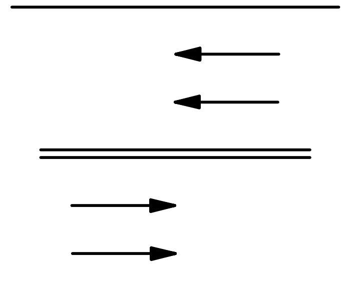
⑥ 3–1f. 27519 PACIFIC COAST HIGHWAY

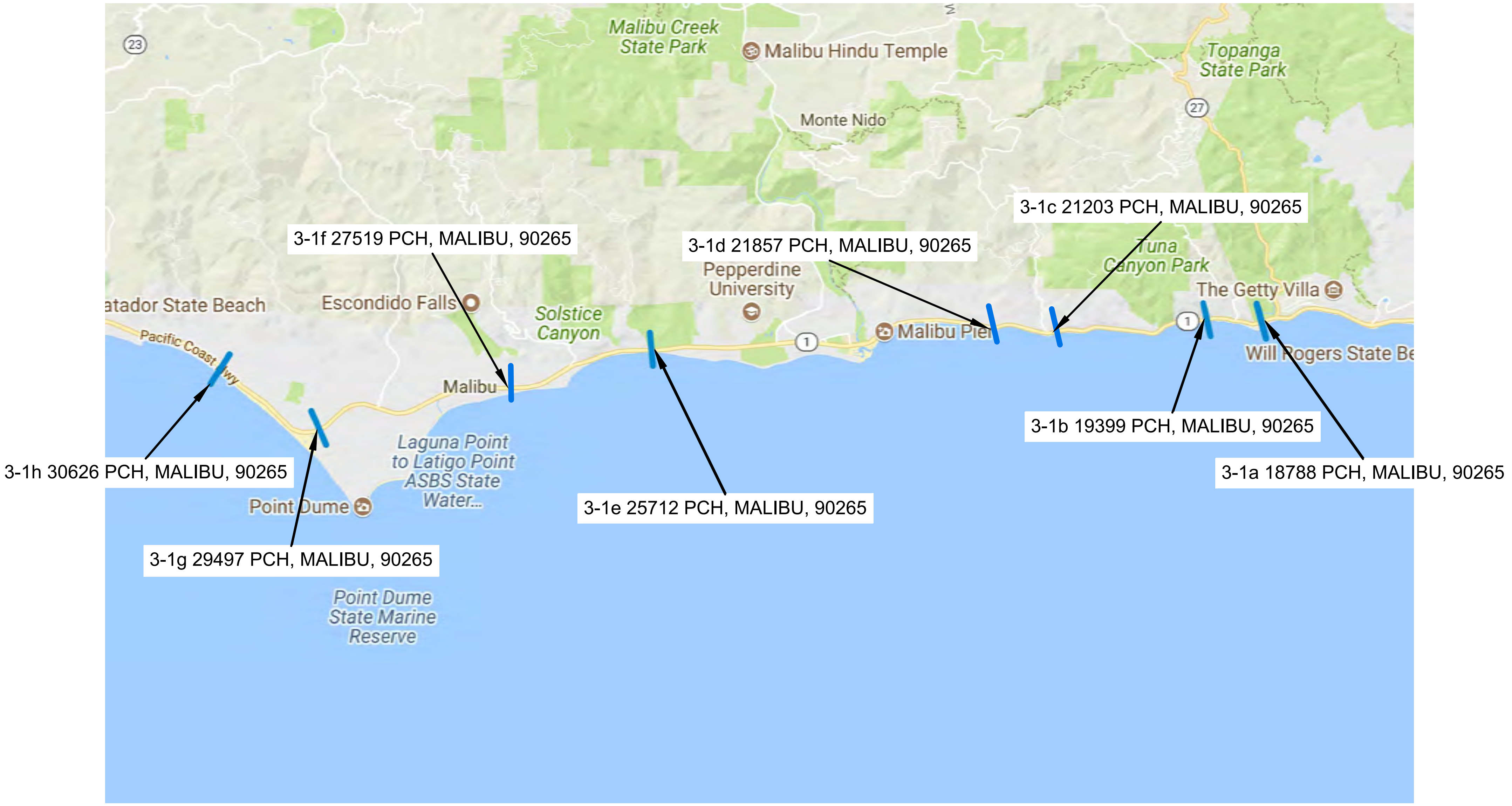


⑦ 3–1g. 29497 PACIFIC COAST HIGHWAY



⑧ 3–1h. 30626 PACIFIC COAST HIGHWAY





LEGEND:

▬ = Study Site

→ = Through Lane

PROJECT 3
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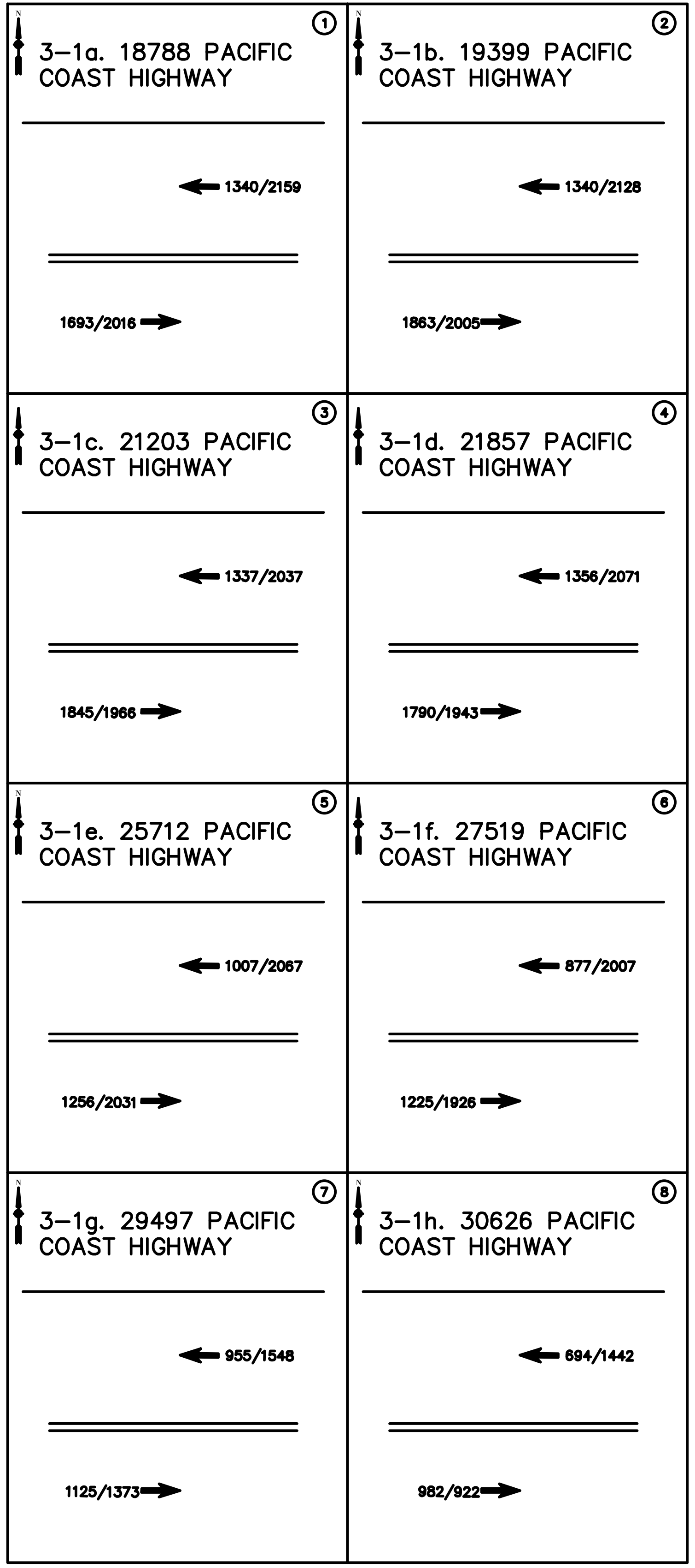
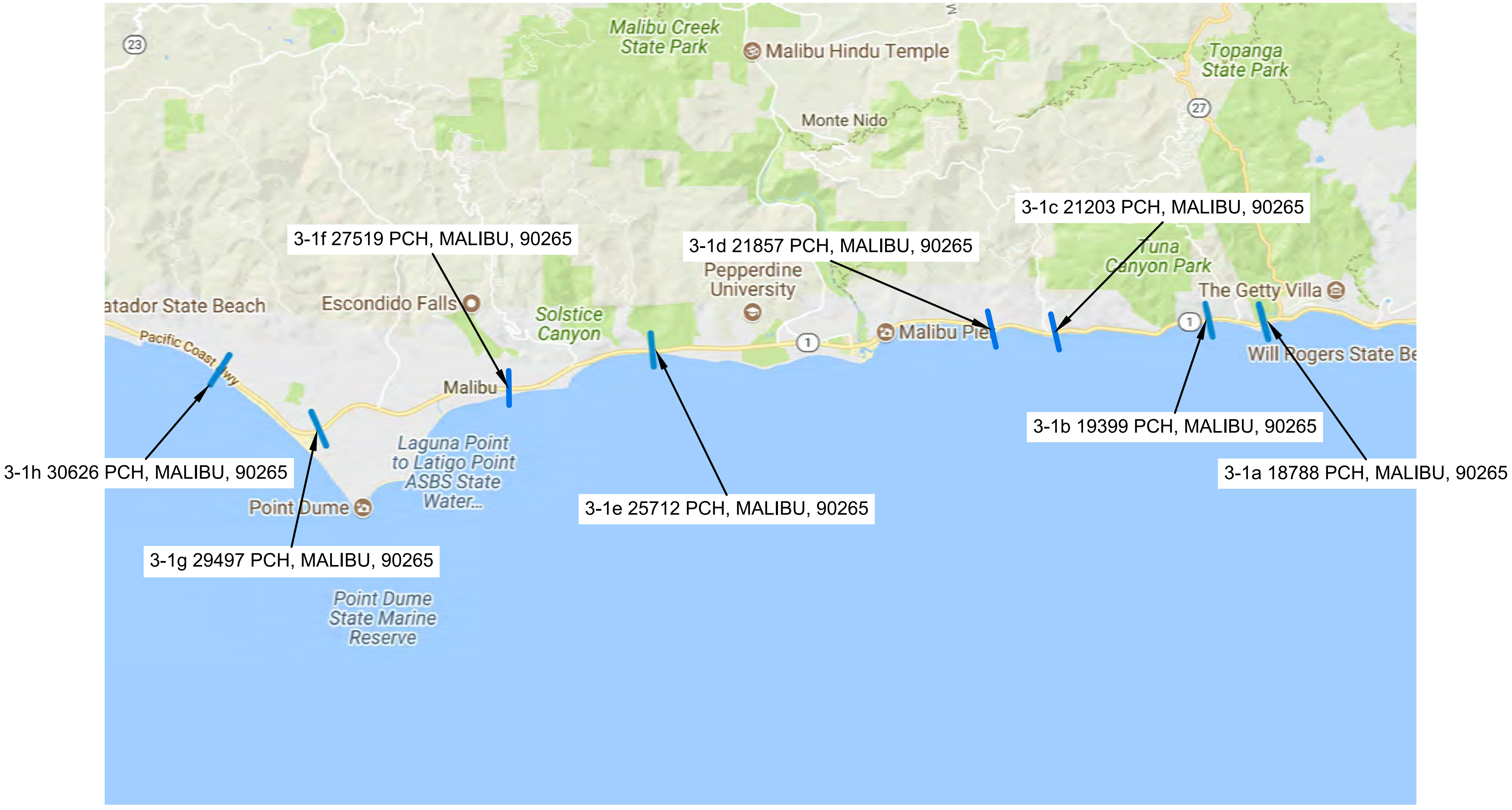
(2020) WITH CONSTRUCTION AND MITIGATION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 4-5





PROJECT 3
N.T.S.

LEGEND:

▬ =	Study Site
XX/YY =	AM/PM Peak Hour Volumes

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(2020) WITH CONSTRUCTION AND MITIGATION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 4-6

PROJECT 3
p. 45

5. PROJECT 4 - FERNWOOD TANK IMPROVEMENT

A. Existing Roadway System

19716 Horseshoe Dr: is at a two lane road that provides access to residential areas west of Topanga Canyon Blvd.

B. Existing LOS

This section provides a summary of the Existing 2018 traffic conditions at the study roadway segments within the scope of Project 4. The project consists of replacing two large water tanks along Horseshoe Dr.

LOS was determined for all of the study area roadway segments. Roadway Segment Analysis data is provided in Appendix J

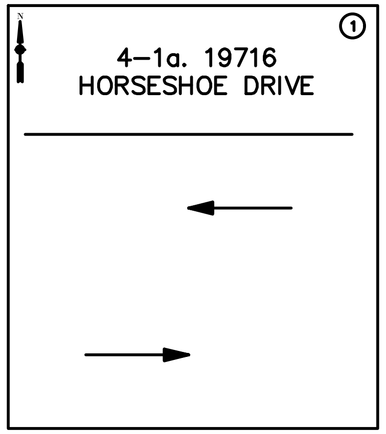
Table 4-1 summarizes the density (for roadway segments). LOS values for each study area are given.

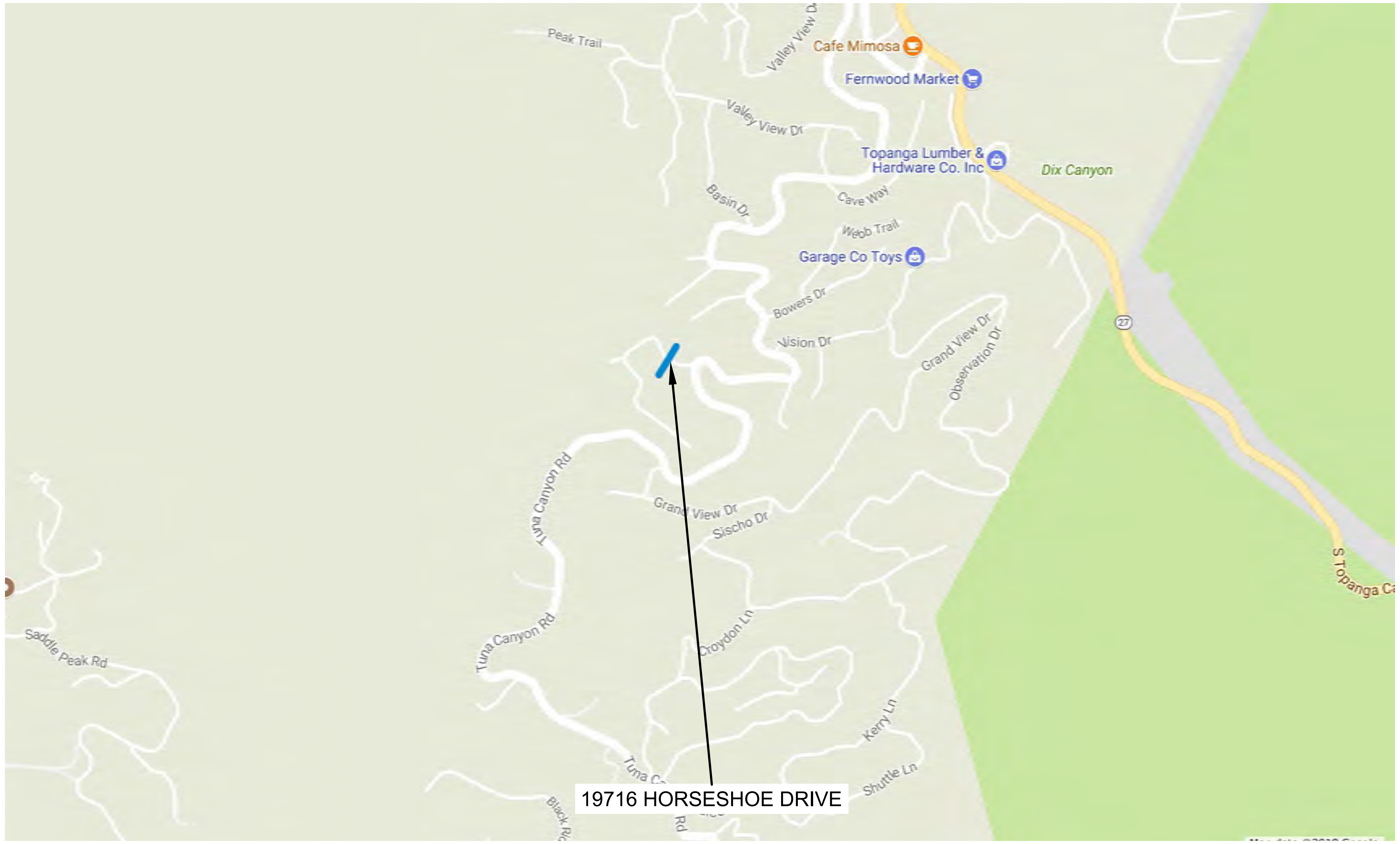
EXISTING (2018) CONDITIONS - PROJECT 4

TABLE 4-1
SUMMARY OF ROADWAY SEGMENT OPERATION
EXISTING CONDITIONS (2018)

Project	Segment	AM			PM		
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol
4	Fernwood Tank on Horseshoe Dr	3.7	A	44	4.3	A	50

Table 4-1 shows that the effected roadway segment within the scope of Project 4 is currently operating at an acceptable level of service. See appendix A for critical V/C ratio interpretations.





PROJECT 4
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LEGEND:

▬ = Study Site

→ = Through Lane

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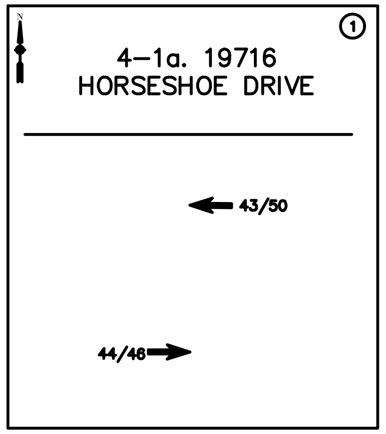
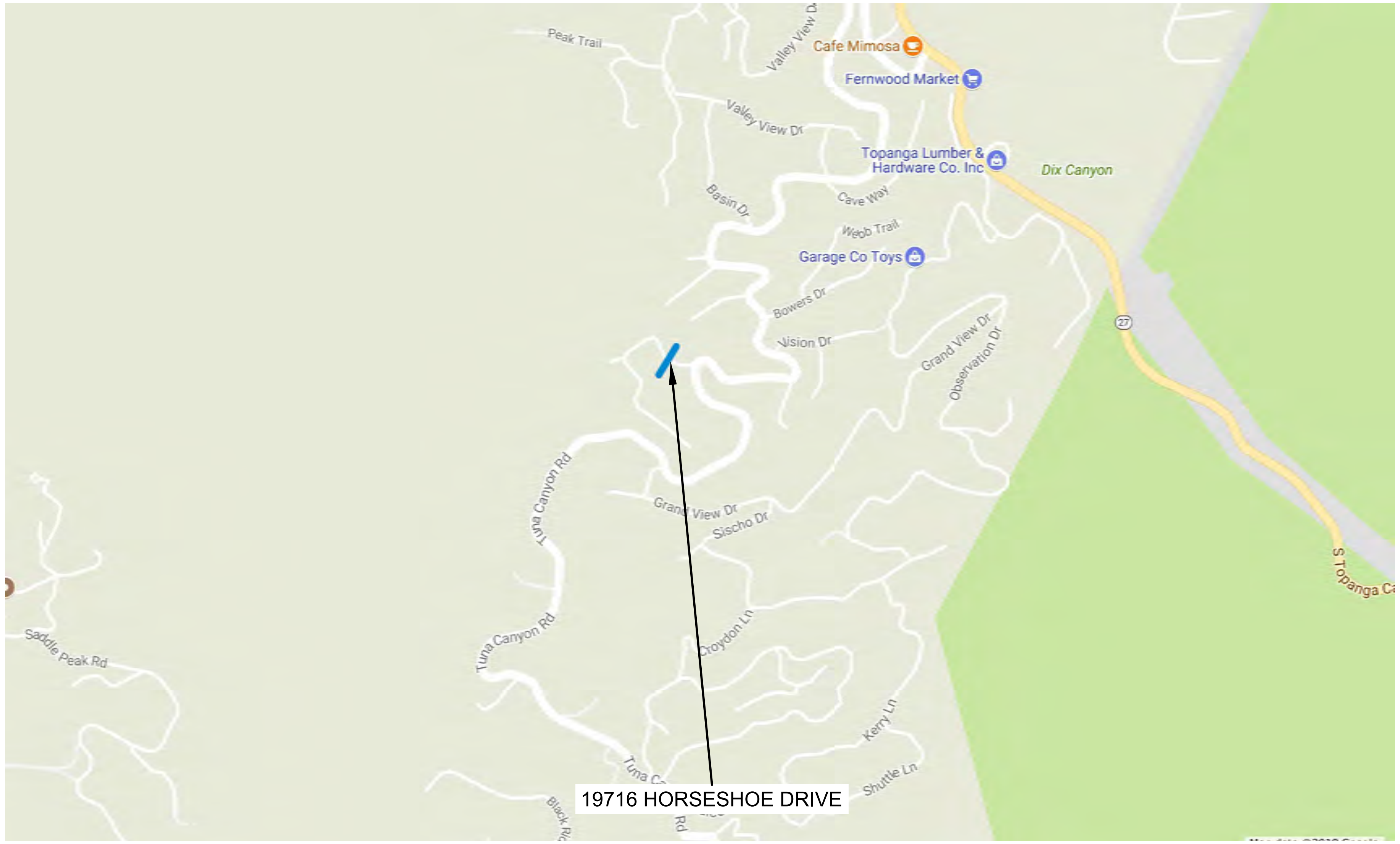
EXISTING ROADWAY SEGMENT CONFIGURATIONS
FIGURE 5-1

PROJECT 4





PROJECT 4
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LEGEND:

━ = Study Site

XX/YY= AM/PM Peak Hour Volumes

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EXISTING YEAR (2018) AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 5-2

C. Existing + Project (Construction) LOS

This section provides a summary of the Existing 2022 traffic conditions at the study intersections with construction of Project 4. The year 2022 was selected for analysis based on the anticipated implementation date of the proposed project. The project consists of replacing two large water tanks along Horseshoe Dr. Lane closure details have not been finalized. However, it is assumed for analysis that one lane will be closed for construction. Once detailed construction methods, schedules, and construction vehicle volumes are available, a qualified traffic consultant will validate the assumptions and findings of the traffic study for the EIR. If the report is validated, the project can proceed without additional analysis or mitigation. If the validation shows that the assumptions were not accurate, further environmental documentation may be required. Construction is scheduled to begin in 2022 with an approximate one-year duration.

In order to define regional traffic growth that would affect operations at the study areas during Year 2022 JMD utilized traffic growth factors from the Congestion Management Program for Los Angeles County. The City of Malibu falls under Regional Statistical Area (RSA) 15 resulting in an annual growth factor of 1.005. Applying this growth factor to a gap of 4 years results in a total growth factor of 1.020 from Year 2018 to Year 2022.

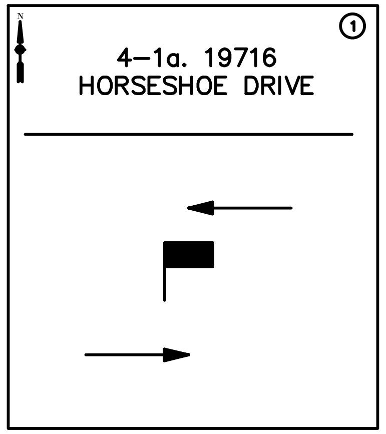
Table 4-2 summarizes the density (for roadway segments). LOS values for each study area are given.

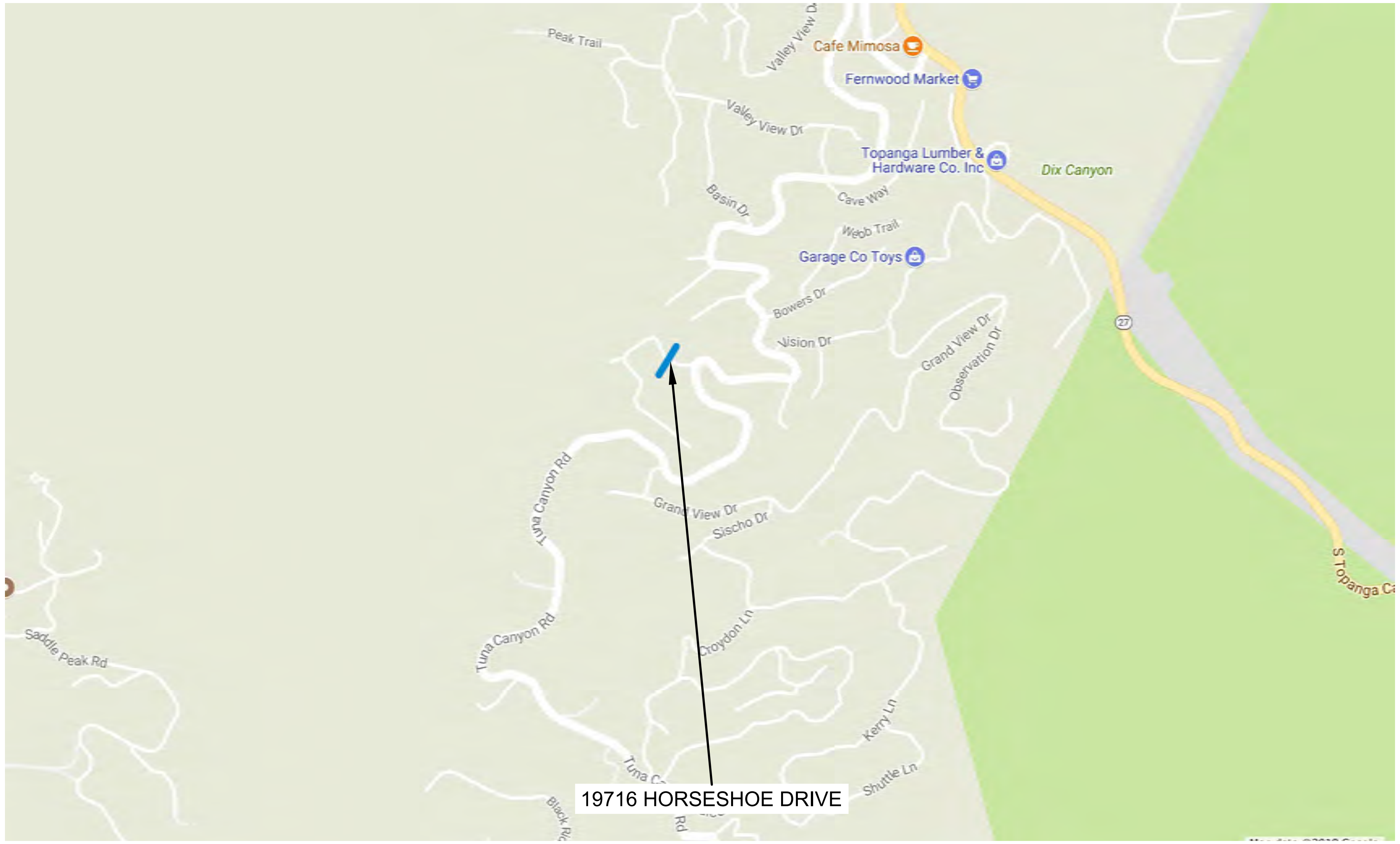
EXISTING (2022) + PROJECT CONSTRUCTION - PROJECT 4

TABLE 4-2
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION (2022)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
4	Fernwood Tank on Horseshoe Dr	7.6	A	45	8.7	A	51	103%	No

Table 4-2 shows that Project 4 will not have a significant impact on the effected roadway segment.





PROJECT 4
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LEGEND:

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→ = Through Lane
⚑ = Flagger

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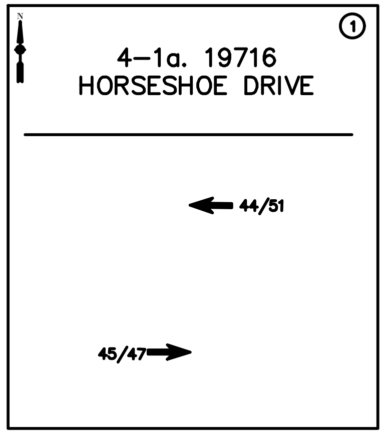
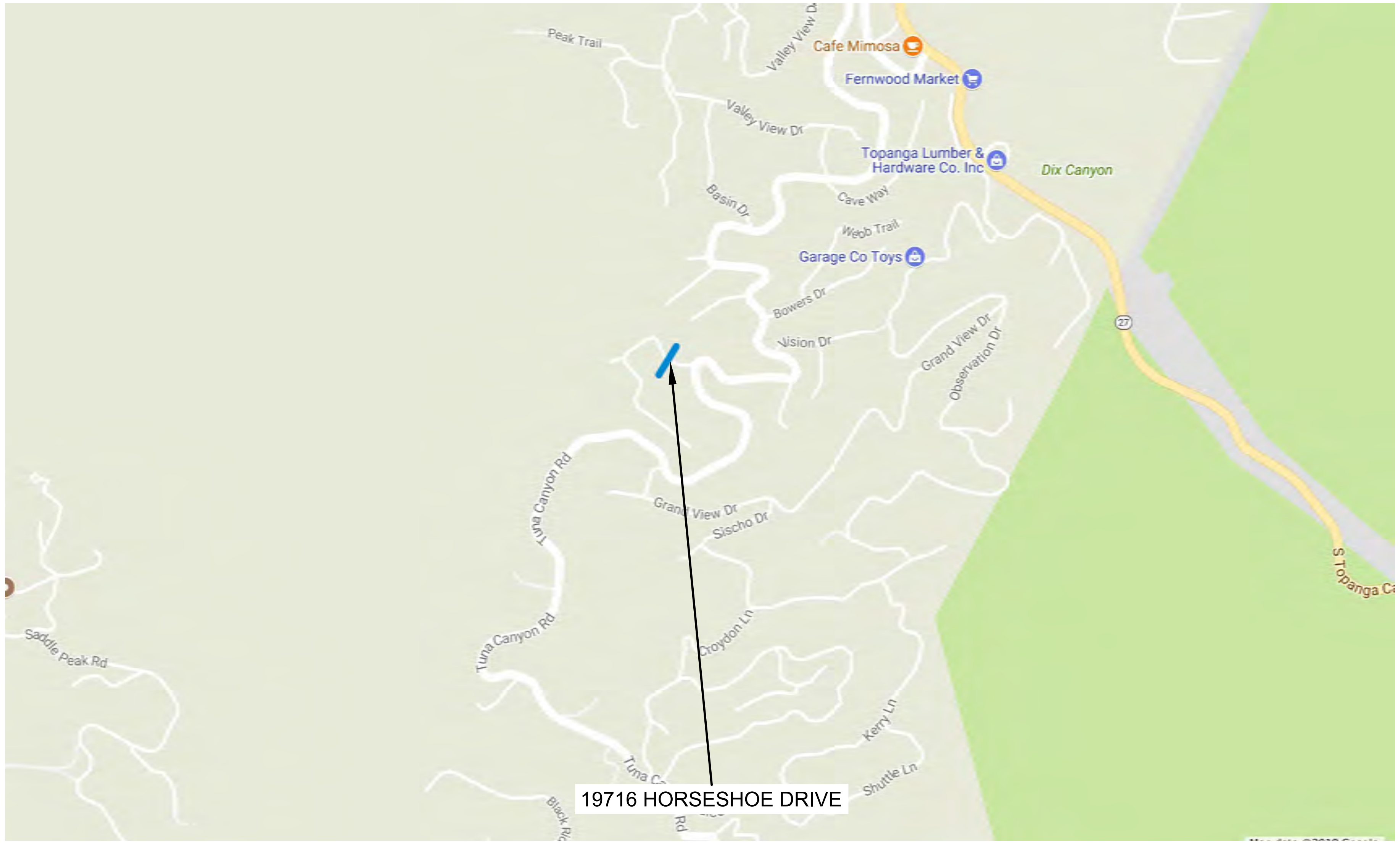
(2022) WITH CONSTRUCTION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 5-3

PROJECT 4





PROJECT 4
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LEGEND:

▬ = Study Site
XX/YY = AM/PM Peak Hour Volumes

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(2022) WITH CONSTRUCTION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 5-4

D. Existing + Project (Construction) + Mitigation LOS

At project location is a two-lane residential street. Due to the very low volumes along this street segment, mitigation is not required during the AM and PM peak periods. However, to avoid disruptions within this residential street, work hours should be limited between 9AM-4PM. Lane closures during construction should include proper flagging procedures. During non-construction periods, all travel lanes should be opened to through traffic.

This section provides a summary of the Existing 2022 traffic conditions at the study intersections with construction of Project 4 during non-peak hours. The year 2022 was selected for analysis based on the anticipated implementation date of the proposed project.

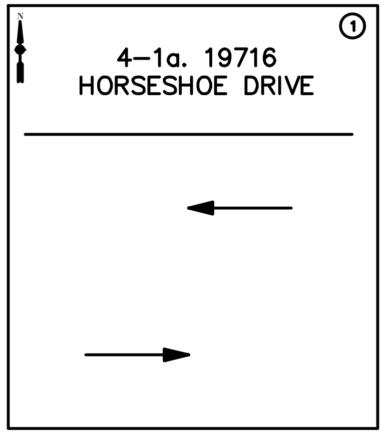
Table 4-3 summarizes the density (for roadway segments). LOS values for each study area are given.

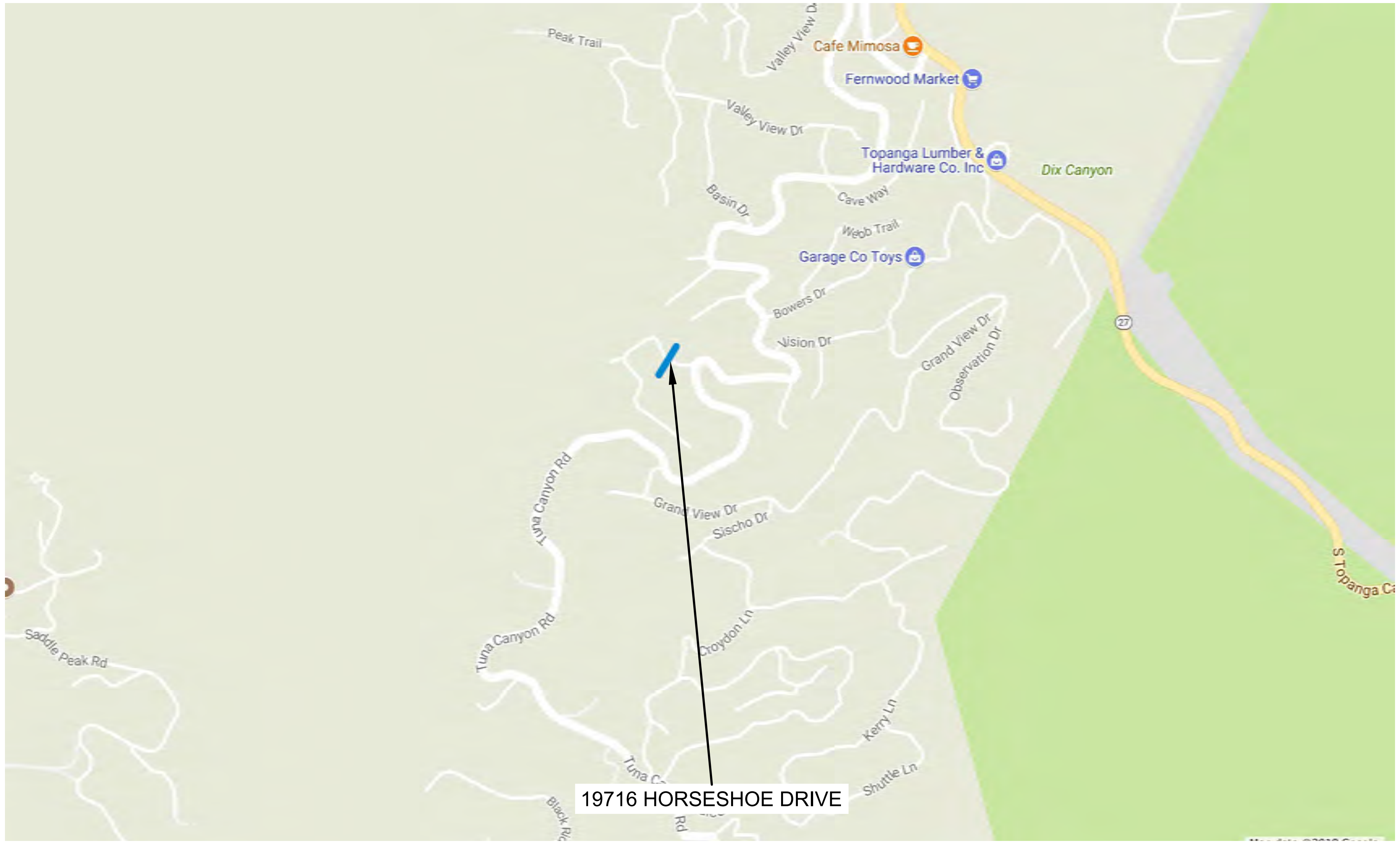
EXISTING (2022) + PROJECT CONSTRUCTION + MITIGATION - PROJECT 4

TABLE 4-3
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION AND MITIGATION (2022)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
4	Fernwood Tank on Horseshoe Dr	3.8	A	45	4.3	A	51	2%	No

Table 4-3 shows that Project 4 with Mitigation will not have a significant impact on the effected roadway segment.





PROJECT 4
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LEGEND:

━ = Study Site

→ = Through Lane

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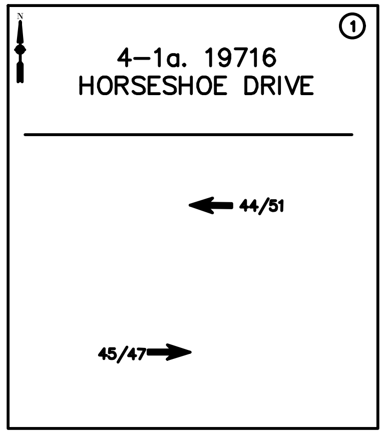
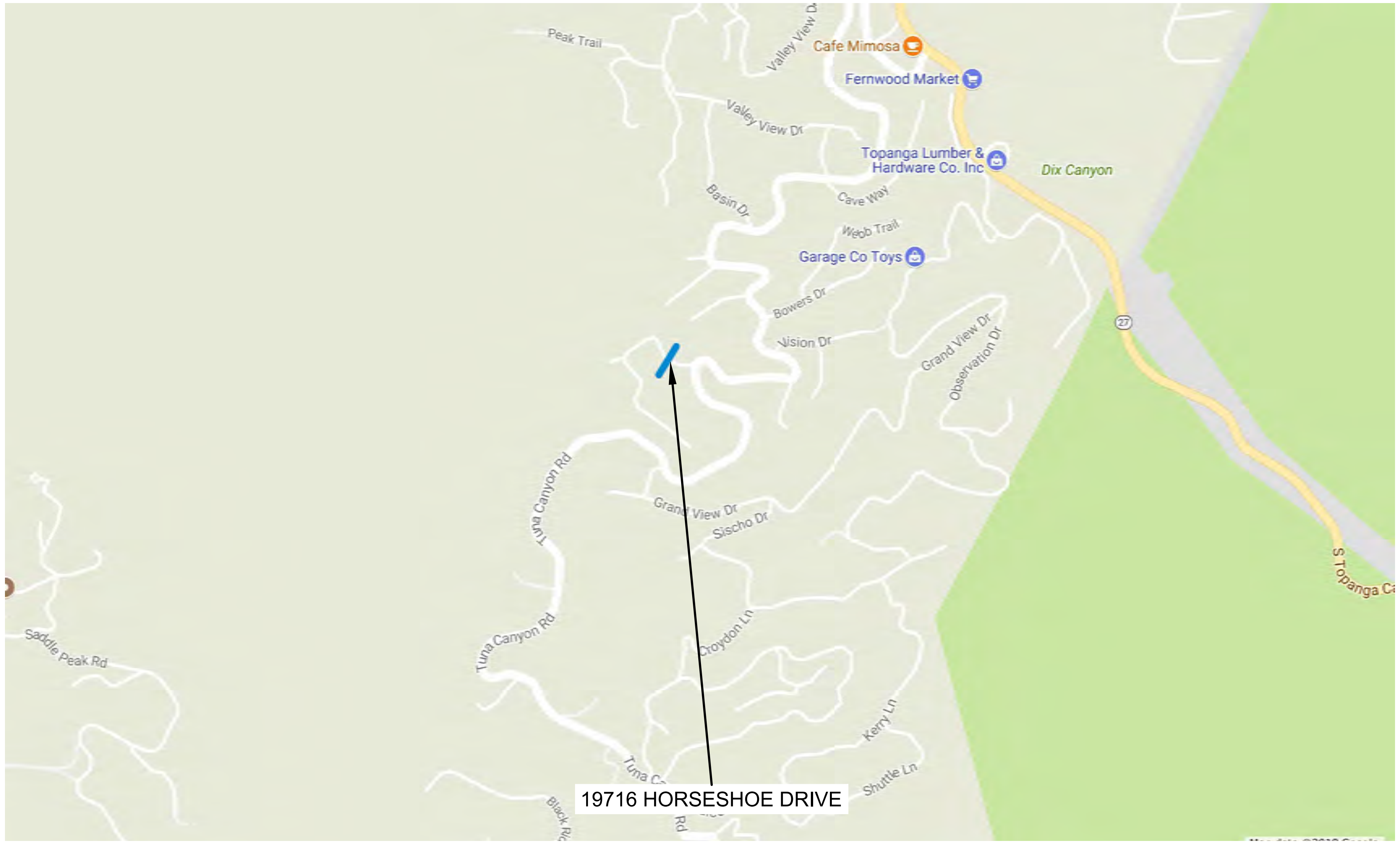
(2022) WITH CONSTRUCTION AND MITIGATION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 5-5

PROJECT 4





PROJECT 4
N.T.S.

LEGEND:

▬ =	Study Site
XX/YY=	AM/PM Peak Hour Volumes

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(2022) WITH CONSTRUCTION AND MITIGATION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 5-6

6. PROJECT 5 - PCH EIGHT-INCH WATERLINE IMPROVEMENTS (ZUMIREZ DRIVE TO ESCONDIDO BEACH ROAD)

A. Existing Roadway System

Pacific Coast Highway (PCH) is a major east-west four lane arterial running through the City of Malibu.

Zumirez Drive: is a north – south two lane road that provides access to residential areas north of PCH and is a signalized intersection at PCH.

Paradise Cove Rd: is a north – south two lane road that provides access to residential areas south of PCH and is a signalized intersection at PCH.

Meadow Ct: is a north – south two lane road that provides access to residential areas north of PCH and is stop controlled at PCH.

Winding Way: is a north – south two lane road that provides access to residential areas north of PCH and is stop controlled at PCH.

W Winding Way: is a north – south two lane road that provides access to residential areas north of PCH and is stop controlled at PCH.

Zuma View Pl: is a north – south two lane road that provides access to residential areas north and south of PCH and is stop controlled at PCH.

Ramirez Mesa Rd: is a north – south two lane road that provides access to residential areas north of PCH and is stop controlled at PCH.

B. Existing LOS

This section provides a summary of the Existing 2018 traffic conditions at the study intersections within the scope of Project 5. The project consists of replacing 9,500 feet of six-inch and eight-inch waterlines along PCH.

LOS was determined for all of the study area intersections. Traffic counts are provided in Appendix B and Analysis Sheets are provided in Appendix C.

Table 5-1 provides the Intersection Capacity Utilization (ICU) for signalized intersections and Table 5-2 provides the same for stop controlled intersections. LOS values for each study intersection are included in each table.

EXISTING (2018) CONDITIONS - PROJECT 5

TABLE 5-1
SUMMARY OF SIGNALIZED INTERSECTION OPERATION
EXISTING CONDITIONS (2018)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Zumirez Dr	0.54	A	0.75	C
Pacific Coast Hwy & Paradise Cove Rd	0.52	A	0.77	C

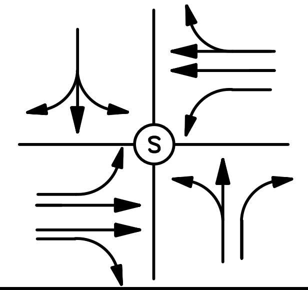
Table 5-1 shows that the intersections are currently operating at acceptable levels of service. See appendix A for critical V/C ratio interpretations.

TABLE 5-2
SUMMARY OF STOP CONTROLLED INTERSECTION OPERATION
EXISTING CONDITIONS (2018)

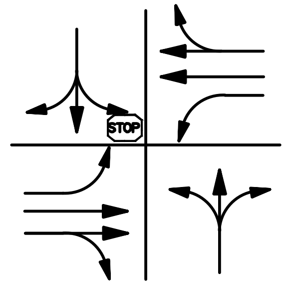
Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Meadows Ct	0.48	A	0.72	C
Pacific Coast Hwy & E Winding Way	0.47	A	0.71	C
Pacific Coast Hwy & W Winding Way	0.50	A	0.77	C
Pacific Coast Hwy & Zuma View Pl	0.49	A	0.76	C
Pacific Coast Hwy & Ramirez Mesa Rd	0.48	A	0.77	C

Table 5-2 shows that all stop-controlled intersections within the scope of Project 5 are currently operating at an acceptable level of service.

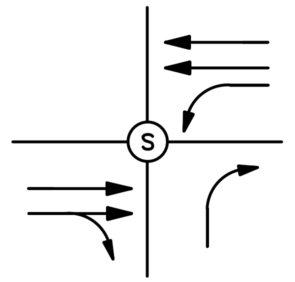
④ 5–1a. ZUMIREZ DR./PACIFIC COAST HIGHWAY



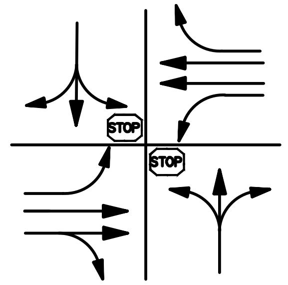
⑧ 5–2c. PACIFIC COAST HIGHWAY/ W WINDING WAY



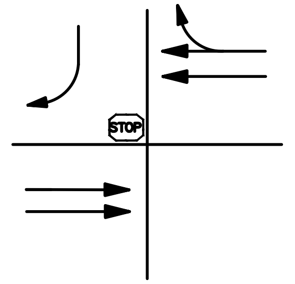
⑤ 5–1b. PARADISE COVE RD./PACIFIC COAST HIGHWAY



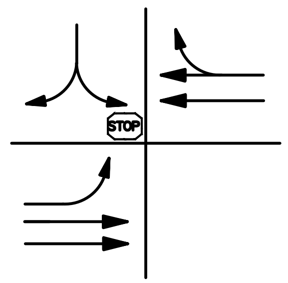
⑨ 5–2d. PACIFIC COAST HIGHWAY/ZUMA VIEW PL



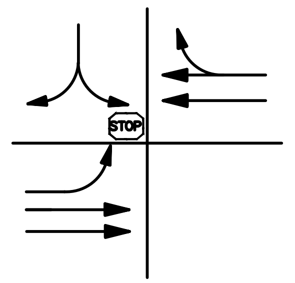
⑥ 5–2a. PACIFIC COAST HIGHWAY/ MEADOWS CT



⑩ 5–2e. PACIFIC COAST HIGHWAY/ RAMIREZ MESA RD.



⑦ 5–2b. PACIFIC COAST HIGHWAY/ WINDING WAY.



PROJECT 5
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LEGEND:

Ⓧ = Study Site
STOP = Stop Sign
Ⓢ = Traffic Signal
→ = Through Lane
⤙ = Turn Lanes

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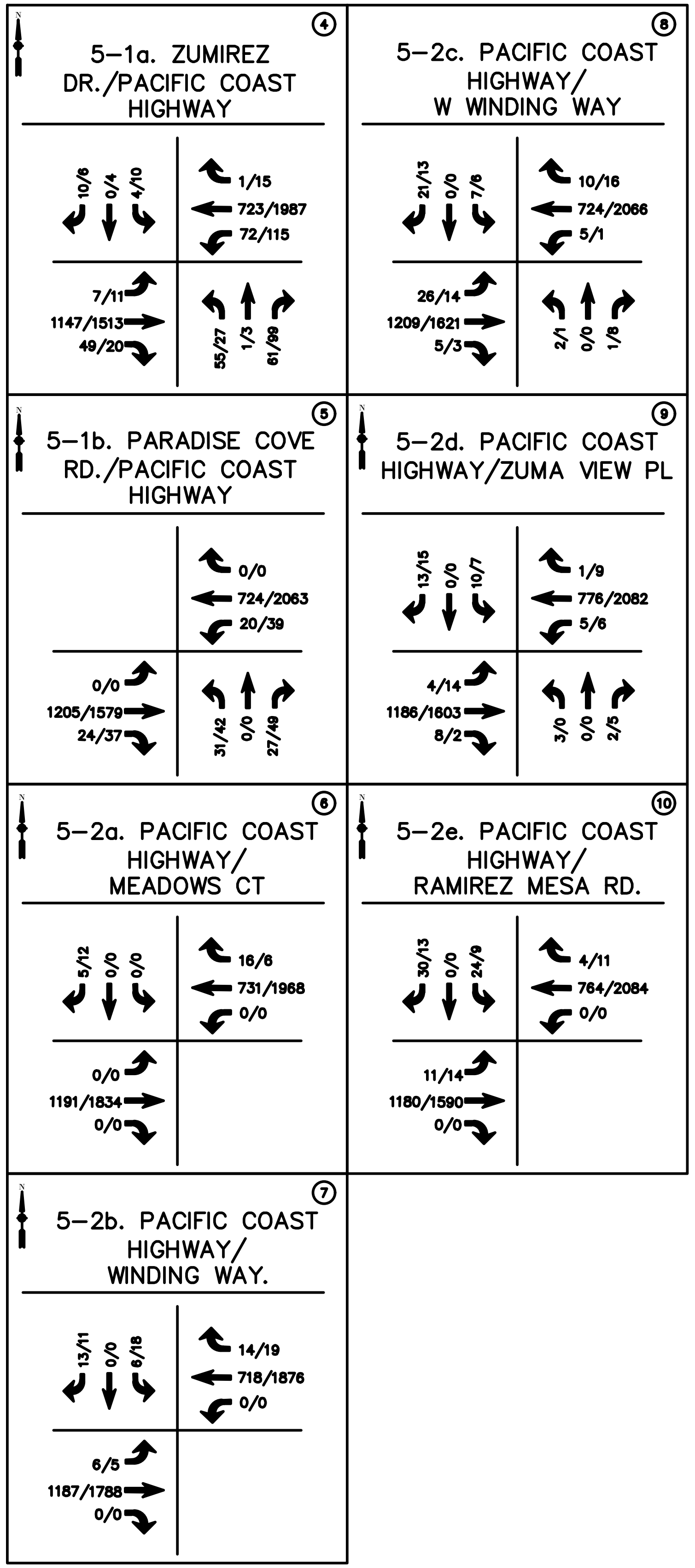
EXISTING INTERSECTION APPROACH CONFIGURATIONS

FIGURE 6-1



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LEGEND:

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XX/YY = AM/PM Peak Hour Turning Movement Volumes

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EXISTING YEAR (2018) AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 6-2

PROJECT 5

C. Existing + Project (Construction) LOS

This section provides a summary of the Existing 2020 traffic conditions at the study intersections with construction of Project 5. The year 2020 was selected for analysis based on the anticipated implementation date of the proposed project. The project consists of replacing 9,500 feet of six-inch and eight-inch waterlines along PCH. Lane closure details have not been finalized. However, it is assumed for analysis that one westbound lane will be closed for construction. Once detailed construction methods, schedules, and construction vehicle volumes are available, a qualified traffic consultant will validate the assumptions and findings of the traffic study for the EIR. If the report is validated, the project can proceed without additional analysis or mitigation. If the validation shows that the assumptions were not accurate, further environmental documentation may be required. Construction is scheduled to begin in 2020 with an approximate one-year duration.

In order to define regional traffic growth that would affect operations at the study areas during Year 2020 JMD utilized traffic growth factors from the Congestion Management Program for Los Angeles County. The City of Malibu falls under Regional Statistical Area (RSA) 15 resulting in an annual growth factor of 1.005. Applying this growth factor to a gap of 2 years results in a total growth factor of 1.01 from Year 2018 to Year 2020.

Table 5-3 provides the Intersection Capacity Utilization (ICU) for signalized intersections and Table 5-4 provides the same for stop controlled intersections. LOS values for each study intersection are included in each table.

EXISTING (2020) + PROJECT CONSTRUCTION - PROJECT 5

TABLE 5-3
SUMMARY OF SIGNALIZED INTERSECTION OPERATION
WITH CONSTRUCTION (2020)

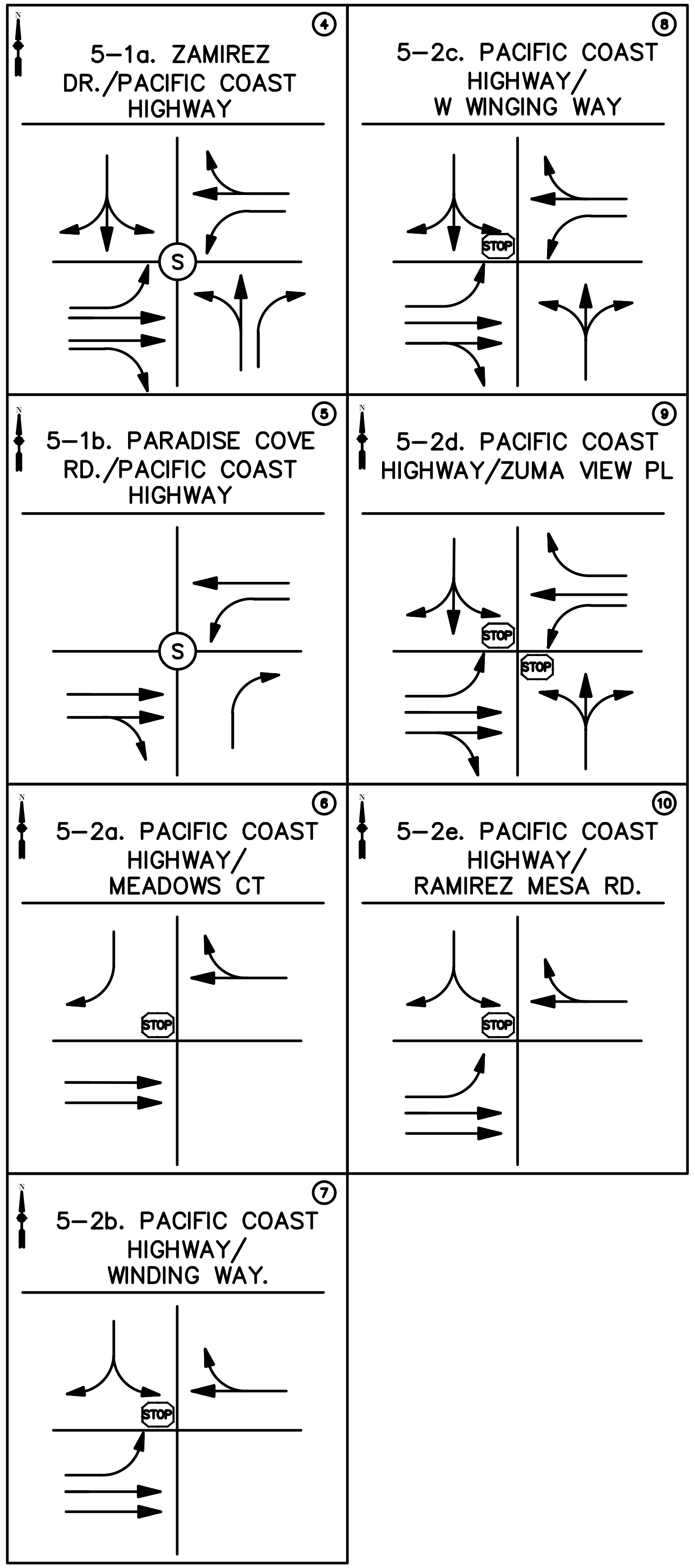
Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Zumirez Dr	0.54	A	0.76	C
Pacific Coast Hwy & Paradise Cove Rd	0.58	A	1.43	**F**

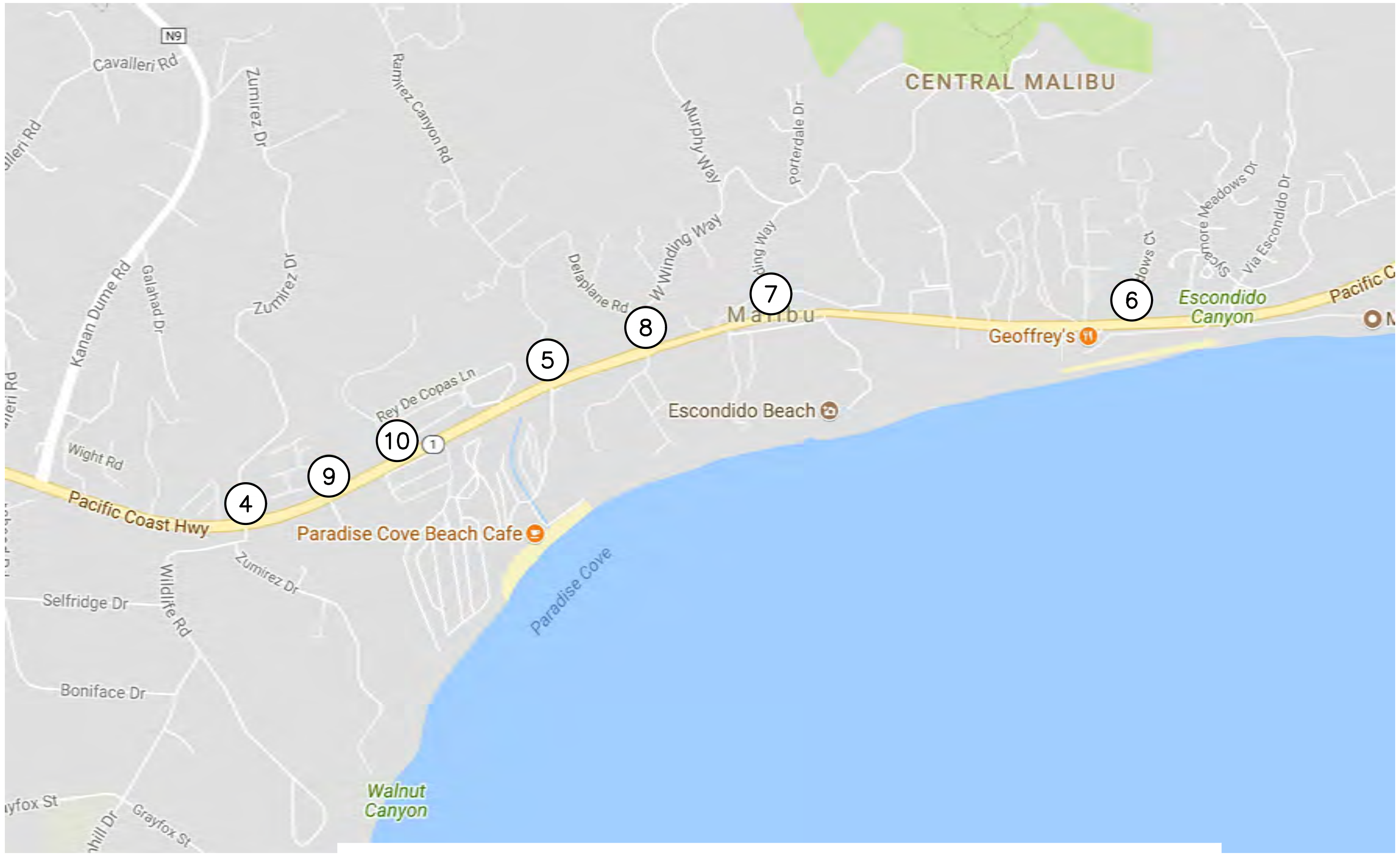
Table 5-3 shows that Project 5 will cause the signalized intersection of Pacific Coast Hwy & Paradise Cove Rd to continue to operate at an unacceptable level.

TABLE 5-4
SUMMARY OF STOP CONTROLLED INTERSECTION OPERATION WITH CONSTRUCTION (2020)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Meadows Ct	0.58	A	1.36	**F**
Pacific Coast Hwy & E Winding Way	0.57	A	1.31	**F**
Pacific Coast Hwy & W Winding Way	0.60	A	1.44	**F**
Pacific Coast Hwy & Zuma View Pl	0.61	B	1.43	**F**
Pacific Coast Hwy & Ramirez Mesa Rd	0.61	B	1.44	**F**

Table 5-4 shows that Project 5 will cause all stop controlled intersections to function at unacceptable levels during PM peak hours..





FUTURE YEAR (2021) INTERSECTION APPROACH CONFIGURATIONS

LEGEND:

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Ⓢ = Traffic Signal

→ = Through Lane

⤙ = Turn Lanes

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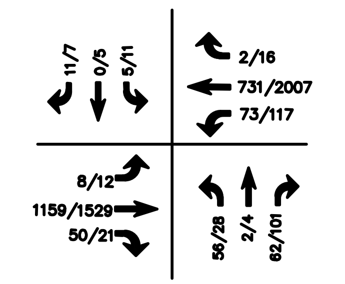
(2020) WITH CONSTRUCTION INTERSECTION APPROACH CONFIGURATIONS

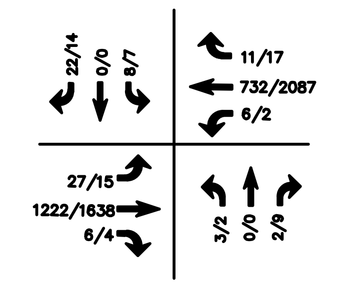
FIGURE 6-3

PROJECT 5

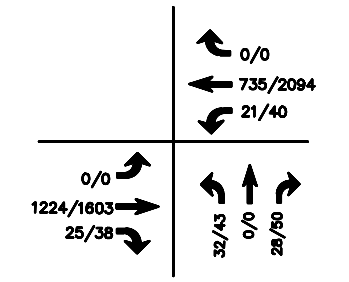
④ 5–1a. ZUMIREZ DR./PACIFIC COAST HIGHWAY



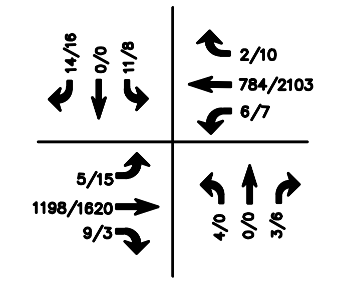
⑧ 5–2c. PACIFIC COAST HIGHWAY/ W WINDING WAY



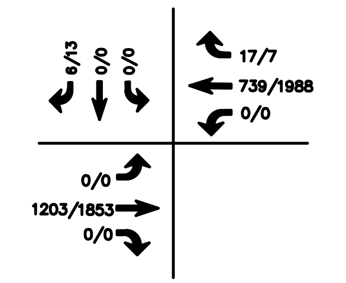
⑤ 5–1b. PARADISE COVE RD./PACIFIC COAST HIGHWAY



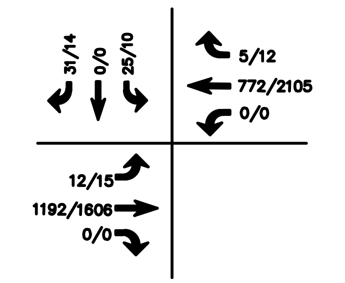
⑨ 5–2d. PACIFIC COAST HIGHWAY/ZUMA VIEW PL



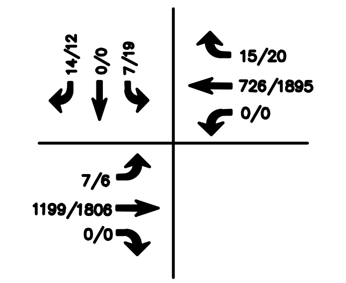
⑥ 5–2a. PACIFIC COAST HIGHWAY/ MEADOWS CT



⑩ 5–2e. PACIFIC COAST HIGHWAY/ RAMIREZ MESA RD.



⑦ 5–2b. PACIFIC COAST HIGHWAY/ WINDING WAY.



PROJECT 5
N.T.S.

LEGEND:

Ⓧ	=	Study Intersection
XX/YY	=	AM/PM Peak Hour Turning Movement Volumes

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(2020) WITH CONSTRUCTION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 6-4

PROJECT 5

D. Existing + Project (Construction) + Mitigation LOS

This project includes the signalized intersections at Zumirez Dr/PCH and Paradise Cove Rd/PCH. It also includes five stop-controlled intersections from Zumirez Dr. to Shadow Ct. along PCH. Although during construction the stop-controlled intersections operate at acceptable levels during the AM and PM peak periods, both signalized intersections will operate at LOS F without mitigation. Thus, in order to avoid the peak hour level of service impacts at the affected location, it is recommended to implement the lane closures outside of the AM and PM peak periods. Possible lane closures could occur off peak (10AM-3PM) or at night (9PM-5AM). During non-construction periods, all travel lanes should be opened to through traffic.

This section provides a summary of the Existing 2020 traffic conditions at the study intersections with construction of Project 5 during non-peak hours. The year 2020 was selected for analysis based on the anticipated implementation date of the proposed project.

Table 5-5 provides the Intersection Capacity Utilization (ICU) for signalized intersections and Table 5-6 provides the same for stop controlled intersections. LOS values for each study intersection are included in each table.

EXISTING (2020) + PROJECT CONSTRUCTION + MITIGATION - PROJECT 5

TABLE 5-5
SUMMARY OF SIGNALIZED INTERSECTION OPERATION
WITH CONSTRUCTION AND MITIGATION (2020)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Zumirez Dr	0.54	A	0.76	C
Pacific Coast Hwy & Paradise Cove Rd	0.52	A	0.78	C

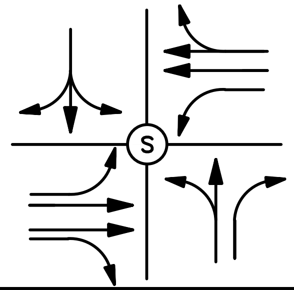
Table 5-5 shows that Project 5 with Mitigation will not cause any signalized intersections to function at unacceptable levels.

TABLE 5-6
SUMMARY OF STOP CONTROLLED INTERSECTION OPERATION WITH CONSTRUCTION AND MITIGATION (2020)

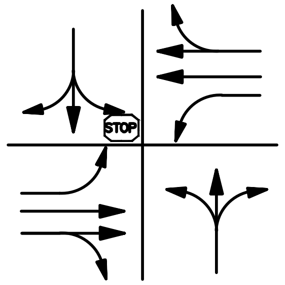
Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Meadows Ct	0.48	A	0.73	C
Pacific Coast Hwy & E Winding Way	0.48	A	0.71	C
Pacific Coast Hwy & W Winding Way	0.51	A	0.78	C
Pacific Coast Hwy & Zuma View Pl	0.50	A	0.77	C
Pacific Coast Hwy & Ramirez Mesa Rd	0.49	A	0.78	C

Table 5-6 shows that Project 5 with Mitigation will not cause any stop controlled intersections to function at unacceptable levels.

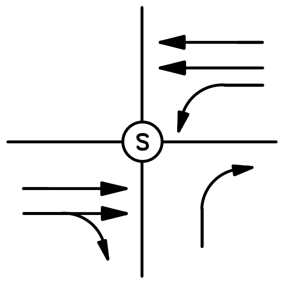
④ 5–1a. ZUMIREZ DR./PACIFIC COAST HIGHWAY



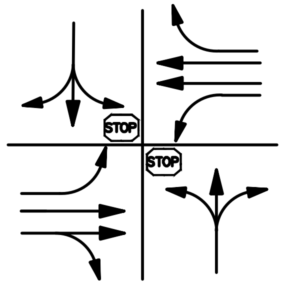
⑧ 5–2c. PACIFIC COAST HIGHWAY/ W WINDING WAY



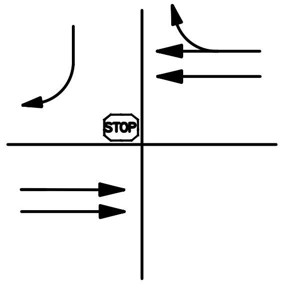
⑤ 5–1b. PARADISE COVE RD./PACIFIC COAST HIGHWAY



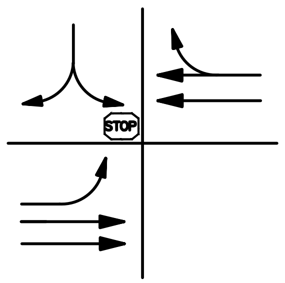
⑨ 5–2d. PACIFIC COAST HIGHWAY/ZUMA VIEW PL



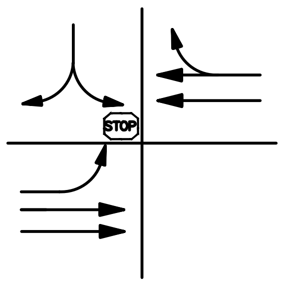
⑥ 5–2a. PACIFIC COAST HIGHWAY/ MEADOWS CT



⑩ 5–2e. PACIFIC COAST HIGHWAY/ RAMIREZ MESA RD.



⑦ 5–2b. PACIFIC COAST HIGHWAY/ WINDING WAY.



PROJECT 5
N.T.S.

LEGEND:

Ⓧ = Study Site
STOP = Stop Sign
Ⓢ = Traffic Signal
→ = Through Lane
↱ = Turn Lanes

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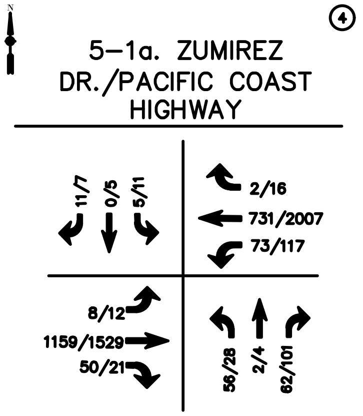
(2020) WITH CONSTRUCTION AND MITIGATION INTERSECTION APPROACH CONFIGURATIONS

FIGURE 6-5

PROJECT 5

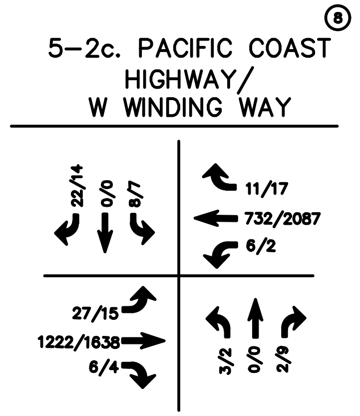
④

5–1a. ZUMIREZ DR./PACIFIC COAST HIGHWAY



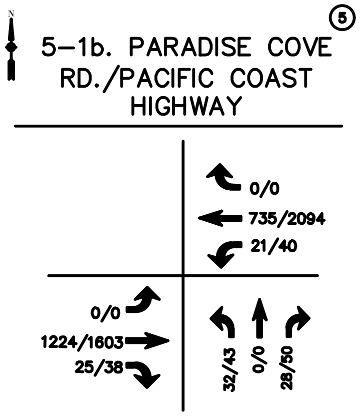
⑧

5–2c. PACIFIC COAST HIGHWAY/ W WINDING WAY



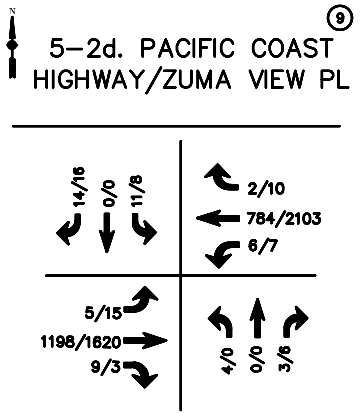
⑤

5–1b. PARADISE COVE RD./PACIFIC COAST HIGHWAY



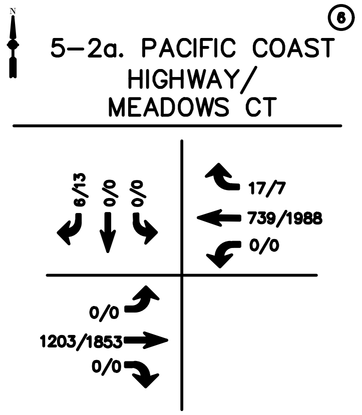
⑨

5–2d. PACIFIC COAST HIGHWAY/ZUMA VIEW PL



⑥

5–2a. PACIFIC COAST HIGHWAY/ MEADOWS CT



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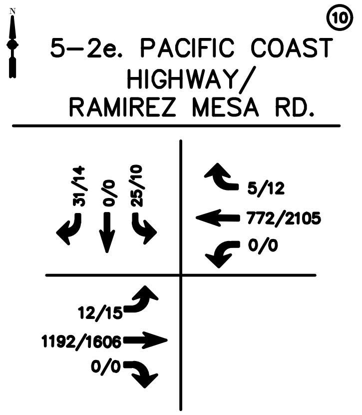
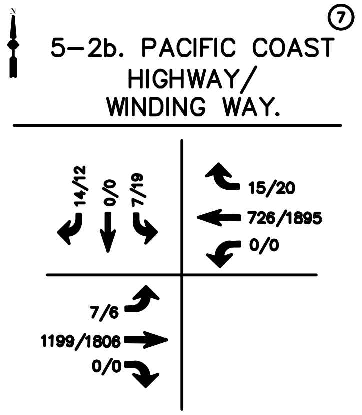
5–2e. PACIFIC COAST HIGHWAY/ RAMIREZ MESA RD.



⑦

5–2b. PACIFIC COAST HIGHWAY/ WINDING WAY.



PROJECT 5
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LEGEND:

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XX/YY = AM/PM Peak Hour Turning Movement Volumes

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(2020) WITH CONSTRUCTION AND MITIGATION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 6-6

7. PROJECT 6 - PCH AND TOPANGA BEACH DRIVE WATERLINE IMPROVEMENTS

A. Existing Roadway System

Pacific Coast Highway (PCH) is a major east-west four lane arterial running through the City of Malibu.

Carbon Canyon Rd: is a north – south two lane road that provides access to residential areas north of PCH and is a signalized intersection at PCH.

Las Flores: is a north – south two lane road that provides access to residential areas north of PCH and is a signalized intersection at PCH.

Rambla Pacifico: is a north – south two lane road that provides access to residential areas north of PCH and is a signalized intersection at PCH.

Tuna Canyon Rd: is a north – south two lane road that provides access to residential areas north of PCH and is stopped controlled at PCH.

Rambla Vista: is an east - west two lane road that provides access to residential areas north of PCH and is stopped controlled at PCH.

B. Existing LOS

This section provides a summary of the Existing 2018 traffic conditions at the study intersections within the scope of Project 6. The project consists of replacing over 8,000 feet of four-inch, six-inch, and eight-inch waterlines along PCH.

LOS was determined for all of the study area intersections. Traffic counts are provided in Appendix B and Analysis Sheets are provided in Appendix C.

Table 6-1 provides the Intersection Capacity Utilization (ICU) for signalized intersections and Table 6-2 provides the same for stop controlled intersections. LOS values for each study intersection are included in each table.

EXISTING (2018) CONDITIONS - PROJECT 6

TABLE 6-1
SUMMARY OF SIGNALIZED INTERSECTION OPERATION
EXISTING CONDITIONS (2018)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Carbon Canyon Rd	0.57	A	0.75	C
Pacific Coast Hwy & Beach Access	0.60	A	0.75	C
Pacific Coast Hwy & Las Flores	0.58	A	0.77	C
Pacific Coast Hwy & Rambla Pacifico	0.58	A	0.74	C
Pacific Coast Hwy & Carbon Beach Estates	0.57	A	0.74	C

Table 6-1 shows that all signalized intersections within the scope of Project 6 are currently operating at an acceptable level of service. See appendix A for critical V/C ratio interpretations.

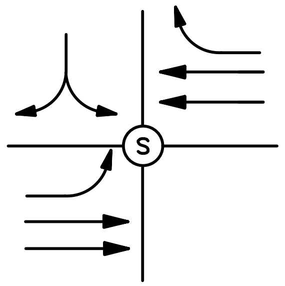
TABLE 6-2
SUMMARY OF STOP CONTROLLED INTERSECTION OPERATION
EXISTING CONDITIONS (2018)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Tuna Canyon Rd	0.62	B	0.75	C
Pacific Coast Hwy & Rambla Vista (East)	0.57	A	0.75	C
Pacific Coast Hwy & Rambla Vista (West)	0.55	A	0.73	C

Table 6-2 shows that all stop-controlled intersections within the scope of Project 6 are currently operating at an acceptable level of service.

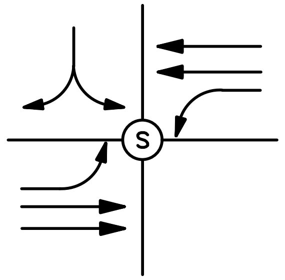
⑪

6–1a. CARBON CANYON RD./PACIFIC COAST HIGHWAY



⑮

6–1e. CARBON BEACH ESTATES/PCH (UNNAMED U TURN)(22725 PCH)



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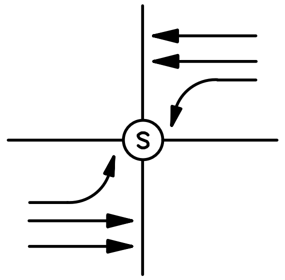
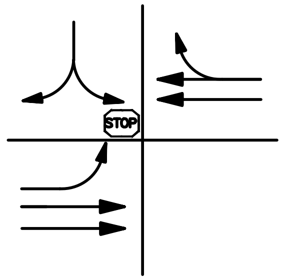
6–1b. (UNNAMED U–TURN)(22725 PCH)



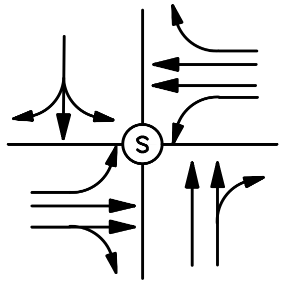
⑯

6–2a. PACIFIC COAST HIGHWAY/TUNA CANYON RD.



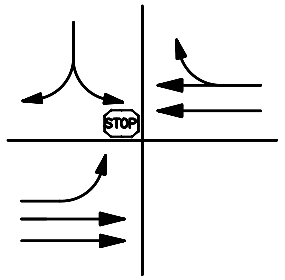
⑬

6–1c. LAS FLORES/PACIFIC COAST HIGHWAY



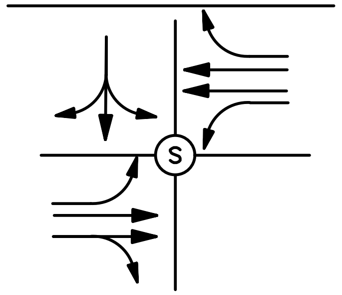
⑰

6–2b. 2 LOCATIONS– PACIFIC COAST HIGHWAY/RAMBLA VISTA.



⑭

6–1d. RAMBLA PACIFICO/PACIFIC COAST HIGHWAY



PROJECT 6

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LEGEND:

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STOP = Stop Sign

Ⓢ = Traffic Signal

→ = Through Lane

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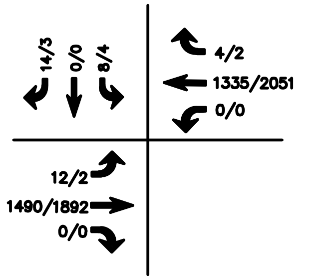
EXISTING INTERSECTION APPROACH CONFIGURATIONS

FIGURE 7-1

PROJECT 6

⑪

6–1a. CARBON CANYON RD./PACIFIC COAST HIGHWAY



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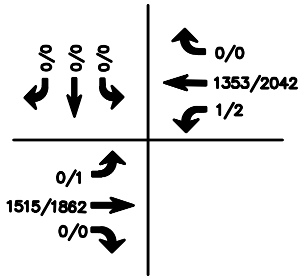
6–1e. CARBON BEACH ESTATES/PCH (UNNAMED U TURN)(22725 PCH)



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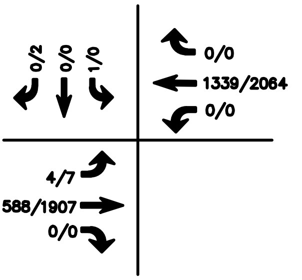
6–1b. (UNNAMED U–TURN)(22725 PCH)



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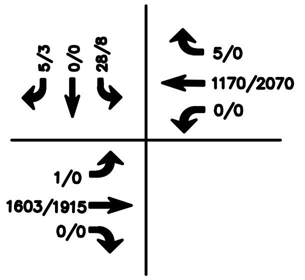
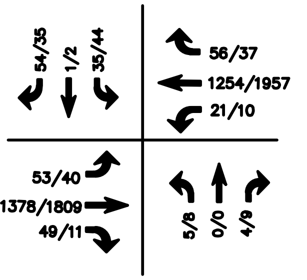
6–2a. PACIFIC COAST HIGHWAY/TUNA CANYON RD.



⑬

6–1c. LAS FLORES/PACIFIC COAST HIGHWAY



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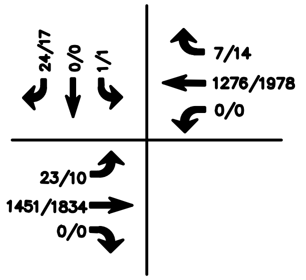
6–2b. 2 LOCATIONS– PACIFIC COAST HIGHWAY/RAMBLA VISTA.



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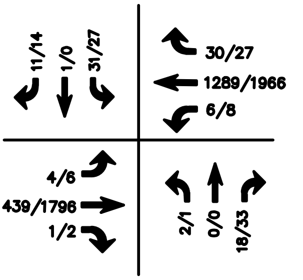
6–1d. RAMBLA PACIFICO/PACIFIC COAST HIGHWAY



PROJECT 6
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LEGEND:

Ⓧ = Study Intersection

XX/YY = AM/PM Peak Hour Turning Movement Volumes

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EXISTING YEAR (2018) AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 7-2

PROJECT 6

C. Existing + Project (Construction) LOS

This section provides a summary of the Existing 2024 traffic conditions at the study intersections with construction of Project 6. The year 2024 was selected for analysis based on the anticipated implementation date of the proposed project. The project consists of replacing over 8,000 feet of four-inch, six-inch, and eight-inch waterlines along PCH. Lane closure details have not been finalized. However, it is assumed for analysis that one westbound lane will be closed for construction. Once detailed construction methods, schedules, and construction vehicle volumes are available, a qualified traffic consultant will validate the assumptions and findings of the traffic study for the EIR. If the report is validated, the project can proceed without additional analysis or mitigation. If the validation shows that the assumptions were not accurate, further environmental documentation may be required. Construction is scheduled to begin in 2024 with an approximate one-year duration.

In order to define regional traffic growth that would affect operations at the study areas during Year 2024 JMD utilized traffic growth factors from the Congestion Management Program for Los Angeles County. The City of Malibu falls under Regional Statistical Area (RSA) 15 resulting in an annual growth factor of 1.005. Applying this growth factor to a gap of 6 years results in a total growth factor of 1.03 from Year 2018 to Year 2024.

Table 6-3 provides the Intersection Capacity Utilization (ICU) for signalized intersections and Table 6-4 provides the same for stop controlled intersections. LOS values for each study intersection are included in each table.

EXISTING (2024) + PROJECT CONSTRUCTION - PROJECT 6

TABLE 6-3
SUMMARY OF SIGNALIZED INTERSECTION OPERATION
WITH CONSTRUCTION (2024)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Carbon Canyon Rd	0.98	E	1.43	F
Pacific Coast Hwy & Beach Access	0.97	E	1.43	F
Pacific Coast Hwy & Las Flores	0.97	E	1.42	F
Pacific Coast Hwy & Rambla Pacifico	0.96	E	1.39	F
Pacific Coast Hwy & Carbon Beach Estates	0.97	E	1.42	F

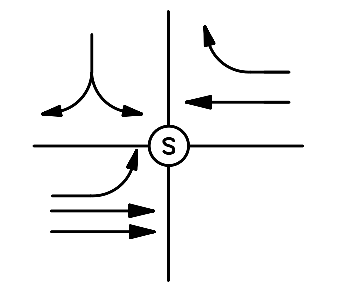
Table 6-3 shows that Project 6 will cause all signalized intersections effected to function at unacceptable levels.

TABLE 6-4
SUMMARY OF STOP CONTROLLED INTERSECTION OPERATION WITH CONSTRUCTION (2024)

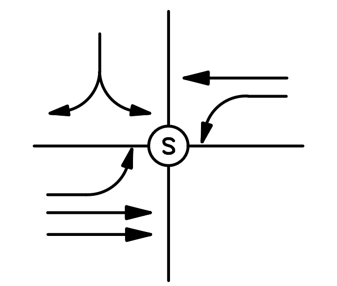
Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Tuna Canyon Rd	0.88	**D**	1.44	**F**
Pacific Coast Hwy & Rambla Vista (East)	0.95	**E**	1.43	**F**
Pacific Coast Hwy & Rambla Vista (West)	0.94	**E**	1.38	**F**

Table 6-4 shows that Project 6 will cause all stop controlled intersections to function at unacceptable levels.

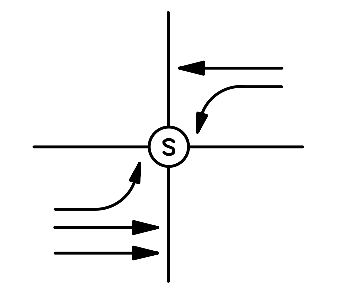
⑪ 6–1a. CARBON CANYON RD./PACIFIC COAST HIGHWAY



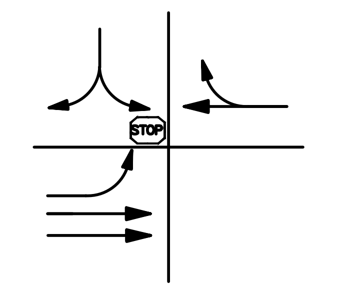
⑮ 6–1e. CARBON BEACH ESTATES/PCH (UNNAMED U TURN)(22725 PCH)



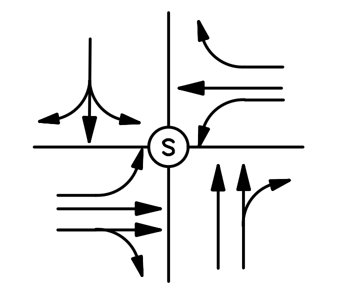
⑫ 6–1b. (UNNAMED U–TURN)(22725 PCH)



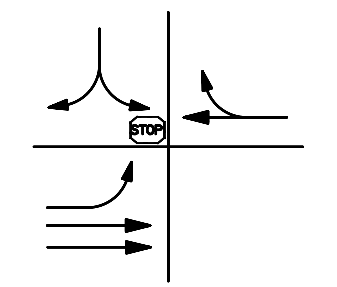
⑯ 6–2a. PACIFIC COAST HIGHWAY/TUNA CANYON RD.



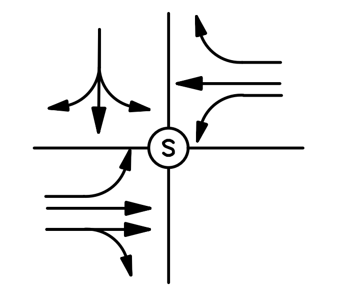
⑬ 6–1c. LAS FLORES/PACIFIC COAST HIGHWAY



⑰ 6–2b. 2 LOCATIONS– PACIFIC COAST HIGHWAY/RAMBLA VISTA.



⑭ 6–1d. RAMBLA PACIFICO/PACIFIC COAST HIGHWAY



PROJECT 6
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LEGEND:

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STOP = Stop Sign
Ⓢ = Traffic Signal
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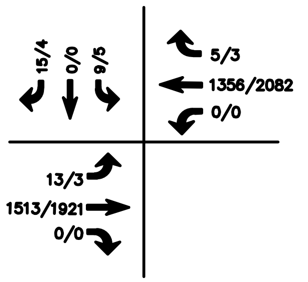
(2024) WITH CONSTRUCTION INTERSECTION APPROACH CONFIGURATIONS

FIGURE 7-3

PROJECT 6

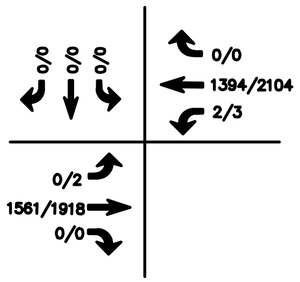
⑪

6–1a. CARBON CANYON RD./PACIFIC COAST HIGHWAY



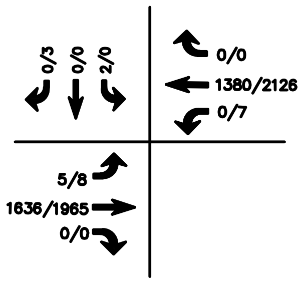
⑮

6–1e. CARBON BEACH ESTATES/PCH (UNNAMED U TURN)(22725 PCH)



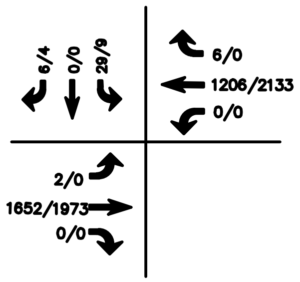
⑫

6–1b. (UNNAMED U–TURN)(22725 PCH)



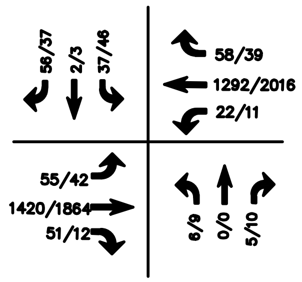
⑯

6–2a. PACIFIC COAST HIGHWAY/TUNA CANYON RD.



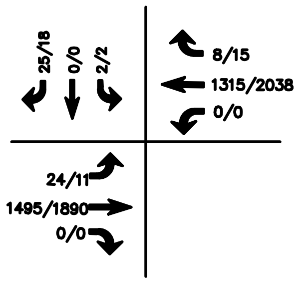
⑬

6–1c. LAS FLORES/PACIFIC COAST HIGHWAY



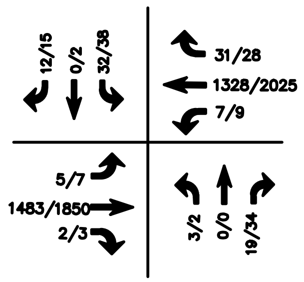
⑰

6–2b. 2 LOCATIONS–PACIFIC COAST HIGHWAY/RAMBLA VISTA.



⑭

6–1d. RAMBLA PACIFICO/PACIFIC COAST HIGHWAY



PROJECT 6
N.T.S.

LEGEND:

Ⓧ = Study Intersection

XX/YY = AM/PM Peak Hour Turning Movement Volumes

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FIGURE 7-4

D. Existing + Project (Construction) + Mitigation LOS

This project includes the five signalized intersections and three stop controlled intersections along PCH from Sweetwater Canyon Dr to Tuna Canyon Rd. Although during construction the stop-controlled intersections operate at acceptable levels during the AM and PM peak periods, all of the signalized intersections downgrade to operate at LOS F without mitigation. Thus, in order to avoid the peak hour level of service impacts at the affected location, it is recommended to implement the lane closures outside of the AM and PM peak periods. Possible lane closures could occur off peak (10AM-3PM) or at night (9PM-5AM). During non-construction periods, all travel lanes should be opened to through traffic.

This section provides a summary of the Existing 2024 traffic conditions at the study intersections with construction of Project 6 during non-peak hours. The year 2024 was selected for analysis based on the anticipated implementation date of the proposed project.

Table 6-5 provides the Intersection Capacity Utilization (ICU) for signalized intersections and Table 6-6 provides the same for stop controlled intersections. LOS values for each study intersection are included in each table.

EXISTING (2024) + PROJECT CONDITIONS + MITIGATION - PROJECT 6

TABLE 6-5
SUMMARY OF SIGNALIZED INTERSECTION OPERATION
WITH CONSTRUCTION AND MITIGATION (2024)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Pacific Coast Hwy & Carbon Canyon Rd	0.59	A	0.77	C
Pacific Coast Hwy & Beach Access	0.61	B	0.77	C
Pacific Coast Hwy & Las Flores	0.60	A	0.79	C
Pacific Coast Hwy & Rambla Pacifico	0.59	A	0.76	C
Pacific Coast Hwy & Carbon Beach Estates	0.59	A	0.76	C

Table 6-5 shows that Project 6 with Mitigation will not cause any signalized intersections to function at unacceptable levels.

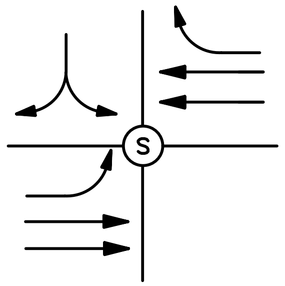
TABLE 6-6
SUMMARY OF STOP CONTROLLED INTERSECTION OPERATION WITH CONSTRUCTION (2024)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	**LOS**	**ICU**	**LOS**
Pacific Coast Hwy & Tuna Canyon Rd	0.64	B	0.77	C
Pacific Coast Hwy & Rambla Vista (East)	0.58	A	0.77	C
Pacific Coast Hwy & Rambla Vista (West)	0.57	A	0.75	C

Table 6-6 shows that Project 6 with Mitigation will not cause any stop controlled intersections to function at unacceptable levels.

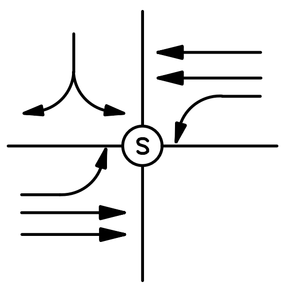
⑪

6–1a. CARBON CANYON RD./PACIFIC COAST HIGHWAY



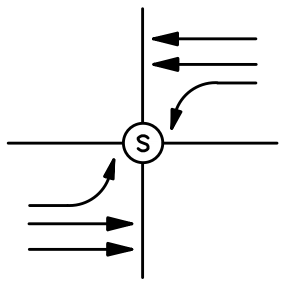
⑮

6–1e. CARBON BEACH ESTATES/PCH (UNNAMED U TURN)(22725 PCH)



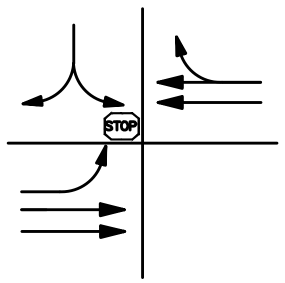
⑫

6–1b. (UNNAMED U–TURN)(22725 PCH)



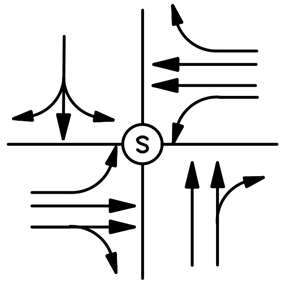
⑯

6–2a. PACIFIC COAST HIGHWAY/TUNA CANYON RD.



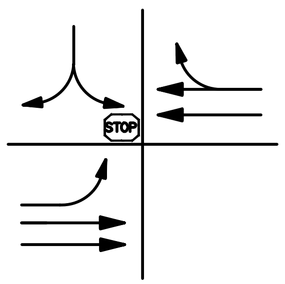
⑬

6–1c. LAS FLORES/PACIFIC COAST HIGHWAY



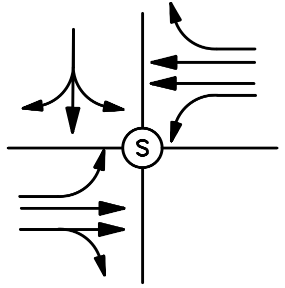
⑰

6–2b. 2 LOCATIONS– PACIFIC COAST HIGHWAY/RAMBLA VISTA.



⑭

6–1d. RAMBLA PACIFICO/PACIFIC COAST HIGHWAY



PROJECT 6
N.T.S.

LEGEND:

Ⓧ = Study Site
STOP = Stop Sign
ⓢ = Traffic Signal
→ = Through Lane
↰ = Turn Lanes

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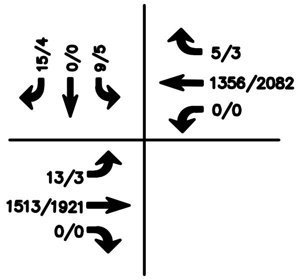
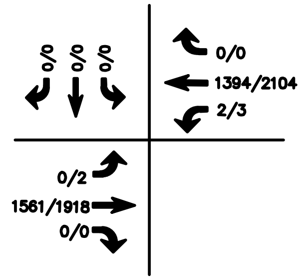
(2024) WITH CONSTRUCTION AND MITIGATION INTERSECTION APPROACH CONFIGURATIONS

FIGURE 7-5

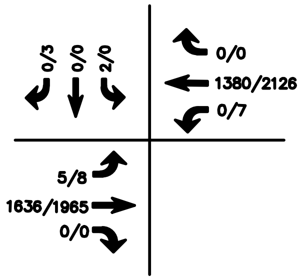
⑪ 6–1a. CARBON CANYON RD./PACIFIC COAST HIGHWAY



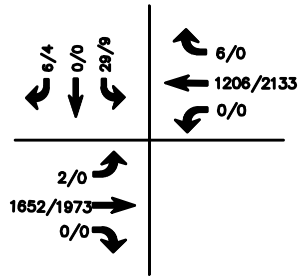
⑮ 6–1e. CARBON BEACH ESTATES/PCH (UNNAMED U TURN)(22725 PCH)



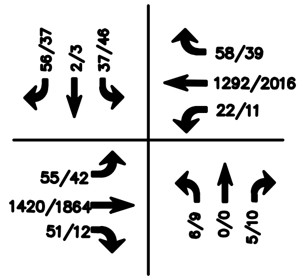
⑫ 6–1b. (UNNAMED U–TURN)(22725 PCH)



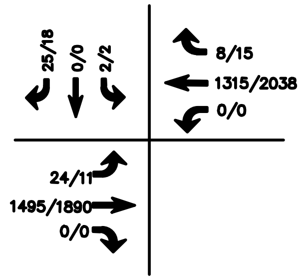
⑯ 6–2a. PACIFIC COAST HIGHWAY/TUNA CANYON RD.



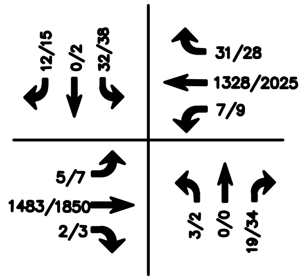
⑬ 6–1c. LAS FLORES/PACIFIC COAST HIGHWAY



⑰ 6–2b. 2 LOCATIONS–PACIFIC COAST HIGHWAY/RAMBLA VISTA.



⑭ 6–1d. RAMBLA PACIFICO/PACIFIC COAST HIGHWAY



PROJECT 6
N.T.S.

LEGEND:

Ⓧ = Study Intersection

XX/YY= AM/PM Peak Hour Turning Movement Volumes

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FIGURE 7-6

PROJECT 6

8. PROJECT 7 - EMERGENCY SOURCE OF WATER SUPPLY CONNECTION (LAS VIRGENES CONNECTION)

A. Existing Roadway System

3525 Encinal Canyon Rd: is at a north – south two lane road that provides access to residential areas north of PCH.

B. Existing LOS

This section provides a summary of the Existing 2018 traffic conditions at the study roadway segments within the scope of Project 7. The project consists of installing 6,300 feet of twelve-inch waterline along Encinal Canyon Rd.

LOS was determined for all of the study area roadway segments. Roadway Segment Analysis data is provided in Appendix J

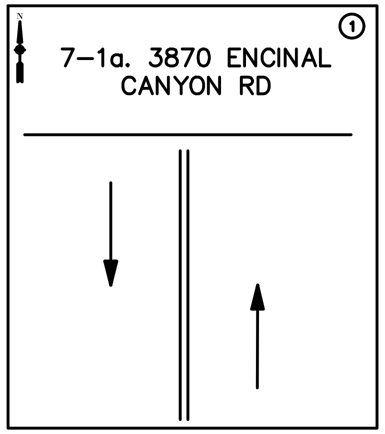
Table 7-1 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2018) CONDITIONS - PROJECT 7

TABLE 7-1
SUMMARY OF ROADWAY SEGMENT OPERATION
EXISTING CONDITIONS (2018)

Project	Segment	AM			PM		
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol
7	3525 Encinal Canyon Rd	1.7	A	59	2.3	A	86

Table 7-1 shows that the effected roadway segment within the scope of Project 7 is currently operating at an acceptable level of service. See appendix A for critical V/C ratio interpretations.



PROJECT 7
N.T.S.

LEGEND:

▬ = Study Site

→ = Through Lane

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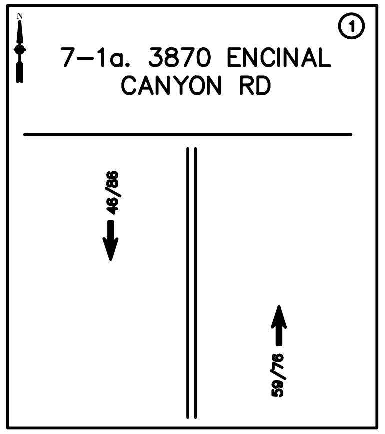
EXISTING ROADWAY SEGMENT CONFIGURATIONS

FIGURE 8-1



PROJECT 7
N.T.S.

LEGEND:

▬ = Study Site

XX/YY = AM/PM Peak Hour Volumes

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EXISTING YEAR (2018) AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 8-2

PROJECT 7

C. Existing + Project (Construction) LOS

This section provides a summary of the Existing 2025 traffic conditions at the study intersections with construction of Project 7. The year 2025 was selected for analysis based on the anticipated implementation date of the proposed project. The project consists of installing 6,300 feet of twelve-inch waterline along Encinal Canyon Rd. Lane closure details have not been finalized. However, it is assumed for analysis that one lane will be closed for construction. Once detailed construction methods, schedules, and construction vehicle volumes are available, a qualified traffic consultant will validate the assumptions and findings of the traffic study for the EIR. If the report is validated, the project can proceed without additional analysis or mitigation. If the validation shows that the assumptions were not accurate, further environmental documentation may be required. Construction is scheduled to begin in 2020 with an approximate one-year duration.

In order to define regional traffic growth that would affect operations at the study areas during Year 2025 JMD utilized traffic growth factors from the Congestion Management Program for Los Angeles County. The City of Malibu falls under Regional Statistical Area (RSA) 15 resulting in an annual growth factor of 1.005. Applying this growth factor to a gap of 7 years results in a total growth factor of 1.036 from Year 2018 to Year 2025.

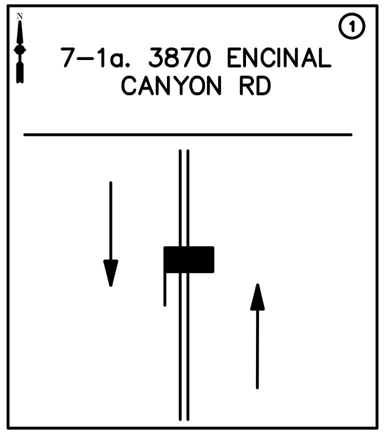
Table 7-2 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2025) + PROJECT CONSTRUCTION - PROJECT 7

TABLE 7-2
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION (2025)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
7	3525 Encinal Canyon Rd	3.5	A	61	4.7	A	89	106%	No

Table 7-2 shows that Project 7 will not have a significant impact on the effected roadway segment.



PROJECT 7
N.T.S.

LEGEND:

━ = Study Site
→ = Through Lane
⚑ = Flagger

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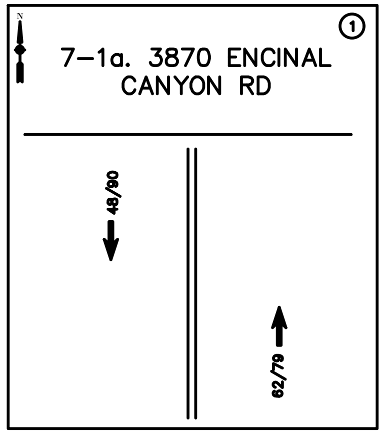
(2025) WITH CONSTRUCTION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 8-3

PROJECT 7



PROJECT 7
N.T.S.

LEGEND:

━ = Study Site

XX/YY = AM/PM Peak Hour Volumes

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(2025) WITH CONSTRUCTION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 8-4

PROJECT 7

D. Existing + Project (Construction) + Mitigation LOS

3870 Encinal Canyon Rd. is a two-lane road. Due to the very low volumes along this street segment, mitigation is not required during the AM and PM peak periods. However, to avoid disruptions within this residential street, work hours should be limited between 9AM-4PM. Lane closures during construction should include proper flagging procedures. During non-construction periods, all travel lanes should be opened to through traffic.

This section provides a summary of the Existing 2025 traffic conditions at the study intersections with construction of Project 7 during non-peak hours. The year 2025 was selected for analysis based on the anticipated implementation date of the proposed project.

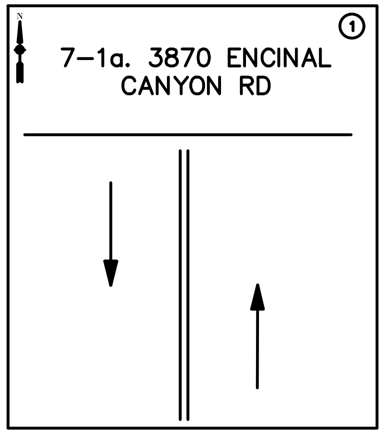
Table 7-3 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2025) + PROJECT CONSTRUCTION + MITIGATION - PROJECT 7

TABLE 7-3
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION AND MITIGATION (2025)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
7	3525 Encinal Canyon Rd	1.8	A	61	2.4	A	89	3%	No

Table 7-3 shows that Project 7 with Mitigation will not have a significant impact on the effected roadway segment.



PROJECT 7
N.T.S.

LEGEND:

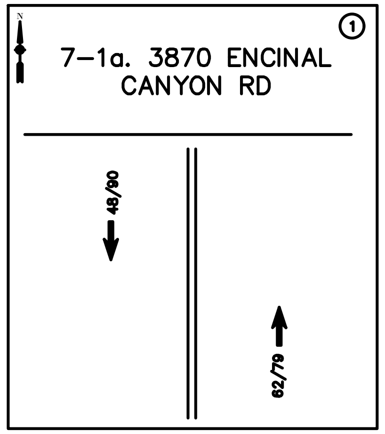
▬ = Study Site

→ = Through Lane

N.T.S.

(2025) WITH CONSTRUCTION AND MITIGATION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 8-5



PROJECT 7
N.T.S.

LEGEND:

▬ = Study Site

XX/YY= AM/PM Peak Hour Volumes

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(2025) WITH CONSTRUCTION AND MITIGATION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 8-6

PROJECT 7

9. PROJECT 8 - BIG ROCK BYPASS IMPROVEMENTS

A. Existing Roadway System

19562 PCH: is at an east – west four lane arterial west of Tuna Canyon Rd.

B. Existing LOS

This section provides a summary of the Existing 2018 traffic conditions at the study roadway segments within the scope of Project 8. The project consists replacing 1,500 feet of waterline from ten-inch to thirty-inch.

LOS was determined for all of the study area roadway segments. Roadway Segment Analysis data is provided in Appendix J

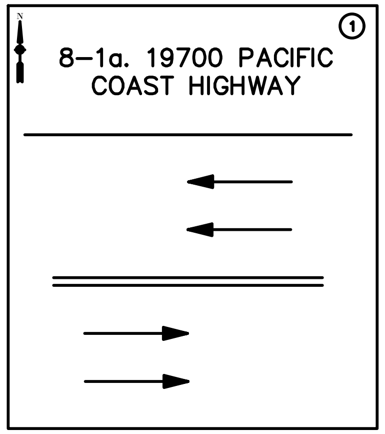
Table 8-1 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2018) CONDITIONS - PROJECT 8

TABLE 8-1
SUMMARY OF ROADWAY SEGMENT OPERATION
EXISTING CONDITIONS (2018)

Project	Segment	AM			PM		
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol
8	19562 PCH	23.7	C	1,866	27.3	D	2,089

Table 8-1 shows that the roadway segment within the scope of Project 8 is currently operating at an acceptable level of service. See appendix A for critical V/C ratio interpretations.



LEGEND:

━ = Study Site

→ = Through Lane

PROJECT 8
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N.T.S.

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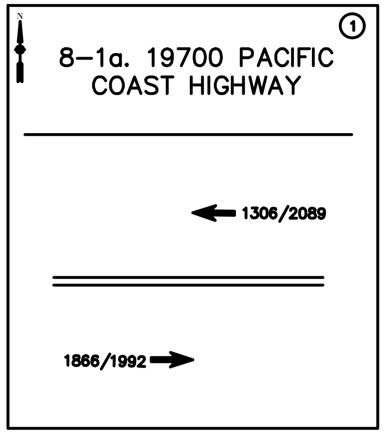
EXISTING ROADWAY SEGMENT CONFIGURATIONS

FIGURE 9-1

PROJECT 8



LEGEND:

PROJECT 8
N.T.S.

▬ = Study Site

XX/YY= AM/PM Peak Hour Volumes

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EXISTING YEAR (2018) AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 9-2

PROJECT 8

C. Existing + Project (Construction) LOS

This section provides a summary of the Existing 2026 traffic conditions at the study intersections with construction of Project 8. The year 2026 was selected for analysis based on the anticipated implementation date of the proposed project. The project consists replacing 1,500 feet of waterline from ten-inch to thirty-inch. Lane closure details have not been finalized. However, it is assumed for analysis that one westbound lane will be closed for construction. Once detailed construction methods, schedules, and construction vehicle volumes are available, a qualified traffic consultant will validate the assumptions and findings of the traffic study for the EIR. If the report is validated, the project can proceed without additional analysis or mitigation. If the validation shows that the assumptions were not accurate, further environmental documentation may be required. Construction is scheduled to begin in 2026 with an approximate one-year duration.

In order to define regional traffic growth that would affect operations at the study areas during Year 2026 JMD utilized traffic growth factors from the Congestion Management Program for Los Angeles County. The City of Malibu falls under Regional Statistical Area (RSA) 15 resulting in an annual growth factor of 1.005. Applying this growth factor to a gap of 8 years results in a total growth factor of 1.041 from Year 2018 to Year 2026.

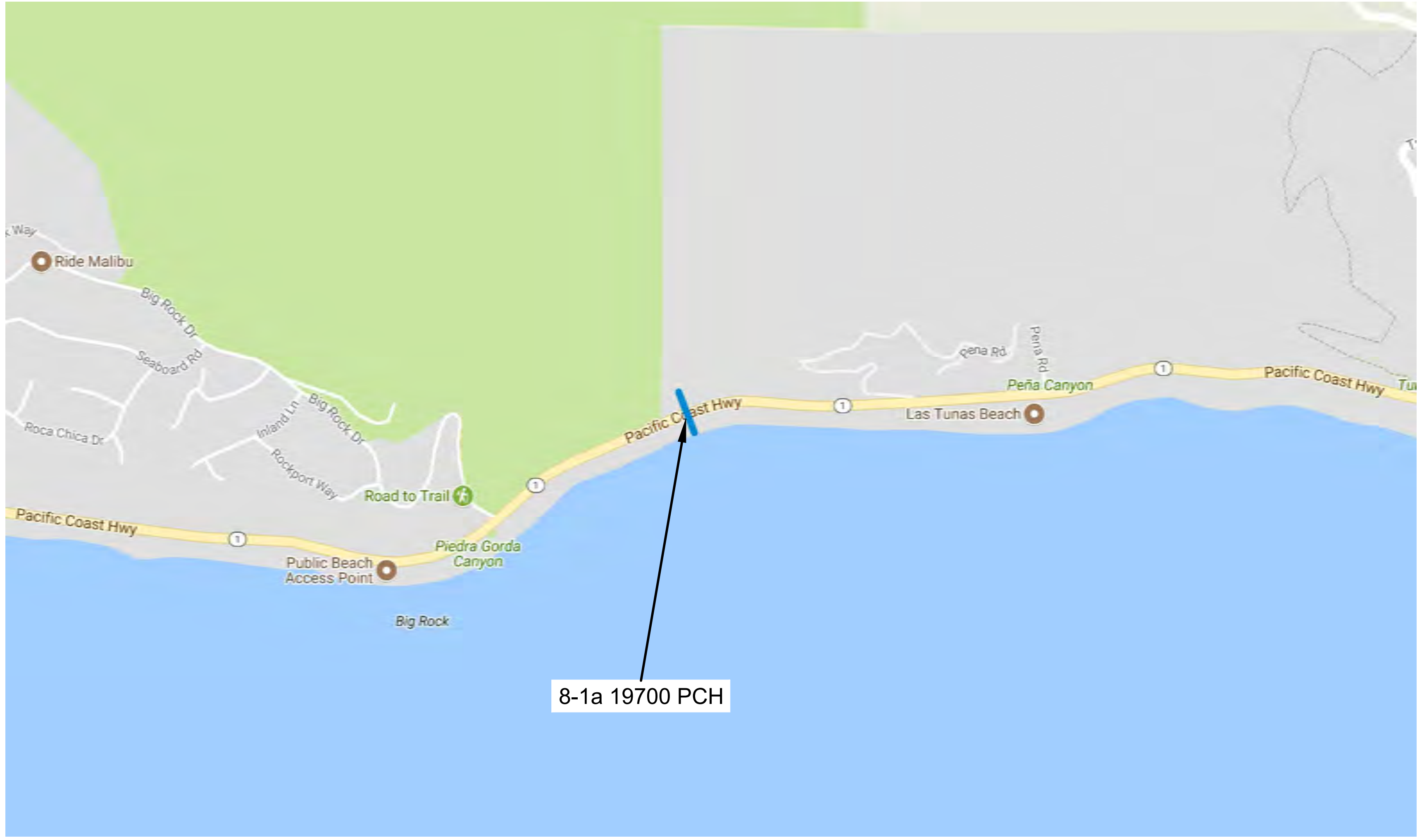
Table 8-2 summarizes the density (for roadway segments). LOS values for each study area are given.

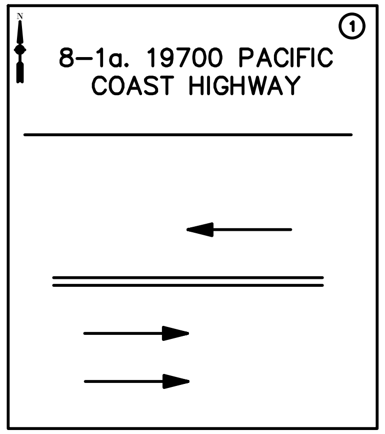
EXISTING (2026) + PROJECT CONSTRUCTION - PROJECT 8

TABLE 8-2
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION (2026)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
8	19562 PCH	49.0	F	1932	56.5	F	2163	107%	Yes

Table 8-2 shows that Project 8 will have a significant impact on the effected roadway segment.





LEGEND:

▬ = Study Site
→ = Through Lane
⚑ = Flagger

PROJECT 8
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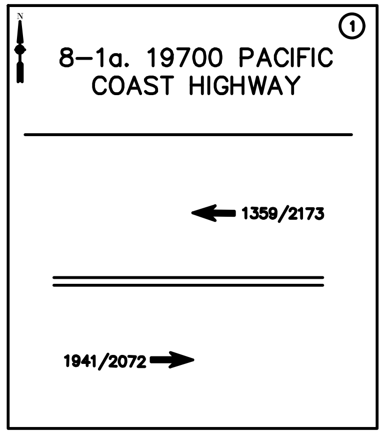
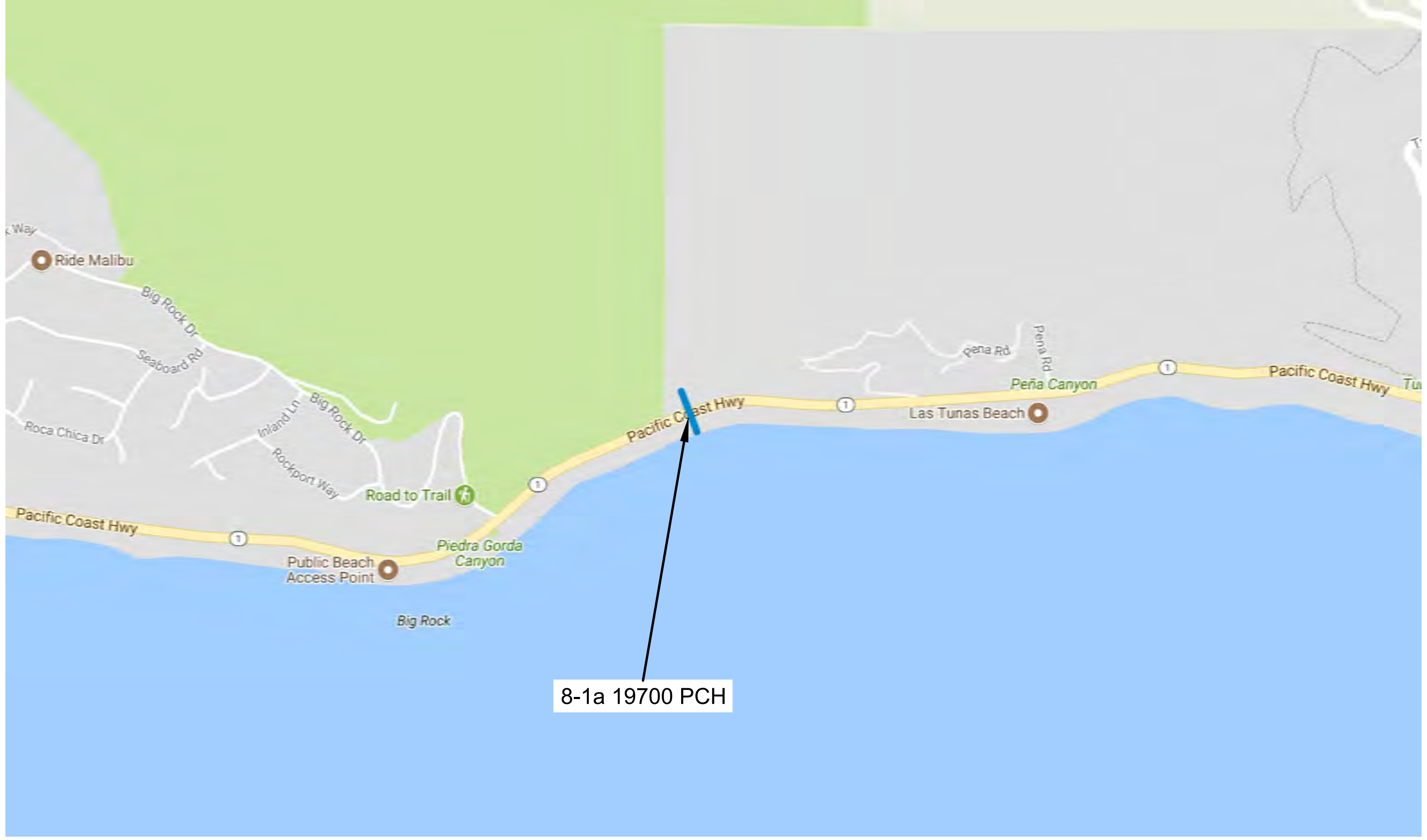
(2026) WITH CONSTRUCTION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 9-3





LEGEND:

▬ = Study Site

XX/YY = AM/PM Peak Hour Volumes

PROJECT 8
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(2026) WITH CONSTRUCTION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 9-4

D. Existing + Project (Construction) + Mitigation LOS

This project includes one roadway segment along PCH between Big Rock Dr. and Tuna Canyon Rd. Existing LOS during AM and PM Peak is at an acceptable level. However, with construction the LOS drops to an unacceptable level. Thus, in order to avoid the peak hour level of service impacts at the affected location, it is recommended to implement the lane closures outside of the AM and PM peak periods. Possible lane closures could occur off peak (10AM-3PM) or at night (9PM-5AM). During non-construction periods, all travel lanes should be opened to through traffic.

This section provides a summary of the Existing 2026 traffic conditions at the study intersections with construction of Project 8. The year 2026 was selected for analysis based on the anticipated implementation date of the proposed project.

Table 8-3 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2026) + PROJECT CONSTRUCTION + MITIGATION - PROJECT 8

TABLE 8-3
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION AND MITIGATION (2026)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
8	19562 PCH	24.5	C	1,932	28.3	D	2,163	4%	No

Table 8-3 shows that Project 8 with Mitigation will not have a significant impact on the effected roadway segment.

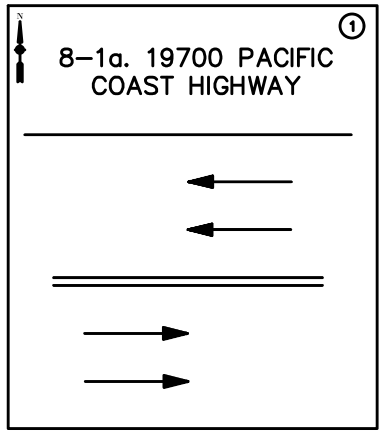
PROJECT 8

N.T.S.

LEGEND:

▬ = Study Site

→ = Through Lane



8–1a. 19700 PACIFIC COAST HIGHWAY

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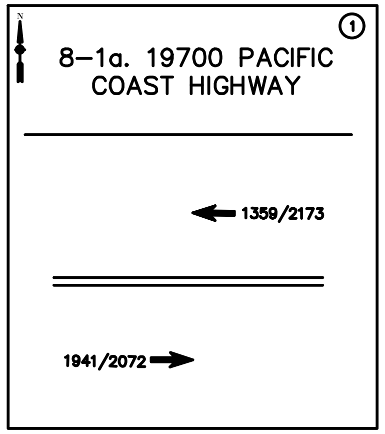
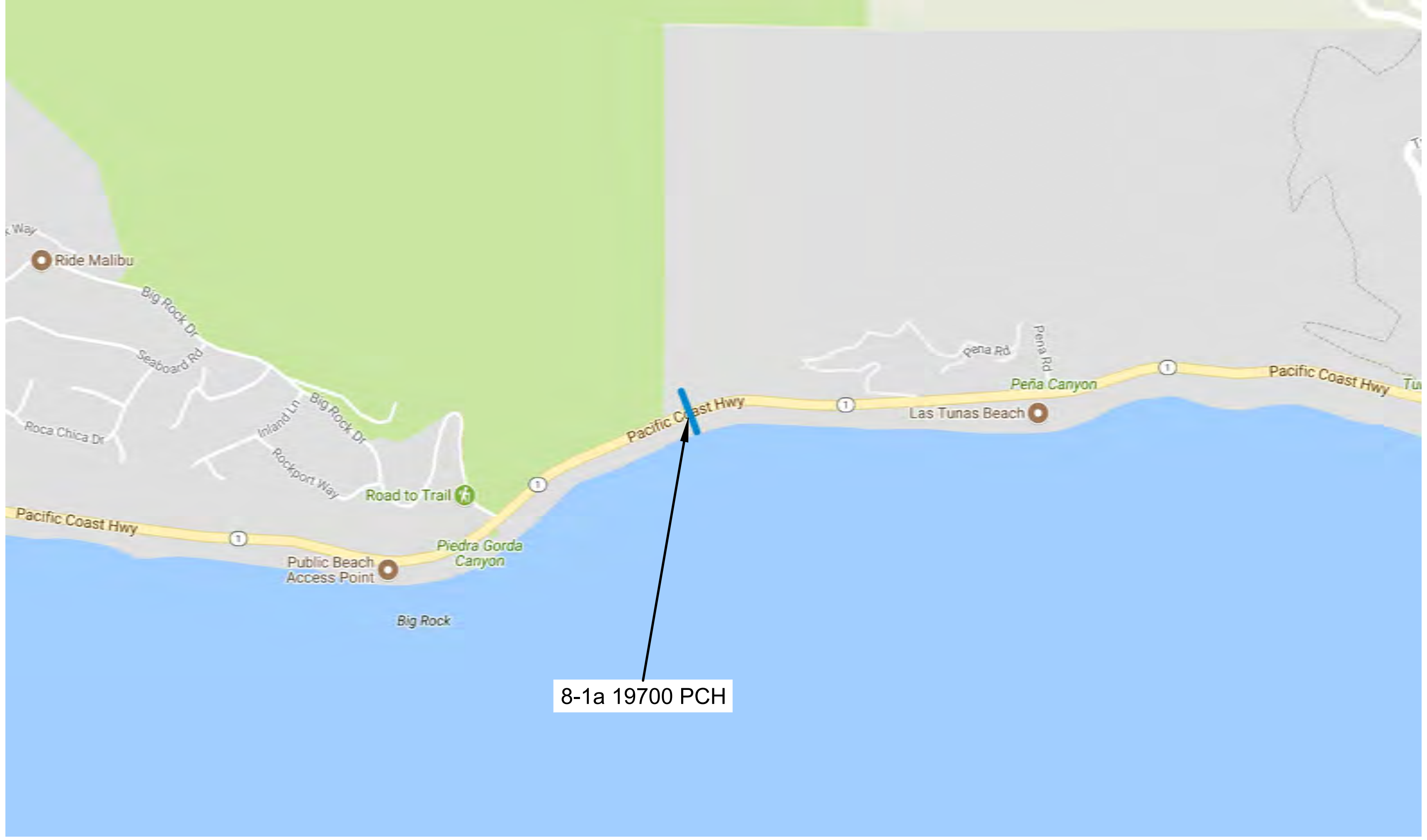
(2026) WITH CONSTRUCTION AND MITIGATION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 9-5

PROJECT 8





PROJECT 8
N.T.S.

LEGEND:

▬ = Study Site
XX/YY = AM/PM Peak Hour Volumes

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(2026) WITH CONSTRUCTION AND MITIGATION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 9-6

PROJECT 8

10. PROJECT 9 – UPPER ENCINAL TANK IMPROVEMENT

A. Existing Roadway System

4400 Encinal Canyon Rd: is at a north – south two lane road that provides access to residential areas north of PCH.

B. Existing LOS

This section provides a summary of the Existing 2018 traffic conditions at the study roadway segments within the scope of Project 7. This improvement would replace an aging and severely deteriorated 70,000-gallon tanks with a single 225,000 gallon tank. Construction activities would include ground-breaking activities.

LOS was determined for all of the study area roadway segments. Roadway Segment Analysis data is provided in Appendix J

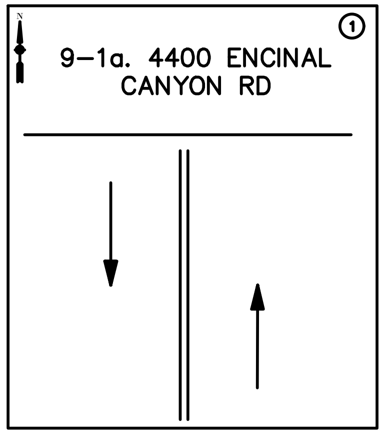
Table 9-1 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2018) CONDITIONS - PROJECT 7

TABLE 9-1
SUMMARY OF ROADWAY SEGMENT OPERATION
EXISTING CONDITIONS (2018)

Project	Segment	AM			PM		
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol
9	4400 Encinal Canyon Rd	1.7	A	59	2.3	A	86

Table 9-1 shows that the effected roadway segment within the scope of Project 9 is currently operating at an acceptable level of service. See appendix A for critical V/C ratio interpretations.



LEGEND:

▬ = Study Site

→ = Through Lane

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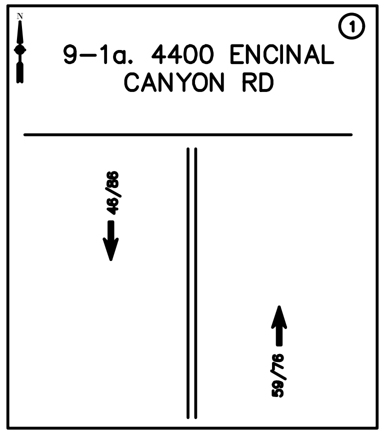
EXISTING (2018) ROADWAY SEGMENT CONFIGURATIONS

FIGURE 10-1



LEGEND:

▬ = Study Site

XX/YY = AM/PM Peak Hour Volumes

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EXISTING (2018) AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 10-2

C. Existing + Project (Construction) LOS

This section provides a summary of the Existing 2022 traffic conditions at the study intersections with construction of Project 9. The year 2022 was selected for analysis based on the anticipated implementation date of the proposed project. This improvement would replace an aging and severely deteriorated 70,000-gallon tanks with a single 225,000 gallon tank. Lane closure details have not been finalized. However, it is assumed for analysis that one lane will be closed for construction. Once detailed construction methods, schedules, and construction vehicle volumes are available, a qualified traffic consultant will validate the assumptions and findings of the traffic study for the EIR. If the report is validated, the project can proceed without additional analysis or mitigation. If the validation shows that the assumptions were not accurate, further environmental documentation may be required. Construction is scheduled to begin in 2021 with an approximate ten month duration.

In order to define regional traffic growth that would affect operations at the study areas during Year 2022 JMD utilized traffic growth factors from the Congestion Management Program for Los Angeles County. The City of Malibu falls under Regional Statistical Area (RSA) 15 resulting in an annual growth factor of 1.005. Applying this growth factor to a gap of 4 years results in a total growth factor of 1.02 from Year 2018 to Year 2022.

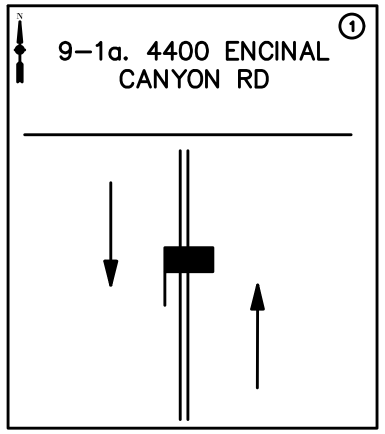
Table 7-2 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2022) + PROJECT CONSTRUCTION - PROJECT 9

TABLE 9-2
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION (2022)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
9	4400 Encinal Canyon Rd	3.4	A	60	4.7	A	87	103%	No

Table 9-2 shows that Project 9 will not have a significant impact on the effected roadway segment.



LEGEND:

— = Study Site

→ = Through Lane

⚑ = Flagger

PROJECT 9

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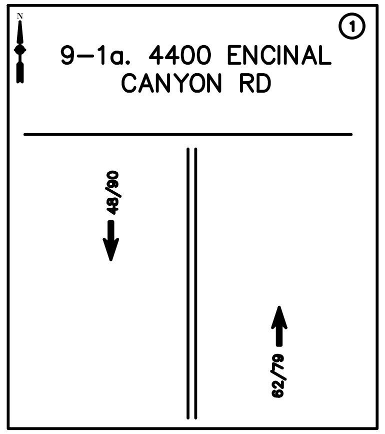
(2022) + CONSTRUCTION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 10-3

PROJECT 9



LEGEND:

▬ = Study Site

XX/YY = AM/PM Peak Hour Volumes

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(2022) + CONSTRUCTION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 10-4

D. Existing + Project (Construction) + Mitigation LOS

4400 Encinal Canyon Rd. is a two-lane road. Due to the very low volumes along this street segment, mitigation is not required during the AM and PM peak periods. However, to avoid disruptions within this residential street, work hours should be limited between 9AM-4PM. Lane closures during construction should include proper flagging procedures. During non-construction periods, all travel lanes should be opened to through traffic.

This section provides a summary of the Existing 2022 traffic conditions at the study intersections with construction of Project 9 during non-peak hours. The year 2022 was selected for analysis based on the anticipated implementation date of the proposed project.

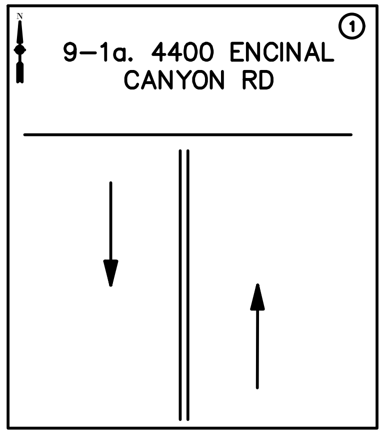
Table 9-3 summarizes the density (for roadway segments). LOS values for each study area are given.

EXISTING (2022) + PROJECT CONSTRUCTION + MITIGATION - PROJECT 9

TABLE 9-3
SUMMARY OF ROADWAY SEGMENT OPERATION
WITH CONSTRUCTION AND MITIGATION (2022)

Project	Segment	AM			PM			Project Related Increase in Density	Significant Impact
		Density (pc/mi/hr)	HCM LOS	Peak Hour Vol	Density (pc/mi/hr)	HCM LOS	Peak Hour Vol		
9	4400 Encinal Canyon Rd	1.7	A	60	2.3	A	87	2%	No

Table 9-3 shows that Project 9 with Mitigation will not have a significant impact on the effected roadway segment.



PROJECT 9
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LEGEND:

▬ = Study Site

→ = Through Lane

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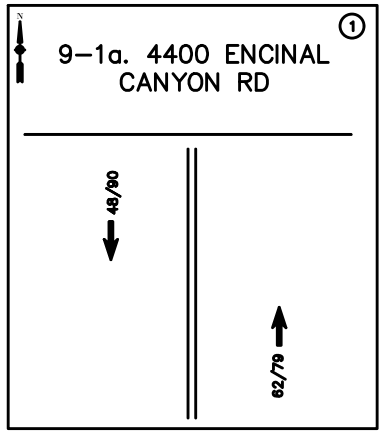
(2022) + CONSTRUCTION + MITIGATION ROADWAY SEGMENT CONFIGURATIONS

FIGURE 10-5

PROJECT 9



LEGEND:

▬ = Study Site

XX/YY = AM/PM Peak Hour Volumes

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(2022) + CONSTRUCTION + MITIGATION AM/PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 10-6

PROJECT 9

10. SUMMARY

The following are the conclusions made from the analysis within this report.

Project 1, Carbon Canyon Road and Carbon Mesa Road Waterline Improvements

- During the Existing (2021) Project 1 Construction scenario, Project 1 will not have a significant impact on the effected roadway segment of 22042 Carbon Mesa Rd. It will continue to operate at an acceptable level of service.
- Mitigation will avoid disruptions within the residential street.

Project 2, Coastline Drive Twelve-Inch Waterline Improvements

- During the Existing (2018) Project 2 scenario, the signalized intersection of Pacific Coast Hwy & Coastline Dr is currently functioning at an AM level of service of E and a PM level of service of F.
- During the Existing (2021) Project 2 Construction scenario, Project 2 will cause the signalized intersection of Pacific Coast Hwy & Coastline Dr to continue to function at a level of service of F during the PM peak hours and drop to F during the AM peak hours.
- Mitigation will benefit the intersection’s level of service, maintaining the current levels of service of E and F.

Project 3, Waterworks District No. 29 Creek Crossing Repair Project

- During the Existing (2020) Project 3 Construction scenario, the roadway segments listed will be significantly affected by lane closures.
  - 18788 PCH
    - Reduce from 2 WBT to 1 WBT
    - AM LOS C to LOS **F**
    - PM LOS D to LOS **F**
  - 19399 PCH
    - Reduce from 2 WBT to 1 WBT
    - AM LOS C to LOS **F**
    - PM LOS D to LOS **F**
  - 21203 PCH
    - Reduce from 2 WBT to 1 WBT
    - AM LOS D to LOS **F**
    - PM LOS **E** to LOS **F**
  - 21857 PCH
    - Reduce from 2 WBT to 1 WBT
    - AM LOS C to LOS **F**
    - PM LOS D to LOS **F**

- 25712 PCH
  - Reduce from 2 WBT to 1 WBT
  - PM LOS D to LOS **F**
- 27519 PCH
  - Reduce from 2 WBT to 1 WBT
  - PM LOS D to LOS **F**

- Mitigation will prevent a majority of the worsening levels of service, lessening the effect to the following:

  - 18788 PCH
    - Reduce from 2 WBT to 1 WBT
    - PM LOS D to LOS **E**
  - 21203 PCH
    - Reduce from 2 WBT to 1 WBT
    - PM LOS **E** to LOS **E**

Project 4, Fernwood Tank Improvement

- During the Existing (2022) Project 4 Construction scenario, Project 4 will not have a significant impact on the effected roadway segment of Fernwood Tank on Horseshoe Dr. It will continue to operate at an acceptable level of service.

- Mitigation will avoid disruptions within the residential street.

Project 5, PCH Eight-inch Waterline Improvements (Zumirez Drive to Escondido Beach Road)

- During the Existing (2018) Project 5 scenario, all intersections are operating at acceptable levels of service.

- During the Existing (2020) Project 5 Construction scenario, Project 5 will cause the signalized intersection of Pacific Coast Hwy & Paradise Cove Rd to operate at a level of service of F. Project 5 will also cause all 5 effected stop-controlled intersections to function at a level of service of F during PM peak hours.

- Mitigation will prevent the intersection of Pacific Coast Hwy & Paradise Cove Rd from functioning at levels of service of F. Mitigation will also prevent all stop-controlled intersections from functioning at levels of service of F.

Project 6, PCH and Topanga Beach Drive Waterline Improvements

- During the Existing (2024) Project 6 Construction scenario, Project 6 will cause all affected signalized and stop-controlled intersections to function at levels of service of D, E or F.

- Mitigation will prevent the all effected signalized intersections from operating at levels of service of D, E or F.

Project 7, Emergency Source of Water Supply Connection (Las Virgenes Connection)

- During the Existing (2025) Project 7 Construction scenario, Project 7 will not have a significant impact on the effected roadway segment of 3525 Encinal Canyon Rd. It will continue to operate at an acceptable level of service.

- Mitigation will avoid disruptions within the residential street.

Project 8, Big Rock Bypass Improvements

- During the Existing (2026) Project 8 Construction scenario, Project 8 will have a significant impact on the effected roadway segment of 19562 PCH. It will operate at a level of service of F during both AM and PM peak hours.

- Mitigation will prevent the roadway segment from operating at a level of service of F.

Project 9, Upper Encinal Tank Improvement

- During the Existing (2022) Project 9 Construction scenario, Project 9 will not have a significant impact on the effected roadway segment of 4400 Encinal Canyon Rd. It will continue to operate at an acceptable level of service.

- Mitigation will avoid disruptions within the residential street.

11. APPENDICES

Appendix A – Analysis Methodologies
Appendix B – Traffic Count Data
Appendix C – Analysis Worksheets for Existing (2018) Conditions
Appendix D – Analysis Worksheets for Existing (2020) + Construction
Appendix E – Analysis Worksheets for Existing (2021+ Construction
Appendix F – Analysis Worksheets for Existing (2024) + Construction
Appendix G – Analysis Worksheets for Existing (2020) + Construction + Mitigation
Appendix H – Analysis Worksheets for Existing (2021) + Construction + Mitigation
Appendix I – Analysis Worksheets for Existing (2024) + Construction + Mitigation
Appendix J – Roadway Segment Significant Impact

APPENDIX A

Analysis Methodologies

DEFINITIONS OF LEVEL OF SERVICE

LEVEL OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTIONS

Level of Service	Intersection Capacity Utilization (ICU)	Definition
A	0.000 - 0.600	EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.
B	0.601 - 0.700	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701 – 0.800	GOOD. Occasionally, drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801 – 0.900	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.901 – 1.00	POOR. Represents the most vehicles that intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	Greater than 1.000	FAILURE. Backups from nearby intersections or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

Source: 2000 Highway Capacity Manual, Transportation Research Board, Washington, D.C.

Level of Service	Signalized Intersections
	Intersection Capacity Utilization (%)
A	≤ 55%
B	> 55% and ≤ 64%
C	> 64% and ≤ 73%
D	> 73% and ≤ 82%
E	> 82% and ≤ 91%
F	> 91% and ≤ 100%
G	> 100% and ≤ 109%
H	> 109%

Source: 2000 Highway Capacity Manual, Transportation Research Board, Washington, D.C.

TWO-WAY STOP CONTROLLED INTERSECTIONS

Unsignalized (two-way stop controlled) intersection level of service is reported for the major street and minor street (generally, left-turn movements). The method assesses available and critical gaps in the traffic stream, which make it possible for side street traffic to enter the main street flow. The *2010 Highway Capacity Manual* describes the detailed methodology. It is not unusual for an intersection to experience Level of Service E or F conditions for the minor street left-turn movements. It should be understood that, often, a poor level of service is experienced by only a few vehicles and that the intersection as a whole operates acceptably.

Unsignalized levels of service are described in the following table.

Delay (seconds)	Level of Service
0-10	A
10-15	B
15-25	C
25-35	D
35-50	E
>50	F

Source: 2000 Highway Capacity Manual, Transportation Research Board, Washington, D.C.

LEVEL OF SERVICE FOR ROADWAY SEGMENTS

Roadway segments Level of Service is defined on the basis of density, which is a measure of the proximity of vehicles to each other in the traffic stream. The capacity of a roadway segment varies with the Free Flow Speed. The *2010 Highway Capacity Manual* describes the detailed methodology.

Level of Service	FFS (mi/h)	Density (pc/mi/hr)
A	All	>0-11
B	All	>11-18
C	All	>18-26
D	All	>26-35
E	60	>35-40
	55	>35-41
	50	>35-43
	45-35	>35-45
F	60	>40
	55	>41
	50	>43
	45-35	>45

Source: 2010 Highway Capacity Manual, Transportation Research Board, Washington, D.C.

APPENDIX B

Traffic Count Data

Prepared by NDS/ATD

VOLUME

Carbon Canyon Rd S/O 22576 Carbon Mesa Rd

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18_5697_001A

DAILY TOTALS	NB	SB	EB	WB	Total
	236	251	0	0	487

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0		12:00	3		10				13	
00:15	0		0				0		12:15	5		8				13	
00:30	0		2				2		12:30	6		5				11	
00:45	0		0	2			0	2	12:45	1	15	6	29			7	44
01:00	0		0				0		13:00	5		8				13	
01:15	0		0				0		13:15	6		2				8	
01:30	0		0				0		13:30	2		2				4	
01:45	0		0				0		13:45	2	15	4	16			6	31
02:00	0		0				0		14:00	4		4				8	
02:15	0		0				0		14:15	1		1				2	
02:30	0		0				0		14:30	5		5				10	
02:45	0		0				0		14:45	5	15	6	16			11	31
03:00	0		0				0		15:00	2		4				6	
03:15	0		0				0		15:15	4		4				8	
03:30	1		1				2		15:30	3		9				12	
03:45	0	1	0	1			0	2	15:45	6	15	6	23			12	38
04:00	0		0				0		16:00	3		4				7	
04:15	0		0				0		16:15	1		5				6	
04:30	0		0				0		16:30	0		4				4	
04:45	2	2	1	1			3	3	16:45	2	6	1	14			3	20
05:00	0		1				1		17:00	5		11				16	
05:15	0		0				0		17:15	1		1				2	
05:30	0		1				1		17:30	3		4				7	
05:45	0		1	3			1	3	17:45	3	12	7	23			10	35
06:00	0		1				1		18:00	1		1				2	
06:15	2		5				7		18:15	3		1				4	
06:30	5		1				6		18:30	0		1				1	
06:45	4	11	1	8			5	19	18:45	8	12	3	6			11	18
07:00	4		5				9		19:00	3		0				3	
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07:45	4	19	7	19			11	38	19:45	4	11	1	1			5	12
08:00	6		5				11		20:00	3		2				5	
08:15	6		6				12		20:15	0		0				0	
08:30	9		5				14		20:30	0		0				0	
08:45	7	28	8	24			15	52	20:45	1	4	3	5			4	9
09:00	4		5				9		21:00	3		2				5	
09:15	6		2				8		21:15	1		1				2	
09:30	9		4				13		21:30	0		0				0	
09:45	4	23	2	13			6	36	21:45	0	4	0	3			0	7
10:00	2		5				7		22:00	1		0				1	
10:15	6		6				12		22:15	0		0				0	
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11:00	5		2				7		23:00	0		2				2	
11:15	5		3				8		23:15	0		0				0	
11:30	8		6				14		23:30	1		0				1	
11:45	5	23	6	17			11	40	23:45	0	1	0	2			0	3
TOTALS		124		111				**235**	**TOTALS**		112		140				**252**
SPLIT %		52.8%		47.2%				**48.3%**	**SPLIT %**		44.4%		55.6%				**51.7%**

DAILY TOTALS	NB	SB	EB	WB	Total
	236	251	0	0	487

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	08:00	11:30			**08:00**	**PM Peak Hour**	12:30	12:00			**12:00**
AM Pk Volume	28	30			**52**	**PM Pk Volume**	18	29			**44**
Pk Hr Factor	0.778	0.750			**0.867**	**Pk Hr Factor**	0.750	0.725			**0.846**
7 - 9 Volume	47	43	0	0	**90**	**4 - 6 Volume**	18	37	0	0	**55**
7 - 9 Peak Hour	08:00	08:00			**08:00**	**4 - 6 Peak Hour**	17:00	17:00			**17:00**
7 - 9 Pk Volume	28	24	0	0	**52**	**4 - 6 Pk Volume**	12	23	0	0	**35**
Pk Hr Factor	0.778	0.750	0.000	0.000	**0.867**	**Pk Hr Factor**	0.600	0.523	0.000	0.000	**0.547**

Prepared by NDS/ATD

VOLUME

Carbon Canyon Rd S/O 22576 Carbon Mesa Rd

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18_5697_001A

DAILY TOTALS	NB	SB	EB	WB	Total
	236	251	0	0	487

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0		12:00	3		10				13	
00:15	0		0				0		12:15	5		8				13	
00:30	0		2				2		12:30	6		5				11	
00:45	0		0	2			0	2	12:45	1	15	6	29			7	44
01:00	0		0				0		13:00	5		8				13	
01:15	0		0				0		13:15	6		2				8	
01:30	0		0				0		13:30	2		2				4	
01:45	0		0				0		13:45	2	15	4	16			6	31
02:00	0		0				0		14:00	4		4				8	
02:15	0		0				0		14:15	1		1				2	
02:30	0		0				0		14:30	5		5				10	
02:45	0		0				0		14:45	5	15	6	16			11	31
03:00	0		0				0		15:00	2		4				6	
03:15	0		0				0		15:15	4		4				8	
03:30	1		1				2		15:30	3		9				12	
03:45	0	1	0	1			0	2	15:45	6	15	6	23			12	38
04:00	0		0				0		16:00	3		4				7	
04:15	0		0				0		16:15	1		5				6	
04:30	0		0				0		16:30	0		4				4	
04:45	2	2	1	1			3	3	16:45	2	6	1	14			3	20
05:00	0		1				1		17:00	5		11				16	
05:15	0		0				0		17:15	1		1				2	
05:30	0		1				1		17:30	3		4				7	
05:45	0		1	3			1	3	17:45	3	12	7	23			10	35
06:00	0		1				1		18:00	1		1				2	
06:15	2		5				7		18:15	3		1				4	
06:30	5		1				6		18:30	0		1				1	
06:45	4	11	1	8			5	19	18:45	8	12	3	6			11	18
07:00	4		5				9		19:00	3		0				3	
07:15	5		4				9		19:15	2		0				2	
07:30	6		3				9		19:30	2		0				2	
07:45	4	19	7	19			11	38	19:45	4	11	1	1			5	12
08:00	6		5				11		20:00	3		2				5	
08:15	6		6				12		20:15	0		0				0	
08:30	9		5				14		20:30	0		0				0	
08:45	7	28	8	24			15	52	20:45	1	4	3	5			4	9
09:00	4		5				9		21:00	3		2				5	
09:15	6		2				8		21:15	1		1				2	
09:30	9		4				13		21:30	0		0				0	
09:45	4	23	2	13			6	36	21:45	0	4	0	3			0	7
10:00	2		5				7		22:00	1		0				1	
10:15	6		6				12		22:15	0		0				0	
10:30	2		6				8		22:30	0		2				2	
10:45	7	17	6	23			13	40	22:45	1	2	0	2			1	4
11:00	5		2				7		23:00	0		2				2	
11:15	5		3				8		23:15	0		0				0	
11:30	8		6				14		23:30	1		0				1	
11:45	5	23	6	17			11	40	23:45	0	1	0	2			0	3
TOTALS		124		111				**235**	**TOTALS**		112		140				**252**
SPLIT %		52.8%		47.2%				**48.3%**	**SPLIT %**		44.4%		55.6%				**51.7%**

DAILY TOTALS	NB	SB	EB	WB	Total
	236	251	0	0	487

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	08:00	11:30			**08:00**	**PM Peak Hour**	12:30	12:00			**12:00**
AM Pk Volume	28	30			**52**	**PM Pk Volume**	18	29			**44**
Pk Hr Factor	0.778	0.750			**0.867**	**Pk Hr Factor**	0.750	0.725			**0.846**
7 - 9 Volume	47	43	0	0	**90**	**4 - 6 Volume**	18	37	0	0	**55**
7 - 9 Peak Hour	08:00	08:00			**08:00**	**4 - 6 Peak Hour**	17:00	17:00			**17:00**
7 - 9 Pk Volume	28	24	0	0	**52**	**4 - 6 Pk Volume**	12	23	0	0	**35**
Pk Hr Factor	0.778	0.750	0.000	0.000	**0.867**	**Pk Hr Factor**	0.600	0.523	0.000	0.000	**0.547**

Prepared by National Data & Surveying Services

Coastline Dr & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-2.1A
City: Malibu

Day: Tuesday
Date: 10/23/2018

	PEAK HOURS	COUNT PERIODS
AM	07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Coastline Dr

SOUTHBOUND

	↲	↓	↳	⮍	⇧	
AM	29	0	188	0	147	AM
NOON	0	0	0	0	0	NOON
PM	47	0	105	0	151	PM
	1.5	0	1.5	0		

Pacific Coast Hwy

EASTBOUND

		AM	NOON	PM
⇦		1574	0	2736
⮌	0	0	0	0
↱	1	34	0	38
→	3	2528	0	1986
↴	0	0	0	0

CONTROL

Signalized

	AM	NOON	PM
TEV	4437	0	4978
PHF	0.98		0.96

Pacific Coast Hwy

WESTBOUND

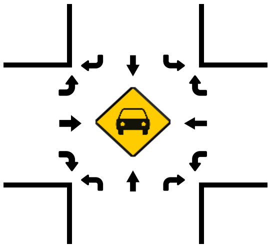
		PM	NOON	AM
↰	1	113	0	113
←	2	2689	0	1545
↲	0	0	0	0
⮎	0	0	0	0
⇨		2091	0	2716

NORTHBOUND

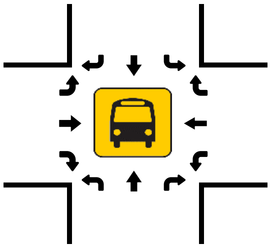
Coastline Dr

	⇩	⮏	↰	↑	↱	
		0	0	0	0	
PM	0	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

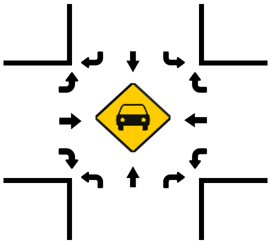
Total Vehicles (AM)



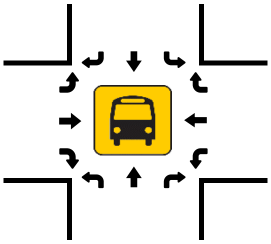
Total Vehicles (AM)



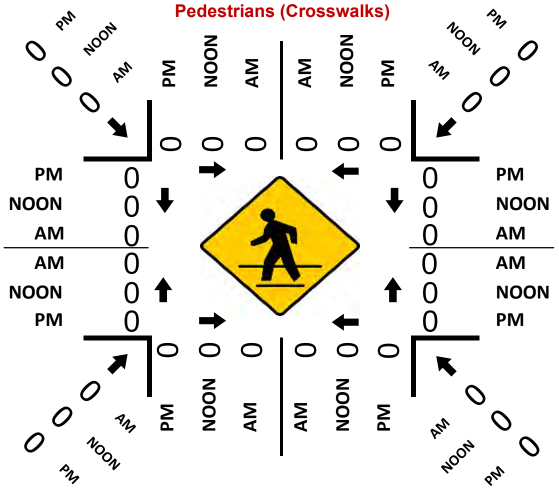
Total Vehicles (NOON)



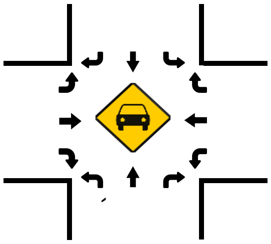
Total Vehicles (NOON)



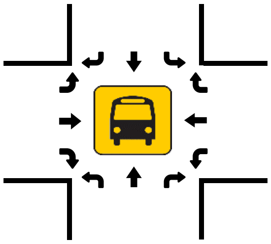
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

S Surfview Dr & Coastline Dr

Peak Hour Turning Movement Count

ID: 18-05695-2.2A
City: Malibu

Day: Tuesday
Date: 10/23/2018

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

S Surfview Dr

SOUTHBOUND

	↲	↓	↳	U	⇧
AM	0	0	41	0	41
NOON	0	0	0	0	0
PM	5	0	43	1	38
	0	1	0	0	

Coastline Dr

EASTBOUND

	AM	NOON	PM	
⇦	104	0	124	
U	0	0	1	0
↱	1	0	4	0
→	179	0	104	1
↴	0	0	0	0

CONTROL

1-Way Stop(SB)

	AM	NOON	PM
TEV	369	0	314
PHF	0.89		0.91

Coastline Dr

WESTBOUND

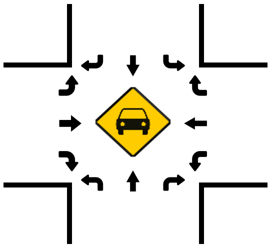
		PM	NOON	AM
↰	0	33	0	40
←	2	118	0	104
↙	0	0	0	0
U	0	4	0	3
⇨		152	0	224

	⇩	U	↰	↑	↱
		0	0	0	0
PM	0	0	0	0	1
NOON	0	0	0	0	0
AM	0	0	0	0	1

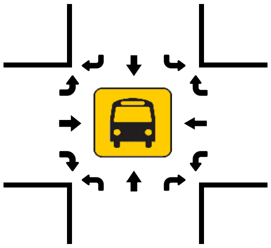
NORTHBOUND

S Surfview Dr

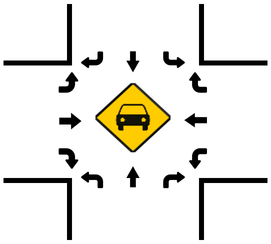
Total Vehicles (AM)



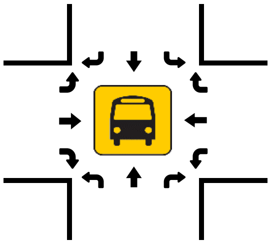
Total Vehicles (AM)



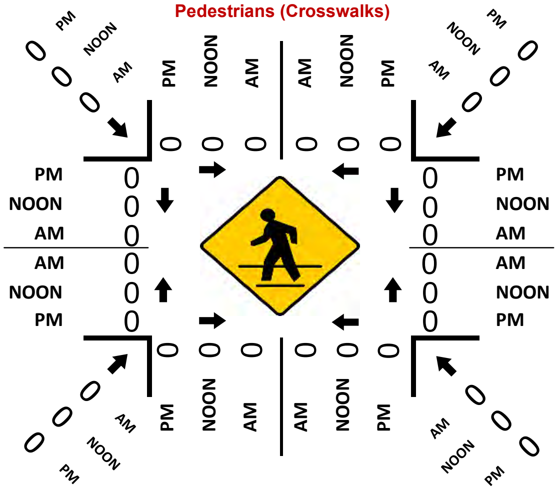
Total Vehicles (NOON)



Total Vehicles (NOON)

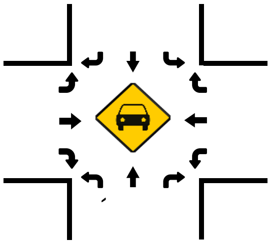


Pedestrians (Crosswalks)

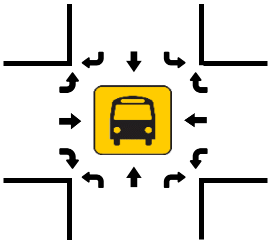


	PM	NOON	AM	AM	NOON	PM
North crosswalk	0	0	0	0	0	0
West crosswalk	0	0	0	0	0	0
East crosswalk	0	0	0	0	0	0
South crosswalk	0	0	0	0	0	0
NW diagonal	0	0	0			
NE diagonal	0	0	0			
SW diagonal	0	0	0			
SE diagonal	0	0	0			

Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Castlerock Rd & Coastline Dr

Peak Hour Turning Movement Count

ID: 18-05695-2.2B
City: Malibu

Day: Tuesday
Date: 10/23/2018

PEAK HOURS		COUNT PERIODS
AM	07:00 AM - 08:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Castlerock Rd
SOUTHBOUND

	↲	↓	↳	↺	⇧	
AM	2	0	115	1	67	AM
NOON	0	0	0	0	0	NOON
PM	1	0	69	0	72	PM
	0	1	0	0		

Coastline Dr
EASTBOUND

	AM	NOON	PM	
⇦	28	0	23	
↺	1	0	0	0
↱	3	0	1	0
→	30	0	20	1
↴	0	0	0	0

Coastline Dr
WESTBOUND

		PM	NOON	AM
0	↰	71	0	63
1	←	22	0	25
0	↙	0	0	0
0	↻	0	0	2
	⇨	89	0	147

NORTHBOUND
Castlerock Rd

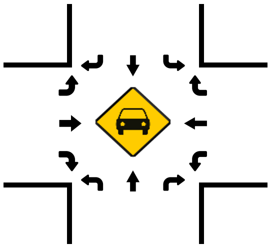
		0	0	0	0	
	⇩	↺	↰	↑	↱	
PM	0	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

CONTROL

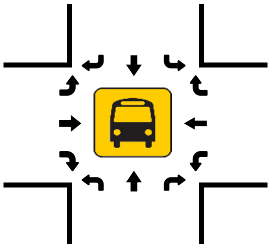
1-Way Stop(SB)

	AM	NOON	PM
TEV	242	0	184
PHF	0.85		0.77

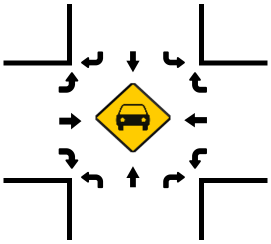
Total Vehicles (AM)



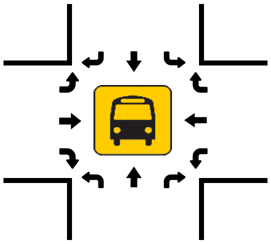
Total Vehicles (AM)



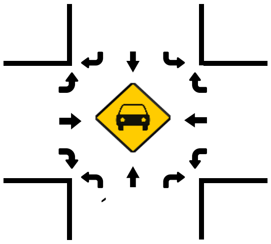
Total Vehicles (NOON)



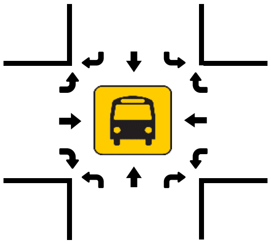
Total Vehicles (NOON)



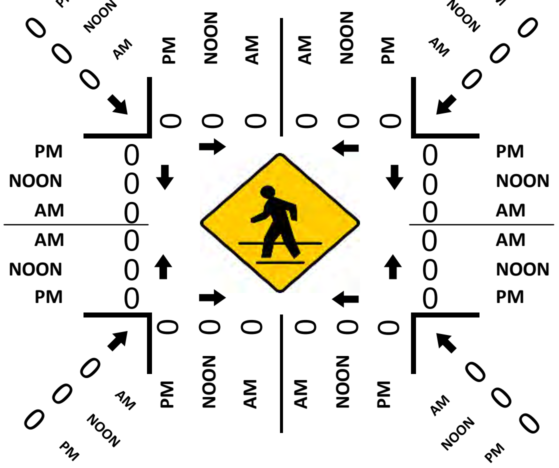
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by NDS/ATD

VOLUME

18788 Pacific Coast Hwy W/O Topanga Canyon Ln

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18-5696-003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	23,037	24,854	47,891

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			34		39		73		**12:00**			288		275		563	
0:15			54		25		79		**12:15**			337		324		661	
0:30			26		27		53		**12:30**			316		263		579	
0:45			17	131	19	110	36	241	**12:45**			298	1239	282	1144	580	2383
1:00			17		20		37		**13:00**			292		278		570	
1:15			21		16		37		**13:15**			314		327		641	
1:30			9		10		19		**13:30**			327		262		589	
1:45			19	66	11	57	30	123	**13:45**			290	1223	315	1182	605	2405
2:00			12		6		18		**14:00**			354		360		714	
2:15			11		6		17		**14:15**			281		313		594	
2:30			9		6		15		**14:30**			346		453		799	
2:45			7	39	4	22	11	61	**14:45**			400	1381	499	1625	899	3006
3:00			13		7		20		**15:00**			405		510		915	
3:15			8		11		19		**15:15**			464		494		958	
3:30			12		16		28		**15:30**			508		461		969	
3:45			11	44	11	45	22	89	**15:45**			526	1903	491	1956	1017	3859
4:00			13		19		32		**16:00**			498		500		998	
4:15			29		25		54		**16:15**			464		505		969	
4:30			26		21		47		**16:30**			492		528		1020	
4:45			28	96	47	112	75	208	**16:45**			487	1941	554	2087	1041	4028
5:00			44		63		107		**17:00**			456		519		975	
5:15			84		98		182		**17:15**			443		499		942	
5:30			110		128		238		**17:30**			499		469		968	
5:45			167	405	146	435	313	840	**17:45**			420	1818	485	1972	905	3790
6:00			234		167		401		**18:00**			386		488		874	
6:15			366		272		638		**18:15**			373		449		822	
6:30			432		286		718		**18:30**			386		423		809	
6:45			437	1469	277	1002	714	2471	**18:45**			412	1557	499	1859	911	3416
7:00			414		268		682		**19:00**			328		530		858	
7:15			393		305		698		**19:15**			248		552		800	
7:30			382		301		683		**19:30**			227		556		783	
7:45			378	1567	320	1194	698	2761	**19:45**			222	1025	454	2092	676	3117
8:00			367		320		687		**20:00**			184		373		557	
8:15			347		321		668		**20:15**			176		348		524	
8:30			350		340		690		**20:30**			152		289		441	
8:45			331	1395	345	1326	676	2721	**20:45**			158	670	320	1330	478	2000
9:00			361		270		631		**21:00**			160		265		425	
9:15			364		285		649		**21:15**			164		243		407	
9:30			375		293		668		**21:30**			96		267		363	
9:45			365	1465	282	1130	647	2595	**21:45**			112	532	223	998	335	1530
10:00			351		283		634		**22:00**			88		196		284	
10:15			314		244		558		**22:15**			88		184		272	
10:30			300		351		651		**22:30**			111		144		255	
10:45			299	1264	264	1142	563	2406	**22:45**			87	374	118	642	205	1016
11:00			315		253		568		**23:00**			77		84		161	
11:15			305		279		584		**23:15**			78		60		138	
11:30			290		300		590		**23:30**			48		79		127	
11:45			276	1186	292	1124	568	2310	**23:45**			44	247	45	268	89	515
TOTALS				9127		7699		**16826**	**TOTALS**				13910		17155		**31065**
SPLIT %				54.2%		45.8%		**35.1%**	**SPLIT %**				44.8%		55.2%		**64.9%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	23,037	24,854	47,891

AM Peak Hour			6:30	8:00	**6:30**	**PM Peak Hour**			15:15	18:45	**16:00**
AM Pk Volume			1676	1326	**2812**	**PM Pk Volume**			1996	2137	**4028**
Pk Hr Factor			0.959	0.961	**0.979**	**Pk Hr Factor**			0.949	0.961	**0.967**
7 - 9 Volume	0	0	2962	2520	**5482**	**4 - 6 Volume**	0	0	3759	4059	**7818**
7 - 9 Peak Hour			7:00	8:00	**7:15**	**4 - 6 Peak Hour**			16:00	16:15	**16:00**
7 - 9 Pk Volume	0	0	1567	1326	**2766**	**4 - 6 Pk Volume**	0	0	1941	2106	**4028**
Pk Hr Factor	0.000	0.000	0.946	0.961	**0.991**	**Pk Hr Factor**	0.000	0.000	0.974	0.950	**0.967**

Prepared by NDS/ATD

VOLUME

19399 Pacific Coast Hwy & W/O Pena Rd

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18-5696-103

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	22,521	24,585	47,106

AM Period	NB		SB		EB		WB		TOTAL	
0:00					32		38		70	
0:15					50		24		74	
0:30					24		27		51	
0:45					19	125	19	108	38	233
1:00					20		20		40	
1:15					15		15		30	
1:30					11		13		24	
1:45					18	64	10	58	28	122
2:00					7		5		12	
2:15					13		6		19	
2:30					8		6		14	
2:45					9	37	4	21	13	58
3:00					12		7		19	
3:15					7		10		17	
3:30					11		14		25	
3:45					13	43	10	41	23	84
4:00					12		19		31	
4:15					28		25		53	
4:30					27		20		47	
4:45					27	94	46	110	73	204
5:00					54		58		112	
5:15					81		96		177	
5:30					106		122		228	
5:45					173	414	143	419	316	833
6:00					235		161		396	
6:15					378		265		643	
6:30					473		258		731	
6:45					481	1567	275	959	756	2526
7:00					454		268		722	
7:15					436		302		738	
7:30					356		306		662	
7:45					349	1595	319	1195	668	2790
8:00					378		316		694	
8:15					303		322		625	
8:30					371		347		718	
8:45					338	1390	341	1326	679	2716
9:00					357		266		623	
9:15					354		277		631	
9:30					318		270		588	
9:45					303	1332	286	1099	589	2431
10:00					278		293		571	
10:15					268		240		508	
10:30					321		330		651	
10:45					278	1145	272	1135	550	2280
11:00					309		253		562	
11:15					298		270		568	
11:30					293		301		594	
11:45					253	1153	296	1120	549	2273
TOTALS						8959		7591		**16550**
SPLIT %						54.1%		45.9%		**35.1%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00					300		262		562	
12:15					336		316		652	
12:30					298		272		570	
12:45					291	1225	277	1127	568	2352
13:00					294		267		561	
13:15					321		324		645	
13:30					297		255		552	
13:45					306	1218	310	1156	616	2374
14:00					318		352		670	
14:15					276		307		583	
14:30					350		446		796	
14:45					390	1334	501	1606	891	2940
15:00					406		517		923	
15:15					469		491		960	
15:30					492		456		948	
15:45					529	1896	491	1955	1020	3851
16:00					493		495		988	
16:15					471		507		978	
16:30					480		520		1000	
16:45					484	1928	557	2079	1041	4007
17:00					469		519		988	
17:15					408		497		905	
17:30					500		452		952	
17:45					414	1791	491	1959	905	3750
18:00					348		475		823	
18:15					393		440		833	
18:30					334		406		740	
18:45					429	1504	494	1815	923	3319
19:00					289		516		805	
19:15					247		545		792	
19:30					199		551		750	
19:45					196	931	442	2054	638	2985
20:00					177		377		554	
20:15					160		350		510	
20:30					141		287		428	
20:45					167	645	317	1331	484	1976
21:00					141		263		404	
21:15					168		264		432	
21:30					91		265		356	
21:45					114	514	217	1009	331	1523
22:00					71		202		273	
22:15					91		178		269	
22:30					92		143		235	
22:45					95	349	117	640	212	989
23:00					75		83		158	
23:15					74		58		132	
23:30					35		80		115	
23:45					43	227	42	263	85	490
TOTALS						13562		16994		**30556**
SPLIT %						44.4%		55.6%		**64.9%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	22,521	24,585	47,106

AM Peak Hour			6:30	8:00	**6:30**	**PM Peak Hour**			15:30	18:45	**16:00**
AM Pk Volume			1844	1326	**2947**	**PM Pk Volume**			1985	2106	**4007**
Pk Hr Factor			0.958	0.955	**0.975**	**Pk Hr Factor**			0.938	0.956	**0.962**
7 - 9 Volume	0	0	2985	2521	**5506**	**4 - 6 Volume**	0	0	3719	4038	**7757**
7 - 9 Peak Hour			7:00	8:00	**7:00**	**4 - 6 Peak Hour**			16:00	16:15	**16:00**
7 - 9 Pk Volume	0	0	1595	1326	**2790**	**4 - 6 Pk Volume**	0	0	1928	2103	**4007**
Pk Hr Factor	0.000	0.000	0.878	0.955	**0.945**	**Pk Hr Factor**	0.000	0.000	0.978	0.944	**0.962**

Prepared by NDS/ATD

VOLUME

21203 Pacific Coast Hwy E/O Rambla Pacifico St

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18-5696-203

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	22,184	24,233	46,417

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			32		41		73		12:00			333		272		605	
0:15			44		23		67		12:15			315		298		613	
0:30			24		19		43		12:30			284		257		541	
0:45			12	112	20	103	32	215	12:45			295	1227	300	1127	595	2354
1:00			19		20		39		13:00			281		272		553	
1:15			11		11		22		13:15			342		316		658	
1:30			8		11		19		13:30			276		262		538	
1:45			18	56	7	49	25	105	13:45			299	1198	313	1163	612	2361
2:00			9		9		18		14:00			290		317		607	
2:15			9		4		13		14:15			290		296		586	
2:30			7		6		13		14:30			359		439		798	
2:45			8	33	4	23	12	56	14:45			364	1303	448	1500	812	2803
3:00			13		7		20		15:00			392		538		930	
3:15			7		9		16		15:15			498		536		1034	
3:30			14		15		29		15:30			471		485		956	
3:45			11	45	9	40	20	85	15:45			499	1860	475	2034	974	3894
4:00			14		16		30		16:00			478		475		953	
4:15			21		23		44		16:15			457		487		944	
4:30			24		15		39		16:30			446		512		958	
4:45			33	92	43	97	76	189	16:45			495	1876	538	2012	1033	3888
5:00			55		49		104		17:00			444		489		933	
5:15			78		86		164		17:15			444		498		942	
5:30			110		126		236		17:30			475		475		950	
5:45			173	416	140	401	313	817	17:45			438	1801	400	1862	838	3663
6:00			256		145		401		18:00			351		432		783	
6:15			388		234		622		18:15			398		469		867	
6:30			475		262		737		18:30			366		408		774	
6:45			451	1570	275	916	726	2486	18:45			386	1501	462	1771	848	3272
7:00			453		284		737		19:00			303		468		771	
7:15			447		298		745		19:15			237		533		770	
7:30			357		303		660		19:30			206		526		732	
7:45			343	1600	315	1200	658	2800	19:45			212	958	489	2016	701	2974
8:00			340		307		647		20:00			176		332		508	
8:15			370		348		718		20:15			151		317		468	
8:30			383		328		711		20:30			130		266		396	
8:45			395	1488	340	1323	735	2811	20:45			160	617	291	1206	451	1823
9:00			350		293		643		21:00			140		227		367	
9:15			290		242		532		21:15			133		300		433	
9:30			280		323		603		21:30			87		283		370	
9:45			288	1208	288	1146	576	2354	21:45			85	445	243	1053	328	1498
10:00			283		279		562		22:00			80		204		284	
10:15			274		266		540		22:15			76		164		240	
10:30			311		291		602		22:30			85		153		238	
10:45			295	1163	354	1190	649	2353	22:45			68	309	112	633	180	942
11:00			272		270		542		23:00			65		85		150	
11:15			298		293		591		23:15			59		61		120	
11:30			289		257		546		23:30			37		72		109	
11:45			241	1100	298	1118	539	2218	23:45			45	206	32	250	77	456
TOTALS				8883		7606		**16489**	**TOTALS**				13301		16627		**29928**
SPLIT %				53.9%		46.1%		**35.5%**	**SPLIT %**				44.4%		55.6%		**64.5%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	22,184	24,233	46,417

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			6:30	8:00	**6:30**	**PM Peak Hour**			15:15	16:30	**15:15**
AM Pk Volume			1826	1323	**2945**	**PM Pk Volume**			1946	2037	**3917**
Pk Hr Factor			0.961	0.950	**0.988**	**Pk Hr Factor**			0.975	0.947	**0.947**
7 - 9 Volume	0	0	3088	2523	**5611**	**4 - 6 Volume**	0	0	3677	3874	**7551**
7 - 9 Peak Hour			7:00	8:00	**8:00**	**4 - 6 Peak Hour**			16:00	16:30	**16:00**
7 - 9 Pk Volume	0	0	1600	1323	**2811**	**4 - 6 Pk Volume**	0	0	1876	2037	**3888**
Pk Hr Factor	0.000	0.000	0.883	0.950	**0.956**	**Pk Hr Factor**	0.000	0.000	0.947	0.947	**0.941**

Prepared by NDS/ATD

VOLUME

21857 Pacific Coast Hwy E/O Carbon Canyon Rd

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18-5696-303

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	22,093	24,144	46,237

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			32		33		65		12:00			309		271		580	
0:15			44		30		74		12:15			334		291		625	
0:30			26		18		44		12:30			285		289		574	
0:45			13	115	16	97	29	212	12:45			285	1213	255	1106	540	2319
1:00			18		23		41		13:00			263		268		531	
1:15			11		13		24		13:15			341		311		652	
1:30			10		12		22		13:30			297		286		583	
1:45			15	54	9	57	24	111	13:45			294	1195	291	1156	585	2351
2:00			6		8		14		14:00			284		313		597	
2:15			9		3		12		14:15			283		331		614	
2:30			7		8		15		14:30			344		379		723	
2:45			9	31	2	21	11	52	14:45			359	1270	476	1499	835	2769
3:00			12		7		19		15:00			386		517		903	
3:15			8		4		12		15:15			505		507		1012	
3:30			11		19		30		15:30			443		485		928	
3:45			12	43	7	37	19	80	15:45			483	1817	477	1986	960	3803
4:00			13		17		30		16:00			492		475		967	
4:15			21		20		41		16:15			451		479		930	
4:30			23		18		41		16:30			463		522		985	
4:45			28	85	35	90	63	175	16:45			457	1863	524	2000	981	3863
5:00			50		49		99		17:00			479		501		980	
5:15			78		83		161		17:15			489		503		992	
5:30			105		117		222		17:30			418		403		821	
5:45			163	396	131	380	294	776	17:45			418	1804	538	1945	956	3749
6:00			250		146		396		18:00			366		433		799	
6:15			383		217		600		18:15			394		447		841	
6:30			443		247		690		18:30			369		409		778	
6:45			437	1513	253	863	690	2376	18:45			397	1526	450	1739	847	3265
7:00			451		258		709		19:00			301		468		769	
7:15			441		326		767		19:15			233		499		732	
7:30			382		303		685		19:30			220		514		734	
7:45			335	1609	306	1193	641	2802	19:45			195	949	514	1995	709	2944
8:00			349		291		640		20:00			177		343		520	
8:15			383		377		760		20:15			147		316		463	
8:30			398		325		723		20:30			137		271		408	
8:45			386	1516	331	1324	717	2840	20:45			151	612	287	1217	438	1829
9:00			355		309		664		21:00			142		231		373	
9:15			295		262		557		21:15			139		289		428	
9:30			273		328		601		21:30			86		280		366	
9:45			289	1212	286	1185	575	2397	21:45			90	457	251	1051	341	1508
10:00			294		273		567		22:00			71		190		261	
10:15			272		263		535		22:15			79		168		247	
10:30			317		317		634		22:30			71		154		225	
10:45			291	1174	332	1185	623	2359	22:45			72	293	125	637	197	930
11:00			278		294		572		23:00			71		86		157	
11:15			317		278		595		23:15			57		60		117	
11:30			295		299		594		23:30			31		55		86	
11:45			258	1148	262	1133	520	2281	23:45			39	198	47	248	86	446
TOTALS				8896		7565		**16461**	**TOTALS**				13197		16579		**29776**
SPLIT %				54.0%		46.0%		**35.6%**	**SPLIT %**				44.3%		55.7%		**64.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	22,093	24,144	46,237

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			6:30	8:15	**8:15**	**PM Peak Hour**			15:15	16:30	**16:30**
AM Pk Volume			1772	1342	**2864**	**PM Pk Volume**			1923	2050	**3938**
Pk Hr Factor			0.982	0.890	**0.942**	**Pk Hr Factor**			0.952	0.978	**0.992**
7 - 9 Volume	0	0	3125	2517	**5642**	**4 - 6 Volume**	0	0	3667	3945	**7612**
7 - 9 Peak Hour			7:00	8:00	**8:00**	**4 - 6 Peak Hour**			16:30	16:30	**16:30**
7 - 9 Pk Volume	0	0	1609	1324	**2840**	**4 - 6 Pk Volume**	0	0	1888	2050	**3938**
Pk Hr Factor	0.000	0.000	0.892	0.878	**0.934**	**Pk Hr Factor**	0.000	0.000	0.965	0.978	**0.992**

Prepared by NDS/ATD

VOLUME

25712 Pacific Coast Hwy E/O Seafood Restaurant Dwy

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18-5696-403

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	18,607	20,225	38,832

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			20		22		42		12:00			236		244		480	
0:15			15		31		46		12:15			256		247		503	
0:30			13		16		29		12:30			228		247		475	
0:45			8	56	16	85	24	141	12:45			244	964	224	962	468	1926
1:00			6		14		20		13:00			263		241		504	
1:15			5		15		20		13:15			247		224		471	
1:30			9		13		22		13:30			222		265		487	
1:45			7	27	8	50	15	77	13:45			239	971	257	987	496	1958
2:00			5		6		11		14:00			226		300		526	
2:15			9		5		14		14:15			308		326		634	
2:30			9		7		16		14:30			315		330		645	
2:45			8	31	6	24	14	55	14:45			381	1230	438	1394	819	2624
3:00			4		2		6		15:00			447		456		903	
3:15			7		3		10		15:15			524		505		1029	
3:30			8		11		19		15:30			537		483		1020	
3:45			12	31	10	26	22	57	15:45			433	1941	529	1973	962	3914
4:00			19		6		25		16:00			516		529		1045	
4:15			18		13		31		16:15			481		492		973	
4:30			22		15		37		16:30			497		491		988	
4:45			35	94	20	54	55	148	16:45			425	1919	522	2034	947	3953
5:00			51		23		74		17:00			371		512		883	
5:15			74		50		124		17:15			339		452		791	
5:30			95		60		155		17:30			347		450		797	
5:45			143	363	78	211	221	574	17:45			402	1459	449	1863	851	3322
6:00			179		90		269		18:00			375		478		853	
6:15			191		138		329		18:15			362		466		828	
6:30			275		154		429		18:30			396		399		795	
6:45			293	938	205	587	498	1525	18:45			301	1434	390	1733	691	3167
7:00			286		176		462		19:00			276		372		648	
7:15			284		201		485		19:15			226		380		606	
7:30			341		205		546		19:30			189		332		521	
7:45			300	1211	197	779	497	1990	19:45			133	824	387	1471	520	2295
8:00			318		165		483		20:00			124		326		450	
8:15			275		184		459		20:15			109		247		356	
8:30			302		196		498		20:30			90		213		303	
8:45			287	1182	208	753	495	1935	20:45			84	407	209	995	293	1402
9:00			259		176		435		21:00			70		230		300	
9:15			254		196		450		21:15			63		221		284	
9:30			269		185		454		21:30			38		174		212	
9:45			297	1079	208	765	505	1844	21:45			37	208	243	868	280	1076
10:00			260		201		461		22:00			33		153		186	
10:15			239		187		426		22:15			43		154		197	
10:30			219		200		419		22:30			42		140		182	
10:45			246	964	240	828	486	1792	22:45			39	157	110	557	149	714
11:00			241		261		502		23:00			40		78		118	
11:15			244		236		480		23:15			21		69		90	
11:30			245		239		484		23:30			24		44		68	
11:45			268	998	259	995	527	1993	23:45			34	119	40	231	74	350
TOTALS				6974		5157		**12131**	**TOTALS**				11633		15068		**26701**
SPLIT %				57.5%		42.5%		**31.2%**	**SPLIT %**				43.6%		56.4%		**68.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	18,607	20,225	38,832

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			7:15	11:45	**7:15**	**PM Peak Hour**			15:15	15:15	**15:15**
AM Pk Volume			1243	997	**2011**	**PM Pk Volume**			2010	2046	**4056**
Pk Hr Factor			0.911	0.962	**0.921**	**Pk Hr Factor**			0.936	0.967	**0.970**
7 - 9 Volume	0	0	2393	1532	**3925**	**4 - 6 Volume**	0	0	3378	3897	**7275**
7 - 9 Peak Hour			7:15	7:00	**7:15**	**4 - 6 Peak Hour**			16:00	16:00	**16:00**
7 - 9 Pk Volume	0	0	1243	779	**2011**	**4 - 6 Pk Volume**	0	0	1919	2034	**3953**
Pk Hr Factor	0.000	0.000	0.911	0.950	**0.921**	**Pk Hr Factor**	0.000	0.000	0.930	0.961	**0.946**

Prepared by NDS/ATD

VOLUME

27519 Pacific Coast Hwy W/O Escondido Beach Rd

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18-5696-503

	NB	SB	EB	WB	Total
DAILY TOTALS	0	0	17,489	19,128	36,617

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00					15		26		41		**12:00**					212		212		424	
0:15					15		28		43		**12:15**					210		211		421	
0:30					12		12		24		**12:30**					224		214		438	
0:45					7	49	10	76	17	125	**12:45**					207	853	219	856	426	1709
1:00					4		15		19		**13:00**					239		237		476	
1:15					4		12		16		**13:15**					216		196		412	
1:30					8		11		19		**13:30**					215		253		468	
1:45					6	22	7	45	13	67	**13:45**					202	872	232	918	434	1790
2:00					7		7		14		**14:00**					210		271		481	
2:15					11		5		16		**14:15**					251		311		562	
2:30					8		5		13		**14:30**					325		315		640	
2:45					6	32	1	18	7	50	**14:45**					358	1144	402	1299	760	2443
3:00					5		2		7		**15:00**					435		458		893	
3:15					3		4		7		**15:15**					520		487		1007	
3:30					8		8		16		**15:30**					488		485		973	
3:45					8	24	7	21	15	45	**15:45**					428	1871	501	1931	929	3802
4:00					17		2		19		**16:00**					470		490		960	
4:15					14		14		28		**16:15**					496		437		933	
4:30					19		13		32		**16:30**					460		546		1006	
4:45					26	76	12	41	38	117	**16:45**					412	1838	514	1987	926	3825
5:00					48		20		68		**17:00**					340		485		825	
5:15					69		43		112		**17:15**					367		430		797	
5:30					91		54		145		**17:30**					360		459		819	
5:45					123	331	66	183	189	514	**17:45**					344	1411	443	1817	787	3228
6:00					165		97		262		**18:00**					378		482		860	
6:15					194		121		315		**18:15**					370		444		814	
6:30					285		147		432		**18:30**					346		395		741	
6:45					274	918	186	551	460	1469	**18:45**					303	1397	370	1691	673	3088
7:00					286		176		462		**19:00**					245		354		599	
7:15					276		171		447		**19:15**					220		377		597	
7:30					336		234		570		**19:30**					168		324		492	
7:45					298	1196	175	756	473	1952	**19:45**					114	747	337	1392	451	2139
8:00					302		170		472		**20:00**					111		346		457	
8:15					254		174		428		**20:15**					103		230		333	
8:30					276		183		459		**20:30**					83		193		276	
8:45					260	1092	196	723	456	1815	**20:45**					78	375	186	955	264	1330
9:00					274		179		453		**21:00**					64		206		270	
9:15					224		168		392		**21:15**					48		204		252	
9:30					266		169		435		**21:30**					49		192		241	
9:45					254	1018	184	700	438	1718	**21:45**					29	190	226	828	255	1018
10:00					245		195		440		**22:00**					37		143		180	
10:15					201		178		379		**22:15**					42		135		177	
10:30					213		158		371		**22:30**					34		133		167	
10:45					217	876	223	754	440	1630	**22:45**					40	153	113	524	153	677
11:00					236		214		450		**23:00**					30		74		104	
11:15					227		198		425		**23:15**					15		60		75	
11:30					227		208		435		**23:30**					17		42		59	
11:45					229	919	231	851	460	1770	**23:45**					23	85	35	211	58	296
TOTALS						6553		4719		**11272**	**TOTALS**						10936		14409		**25345**
SPLIT %						58.1%		41.9%		**30.8%**	**SPLIT %**						43.1%		56.9%		**69.2%**

	NB	SB	EB	WB	Total
DAILY TOTALS	0	0	17,489	19,128	36,617

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			7:15	11:45	**7:15**	**PM Peak Hour**			15:15	16:00	**15:15**
AM Pk Volume			1212	868	**1962**	**PM Pk Volume**			1906	1987	**3869**
Pk Hr Factor			0.902	0.939	**0.861**	**Pk Hr Factor**			0.916	0.910	**0.961**
7 - 9 Volume	0	0	2288	1479	**3767**	**4 - 6 Volume**	0	0	3249	3804	**7053**
7 - 9 Peak Hour			7:15	7:00	**7:15**	**4 - 6 Peak Hour**			16:00	16:00	**16:00**
7 - 9 Pk Volume	0	0	1212	756	**1962**	**4 - 6 Pk Volume**	0	0	1838	1987	**3825**
Pk Hr Factor	0.000	0.000	0.902	0.808	**0.861**	**Pk Hr Factor**	0.000	0.000	0.926	0.910	**0.951**

Prepared by NDS/ATD

VOLUME

29497 Pacific Coast Hwy W/O Westward Beach Rd

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18-5696-603

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,308	14,903	28,211

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			13		10		23		12:00			224		208		432	
0:15			10		13		23		12:15			190		193		383	
0:30			6		19		25		12:30			204		194		398	
0:45			5	34	10	52	15	86	12:45			184	802	215	810	399	1612
1:00			4		9		13		13:00			189		182		371	
1:15			4		8		12		13:15			236		209		445	
1:30			6		9		15		13:30			202		183		385	
1:45			8	22	8	34	16	56	13:45			188	815	207	781	395	1596
2:00			6		2		8		14:00			180		195		375	
2:15			8		4		12		14:15			204		225		429	
2:30			6		4		10		14:30			227		262		489	
2:45			7	27	2	12	9	39	14:45			249	860	294	976	543	1836
3:00			5		1		6		15:00			303		368		671	
3:15			3		1		4		15:15			442		354		796	
3:30			9		3		12		15:30			329		400		729	
3:45			7	24	5	10	12	34	15:45			285	1359	374	1496	659	2855
4:00			8		1		9		16:00			243		329		572	
4:15			12		5		17		16:15			281		285		566	
4:30			16		6		22		16:30			280		344		624	
4:45			23	59	8	20	31	79	16:45			273	1077	409	1367	682	2444
5:00			34		17		51		17:00			200		390		590	
5:15			64		24		88		17:15			220		389		609	
5:30			73		39		112		17:30			215		343		558	
5:45			91	262	69	149	160	411	17:45			207	842	311	1433	518	2275
6:00			149		66		215		18:00			214		311		525	
6:15			144		99		243		18:15			204		307		511	
6:30			193		114		307		18:30			216		264		480	
6:45			203	689	136	415	339	1104	18:45			184	818	254	1136	438	1954
7:00			215		148		363		19:00			127		234		361	
7:15			206		163		369		19:15			133		221		354	
7:30			252		287		539		19:30			78		221		299	
7:45			285	958	292	890	577	1848	19:45			75	413	197	873	272	1286
8:00			319		201		520		20:00			76		209		285	
8:15			257		165		422		20:15			77		186		263	
8:30			218		170		388		20:30			84		144		228	
8:45			259	1053	162	698	421	1751	20:45			57	294	124	663	181	957
9:00			227		187		414		21:00			56		94		150	
9:15			225		157		382		21:15			56		115		171	
9:30			217		167		384		21:30			37		117		154	
9:45			223	892	156	667	379	1559	21:45			32	181	105	431	137	612
10:00			200		173		373		22:00			27		139		166	
10:15			203		173		376		22:15			31		86		117	
10:30			207		159		366		22:30			33		73		106	
10:45			192	802	160	665	352	1467	22:45			26	117	84	382	110	499
11:00			217		186		403		23:00			24		68		92	
11:15			199		175		374		23:15			18		48		66	
11:30			179		186		365		23:30			11		39		50	
11:45			240	835	213	760	453	1595	23:45			20	73	28	183	48	256
TOTALS				5657		4372		**10029**	**TOTALS**				7651		10531		**18182**
SPLIT %				56.4%		43.6%		**35.5%**	**SPLIT %**				42.1%		57.9%		**64.5%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,308	14,903	28,211

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			7:30	7:30	**7:30**	**PM Peak Hour**			15:00	16:30	**15:00**
AM Pk Volume			1113	945	**2058**	**PM Pk Volume**			1359	1532	**2855**
Pk Hr Factor			0.872	0.809	**0.892**	**Pk Hr Factor**			0.769	0.936	**0.897**
7 - 9 Volume	0	0	2011	1588	**3599**	**4 - 6 Volume**	0	0	1919	2800	**4719**
7 - 9 Peak Hour			7:30	7:30	**7:30**	**4 - 6 Peak Hour**			16:00	16:30	**16:30**
7 - 9 Pk Volume	0	0	1113	945	**2058**	**4 - 6 Pk Volume**	0	0	1077	1532	**2505**
Pk Hr Factor	0.000	0.000	0.872	0.809	**0.892**	**Pk Hr Factor**	0.000	0.000	0.958	0.936	**0.918**

Prepared by NDS/ATD

VOLUME

30626 Pacific Coast Hwy E/O Trancas Canyon Rd

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18-5696-703

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,614	12,537	23,151

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			8		11		19		**12:00**			153		155		308	
0:15			5		17		22		**12:15**			152		183		335	
0:30			4		8		12		**12:30**			155		170		325	
0:45			6	23	9	45	15	68	**12:45**			151	611	153	661	304	1272
1:00			6		5		11		**13:00**			162		154		316	
1:15			4		7		11		**13:15**			144		158		302	
1:30			3		10		13		**13:30**			148		149		297	
1:45			7	20	4	26	11	46	**13:45**			144	598	154	615	298	1213
2:00			6		2		8		**14:00**			141		173		314	
2:15			6		3		9		**14:15**			159		194		353	
2:30			7		3		10		**14:30**			208		235		443	
2:45			7	26	1	9	8	35	**14:45**			185	693	241	843	426	1536
3:00			2		1		3		**15:00**			249		338		587	
3:15			4		3		7		**15:15**			252		354		606	
3:30			6		4		10		**15:30**			216		368		584	
3:45			8	20	2	10	10	30	**15:45**			195	912	339	1399	534	2311
4:00			8		1		9		**16:00**			202		290		492	
4:15			12		5		17		**16:15**			217		277		494	
4:30			16		7		23		**16:30**			208		348		556	
4:45			32	68	7	20	39	88	**16:45**			177	804	363	1278	540	2082
5:00			45		13		58		**17:00**			155		367		522	
5:15			54		11		65		**17:15**			172		349		521	
5:30			91		20		111		**17:30**			171		325		496	
5:45			121	311	31	75	152	386	**17:45**			174	672	294	1335	468	2007
6:00			139		36		175		**18:00**			166		262		428	
6:15			179		71		250		**18:15**			160		271		431	
6:30			193		99		292		**18:30**			158		236		394	
6:45			201	712	97	303	298	1015	**18:45**			130	614	230	999	360	1613
7:00			228		98		326		**19:00**			88		212		300	
7:15			205		93		298		**19:15**			82		185		267	
7:30			276		117		393		**19:30**			64		208		272	
7:45			263	972	177	485	440	1457	**19:45**			61	295	170	775	231	1070
8:00			221		131		352		**20:00**			54		193		247	
8:15			193		147		340		**20:15**			46		136		182	
8:30			229		131		360		**20:30**			35		110		145	
8:45			191	834	125	534	316	1368	**20:45**			48	183	117	556	165	739
9:00			173		117		290		**21:00**			48		88		136	
9:15			173		94		267		**21:15**			32		106		138	
9:30			194		139		333		**21:30**			26		113		139	
9:45			185	725	116	466	301	1191	**21:45**			20	126	102	409	122	535
10:00			155		140		295		**22:00**			18		101		119	
10:15			136		125		261		**22:15**			14		72		86	
10:30			149		126		275		**22:30**			56		126		182	
10:45			165	605	146	537	311	1142	**22:45**			18	106	65	364	83	470
11:00			153		146		299		**23:00**			18		54		72	
11:15			164		152		316		**23:15**			7		41		48	
11:30			161		177		338		**23:30**			7		27		34	
11:45			161	639	172	647	333	1286	**23:45**			13	45	24	146	37	191
TOTALS				4955		3157		**8112**	**TOTALS**				5659		9380		**15039**
SPLIT %				61.1%		38.9%		**35.0%**	**SPLIT %**				37.6%		62.4%		**65.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,614	12,537	23,151

AM Peak Hour			7:00	11:30	**7:30**	**PM Peak Hour**			15:00	16:30	**15:00**
AM Pk Volume			972	687	**1525**	**PM Pk Volume**			912	1427	**2311**
Pk Hr Factor			0.880	0.939	**0.866**	**Pk Hr Factor**			0.905	0.972	**0.953**
7 - 9 Volume	0	0	1806	1019	**2825**	**4 - 6 Volume**	0	0	1476	2613	**4089**
7 - 9 Peak Hour			7:00	7:45	**7:30**	**4 - 6 Peak Hour**			16:00	16:30	**16:30**
7 - 9 Pk Volume	0	0	972	586	**1525**	**4 - 6 Pk Volume**	0	0	804	1427	**2139**
Pk Hr Factor	0.000	0.000	0.880	0.828	**0.866**	**Pk Hr Factor**	0.000	0.000	0.926	0.972	**0.962**

Prepared by NDS/ATD

VOLUME

Fernwood pacific Dr Tank W/O Bainum Dr

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18_5697_004A

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	459	530	989

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			11		3		14	
00:15			2		0		2		12:15			9		6		15	
00:30			0		1		1		12:30			8		6		14	
00:45			0	2	1	2	1	4	12:45			6	34	14	29	20	63
01:00			0		0		0		13:00			5		5		10	
01:15			0		0		0		13:15			7		5		12	
01:30			0		0		0		13:30			4		12		16	
01:45			0		0		0		13:45			8	24	16	38	24	62
02:00			0		0		0		14:00			12		7		19	
02:15			0		0		0		14:15			7		7		14	
02:30			0		1		1		14:30			19		9		28	
02:45			0		0	1	0	1	14:45			7	45	13	36	20	81
03:00			0		1		1		15:00			7		9		16	
03:15			0		1		1		15:15			6		9		15	
03:30			0		0		0		15:30			16		9		25	
03:45			1	1	0	2	1	3	15:45			6	35	11	38	17	73
04:00			0		0		0		16:00			7		12		19	
04:15			0		0		0		16:15			4		10		14	
04:30			0		0		0		16:30			16		7		23	
04:45			0		0		0		16:45			5	32	10	39	15	71
05:00			2		0		2		17:00			12		12		24	
05:15			1		0		1		17:15			12		16		28	
05:30			2		0		2		17:30			7		12		19	
05:45			1	6	1	1	2	7	17:45			6	37	6	46	12	83
06:00			3		0		3		18:00			4		13		17	
06:15			6		1		7		18:15			7		4		11	
06:30			5		2		7		18:30			9		15		24	
06:45			6	20	8	11	14	31	18:45			6	26	5	37	11	63
07:00			5		7		12		19:00			5		10		15	
07:15			11		9		20		19:15			7		6		13	
07:30			8		10		18		19:30			5		7		12	
07:45			10	34	5	31	15	65	19:45			1	18	9	32	10	50
08:00			8		9		17		20:00			5		10		15	
08:15			4		9		13		20:15			2		8		10	
08:30			9		9		18		20:30			3		8		11	
08:45			9	30	11	38	20	68	20:45			3	13	3	29	6	42
09:00			5		14		19		21:00			0		4		4	
09:15			8		6		14		21:15			1		5		6	
09:30			6		7		13		21:30			0		3		3	
09:45			10	29	9	36	19	65	21:45			1	2	5	17	6	19
10:00			4		1		5		22:00			1		1		2	
10:15			8		9		17		22:15			1		2		3	
10:30			7		6		13		22:30			0		2		2	
10:45			5	24	11	27	16	51	22:45			1	3	3	8	4	11
11:00			14		7		21		23:00			0		0		0	
11:15			10		4		14		23:15			0		2		2	
11:30			11		8		19		23:30			0		3		3	
11:45			9	44	7	26	16	70	23:45			0		1	6	1	6
TOTALS				190		175		**365**	**TOTALS**				269		355		**624**
SPLIT %				52.1%		47.9%		**36.9%**	**SPLIT %**				43.1%		56.9%		**63.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	459	530	989

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			11:00	08:15	**08:30**	**PM Peak Hour**			13:45	16:45	**16:30**
AM Pk Volume			44	43	**71**	**PM Pk Volume**			46	50	**90**
Pk Hr Factor			0.786	0.768	**0.888**	**Pk Hr Factor**			0.605	0.781	**0.804**
7 - 9 Volume	0	0	64	69	**133**	**4 - 6 Volume**	0	0	69	85	**154**
7 - 9 Peak Hour			07:15	08:00	**07:15**	**4 - 6 Peak Hour**			16:30	16:45	**16:30**
7 - 9 Pk Volume	0	0	37	38	**70**	**4 - 6 Pk Volume**	0	0	45	50	**90**
Pk Hr Factor	0.000	0.000	0.841	0.864	**0.875**	**Pk Hr Factor**	0.000	0.000	0.703	0.781	**0.804**

Prepared by National Data & Surveying Services

Zumirez Dr & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-5.1A
City: Malibu

Day: Tuesday
Date: 10/23/2018

PEAK HOURS	COUNT PERIODS
07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NONE	NONE
04:15 PM - 05:15 PM	04:00 PM - 06:00 PM

Zumirez Dr
SOUTHBOUND

	↲	↓	↳	U	⇧
AM	10	0	4	0	5
NOON	0	0	0	0	0
PM	6	4	10	0	23
	0	1	0	0	

Pacific Coast Hwy
EASTBOUND

	AM	NOON	PM	
⇦	792	0	2026	
U	4	0	6	0
↰	3	0	5	1
→	1147	0	1513	2
↴	49	0	20	1

Pacific Coast Hwy
WESTBOUND

		PM	NOON	AM
0	↰	15	0	1
2	←	1987	0	723
1	↲	113	0	68
0	U	2	0	4
	⇨	1624	0	1216

NORTHBOUND
Zumirez Dr

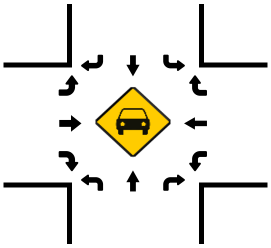
	⇩	U	↰	↑	↱
		0	0.5	0.5	1
PM	137	0	27	3	99
NOON	0	0	0	0	0
AM	117	0	55	1	61

CONTROL

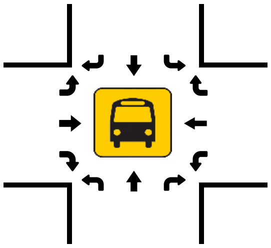
Signalized

	AM	NOON	PM
TEV	2130	0	3810
PHF	0.87		0.93

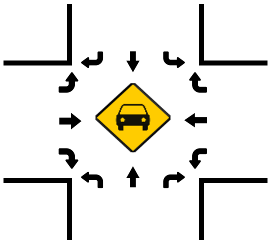
Total Vehicles (AM)



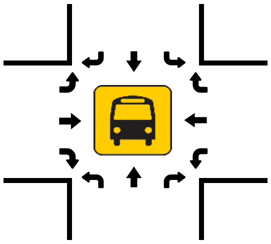
Total Vehicles (AM)



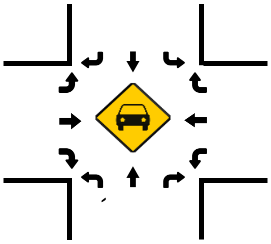
Total Vehicles (NOON)



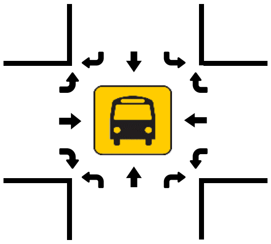
Total Vehicles (NOON)



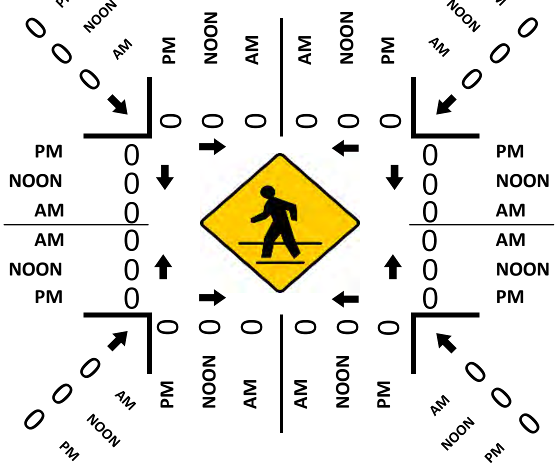
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Crosswalk	PM	NOON	AM	AM	NOON	PM
North	0	0	0	0	0	0
West	0	0	0	0	0	0
East	0	0	0	0	0	0
South	0	0	0	0	0	0

Corner	PM	NOON	AM
Northwest	0	0	0
Northeast	0	0	0
Southwest	0	0	0
Southeast	0	0	0

Prepared by National Data & Surveying Services

Paradise Cove Rd & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-5.1B
City: Malibu

Day: Tuesday
Date: 10/23/2018

PEAK HOURS	
AM	07:15 AM - 08:15 AM
NOON	NONE
PM	04:15 PM - 05:15 PM

COUNT PERIODS	
AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Paradise Cove Rd
SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	0	0	0	0	0
	0	0	0	0	

Pacific Coast Hwy
EASTBOUND

		AM	NOON	PM
⇦		755	0	2105
↶	0	0	0	0
↱	0	0	0	0
→	2	1205	0	1579
↴	0	24	0	37

Pacific Coast Hwy
WESTBOUND

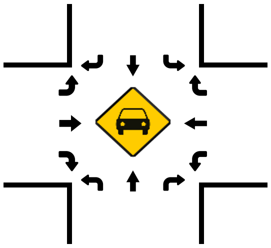
		PM	NOON	AM
↰	0	0	0	0
←	2	2063	0	724
↙	1	39	0	20
↶	0	0	0	0
⇨		1628	0	1232

CONTROL			
Signalized			
TEV	2031	0	3809
	AM	NOON	PM
PHF	0.89		0.92

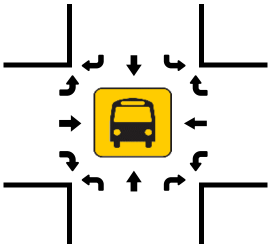
NORTHBOUND
Paradise Cove Rd

	⇩	↶	↰	↑	↱
		0	0	1	0
PM	76	0	42	0	49
NOON	0	0	0	0	0
AM	44	0	31	0	27

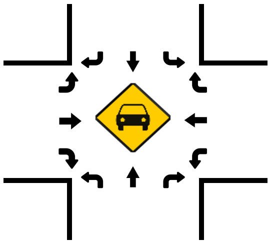
Total Vehicles (AM)



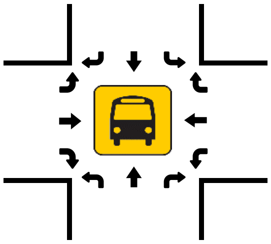
Total Vehicles (AM)



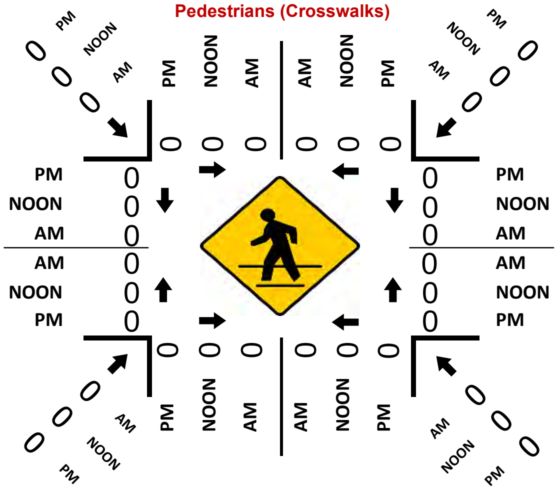
Total Vehicles (NOON)



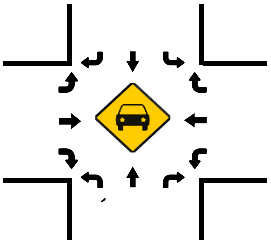
Total Vehicles (NOON)



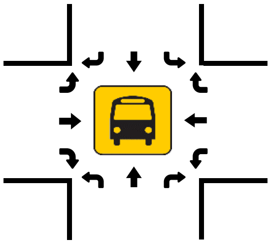
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



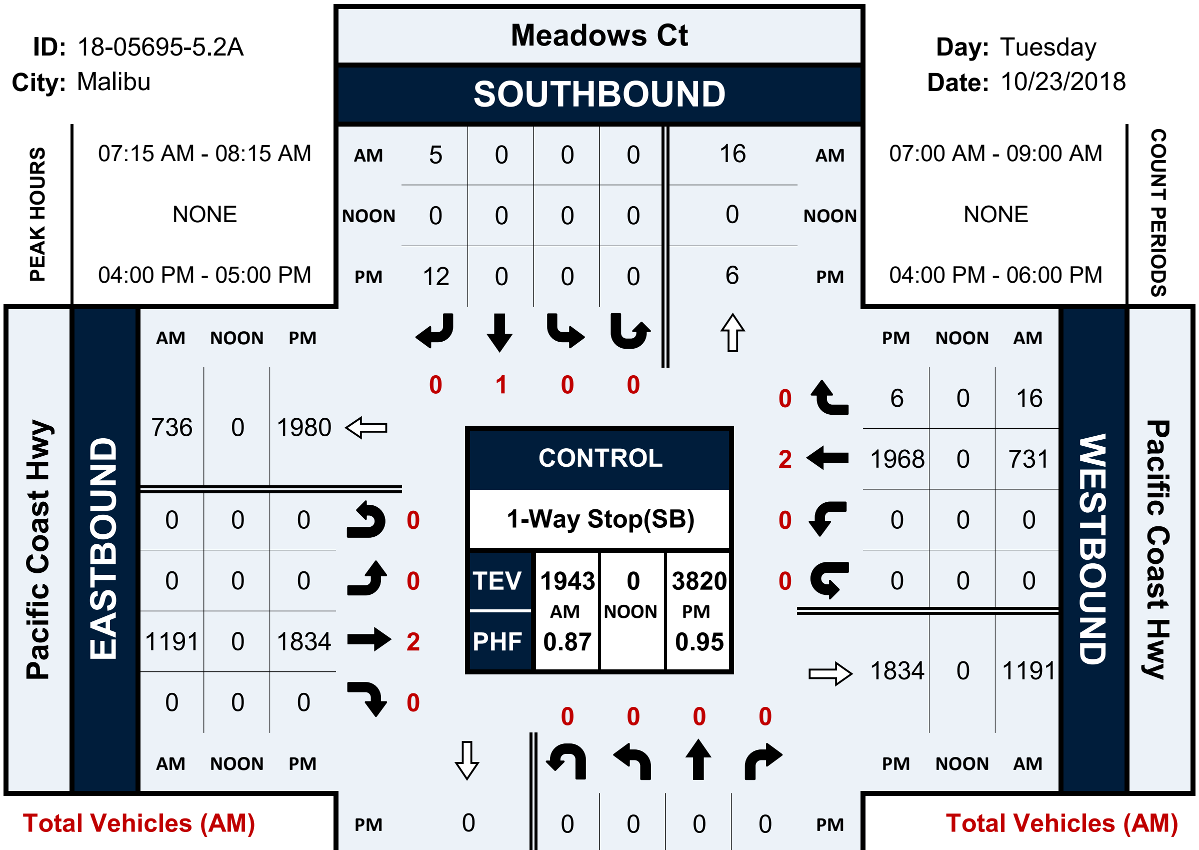
Prepared by National Data & Surveying Services

Meadows Ct & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-5.2A
City: Malibu

Day: Tuesday
Date: 10/23/2018



PEAK HOURS
07:15 AM - 08:15 AM
NONE
04:00 PM - 05:00 PM

COUNT PERIODS
07:00 AM - 09:00 AM
NONE
04:00 PM - 06:00 PM

Meadows Ct
SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	5	0	0	0	16
NOON	0	0	0	0	0
PM	12	0	0	0	6
	0	1	0	0	

Pacific Coast Hwy
EASTBOUND

	AM	NOON	PM	
⇦	736	0	1980	
↶	0	0	0	0
↱	0	0	0	0
→	1191	0	1834	2
↴	0	0	0	0

Pacific Coast Hwy
WESTBOUND

		PM	NOON	AM
↰	0	6	0	16
←	2	1968	0	731
↲	0	0	0	0
↷	0	0	0	0
⇨		1834	0	1191

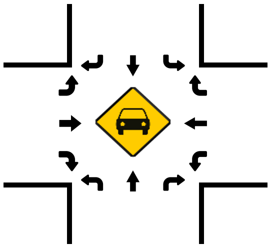
NORTHBOUND
Meadows Ct

	⇩	↶	↰	↑	↱
		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

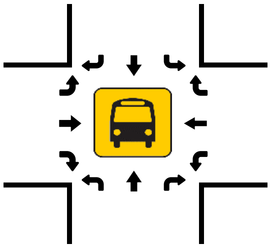
CONTROL
1-Way Stop(SB)

	AM	NOON	PM
TEV	1943	0	3820
PHF	0.87		0.95

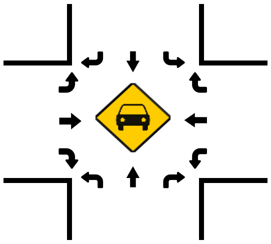
Total Vehicles (AM)



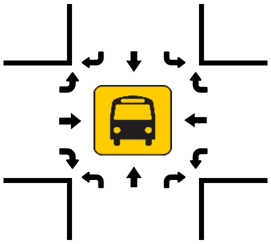
Total Vehicles (AM)



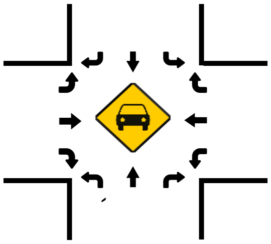
Total Vehicles (NOON)



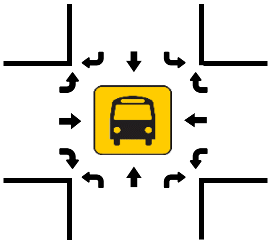
Total Vehicles (NOON)



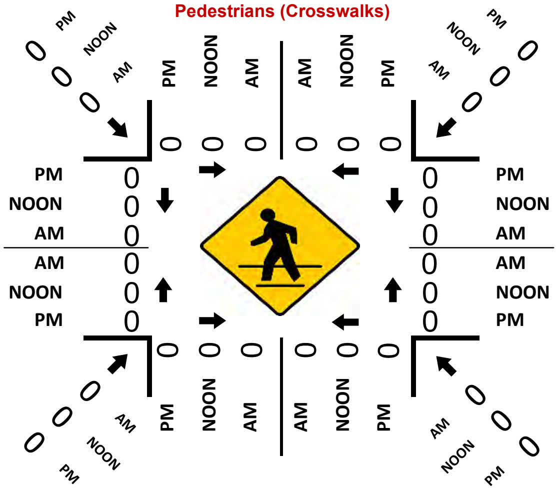
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



	PM	NOON	AM	AM	NOON	PM
North	0	0	0	0	0	0
West	0	0	0	0	0	0
East	0	0	0	0	0	0
South	0	0	0	0	0	0

	PM	NOON	AM
↘	0	0	0
↙	0	0	0
↗	0	0	0
↖	0	0	0

Prepared by National Data & Surveying Services

Winding Way & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-5.2B
City: Malibu

Day: Tuesday
Date: 10/23/2018

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Winding Way
SOUTHBOUND

	↲	↓	↳	U	⇧
AM	13	0	6	0	20
NOON	0	0	0	0	0
PM	11	0	18	0	22
	0	1	0	0	

Pacific Coast Hwy
EASTBOUND

	AM	NOON	PM	
⇦	731	0	1889	
↶	0	0	2	0
↱	6	0	3	1
→	1187	0	1788	2
↴	0	0	0	0

Pacific Coast Hwy
WESTBOUND

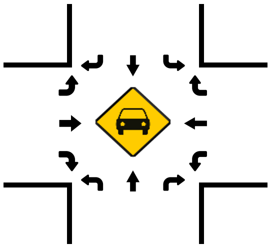
		PM	NOON	AM
0	↰	19	0	14
2	←	1876	0	718
0	↲	0	0	0
0	↷	0	0	0
	⇨	1806	0	1193

CONTROL			
1-Way Stop(SB)			
TEV	1944 AM	0 NOON	3717 PM
PHF	0.94		0.87

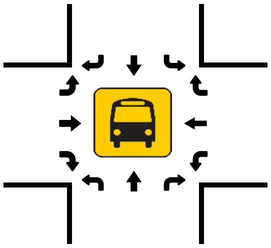
NORTHBOUND
Winding Way

	⇩	↶	↰	↑	↱
		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

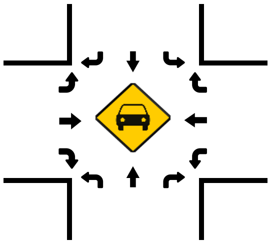
Total Vehicles (AM)



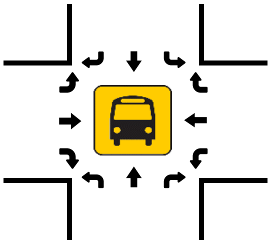
Total Vehicles (AM)



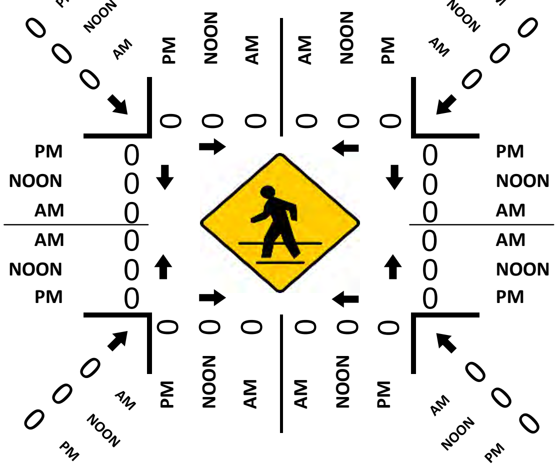
Total Vehicles (NOON)



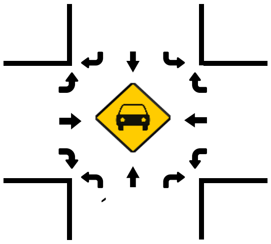
Total Vehicles (NOON)



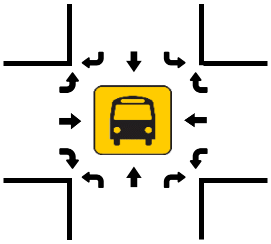
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

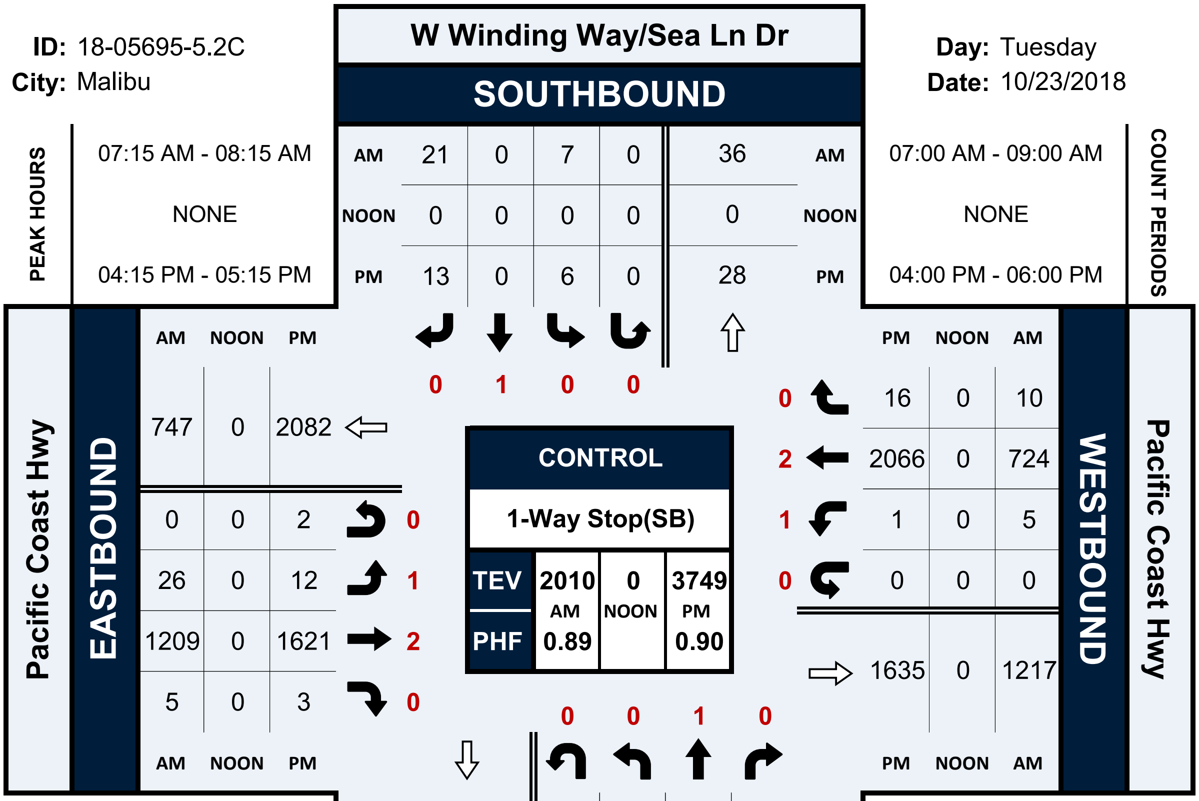
W Winding Way/Sea Ln Dr & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-5.2C
City: Malibu

Day: Tuesday
Date: 10/23/2018

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:15 PM - 05:15 PM	04:00 PM - 06:00 PM



W Winding Way/Sea Ln Dr — SOUTHBOUND

AM	21	0	7	0	36
NOON	0	0	0	0	0
PM	13	0	6	0	28
	0	1	0	0	

Pacific Coast Hwy — EASTBOUND

	AM	NOON	PM
	747	0	2082
0	0	0	2
1	26	0	12
2	1209	0	1621
0	5	0	3

Pacific Coast Hwy — WESTBOUND

	PM	NOON	AM
0	16	0	10
2	2066	0	724
1	1	0	5
0	0	0	0
	1635	0	1217

CONTROL

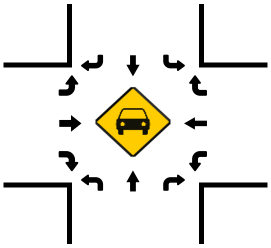
1-Way Stop(SB)

	AM	NOON	PM
TEV	2010	0	3749
PHF	0.89		0.90

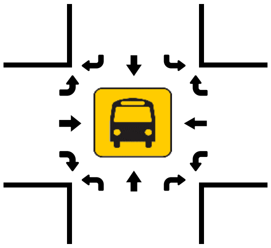
NORTHBOUND — W Winding Way/Sea Ln Dr

		0	0	1	0
PM	4	0	1	0	8
NOON	0	0	0	0	0
AM	10	0	2	0	1

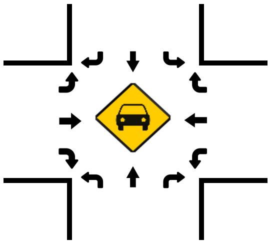
Total Vehicles (AM)



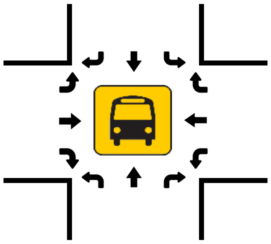
Total Vehicles (AM)



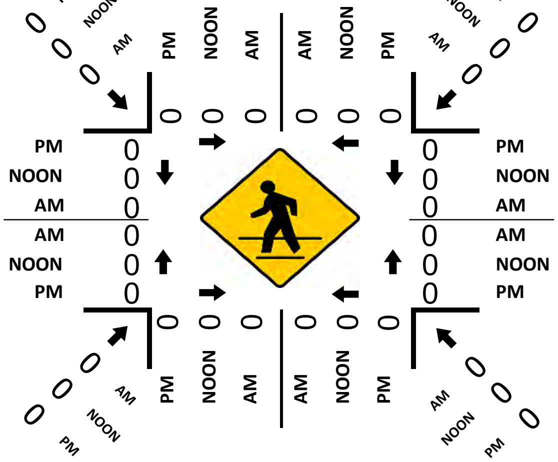
Total Vehicles (NOON)



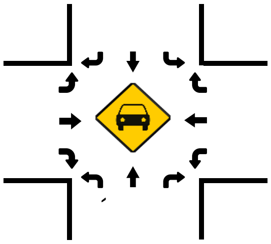
Total Vehicles (NOON)



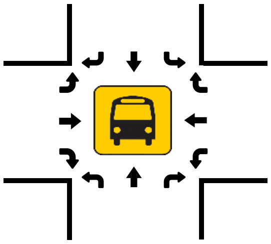
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Zuma View Pl & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-5.2D
City: Malibu

Day: Tuesday
Date: 10/23/2018

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:15 PM - 05:15 PM	04:00 PM - 06:00 PM

Zuma View Pl

SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	13	0	10	0	4
NOON	0	0	0	0	0
PM	15	0	7	0	21
	0	1	0	0	

Pacific Coast Hwy

EASTBOUND

	AM	NOON	PM	
⇦	793	0	2099	
↶	1	0	2	0
↰	3	0	12	1
→	1186	0	1603	2
↴	8	0	2	0

Pacific Coast Hwy

WESTBOUND

		PM	NOON	AM
↰	1	9	0	1
←	2	2082	0	776
↙	1	4	0	0
↶	0	2	0	5
⇨		1617	0	1203

CONTROL

2-Way Stop(NB/SB)

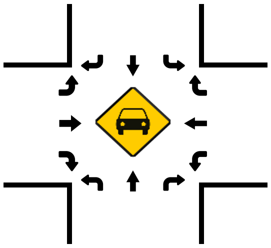
	AM	NOON	PM
TEV	**2008**	**0**	**3743**
PHF	**0.90**		**0.91**

Zuma View Pl

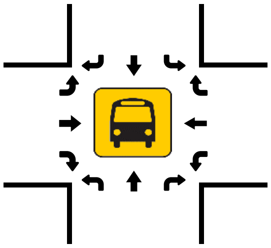
NORTHBOUND

	⇩	↶	↰	↑	↱
		0	0	1	0
PM	6	0	0	0	5
NOON	0	0	0	0	0
AM	8	0	3	0	2

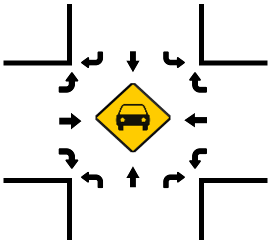
Total Vehicles (AM)



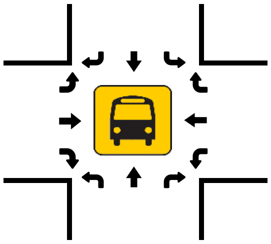
Total Vehicles (AM)



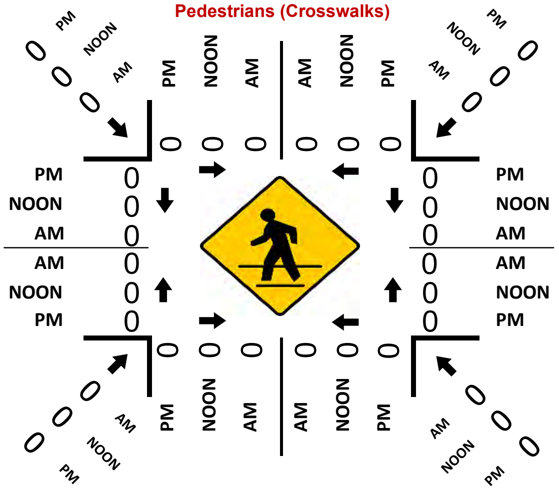
Total Vehicles (NOON)



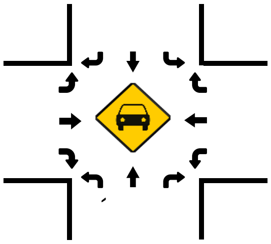
Total Vehicles (NOON)



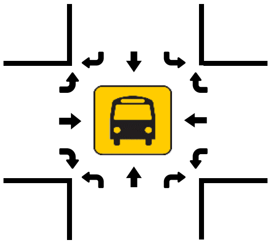
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Ramirez Mesa Rd & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-5.2E
City: Malibu

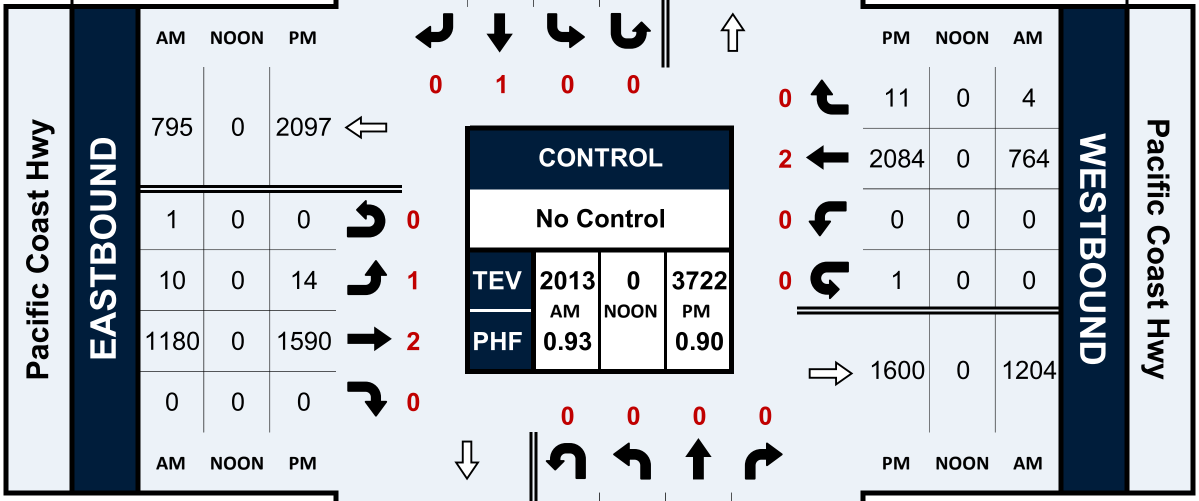
Day: Tuesday
Date: 10/23/2018

PEAK HOURS	COUNT PERIODS
07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NONE	NONE
04:15 PM - 05:15 PM	04:00 PM - 06:00 PM

Ramirez Mesa Rd

SOUTHBOUND

	↲	↓	↳	⮌	⇧	
AM	30	0	24	0	14	AM
NOON	0	0	0	0	0	NOON
PM	13	0	9	0	25	PM
	0	1	0	0		



Pacific Coast Hwy

EASTBOUND

	AM	NOON	PM	
⇦	795	0	2097	
⮌	1	0	0	0
↱	10	0	14	1
→	1180	0	1590	2
↴	0	0	0	0

CONTROL

No Control

	AM	NOON	PM
TEV	2013	0	3722
PHF	0.93		0.90

Pacific Coast Hwy

WESTBOUND

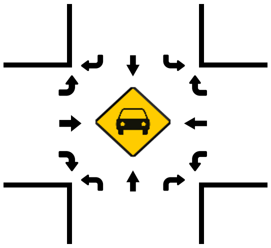
	PM	NOON	AM
0 ↰	11	0	4
2 ←	2084	0	764
0 ↲	0	0	0
0 ⮎	1	0	0
⇨	1600	0	1204

NORTHBOUND

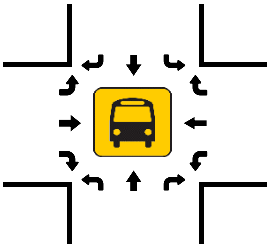
Ramirez Mesa Rd

	⇩	⮍	↰	↑	↱	
		0	0	0	0	
PM	0	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

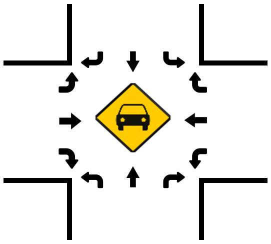
Total Vehicles (AM)



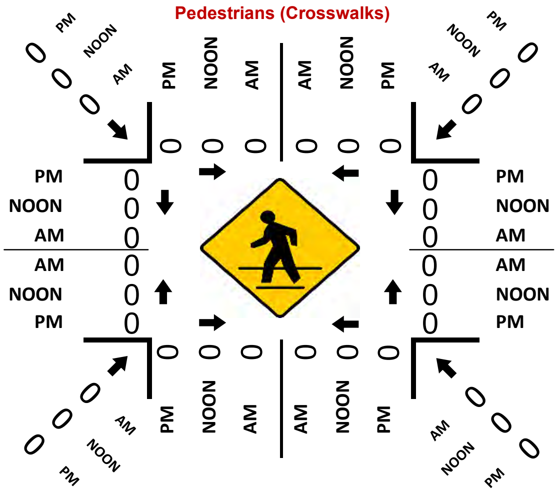
Total Vehicles (AM)



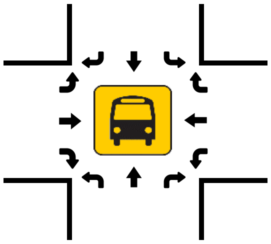
Total Vehicles (NOON)



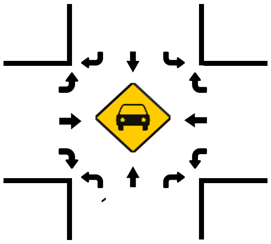
Pedestrians (Crosswalks)



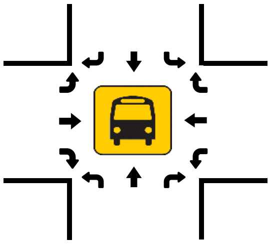
Total Vehicles (NOON)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Carbon Canyon Rd & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-6.1A
City: Malibu

Day: Tuesday
Date: 10/23/2018

	PEAK HOURS	COUNT PERIODS
AM	08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Carbon Canyon Rd
SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	14	0	8	0	16
NOON	0	0	0	0	0
PM	3	0	4	0	4
	0	1	0	0	

Pacific Coast Hwy
EASTBOUND

	AM	NOON	PM	
⇦	1349	0	2054	
↶	0	0	0	0
↱	12	0	2	1
→	1490	0	1892	2
↴	0	0	0	0

Pacific Coast Hwy
WESTBOUND

		PM	NOON	AM
↰	1	2	0	4
←	2	2051	0	1335
↲	0	0	0	0
↷	0	0	0	0
⇨		1896	0	1498

CONTROL

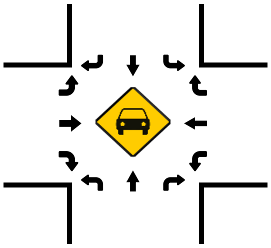
Signalized

	AM	NOON	PM
TEV	2863	0	3954
PHF	0.93		0.98

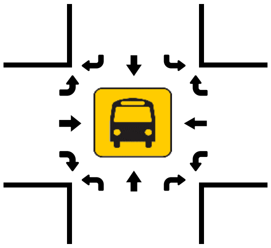
NORTHBOUND
Carbon Canyon Rd

	⇩	↶	↰	↑	↱
		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

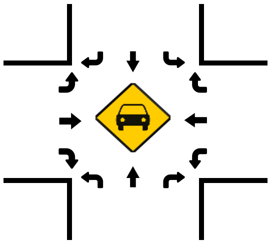
Total Vehicles (AM)



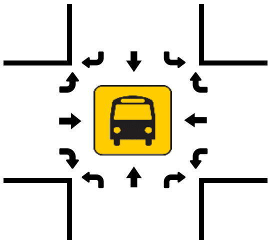
Total Vehicles (AM)



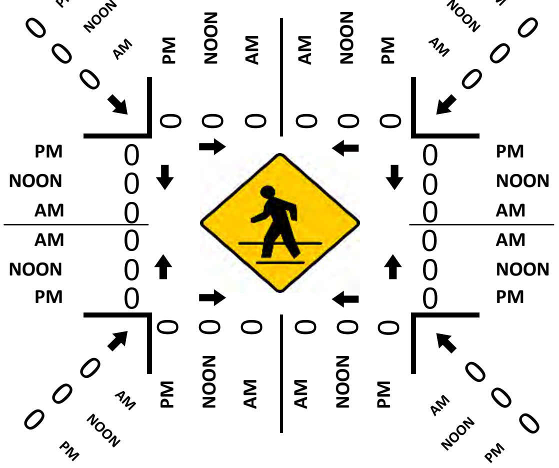
Total Vehicles (NOON)



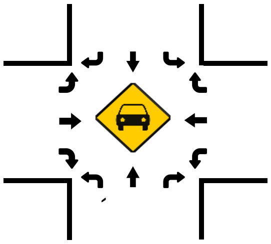
Total Vehicles (NOON)



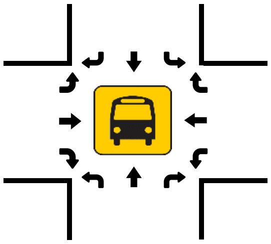
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Beach Access Path & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-6.1B
City: Malibu

Day: Tuesday
Date: 10/23/2018

	PEAK HOURS	COUNT PERIODS
AM	08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Beach Access Path

SOUTHBOUND

	↲	↓	↳	U	⇧
AM	0	0	1	0	1
NOON	0	0	0	0	0
PM	2	0	0	0	1
	0	0	0	0	

Pacific Coast Hwy

EASTBOUND

	AM	NOON	PM	
⇦	1342	0	2072	
U	3	0	6	0
↱	1	0	1	0
→	1588	0	1907	3
↴	0	0	0	0

Pacific Coast Hwy

WESTBOUND

		PM	NOON	AM
↰	0	0	0	0
←	3	2064	0	1339
↙	0	0	0	0
U	0	6	0	0
⇨		1913	0	1589

Beach Access Path

NORTHBOUND

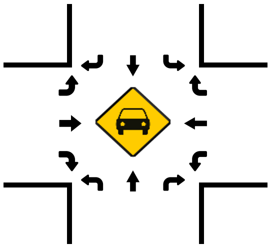
	⇩	U	↰	↑	↱
		0	0	1	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

CONTROL

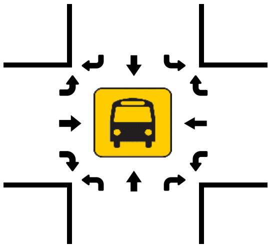
No Control

	AM	NOON	PM
TEV	2932	0	3986
PHF	0.96		0.91

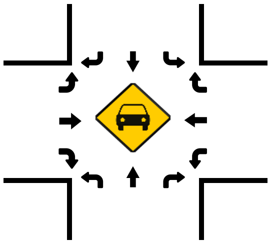
Total Vehicles (AM)



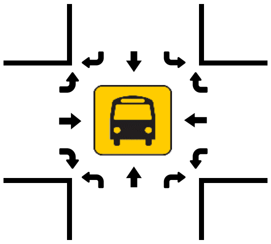
Total Vehicles (AM)



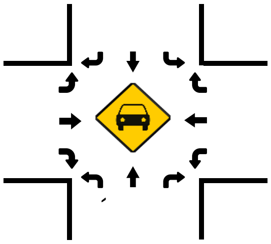
Total Vehicles (NOON)



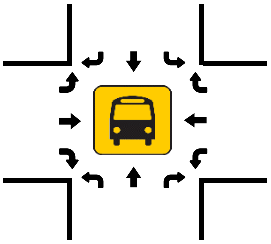
Total Vehicles (NOON)



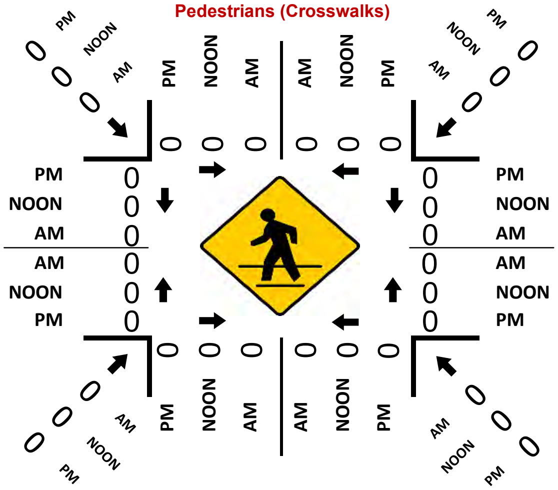
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



	PM	NOON	AM	AM	NOON	PM
North diagonal (left)	0	0	0			
North crosswalk	0	0	0	0	0	0
North diagonal (right)				0	0	0
West crosswalk	0	0	0	0	0	0
East crosswalk	0	0	0	0	0	0
South diagonal (left)				0	0	0
South crosswalk	0	0	0	0	0	0
South diagonal (right)				0	0	0

Prepared by National Data & Surveying Services

Las Flores Canyon Rd & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-6.1C
City: Malibu

Day: Tuesday
Date: 10/23/2018

PEAK HOURS

08:00 AM - 09:00 AM

NONE

04:00 PM - 05:00 PM

COUNT PERIODS

07:00 AM - 09:00 AM

NONE

04:00 PM - 06:00 PM

Las Flores Canyon Rd

SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	54	1	35	0	104
NOON	0	0	0	0	0
PM	35	2	44	0	76
	0	1	0	0	

Pacific Coast Hwy

EASTBOUND

		AM	NOON	PM
⇦		1318	0	2001
↶	0	5	0	1
↱	1	48	0	39
→	3	1378	0	1809
↴	0	49	0	11

Pacific Coast Hwy

WESTBOUND

		PM	NOON	AM
↰	1	37	0	56
←	2	1957	0	1254
↙	1	10	0	21
↷	0	0	0	0
⇨		1862	0	1417

CONTROL

Signalized

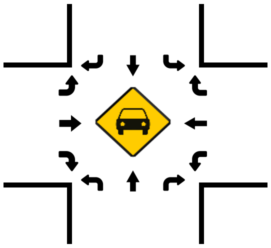
	AM	NOON	PM
TEV	2910	0	3962
PHF	0.94		0.95

NORTHBOUND

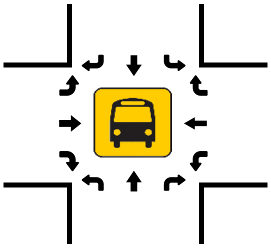
Las Flores Canyon Rd

	⇩	↶	↰	↑	↱
		0	0	1	0
PM	23	0	8	0	9
NOON	0	0	0	0	0
AM	71	0	5	0	4

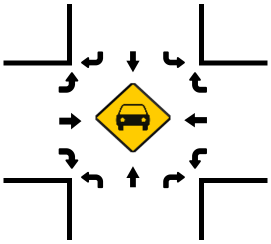
Total Vehicles (AM)



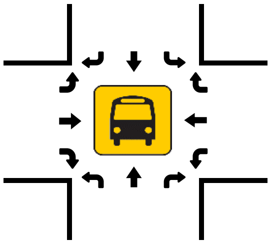
Total Vehicles (AM)



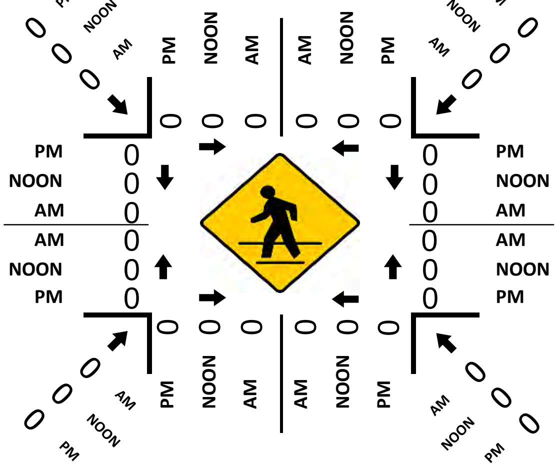
Total Vehicles (NOON)



Total Vehicles (NOON)



Pedestrians (Crosswalks)



North crosswalk: PM 0, NOON 0, AM 0, AM 0, NOON 0, PM 0

West crosswalk: PM 0, NOON 0, AM 0, AM 0, NOON 0, PM 0

East crosswalk: PM 0, NOON 0, AM 0, AM 0, NOON 0, PM 0

South crosswalk: PM 0, NOON 0, AM 0, AM 0, NOON 0, PM 0

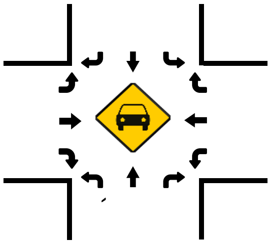
Northwest corner: PM 0, NOON 0, AM 0

Northeast corner: PM 0, NOON 0, AM 0

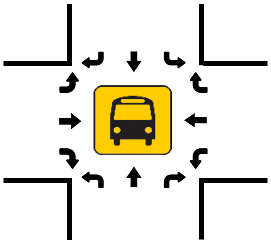
Southwest corner: AM 0, NOON 0, PM 0

Southeast corner: AM 0, NOON 0, PM 0

Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Rambla Pacifico St & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-6.1D
City: Malibu

Day: Tuesday
Date: 10/23/2018

	PEAK HOURS	COUNT PERIODS
AM	08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Rambla Pacifico St
SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	11	1	31	0	34
NOON	0	0	0	0	0
PM	14	0	27	0	33
	0	1	0	0	

Pacific Coast Hwy
EASTBOUND

	AM	NOON	PM	
⇦	1302	0	1981	
↶	0	0	0	0
↱	4	0	6	1
→	1439	0	1796	3
↴	1	0	2	0

Pacific Coast Hwy
WESTBOUND

		PM	NOON	AM
1	↰	27	0	30
2	←	1966	0	1289
1	↲	4	0	6
0	↶	4	0	0
	⇨	1860	0	1488

CONTROL

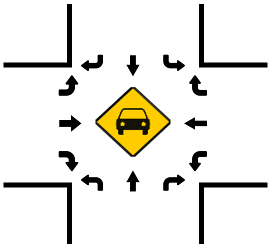
Signalized

	AM	NOON	PM
TEV	2832	0	3880
PHF	0.94		0.95

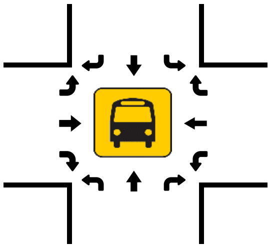
NORTHBOUND
Rambla Pacifico St

	⇩	↶	↰	↑	↱
		0	0	1	0
PM	6	0	1	0	33
NOON	0	0	0	0	0
AM	8	0	2	0	18

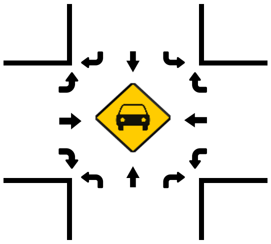
Total Vehicles (AM)



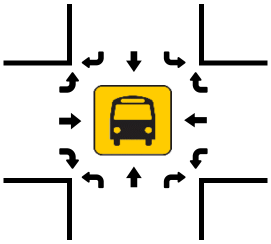
Total Vehicles (AM)



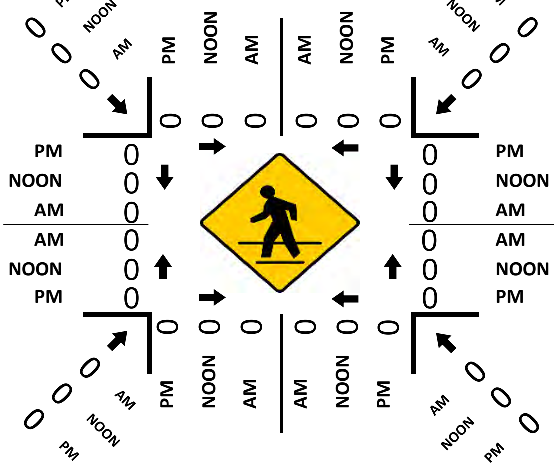
Total Vehicles (NOON)



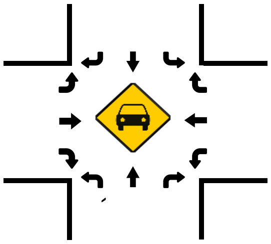
Total Vehicles (NOON)



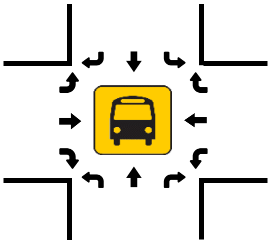
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Carbon Beach Terrace & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-6.1E
City: Malibu

Day: Tuesday
Date: 10/23/2018

	PEAK HOURS	COUNT PERIODS
AM	08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Carbon Beach Terrace
SOUTHBOUND

	↲	↓	↳	U-turn	⇧
AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	0	0	0	0	0
	0	0	0	0	

Pacific Coast Hwy
EASTBOUND

	AM	NOON	PM	
⇦	1353	0	2043	
U-turn	0	0	1	0
↱	0	0	0	0
→	1515	0	1862	3
↴	0	0	0	0

Pacific Coast Hwy
WESTBOUND

		PM	NOON	AM
↰	0	0	0	0
←	3	2042	0	1353
↲	0	0	0	0
U-turn	0	2	0	1
⇨		1864	0	1516

NORTHBOUND
Carbon Beach Terrace

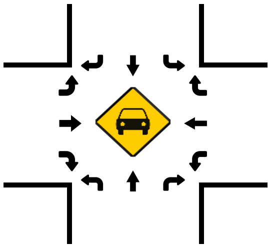
	⇩	U-turn	↰	↑	↱
		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

CONTROL

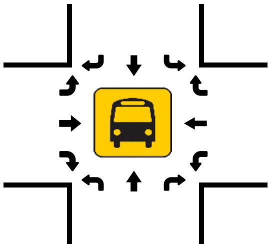
No Control

	AM	NOON	PM
TEV	2869	0	3907
PHF	0.94		0.94

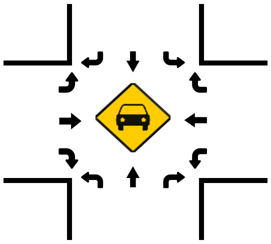
Total Vehicles (AM)



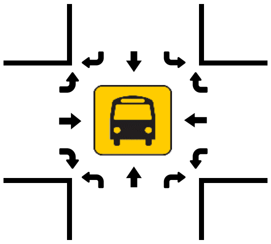
Total Vehicles (AM)



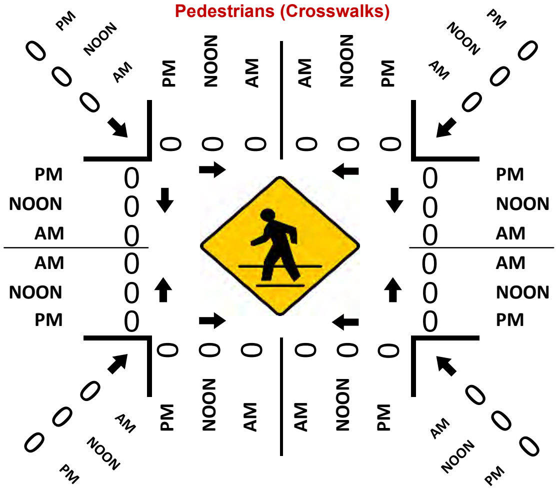
Total Vehicles (NOON)



Total Vehicles (NOON)

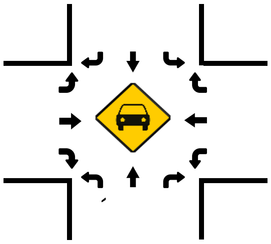


Pedestrians (Crosswalks)

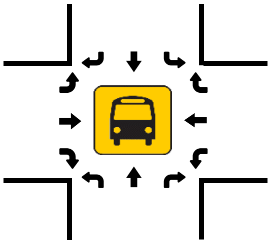


Crosswalk	AM	NOON	PM
NW corner ↘	0	0	0
North →	0	0	0
North ←	0	0	0
NE corner ↙	0	0	0
West ↓	0	0	0
West ↑	0	0	0
East ↓	0	0	0
East ↑	0	0	0
South →	0	0	0
South ←	0	0	0
SW corner ↗	0	0	0
SE corner ↖	0	0	0

Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Tuna Canyon Rd & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-6.2A
City: Malibu

Day: Tuesday
Date: 10/23/2018

PEAK HOURS		COUNT PERIODS
07:00 AM - 08:00 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:00 PM - 05:00 PM	PM	04:00 PM - 06:00 PM

Tuna Canyon Rd
SOUTHBOUND

	↲	↓	↳	U	⇧
AM	5	0	28	0	6
NOON	0	0	0	0	0
PM	3	0	8	0	0
	0	1	0	0	

Pacific Coast Hwy
EASTBOUND

	AM	NOON	PM	
⇦	1175	0	2073	
U	0	0	0	0
↱	1	0	0	0
→	1603	0	1915	3
↴	0	0	0	0

Pacific Coast Hwy
WESTBOUND

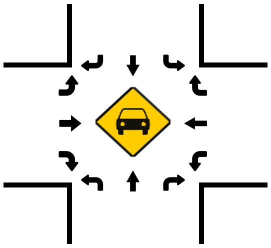
		PM	NOON	AM
↰	0	0	0	5
←	2	2070	0	1170
↲	0	0	0	0
U	0	0	0	0
⇨		1923	0	1631

CONTROL			
1-Way Stop(SB)			
	AM	NOON	PM
TEV	2812	0	3996
PHF	0.97		0.99

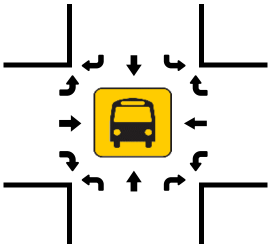
NORTHBOUND
Tuna Canyon Rd

	⇩	U	↰	↑	↱
		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

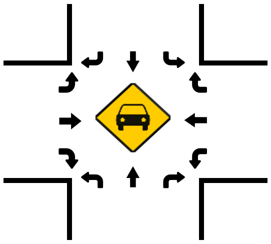
Total Vehicles (AM)



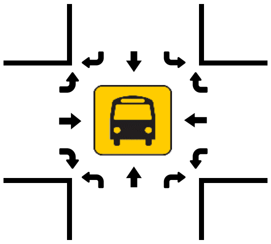
Total Vehicles (AM)



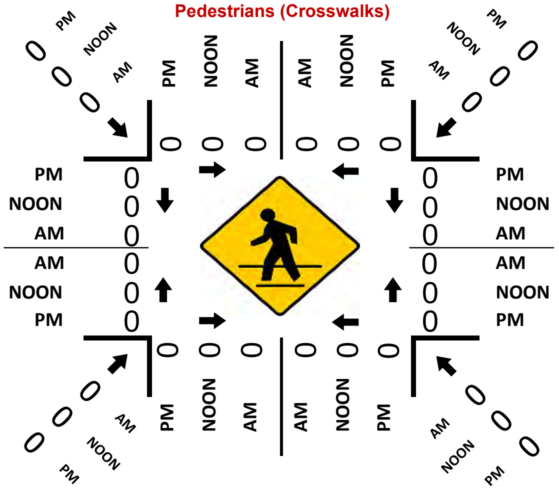
Total Vehicles (NOON)



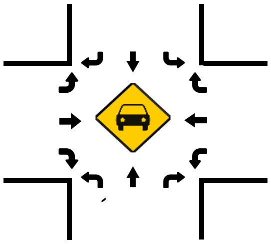
Total Vehicles (NOON)



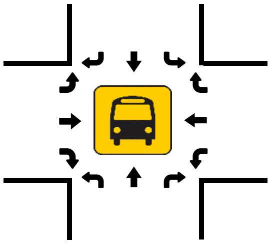
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

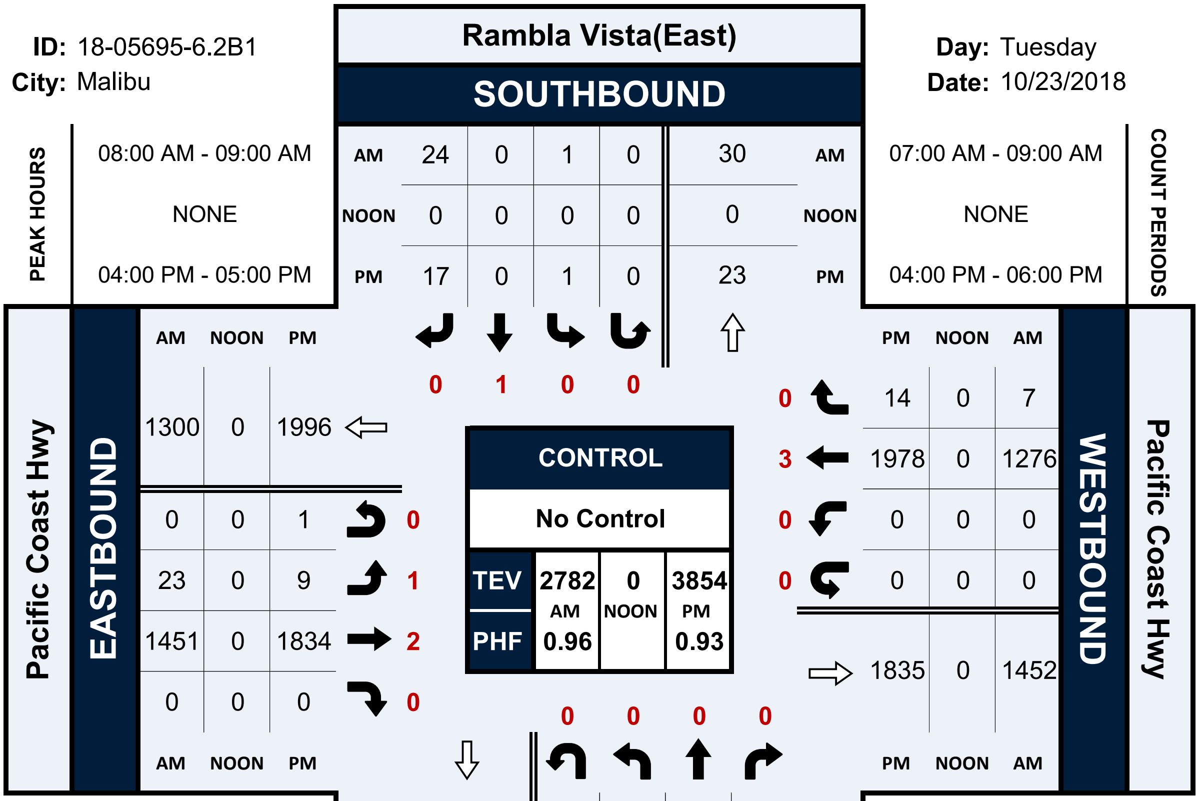
Rambla Vista(East) & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-6.2B1
City: Malibu

Day: Tuesday
Date: 10/23/2018

PEAK HOURS		COUNT PERIODS
08:00 AM - 09:00 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:00 PM - 05:00 PM	PM	04:00 PM - 06:00 PM



Rambla Vista(East) — SOUTHBOUND

	↲	↓	↳	U	⇧
AM	24	0	1	0	30
NOON	0	0	0	0	0
PM	17	0	1	0	23
	0	1	0	0	

Pacific Coast Hwy — EASTBOUND

	AM	NOON	PM	
⇦	1300	0	1996	
U	0	0	1	0
↰	23	0	9	1
→	1451	0	1834	2
↴	0	0	0	0

Pacific Coast Hwy — WESTBOUND

		PM	NOON	AM
↰	0	14	0	7
←	3	1978	0	1276
↙	0	0	0	0
U	0	0	0	0
⇨		1835	0	1452

Rambla Vista(East) — NORTHBOUND

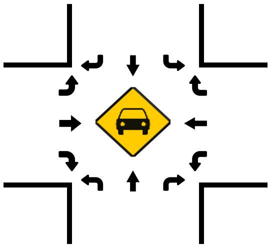
	⇩	U	↰	↑	↱
		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

CONTROL

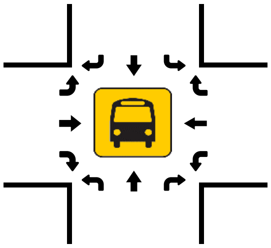
No Control

	AM	NOON	PM
TEV	2782	0	3854
PHF	0.96		0.93

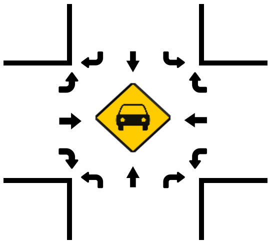
Total Vehicles (AM)



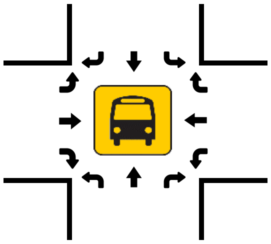
Total Vehicles (AM)



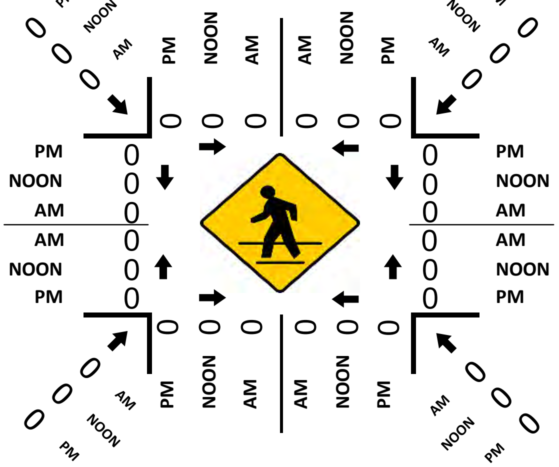
Total Vehicles (NOON)



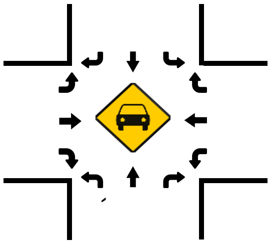
Total Vehicles (NOON)



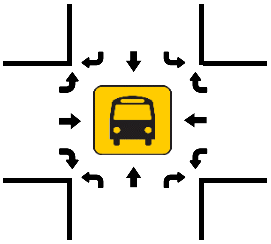
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



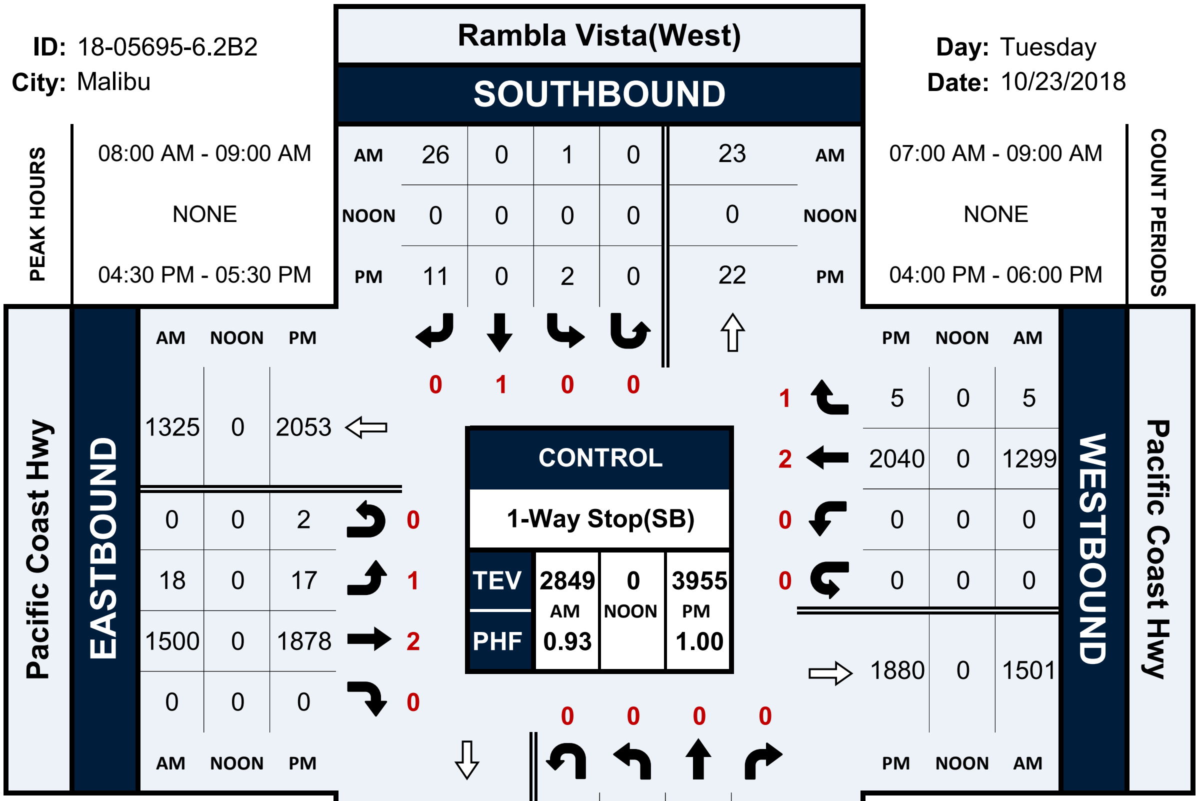
Prepared by National Data & Surveying Services

Rambla Vista(West) & Pacific Coast Hwy

Peak Hour Turning Movement Count

ID: 18-05695-6.2B2
City: Malibu

Day: Tuesday
Date: 10/23/2018



PEAK HOURS		COUNT PERIODS
08:00 AM - 09:00 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:30 PM - 05:30 PM	PM	04:00 PM - 06:00 PM

Rambla Vista(West)

SOUTHBOUND

	↲	↓	↳	⮌	⇧	
AM	26	0	1	0	23	AM
NOON	0	0	0	0	0	NOON
PM	11	0	2	0	22	PM
	0	1	0	0		

Pacific Coast Hwy

EASTBOUND

	AM	NOON	PM	
⇦	1325	0	2053	
⮌	0	0	2	0
↱	18	0	17	1
→	1500	0	1878	2
↴	0	0	0	0

Pacific Coast Hwy

WESTBOUND

		PM	NOON	AM
1	↰	5	0	5
2	←	2040	0	1299
0	↙	0	0	0
0	⮎	0	0	0
	⇨	1880	0	1501

CONTROL

1-Way Stop(SB)

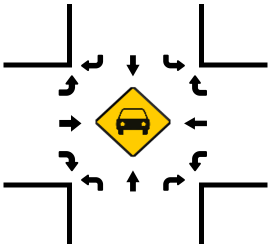
	AM	NOON	PM
TEV	2849	0	3955
PHF	0.93		1.00

Rambla Vista(West)

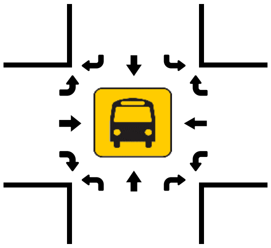
NORTHBOUND

	⇩	⮌	↰	↑	↱	
		0	0	0	0	
PM	0	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

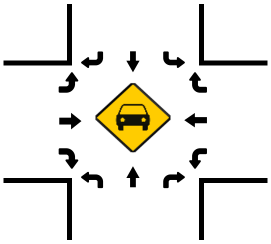
Total Vehicles (AM)



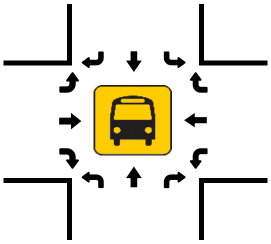
Total Vehicles (AM)



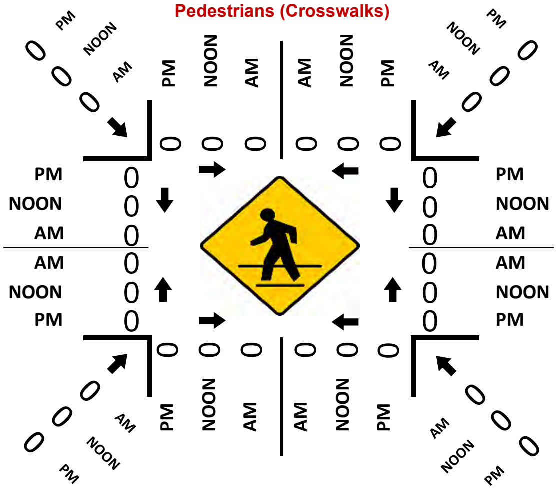
Total Vehicles (NOON)



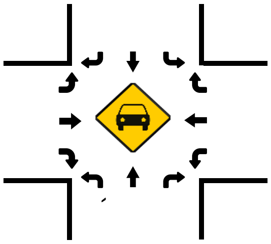
Total Vehicles (NOON)



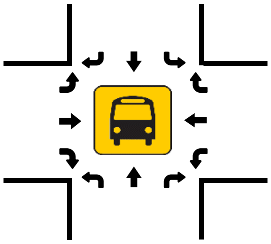
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by NDS/ATD

VOLUME

Encinal Canyon Rd S/O Noranda Ln

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18_5697_007A

DAILY TOTALS	NB	SB	EB	WB	Total
	654	691	0	0	1,345

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0		12:00	9		15				24	
00:15	0		1				1		12:15	10		12				22	
00:30	1		0				1		12:30	11		14				25	
00:45	1	2	1	2			2	4	12:45	14	44	11	52			25	96
01:00	0		0				0		13:00	17		8				25	
01:15	0		0				0		13:15	14		15				29	
01:30	0		0				0		13:30	10		9				19	
01:45	0		0				0		13:45	9	50	4	36			13	86
02:00	0		0				0		14:00	10		10				20	
02:15	1		0				1		14:15	14		9				23	
02:30	0		0				0		14:30	6		11				17	
02:45	0	1	0				0	1	14:45	6	36	14	44			20	80
03:00	0		0				0		15:00	12		22				34	
03:15	0		0				0		15:15	10		23				33	
03:30	1		0				1		15:30	17		20				37	
03:45	0	1	0				0	1	15:45	13	52	21	86			34	138
04:00	0		0				0		16:00	9		22				31	
04:15	0		0				0		16:15	18		13				31	
04:30	0		0				0		16:30	19		17				36	
04:45	0		0				0		16:45	14	60	17	69			31	129
05:00	2		0				2		17:00	25		12				37	
05:15	2		3				5		17:15	15		30				45	
05:30	1		5				6		17:30	9		19				28	
05:45	4	9	1	9			5	18	17:45	8	57	11	72			19	129
06:00	5		0				5		18:00	7		17				24	
06:15	7		3				10		18:15	4		21				25	
06:30	17		4				21		18:30	7		13				20	
06:45	14	43	4	11			18	54	18:45	8	26	18	69			26	95
07:00	14		3				17		19:00	3		6				9	
07:15	14		7				21		19:15	4		8				12	
07:30	12		4				16		19:30	1		14				15	
07:45	16	56	12	26			28	82	19:45	1	9	3	31			4	40
08:00	9		11				20		20:00	6		12				18	
08:15	13		10				23		20:15	1		4				5	
08:30	14		8				22		20:30	3		5				8	
08:45	14	50	11	40			25	90	20:45	6	16	5	26			11	42
09:00	9		12				21		21:00	1		5				6	
09:15	7		12				19		21:15	2		2				4	
09:30	8		6				14		21:30	3		1				4	
09:45	8	32	11	41			19	73	21:45	3	9	1	9			4	18
10:00	9		9				18		22:00	3		1				4	
10:15	7		5				12		22:15	0		1				1	
10:30	12		5				17		22:30	2		1				3	
10:45	19	47	10	29			29	76	22:45	0	5	0	3			0	8
11:00	11		9				20		23:00	1		1				2	
11:15	12		11				23		23:15	0		0				0	
11:30	12		9				21		23:30	2		1				3	
11:45	11	46	5	34			16	80	23:45	0	3	0	2			0	5
TOTALS		287		192				**479**	**TOTALS**		367		499				**866**
SPLIT %		59.9%		40.1%				**35.6%**	**SPLIT %**		42.4%		57.6%				**64.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	654	691	0	0	1,345

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	06:30	11:45			**07:45**	**PM Peak Hour**	16:15	15:00			**16:30**
AM Pk Volume	59	46			**93**	**PM Pk Volume**	76	86			**149**
Pk Hr Factor	0.868	0.767			**0.830**	**Pk Hr Factor**	0.760	0.935			**0.828**
7 - 9 Volume	106	66	0	0	**172**	**4 - 6 Volume**	117	141	0	0	**258**
7 - 9 Peak Hour	07:00	07:45			**07:45**	**4 - 6 Peak Hour**	16:15	16:45			**16:30**
7 - 9 Pk Volume	56	41	0	0	**93**	**4 - 6 Pk Volume**	76	78	0	0	**149**
Pk Hr Factor	0.875	0.854	0.000	0.000	**0.830**	**Pk Hr Factor**	0.760	0.650	0.000	0.000	**0.828**

Prepared by NDS/ATD

VOLUME

Pacific Coast Hwy Bet. 19562 Pacific Coast Hwy & 19742 Pacific Coast Hwy

Day: Tuesday
Date: 10/23/2018

City: Malibu
Project #: CA18-5696-008

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	22,498	24,453	46,951

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			38		33		71		12:00			297		295		592	
0:15			43		24		67		12:15			346		294		640	
0:30			29		25		54		12:30			285		254		539	
0:45			16	126	20	102	36	228	12:45			287	1215	298	1141	585	2356
1:00			20		16		36		13:00			292		275		567	
1:15			14		17		31		13:15			327		289		616	
1:30			13		10		23		13:30			310		279		589	
1:45			19	66	9	52	28	118	13:45			306	1235	317	1160	623	2395
2:00			7		6		13		14:00			306		326		632	
2:15			11		6		17		14:15			289		335		624	
2:30			9		7		16		14:30			340		457		797	
2:45			8	35	3	22	11	57	14:45			386	1321	468	1586	854	2907
3:00			13		7		20		15:00			413		524		937	
3:15			9		11		20		15:15			484		495		979	
3:30			13		14		27		15:30			501		454		955	
3:45			12	47	12	44	24	91	15:45			506	1904	463	1936	969	3840
4:00			17		19		36		16:00			501		514		1015	
4:15			25		23		48		16:15			478		522		1000	
4:30			27		22		49		16:30			452		520		972	
4:45			27	96	48	112	75	208	16:45			495	1926	510	2066	1005	3992
5:00			60		69		129		17:00			474		526		1000	
5:15			84		96		180		17:15			436		507		943	
5:30			112		118		230		17:30			470		452		922	
5:45			172	428	144	427	316	855	17:45			409	1789	454	1939	863	3728
6:00			247		152		399		18:00			361		487		848	
6:15			394		268		662		18:15			387		450		837	
6:30			463		284		747		18:30			349		413		762	
6:45			461	1565	277	981	738	2546	18:45			404	1501	459	1809	863	3310
7:00			469		278		747		19:00			294		546		840	
7:15			473		314		787		19:15			227		544		771	
7:30			369		302		671		19:30			210		540		750	
7:45			328	1639	289	1183	617	2822	19:45			202	933	426	2056	628	2989
8:00			367		306		673		20:00			182		391		573	
8:15			326		316		642		20:15			149		332		481	
8:30			366		343		709		20:30			147		289		436	
8:45			343	1402	341	1306	684	2708	20:45			162	640	305	1317	467	1957
9:00			346		270		616		21:00			145		267		412	
9:15			348		277		625		21:15			159		244		403	
9:30			269		296		565		21:30			97		263		360	
9:45			287	1250	294	1137	581	2387	21:45			101	502	211	985	312	1487
10:00			290		254		544		22:00			82		192		274	
10:15			268		264		532		22:15			84		175		259	
10:30			313		325		638		22:30			96		136		232	
10:45			292	1163	252	1095	544	2258	22:45			85	347	113	616	198	963
11:00			292		263		555		23:00			73		78		151	
11:15			306		305		611		23:15			70		57		127	
11:30			305		267		572		23:30			38		78		116	
11:45			241	1144	291	1126	532	2270	23:45			43	224	42	255	85	479
TOTALS				8961		7587		**16548**	**TOTALS**				13537		16866		**30403**
SPLIT %				54.2%		45.8%		**35.2%**	**SPLIT %**				44.5%		55.5%		**64.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	22,498	24,453	46,951

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			6:30	8:00	**6:30**	**PM Peak Hour**			15:15	18:45	**16:00**
AM Pk Volume			1866	1306	**3019**	**PM Pk Volume**			1992	2089	**3992**
Pk Hr Factor			0.986	0.952	**0.959**	**Pk Hr Factor**			0.984	0.957	**0.983**
7 - 9 Volume	0	0	3041	2489	**5530**	**4 - 6 Volume**	0	0	3715	4005	**7720**
7 - 9 Peak Hour			7:00	8:00	**7:00**	**4 - 6 Peak Hour**			16:00	16:15	**16:00**
7 - 9 Pk Volume	0	0	1639	1306	**2822**	**4 - 6 Pk Volume**	0	0	1926	2078	**3992**
Pk Hr Factor	0.000	0.000	0.866	0.952	**0.896**	**Pk Hr Factor**	0.000	0.000	0.961	0.988	**0.983**

APPENDIX C

Analysis Worksheets for Existing (2018) Conditions

Appendix C.1
2018 Signalized Intersection Morning (AM) Traffic Analysis

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↰	↱
Traffic Volume (vph)	34	2528	1545	113	188	29
Future Volume (vph)	34	2528	1545	113	188	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	11
Total Lost time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	3250	3250	1583	3322	1393
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1711	3250	3250	1583	3322	1393
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	2748	1679	123	204	32
RTOR Reduction (vph)	0	0	0	20	0	13
Lane Group Flow (vph)	37	2748	1679	103	207	16
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	11.2	265.3	249.8	249.8	23.0	23.0
Effective Green, g (s)	11.2	265.3	249.8	249.8	23.0	23.0
Actuated g/C Ratio	0.04	0.89	0.84	0.84	0.08	0.08
Clearance Time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Vehicle Extension (s)	2.0	7.0	7.0	7.0	2.0	2.0
Lane Grp Cap (vph)	64	2884	2716	1322	255	107
v/s Ratio Prot	0.02	c0.85	0.52		c0.06	0.01
v/s Ratio Perm				0.06		
v/c Ratio	0.58	0.95	0.62	0.08	0.81	0.15
Uniform Delay, d1	141.5	12.2	8.3	4.3	135.8	128.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	8.9	1.1	0.1	16.7	0.2
Delay (s)	149.2	21.1	9.4	4.4	152.5	129.1
Level of Service	F	C	A	A	F	F
Approach Delay (s)		22.8	9.1		149.7	
Approach LOS		C	A		F	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	298.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

	⤴	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↱			↰	↱		✥	↱
Traffic Volume (vph)	7	1147	49	72	723	1	55	1	61	4	0	10
Future Volume (vph)	7	1147	49	72	723	1	55	1	61	4	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	12	14	12	12	12	12	11	12	12	12
Total Lost time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.93	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.98	1.00
Satd. Flow (prot)	1888	3362	1583	1888	3362			1775	1531		1597	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.72	1.00		0.86	1.00
Satd. Flow (perm)	1888	3362	1583	1888	3362			1349	1531		1401	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	1247	53	78	786	1	60	1	66	4	0	11
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	61	0	7	6
Lane Group Flow (vph)	8	1247	39	78	787	0	0	61	5	0	1	1
Parking (#/hr)		0			0							
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4		4	8		8
Actuated Green, G (s)	1.3	96.8	96.8	8.3	103.8			9.9	9.9		9.9	9.9
Effective Green, g (s)	1.3	96.8	96.8	8.3	103.8			9.9	9.9		9.9	9.9
Actuated g/C Ratio	0.01	0.74	0.74	0.06	0.79			0.08	0.08		0.08	0.08
Clearance Time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	5.0	5.0	1.5	5.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	18	2489	1172	119	2670			102	115		106	113
v/s Ratio Prot	0.00	c0.37		c0.04	0.23							
v/s Ratio Perm			0.02					c0.05	0.00		0.00	0.00
v/c Ratio	0.44	0.50	0.03	0.66	0.29			0.60	0.04		0.01	0.00
Uniform Delay, d1	64.3	7.0	4.5	59.8	3.6			58.5	56.0		55.8	55.8
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.2	0.7	0.1	9.5	0.3			9.1	0.2		0.0	0.0
Delay (s)	70.6	7.7	4.6	69.3	3.9			67.6	56.2		55.9	55.9
Level of Service	E	A	A	E	A			E	E		E	E
Approach Delay (s)		8.0			9.8			61.6			55.9	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.7	Sum of lost time (s)	15.7
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

5-1b: Paradise Cove Rd & PCH

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑↑	↰↱	
Traffic Volume (vph)	1205	24	20	724	31	27
Future Volume (vph)	1205	24	20	724	31	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	10	12	11	16	12
Total Lost time (s)	7.2		6.4	7.2	5.3	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	1.00		1.00	1.00	0.94	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3241		1593	3250	1928	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3241		1593	3250	1928	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1310	26	22	787	34	29
RTOR Reduction (vph)	2	0	0	0	21	0
Lane Group Flow (vph)	1334	0	22	787	42	0
Parking (#/hr)	0	0	0	0		
Turn Type	NA		Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases						
Actuated Green, G (s)	28.8		2.0	37.2	19.2	
Effective Green, g (s)	28.8		2.0	37.2	19.2	
Actuated g/C Ratio	0.42		0.03	0.54	0.28	
Clearance Time (s)	7.2		6.4	7.2	5.3	
Vehicle Extension (s)	4.0		2.0	4.0	3.0	
Lane Grp Cap (vph)	1354		46	1754	537	
v/s Ratio Prot	c0.41		0.01	c0.24	c0.02	
v/s Ratio Perm						
v/c Ratio	0.99		0.48	0.45	0.08	
Uniform Delay, d1	19.8		32.9	9.6	18.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	20.9		2.8	0.3	0.3	
Delay (s)	40.7		35.8	9.9	18.6	
Level of Service	D		D	A	B	
Approach Delay (s)	40.7			10.6	18.6	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	18.9
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	12	1490	1335	4	8	14
Future Volume (vph)	12	1490	1335	4	8	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	12	12
Total Lost time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3362	3362	1794	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3362	3362	1794	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	1620	1451	4	9	15
RTOR Reduction (vph)	0	0	0	1	0	12
Lane Group Flow (vph)	13	1620	1451	3	9	3
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases				2		4
Actuated Green, G (s)	2.8	110.7	103.0	103.0	35.2	35.2
Effective Green, g (s)	2.8	110.7	103.0	103.0	35.2	35.2
Actuated g/C Ratio	0.02	0.71	0.66	0.66	0.22	0.22
Clearance Time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Vehicle Extension (s)	2.0	8.0	8.0	8.0	2.0	2.0
Lane Grp Cap (vph)	31	2372	2207	1177	397	355
v/s Ratio Prot	0.01	c0.48	0.43		c0.01	
v/s Ratio Perm				0.00		0.00
v/c Ratio	0.42	0.68	0.66	0.00	0.02	0.01
Uniform Delay, d1	76.2	13.1	16.3	9.3	47.4	47.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	1.6	1.5	0.0	0.1	0.0
Delay (s)	79.6	14.7	17.8	9.3	47.5	47.3
Level of Service	E	B	B	A	D	D
Approach Delay (s)		15.3	17.8		47.4	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	156.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1b: Signal (Unnamed U-Turn) (22725 PCH)

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱							
Traffic Volume (vph)	4	1588	0	0	1339	0	0	0	0	0	0	0
Future Volume (vph)	4	1588	0	0	1339	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	6.2			6.2							
Lane Util. Factor	1.00	0.95			0.95							
Frt	1.00	1.00			1.00							
Flt Protected	0.95	1.00			1.00							
Satd. Flow (prot)	1770	3362			3362							
Flt Permitted	0.08	1.00			1.00							
Satd. Flow (perm)	148	3362			3362							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	1726	0	0	1455	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	4	1726	0	0	1455	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA							
Protected Phases	1	6		5	2							
Permitted Phases	6			2								
Actuated Green, G (s)	174.8	101.0			101.0							
Effective Green, g (s)	174.8	101.0			101.0							
Actuated g/C Ratio	0.94	0.54			0.54							
Clearance Time (s)	4.9	6.2			6.2							
Vehicle Extension (s)	2.0	8.0			8.0							
Lane Grp Cap (vph)	783	1826			1826							
v/s Ratio Prot	c0.00	c0.51			0.43							
v/s Ratio Perm	0.00											
v/c Ratio	0.01	0.95			0.80							
Uniform Delay, d1	9.1	39.9			34.2							
Progression Factor	1.00	1.00			1.00							
Incremental Delay, d2	0.0	11.6			3.4							
Delay (s)	9.1	51.4			37.6							
Level of Service	A	D			D							
Approach Delay (s)		51.3			37.6			0.0			0.0	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	45.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	185.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱		↰	↱		↰	↱
Traffic Volume (vph)	53	1378	49	21	1254	56	0	0	0	35	1	54
Future Volume (vph)	53	1378	49	21	1254	56	0	0	0	35	1	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	11	10	12	16	12	8	12	12
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7					5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00					1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85					1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00					0.95	1.00
Satd. Flow (prot)	1652	3122		1652	3250	1478					1776	1583
Flt Permitted	0.17	1.00		0.14	1.00	1.00					0.73	1.00
Satd. Flow (perm)	299	3122		247	3250	1478					1363	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	1498	53	23	1363	61	0	0	0	38	1	59
RTOR Reduction (vph)	0	1	0	0	0	13	0	0	0	0	0	0
Lane Group Flow (vph)	58	1550	0	23	1363	48	0	0	0	0	39	59
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm			Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	124.3	119.9		120.5	118.0	118.0					9.6	9.6
Effective Green, g (s)	124.3	119.9		120.5	118.0	118.0					9.6	9.6
Actuated g/C Ratio	0.83	0.80		0.80	0.79	0.79					0.06	0.06
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7					5.3	5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0					3.0	3.0
Lane Grp Cap (vph)	287	2497		221	2558	1163					87	101
v/s Ratio Prot	c0.01	c0.50		0.00	0.42							
v/s Ratio Perm	0.16			0.08		0.03					0.03	c0.04
v/c Ratio	0.20	0.62		0.10	0.53	0.04					0.45	0.58
Uniform Delay, d1	3.3	6.0		3.9	5.8	3.5					67.6	68.2
Progression Factor	0.50	0.24		1.00	1.00	1.00					1.00	1.00
Incremental Delay, d2	0.1	1.0		0.1	0.8	0.1					3.6	8.3
Delay (s)	1.8	2.4		4.0	6.6	3.6					71.2	76.5
Level of Service	A	A		A	A	A					E	E
Approach Delay (s)		2.4			6.5			0.0			74.4	
Approach LOS		A			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1d: Pacific Coast Highway & Rambla Pacifico

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱				↰		↱↱↱↱
Traffic Volume (vph)	4	1439	1	6	1289	30	0	0	0	31	0	11
Future Volume (vph)	4	1439	1	6	1289	30	0	0	0	31	0	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	11	12	12	12	12	11	12	11
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				1.00		0.64
Frt	1.00	1.00		1.00	1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95		1.00
Satd. Flow (prot)	1652	3138		1770	3250	1583				1711		3918
Flt Permitted	0.16	1.00		0.14	1.00	1.00				0.95		1.00
Satd. Flow (perm)	285	3138		259	3250	1583				1711		3918
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	1564	1	7	1401	33	0	0	0	34	0	12
RTOR Reduction (vph)	0	0	0	0	0	7	0	0	0	0	0	11
Lane Group Flow (vph)	4	1565	0	7	1401	26	0	0	0	34	0	1
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm		Prot
Protected Phases	5	2		1	6							4
Permitted Phases	2			6		6				4		
Actuated Green, G (s)	124.3	119.9		120.5	118.0	118.0				9.6		9.6
Effective Green, g (s)	124.3	119.9		120.5	118.0	118.0				9.6		9.6
Actuated g/C Ratio	0.83	0.80		0.80	0.79	0.79				0.06		0.06
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0				3.0		3.0
Lane Grp Cap (vph)	276	2509		233	2558	1246				109		250
v/s Ratio Prot	0.00	c0.50		c0.00	0.43							0.00
v/s Ratio Perm	0.01			0.02		0.02				c0.02		
v/c Ratio	0.01	0.62		0.03	0.55	0.02				0.31		0.00
Uniform Delay, d1	3.2	6.0		3.8	6.0	3.5				67.0		65.7
Progression Factor	1.00	1.00		0.40	0.27	0.00				1.00		1.00
Incremental Delay, d2	0.0	1.2		0.0	0.7	0.0				1.6		0.0
Delay (s)	3.2	7.2		1.6	2.4	0.0				68.6		65.7
Level of Service	A	A		A	A	A				E		E
Approach Delay (s)		7.2			2.3			0.0			67.9	
Approach LOS		A			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1e: Carbon Beach Estates & PCH (22333 PCH)

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱							
Traffic Volume (vph)	0	1515	0	1	1353	0	0	0	0	0	0	0
Future Volume (vph)	0	1515	0	1	1353	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2		4.9	6.2							
Lane Util. Factor		0.95		1.00	0.95							
Frt		1.00		1.00	1.00							
Flt Protected		1.00		0.95	1.00							
Satd. Flow (prot)		3362		1770	3362							
Flt Permitted		1.00		0.04	1.00							
Satd. Flow (perm)		3362		76	3362							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1647	0	1	1471	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1647	0	1	1471	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA							
Protected Phases	1	6		5	2							
Permitted Phases	6			2								
Actuated Green, G (s)		100.0		173.8	100.0							
Effective Green, g (s)		100.0		173.8	100.0							
Actuated g/C Ratio		0.54		0.94	0.54							
Clearance Time (s)		6.2		4.9	6.2							
Vehicle Extension (s)		8.0		2.0	8.0							
Lane Grp Cap (vph)		1818		747	1818							
v/s Ratio Prot		c0.49		c0.00	0.44							
v/s Ratio Perm				0.00								
v/c Ratio		0.91		0.00	0.81							
Uniform Delay, d1		38.2		14.7	34.7							
Progression Factor		1.00		1.00	1.00							
Incremental Delay, d2		8.0		0.0	3.6							
Delay (s)		46.2		14.7	38.3							
Level of Service		D		B	D							
Approach Delay (s)		46.2			38.3			0.0			0.0	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	184.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix C.2

2018 Stop Controlled Intersection Morning (AM) Traffic Analysis

HCM Unsignalized Intersection Capacity Analysis
2-2a: Coastline Dr & Surfview Dr

04/16/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		↰↱	
Traffic Volume (veh/h)	1	179	107	40	41	0
Future Volume (Veh/h)	1	179	107	40	41	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	195	116	43	45	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			309			
pX, platoon unblocked						
vC, conflicting volume	159				237	80
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	159				237	80
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1418				730	965

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	66	130	77	82	45
Volume Left	1	0	0	0	45
Volume Right	0	0	0	43	0
cSH	1418	1700	1700	1700	730
Volume to Capacity	0.00	0.08	0.05	0.05	0.06
Queue Length 95th (ft)	0	0	0	0	5
Control Delay (s)	0.1	0.0	0.0	0.0	10.3
Lane LOS	A				B
Approach Delay (s)	0.0		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	15.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2-2b: Coastline Dr & Castlerock Rd

04/16/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		⋎	
Traffic Volume (veh/h)	4	30	27	63	116	2
Future Volume (Veh/h)	4	30	27	63	116	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	33	29	68	126	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	97				104	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	97				104	63
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				86	100
cM capacity (veh/h)	1496				892	1002

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	37	97	128
Volume Left	4	0	126
Volume Right	0	68	2
cSH	1496	1700	893
Volume to Capacity	0.00	0.06	0.14
Queue Length 95th (ft)	0	0	12
Control Delay (s)	0.8	0.0	9.7
Lane LOS	A		A
Approach Delay (s)	0.8	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	18.5%	ICU Level of Service	A
Analysis Period (min)	15		

5-2a: PCH & Meadows Ct

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Volume (veh/h)	0	1191	731	16	0	5
Future Volume (Veh/h)	0	1191	731	16	0	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1295	795	17	0	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	812				1451	406
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	812				1451	406
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	810				122	594

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	648	648	530	282	5
Volume Left	0	0	0	0	0
Volume Right	0	0	0	17	5
cSH	1700	1700	1700	1700	594
Volume to Capacity	0.38	0.38	0.31	0.17	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	11.1
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.1
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2b: PCH & E Winding Way

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰↱	
Traffic Volume (veh/h)	6	1187	718	14	6	13
Future Volume (Veh/h)	6	1187	718	14	6	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1290	780	15	7	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	795				1446	398
vC1, stage 1 conf vol					788	
vC2, stage 2 conf vol					659	
vCu, unblocked vol	795				1446	398
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	98
cM capacity (veh/h)	822				323	602

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	7	645	645	520	275	21
Volume Left	7	0	0	0	0	7
Volume Right	0	0	0	0	15	14
cSH	822	1700	1700	1700	1700	468
Volume to Capacity	0.01	0.38	0.38	0.31	0.16	0.04
Queue Length 95th (ft)	1	0	0	0	0	4
Control Delay (s)	9.4	0.0	0.0	0.0	0.0	13.1
Lane LOS	A					B
Approach Delay (s)	0.1			0.0		13.1
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2c: PCH & W Winding Way

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✣			✣	
Traffic Volume (veh/h)	26	1209	5	5	724	10	2	0	1	7	0	21
Future Volume (Veh/h)	26	1209	5	5	724	10	2	0	1	7	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	28	1314	5	5	787	11	2	0	1	8	0	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)		970										
pX, platoon unblocked				0.62			0.62	0.62	0.62	0.62	0.62	
vC, conflicting volume	798			1319			1799	2180	660	1516	2178	399
vC1, stage 1 conf vol							1372	1372		802	802	
vC2, stage 2 conf vol							426	808		714	1375	
vCu, unblocked vol	798			307			1076	1687	0	623	1682	399
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			99	100	100	98	100	96
cM capacity (veh/h)	820			781			306	254	677	326	261	601

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	28	876	443	5	525	273	3	31
Volume Left	28	0	0	5	0	0	2	8
Volume Right	0	0	5	0	0	11	1	23
cSH	820	1700	1700	781	1700	1700	374	493
Volume to Capacity	0.03	0.52	0.26	0.01	0.31	0.16	0.01	0.06
Queue Length 95th (ft)	3	0	0	0	0	0	1	5
Control Delay (s)	9.5	0.0	0.0	9.6	0.0	0.0	14.7	12.8
Lane LOS	A			A			B	B
Approach Delay (s)	0.2			0.1			14.7	12.8
Approach LOS							B	B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

5-2d: Zuma View Pl & PCH

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱		✥			✥	
Traffic Volume (veh/h)	4	1186	8	5	776	1	3	0	2	10	0	13
Future Volume (Veh/h)	4	1186	8	5	776	1	3	0	2	10	0	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	4	1289	9	5	843	1	3	0	2	11	0	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		836										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	844			1298			1747	2156	649	1508	2159	422
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	844			987			1518	2001	219	1234	2005	422
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	100	100	90	100	98
cM capacity (veh/h)	788			588			67	49	664	111	49	581

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	4	859	439	5	422	422	1	5	25
Volume Left	4	0	0	5	0	0	0	3	11
Volume Right	0	0	9	0	0	0	1	2	14
cSH	788	1700	1700	588	1700	1700	1700	104	202
Volume to Capacity	0.01	0.51	0.26	0.01	0.25	0.25	0.00	0.05	0.12
Queue Length 95th (ft)	0	0	0	1	0	0	0	4	10
Control Delay (s)	9.6	0.0	0.0	11.2	0.0	0.0	0.0	41.3	25.3
Lane LOS	A			B				E	D
Approach Delay (s)	0.0			0.1				41.3	25.3
Approach LOS								E	D

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

5-2e: PCH & Ramirez Mesa Rd

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰↱	
Traffic Volume (veh/h)	11	1180	764	4	24	30
Future Volume (Veh/h)	11	1180	764	4	24	30
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	1283	830	4	26	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	834				1498	417
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	834				1498	417
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				77	94
cM capacity (veh/h)	795				112	585

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	12	642	642	553	281	59
Volume Left	12	0	0	0	0	26
Volume Right	0	0	0	0	4	33
cSH	795	1700	1700	1700	1700	204
Volume to Capacity	0.02	0.38	0.38	0.33	0.17	0.29
Queue Length 95th (ft)	1	0	0	0	0	29
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	29.7
Lane LOS	A					D
Approach Delay (s)	0.1			0.0		29.7
Approach LOS						D

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2a: Pacific Coast highway & Tuna Canyon Road

04/16/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		↰↱	
Traffic Volume (veh/h)	1	1603	1170	5	28	5
Future Volume (Veh/h)	1	1603	1170	5	28	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1742	1272	5	30	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1277				2148	638
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1277				2148	638
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				27	99
cM capacity (veh/h)	540				41	419

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	582	1161	848	429	35
Volume Left	1	0	0	0	30
Volume Right	0	0	0	5	5
cSH	540	1700	1700	1700	47
Volume to Capacity	0.00	0.68	0.50	0.25	0.74
Queue Length 95th (ft)	0	0	0	0	73
Control Delay (s)	0.1	0.0	0.0	0.0	191.6
Lane LOS	A				F
Approach Delay (s)	0.0		0.0		191.6
Approach LOS					F

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(1): Pacific Coast Highway & Rambla Vista (East)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		Y	
Traffic Volume (veh/h)	18	1500	1299	5	1	26
Future Volume (Veh/h)	18	1500	1299	5	1	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	1630	1412	5	1	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			411			
pX, platoon unblocked	0.84				0.84	0.84
vC, conflicting volume	1417				2270	708
vC1, stage 1 conf vol					1414	
vC2, stage 2 conf vol					855	
vCu, unblocked vol	1107				2127	260
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				99	95
cM capacity (veh/h)	524				192	618

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	20	815	815	941	476	29
Volume Left	20	0	0	0	0	1
Volume Right	0	0	0	0	5	28
cSH	524	1700	1700	1700	1700	574
Volume to Capacity	0.04	0.48	0.48	0.55	0.28	0.05
Queue Length 95th (ft)	3	0	0	0	0	4
Control Delay (s)	12.1	0.0	0.0	0.0	0.0	11.6
Lane LOS	B					B
Approach Delay (s)	0.1			0.0		11.6
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(2): Pacific Coast Highway & Rambla Vista (West)

04/16/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	Y	
Traffic Volume (veh/h)	23	1451	1276	7	1	24
Future Volume (Veh/h)	23	1451	1276	7	1	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	1577	1387	8	1	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		650				
pX, platoon unblocked					0.72	
vC, conflicting volume	1395				2226	694
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1395				1922	694
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				98	93
cM capacity (veh/h)	486				40	386

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	25	788	788	694	694	8	27
Volume Left	25	0	0	0	0	0	1
Volume Right	0	0	0	0	0	8	26
cSH	486	1700	1700	1700	1700	1700	292
Volume to Capacity	0.05	0.46	0.46	0.41	0.41	0.00	0.09
Queue Length 95th (ft)	4	0	0	0	0	0	8
Control Delay (s)	12.8	0.0	0.0	0.0	0.0	0.0	18.6
Lane LOS	B						C
Approach Delay (s)	0.2			0.0			18.6
Approach LOS							C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C.3

2018 Signalized Intersection Afternoon (PM) Traffic Analysis

HCM Signalized Intersection Capacity Analysis
2-1a: PCH & Coastline Dr

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↰	↱
Traffic Volume (vph)	38	1986	2689	113	105	47
Future Volume (vph)	38	1986	2689	113	105	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	11
Total Lost time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	3250	3250	1583	3313	1393
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1711	3250	3250	1583	3313	1393
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	2159	2923	123	114	51
RTOR Reduction (vph)	0	0	0	11	1	41
Lane Group Flow (vph)	41	2159	2923	112	118	5
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	11.8	273.3	257.2	257.2	15.0	15.0
Effective Green, g (s)	11.8	273.3	257.2	257.2	15.0	15.0
Actuated g/C Ratio	0.04	0.91	0.86	0.86	0.05	0.05
Clearance Time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Vehicle Extension (s)	2.0	7.0	7.0	7.0	2.0	2.0
Lane Grp Cap (vph)	67	2971	2796	1362	166	69
v/s Ratio Prot	0.02	c0.66	c0.90		c0.04	0.00
v/s Ratio Perm				0.07		
v/c Ratio	0.61	0.73	1.05	0.08	0.71	0.07
Uniform Delay, d1	141.3	3.3	20.8	3.1	139.8	135.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	1.6	30.4	0.1	11.3	0.2
Delay (s)	152.4	4.9	51.3	3.2	151.1	135.5
Level of Service	F	A	D	A	F	F
Approach Delay (s)		7.6	49.3		146.8	
Approach LOS		A	D		F	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	298.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5-1a: PCH & Zumirez Dr

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑↱			↰↑	↱		↰↑↱	↱
Traffic Volume (vph)	11	1513	20	115	1987	15	27	3	99	10	4	6
Future Volume (vph)	11	1513	20	115	1987	15	27	3	99	10	4	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	12	14	12	12	12	12	11	12	12	12
Total Lost time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.99	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1888	3362	1583	1888	3359			1782	1531		1695	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.78	1.00
Satd. Flow (perm)	1888	3362	1583	1888	3359			1367	1531		1372	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1645	22	125	2160	16	29	3	108	11	4	7
RTOR Reduction (vph)	0	0	6	0	0	0	0	0	100	0	1	6
Lane Group Flow (vph)	12	1645	16	125	2176	0	0	32	8	0	15	0
Parking (#/hr)		0			0							
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4		4	8		8
Actuated Green, G (s)	2.6	93.3	93.3	12.6	103.3			9.1	9.1		9.1	9.1
Effective Green, g (s)	2.6	93.3	93.3	12.6	103.3			9.1	9.1		9.1	9.1
Actuated g/C Ratio	0.02	0.71	0.71	0.10	0.79			0.07	0.07		0.07	0.07
Clearance Time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	5.0	5.0	1.5	5.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	37	2399	1130	182	2654			95	106		95	104
v/s Ratio Prot	0.01	0.49		c0.07	c0.65							
v/s Ratio Perm			0.01					c0.02	0.00		0.01	0.00
v/c Ratio	0.32	0.69	0.01	0.69	0.82			0.34	0.07		0.16	0.00
Uniform Delay, d1	63.2	10.5	5.4	57.1	8.2			57.9	56.8		57.2	56.6
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	1.6	0.0	8.3	3.0			2.1	0.3		0.8	0.0
Delay (s)	65.0	12.1	5.4	65.4	11.1			60.0	57.1		58.0	56.6
Level of Service	E	B	A	E	B			E	E		E	E
Approach Delay (s)		12.4			14.1			57.8			57.6	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.7	Sum of lost time (s)	15.7
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5-1b: Paradise Cove Rd & PCH

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑↑	↰↱	
Traffic Volume (vph)	1579	37	39	2063	42	49
Future Volume (vph)	1579	37	39	2063	42	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	10	12	11	16	12
Total Lost time (s)	7.2		6.4	7.2	5.3	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	1.00		1.00	1.00	0.93	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3239		1593	3250	1914	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	3239		1593	3250	1914	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1716	40	42	2242	46	53
RTOR Reduction (vph)	2	0	0	0	37	0
Lane Group Flow (vph)	1754	0	42	2242	62	0
Parking (#/hr)	0	0	0	0		
Turn Type	NA		Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases						
Actuated Green, G (s)	26.6		3.0	36.0	20.4	
Effective Green, g (s)	26.6		3.0	36.0	20.4	
Actuated g/C Ratio	0.39		0.04	0.52	0.30	
Clearance Time (s)	7.2		6.4	7.2	5.3	
Vehicle Extension (s)	4.0		2.0	4.0	3.0	
Lane Grp Cap (vph)	1250		69	1698	566	
v/s Ratio Prot	0.54		0.03	c0.69	c0.03	
v/s Ratio Perm						
v/c Ratio	1.40		0.61	1.32	0.11	
Uniform Delay, d1	21.2		32.4	16.5	17.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	186.4		10.0	148.4	0.4	
Delay (s)	207.5		42.4	164.9	18.0	
Level of Service	F		D	F	B	
Approach Delay (s)	207.5			162.6	18.0	
Approach LOS	F			F	B	

Intersection Summary			
HCM 2000 Control Delay	178.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	18.9
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1a: Pacific Coast Highway & Carbon Canyon

04/16/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	2	1892	2051	2	4	3
Future Volume (vph)	2	1892	2051	2	4	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	12	12
Total Lost time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3362	3362	1794	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3362	3362	1794	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	2057	2229	2	4	3
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	2	2057	2229	2	4	1
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases				2		4
Actuated Green, G (s)	1.1	117.4	111.4	111.4	28.5	28.5
Effective Green, g (s)	1.1	117.4	111.4	111.4	28.5	28.5
Actuated g/C Ratio	0.01	0.75	0.71	0.71	0.18	0.18
Clearance Time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Vehicle Extension (s)	2.0	8.0	8.0	8.0	2.0	2.0
Lane Grp Cap (vph)	12	2515	2387	1273	321	287
v/s Ratio Prot	0.00	c0.61	c0.66		c0.00	
v/s Ratio Perm				0.00		0.00
v/c Ratio	0.17	0.82	0.93	0.00	0.01	0.00
Uniform Delay, d1	77.4	12.8	19.6	6.6	52.7	52.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	2.8	8.3	0.0	0.1	0.0
Delay (s)	79.8	15.6	27.9	6.6	52.7	52.6
Level of Service	E	B	C	A	D	D
Approach Delay (s)		15.7	27.9		52.7	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	156.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1b: Signal (Unnamed U-Turn) (22725 PCH)

04/16/2019

	↰	→	↱	↰	←	↱	↰	↑	↱	↰	↓	↱
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Volume (vph)	7	1907	0	6	2064	0	0	0	0	0	0	2
Future Volume (vph)	7	1907	0	6	2064	0	0	0	0	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	6.2		4.9	6.2						6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95						1.00	
Frt	1.00	1.00		1.00	1.00						0.86	
Flt Protected	0.95	1.00		0.95	1.00						1.00	
Satd. Flow (prot)	1770	3362		1770	3362						1611	
Flt Permitted	0.04	1.00		0.04	1.00						1.00	
Satd. Flow (perm)	74	3362		74	3362						1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	2073	0	7	2243	0	0	0	0	0	0	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	8	2073	0	7	2243	0	0	0	0	0	1	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA						NA	
Protected Phases	1!	6!		5!	2!			2!			6!	
Permitted Phases	6!			2!			2!			6!		
Actuated Green, G (s)	174.8	101.0		174.8	101.0						101.0	
Effective Green, g (s)	174.8	101.0		174.8	101.0						101.0	
Actuated g/C Ratio	0.94	0.54		0.94	0.54						0.54	
Clearance Time (s)	4.9	6.2		4.9	6.2						6.2	
Vehicle Extension (s)	2.0	8.0		2.0	8.0						8.0	
Lane Grp Cap (vph)	742	1826		742	1826						875	
v/s Ratio Prot	c0.00	0.62		0.00	c0.67						0.00	
v/s Ratio Perm	0.01			0.01								
v/c Ratio	0.01	1.14		0.01	1.23						0.00	
Uniform Delay, d1	25.7	42.5		25.7	42.5						19.4	
Progression Factor	1.00	1.00		1.00	1.00						1.00	
Incremental Delay, d2	0.0	68.2		0.0	107.8						0.0	
Delay (s)	25.8	110.7		25.8	150.3						19.4	
Level of Service	C	F		C	F						B	
Approach Delay (s)		110.4			149.9			0.0			19.4	
Approach LOS		F			F			A			B	

Intersection Summary			
HCM 2000 Control Delay	130.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	185.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1c: Pacific Coast Highway & Las Flores

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱		↰	↱		↰	↱
Traffic Volume (vph)	40	1809	11	10	1957	37	8	0	9	44	2	35
Future Volume (vph)	40	1809	11	10	1957	37	8	0	9	44	2	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	11	10	12	16	12	8	12	12
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1652	3135		1652	3250	1478		2006	1583		1777	1583
Flt Permitted	0.05	1.00		0.08	1.00	1.00		0.72	1.00		0.73	1.00
Satd. Flow (perm)	95	3135		134	3250	1478		1529	1583		1357	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1966	12	11	2127	40	9	0	10	48	2	38
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	0	0	0	0
Lane Group Flow (vph)	43	1978	0	11	2127	31	0	9	10	0	50	38
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	124.4	120.0		120.4	118.0	118.0		9.6	9.6		9.6	9.6
Effective Green, g (s)	124.4	120.0		120.4	118.0	118.0		9.6	9.6		9.6	9.6
Actuated g/C Ratio	0.83	0.80		0.80	0.79	0.79		0.06	0.06		0.06	0.06
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0		2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	124	2509		131	2558	1163		97	101		86	101
v/s Ratio Prot	c0.01	0.63		0.00	c0.65							
v/s Ratio Perm	0.28			0.07		0.02		0.01	0.01		c0.04	0.02
v/c Ratio	0.35	0.79		0.08	0.83	0.03		0.09	0.10		0.58	0.38
Uniform Delay, d1	12.7	8.1		6.6	9.8	3.5		66.0	66.1		68.2	67.3
Progression Factor	2.65	0.16		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	1.8		0.1	3.3	0.0		0.2	0.2		9.6	2.3
Delay (s)	34.1	3.1		6.7	13.2	3.5		66.2	66.2		77.8	69.6
Level of Service	C	A		A	B	A		E	E		E	E
Approach Delay (s)		3.7			12.9			66.2			74.3	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1d: Pacific Coast Highway & Rambla Pacifico

04/16/2019

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱				↰		↱↱↱↱
Traffic Volume (vph)	6	1796	2	8	1966	27	0	0	0	27	0	14
Future Volume (vph)	6	1796	2	8	1966	27	0	0	0	27	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	11	12	12	12	12	11	12	11
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				1.00		0.64
Frt	1.00	1.00		1.00	1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95		1.00
Satd. Flow (prot)	1652	3138		1770	3250	1583				1711		3918
Flt Permitted	0.05	1.00		0.08	1.00	1.00				0.95		1.00
Satd. Flow (perm)	93	3138		149	3250	1583				1711		3918
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	1952	2	9	2137	29	0	0	0	29	0	15
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	14
Lane Group Flow (vph)	7	1954	0	9	2137	23	0	0	0	29	0	1
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm		Prot
Protected Phases	5	2		1	6							4
Permitted Phases	2			6		6				4		
Actuated Green, G (s)	124.4	120.0		120.4	118.0	118.0				9.6		9.6
Effective Green, g (s)	124.4	120.0		120.4	118.0	118.0				9.6		9.6
Actuated g/C Ratio	0.83	0.80		0.80	0.79	0.79				0.06		0.06
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0				3.0		3.0
Lane Grp Cap (vph)	122	2512		145	2558	1246				109		250
v/s Ratio Prot	c0.00	0.62		0.00	c0.66							0.00
v/s Ratio Perm	0.05			0.05		0.01				c0.02		
v/c Ratio	0.06	0.78		0.06	0.84	0.02				0.27		0.00
Uniform Delay, d1	10.4	7.9		6.3	9.9	3.4				66.8		65.7
Progression Factor	1.00	1.00		0.34	0.13	0.13				1.00		1.00
Incremental Delay, d2	0.1	2.4		0.0	2.0	0.0				1.3		0.0
Delay (s)	10.4	10.4		2.2	3.3	0.5				68.1		65.7
Level of Service	B	B		A	A	A				E		E
Approach Delay (s)		10.4			3.3			0.0			67.3	
Approach LOS		B			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱							
Traffic Volume (vph)	1	1862	0	2	2042	0	0	0	0	0	0	0
Future Volume (vph)	1	1862	0	2	2042	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	6.2		4.9	6.2							
Lane Util. Factor	1.00	0.95		1.00	0.95							
Frt	1.00	1.00		1.00	1.00							
Flt Protected	0.95	1.00		0.95	1.00							
Satd. Flow (prot)	1770	3362		1770	3362							
Flt Permitted	0.04	1.00		0.04	1.00							
Satd. Flow (perm)	75	3362		75	3362							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	2024	0	2	2220	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	2024	0	2	2220	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA							
Protected Phases	1	6		5	2							
Permitted Phases	6			2								
Actuated Green, G (s)	173.8	100.0		173.8	100.0							
Effective Green, g (s)	173.8	100.0		173.8	100.0							
Actuated g/C Ratio	0.94	0.54		0.94	0.54							
Clearance Time (s)	4.9	6.2		4.9	6.2							
Vehicle Extension (s)	2.0	8.0		2.0	8.0							
Lane Grp Cap (vph)	747	1818		747	1818							
v/s Ratio Prot	0.00	0.60		c0.00	c0.66							
v/s Ratio Perm	0.00			0.00								
v/c Ratio	0.00	1.11		0.00	1.22							
Uniform Delay, d1	25.3	42.5		25.3	42.5							
Progression Factor	1.00	1.00		1.00	1.00							
Incremental Delay, d2	0.0	59.3		0.0	104.7							
Delay (s)	25.3	101.8		25.3	147.2							
Level of Service	C	F		C	F							
Approach Delay (s)		101.8			147.0			0.0			0.0	
Approach LOS		F			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	125.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	184.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Appendix C.4

2018 Stop Controlled Intersection Afternoon (PM) Traffic Analysis

HCM Unsignalized Intersection Capacity Analysis
2-2a: Coastline Dr & Surfview Dr

04/16/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		Y	
Traffic Volume (veh/h)	5	104	118	33	44	5
Future Volume (Veh/h)	5	104	118	33	44	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	113	128	36	48	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			309			
pX, platoon unblocked						
vC, conflicting volume	164				212	82
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	164				212	82
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	99
cM capacity (veh/h)	1412				754	961

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	43	75	85	79	53
Volume Left	5	0	0	0	48
Volume Right	0	0	0	36	5
cSH	1412	1700	1700	1700	769
Volume to Capacity	0.00	0.04	0.05	0.05	0.07
Queue Length 95th (ft)	0	0	0	0	6
Control Delay (s)	0.9	0.0	0.0	0.0	10.0
Lane LOS	A				B
Approach Delay (s)	0.3		0.0		10.0
Approach LOS					B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	16.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2-2b: Coastline Dr & Castlerock Rd

04/16/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		Y	
Traffic Volume (veh/h)	1	20	22	71	69	1
Future Volume (Veh/h)	1	20	22	71	69	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	22	24	77	75	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	101				86	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	101				86	62
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				92	100
cM capacity (veh/h)	1491				914	1002

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	23	101	76
Volume Left	1	0	75
Volume Right	0	77	1
cSH	1491	1700	915
Volume to Capacity	0.00	0.06	0.08
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.3	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	0.3	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2a: PCH & Meadows Ct

04/16/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Volume (veh/h)	0	1834	1968	6	0	12
Future Volume (Veh/h)	0	1834	1968	6	0	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1993	2139	7	0	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2146				3139	1073
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2146				3139	1073
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	248				8	216

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	996	996	1426	720	13
Volume Left	0	0	0	0	0
Volume Right	0	0	0	7	13
cSH	1700	1700	1700	1700	216
Volume to Capacity	0.59	0.59	0.84	0.42	0.06
Queue Length 95th (ft)	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	22.7
Lane LOS					C
Approach Delay (s)	0.0		0.0		22.7
Approach LOS					C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2b: PCH & E Winding Way

	↗	→	←	↖	↘	↙
Movement	**EBL**	**EBT**	**WBT**	**WBR**	**SBL**	**SBR**
Lane Configurations	↰	↑↑	↑↱		Y	
Traffic Volume (veh/h)	5	1788	1876	19	18	11
Future Volume (Veh/h)	5	1788	1876	19	18	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1943	2039	21	20	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2060				3031	1030
vC1, stage 1 conf vol					2050	
vC2, stage 2 conf vol					982	
vCu, unblocked vol	2060				3031	1030
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				75	95
cM capacity (veh/h)	268				80	231

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	5	972	972	1359	701	32
Volume Left	5	0	0	0	0	20
Volume Right	0	0	0	0	21	12
cSH	268	1700	1700	1700	1700	106
Volume to Capacity	0.02	0.57	0.57	0.80	0.41	0.30
Queue Length 95th (ft)	1	0	0	0	0	29
Control Delay (s)	18.7	0.0	0.0	0.0	0.0	53.2
Lane LOS	C					F
Approach Delay (s)	0.0			0.0		53.2
Approach LOS						F

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✣			✣	
Traffic Volume (veh/h)	12	1621	3	1	2066	0	1	0	8	6	0	13
Future Volume (Veh/h)	12	1621	3	1	2066	0	1	0	8	6	0	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	13	1762	3	1	2246	0	1	0	9	7	0	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)		994										
pX, platoon unblocked				0.64			0.64	0.64	0.64	0.64	0.64	
vC, conflicting volume	2246			1765			2928	4038	882	3164	4039	1123
vC1, stage 1 conf vol							1790	1790		2248	2248	
vC2, stage 2 conf vol							1139	2248		916	1791	
vCu, unblocked vol	2246			1084			2889	4610	0	3254	4612	1123
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			99	100	99	83	100	93
cM capacity (veh/h)	226			412			101	57	699	41	66	200

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	13	1175	590	1	1497	749	10	21
Volume Left	13	0	0	1	0	0	1	7
Volume Right	0	0	3	0	0	0	9	14
cSH	226	1700	1700	412	1700	1700	440	88
Volume to Capacity	0.06	0.69	0.35	0.00	0.88	0.44	0.02	0.24
Queue Length 95th (ft)	5	0	0	0	0	0	2	21
Control Delay (s)	21.9	0.0	0.0	13.8	0.0	0.0	13.4	58.5
Lane LOS	C			B			B	F
Approach Delay (s)	0.2			0.0			13.4	58.5
Approach LOS							B	F

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2d: Zuma View Pl & PCH

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Volume (veh/h)	0	1603	2	6	2082	0	0	0	5	7	0	15
Future Volume (Veh/h)	0	1603	2	6	2082	0	0	0	5	7	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	1742	2	7	2263	0	0	0	5	8	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		836										
pX, platoon unblocked				0.71			0.71	0.71	0.71	0.71	0.71	
vC, conflicting volume	2263			1744			2904	4020	872	3153	4021	1132
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2263			1228			2865	4439	0	3216	4440	1132
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	99	0	100	92
cM capacity (veh/h)	223			399			5	1	769	3	1	197

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	1161	583	7	1509	754	5	24
Volume Left	0	0	0	7	0	0	0	8
Volume Right	0	0	2	0	0	0	5	16
cSH	1700	1700	1700	399	1700	1700	769	8
Volume to Capacity	0.00	0.68	0.34	0.02	0.89	0.44	0.01	2.96
Queue Length 95th (ft)	0	0	0	1	0	0	0	104
Control Delay (s)	0.0	0.0	0.0	14.2	0.0	0.0	9.7	1779.8
Lane LOS				B			A	F
Approach Delay (s)	0.0			0.0			9.7	1779.8
Approach LOS							A	F

Intersection Summary			
Average Delay	10.6		
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2e: PCH & Ramirez Mesa Rd

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰↱	
Traffic Volume (veh/h)	14	1590	2084	11	9	13
Future Volume (Veh/h)	14	1590	2084	11	9	13
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	1728	2265	12	10	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2277				3165	1138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2277				3165	1138
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				0	93
cM capacity (veh/h)	220				8	195

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	15	864	864	1510	767	24
Volume Left	15	0	0	0	0	10
Volume Right	0	0	0	0	12	14
cSH	220	1700	1700	1700	1700	17
Volume to Capacity	0.07	0.51	0.51	0.89	0.45	1.40
Queue Length 95th (ft)	5	0	0	0	0	86
Control Delay (s)	22.6	0.0	0.0	0.0	0.0	676.6
Lane LOS	C					F
Approach Delay (s)	0.2			0.0		676.6
Approach LOS						F

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

6-2a: Pacific Coast highway & Tuna Canyon Road

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		Y	
Traffic Volume (veh/h)	0	1915	2070	0	8	3
Future Volume (Veh/h)	0	1915	2070	0	8	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2082	2250	0	9	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2250				3291	1125
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2250				3291	1125
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				0	98
cM capacity (veh/h)	226				7	199

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	694	1388	1500	750	12
Volume Left	0	0	0	0	9
Volume Right	0	0	0	0	3
cSH	226	1700	1700	1700	9
Volume to Capacity	0.00	0.82	0.88	0.44	1.38
Queue Length 95th (ft)	0	0	0	0	58
Control Delay (s)	0.0	0.0	0.0	0.0	1017.7
Lane LOS					F
Approach Delay (s)	0.0		0.0		1017.7
Approach LOS					F

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰↱	
Traffic Volume (veh/h)	19	1878	2040	5	2	11
Future Volume (Veh/h)	19	1878	2040	5	2	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	2041	2217	5	2	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			411			
pX, platoon unblocked	0.23				0.23	0.23
vC, conflicting volume	2222				3282	1111
vC1, stage 1 conf vol					2220	
vC2, stage 2 conf vol					1062	
vCu, unblocked vol	0				4253	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	94				99	95
cM capacity (veh/h)	365				163	244

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	21	1020	1020	1478	744	14
Volume Left	21	0	0	0	0	2
Volume Right	0	0	0	0	5	12
cSH	365	1700	1700	1700	1700	228
Volume to Capacity	0.06	0.60	0.60	0.87	0.44	0.06
Queue Length 95th (ft)	5	0	0	0	0	5
Control Delay (s)	15.5	0.0	0.0	0.0	0.0	21.8
Lane LOS	C					C
Approach Delay (s)	0.2			0.0		21.8
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(2): Pacific Coast Highway & Rambla Vista (West)

04/16/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	Y	
Traffic Volume (veh/h)	10	1834	1978	14	1	17
Future Volume (Veh/h)	10	1834	1978	14	1	17
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	1993	2150	15	1	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		650				
pX, platoon unblocked					0.53	
vC, conflicting volume	2165				3168	1075
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2165				3318	1075
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				69	92
cM capacity (veh/h)	244				3	215

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	11	996	996	1075	1075	15	19
Volume Left	11	0	0	0	0	0	1
Volume Right	0	0	0	0	0	15	18
cSH	244	1700	1700	1700	1700	1700	48
Volume to Capacity	0.05	0.59	0.59	0.63	0.63	0.01	0.40
Queue Length 95th (ft)	4	0	0	0	0	0	35
Control Delay (s)	20.5	0.0	0.0	0.0	0.0	0.0	122.8
Lane LOS	C						F
Approach Delay (s)	0.1			0.0			122.8
Approach LOS							F

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

APPENDIX D

Analysis Worksheets for Existing (2020) + Project Construction

Appendix D.1

2020 Signalized Intersection Morning (AM) Traffic Analysis

HCM Signalized Intersection Capacity Analysis
5-1a: PCH & Zumirez Dr

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↱			↰	↱		✥	↱
Traffic Volume (vph)	8	1159	50	73	731	2	56	2	62	5	0	10
Future Volume (vph)	8	1159	50	73	731	2	56	2	62	5	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	12	14	12	12	12	12	11	12	12	12
Total Lost time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00			1.00	1.00		0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.94	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.97	1.00
Satd. Flow (prot)	1888	3362	1583	1888	1676			1777	1531		1619	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.84	1.00
Satd. Flow (perm)	1888	3362	1583	1888	1676			1354	1531		1400	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	1260	54	79	795	2	61	2	67	5	0	11
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	61	0	7	7
Lane Group Flow (vph)	9	1260	39	79	797	0	0	63	6	0	1	1
Parking (#/hr)		0			0							
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4		4	8		8
Actuated Green, G (s)	1.3	95.0	95.0	8.4	102.1			11.6	11.6		11.6	11.6
Effective Green, g (s)	1.3	95.0	95.0	8.4	102.1			11.6	11.6		11.6	11.6
Actuated g/C Ratio	0.01	0.73	0.73	0.06	0.78			0.09	0.09		0.09	0.09
Clearance Time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	5.0	5.0	1.5	5.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	18	2443	1150	121	1309			120	135		124	133
v/s Ratio Prot	0.00	0.37		c0.04	c0.48							
v/s Ratio Perm			0.02					c0.05	0.00		0.00	0.00
v/c Ratio	0.50	0.52	0.03	0.65	0.61			0.53	0.04		0.01	0.01
Uniform Delay, d1	64.4	7.8	5.0	59.7	6.0			56.9	54.5		54.3	54.3
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	7.7	0.8	0.1	9.2	2.1			4.1	0.1		0.0	0.0
Delay (s)	72.1	8.6	5.1	69.0	8.1			61.0	54.6		54.3	54.3
Level of Service	E	A	A	E	A			E	D		D	D
Approach Delay (s)		8.9			13.6			57.7			54.3	
Approach LOS		A			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.7	Sum of lost time (s)	15.7
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5-1b: Paradise Cove Rd & PCH

04/16/2019

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑	↰↱	
Traffic Volume (vph)	1218	25	21	732	32	28
Future Volume (vph)	1218	25	21	732	32	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	10	12	11	16	12
Total Lost time (s)	7.2		6.4	7.2	5.3	
Lane Util. Factor	0.95		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.94	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3240		1593	1621	1928	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3240		1593	1621	1928	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1324	27	23	796	35	30
RTOR Reduction (vph)	2	0	0	0	22	0
Lane Group Flow (vph)	1349	0	23	796	43	0
Parking (#/hr)	0	0	0	0		
Turn Type	NA		Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases						
Actuated Green, G (s)	28.8		2.0	37.2	19.2	
Effective Green, g (s)	28.8		2.0	37.2	19.2	
Actuated g/C Ratio	0.42		0.03	0.54	0.28	
Clearance Time (s)	7.2		6.4	7.2	5.3	
Vehicle Extension (s)	4.0		2.0	4.0	3.0	
Lane Grp Cap (vph)	1354		46	875	537	
v/s Ratio Prot	c0.42		0.01	c0.49	c0.02	
v/s Ratio Perm						
v/c Ratio	1.00		0.50	0.91	0.08	
Uniform Delay, d1	20.0		33.0	14.3	18.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	23.5		3.1	13.4	0.3	
Delay (s)	43.5		36.0	27.7	18.6	
Level of Service	D		D	C	B	
Approach Delay (s)	43.5			28.0	18.6	
Approach LOS	D			C	B	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	18.9
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Appendix D.2

2020 Stop Controlled Intersection Morning (AM) Traffic Analysis

HCM Unsignalized Intersection Capacity Analysis
5-2a: PCH & Meadows Ct

04/16/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↱			↱
Traffic Volume (veh/h)	0	1203	739	17	0	6
Future Volume (Veh/h)	0	1203	739	17	0	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1308	803	18	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	821				1466	812
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	821				1466	812
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	804				119	322

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	654	654	821	7
Volume Left	0	0	0	0
Volume Right	0	0	18	7
cSH	1700	1700	1700	322
Volume to Capacity	0.38	0.38	0.48	0.02
Queue Length 95th (ft)	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	16.4
Lane LOS				C
Approach Delay (s)	0.0		0.0	16.4
Approach LOS				C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2b: PCH & E Winding Way

04/16/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↱		↰↱	
Traffic Volume (veh/h)	7	1199	726	15	7	14
Future Volume (Veh/h)	7	1199	726	15	7	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	1303	789	16	8	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	805				1464	797
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	805				1464	797
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				93	95
cM capacity (veh/h)	815				118	329

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	SB 1
Volume Total	8	652	652	805	23
Volume Left	8	0	0	0	8
Volume Right	0	0	0	16	15
cSH	815	1700	1700	1700	203
Volume to Capacity	0.01	0.38	0.38	0.47	0.11
Queue Length 95th (ft)	1	0	0	0	9
Control Delay (s)	9.5	0.0	0.0	0.0	25.0
Lane LOS	A				D
Approach Delay (s)	0.1			0.0	25.0
Approach LOS					D

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	27	1222	6	6	732	11	3	0	2	8	0	22
Future Volume (Veh/h)	27	1222	6	6	732	11	3	0	2	8	0	22
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	29	1328	7	7	796	12	3	0	2	9	0	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		970										
pX, platoon unblocked				0.62			0.62	0.62	0.62	0.62	0.62	
vC, conflicting volume	808			1335			2224	2212	668	1540	2209	802
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	808			314			1747	1728	0	645	1724	802
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			90	100	100	96	100	93
cM capacity (veh/h)	813			771			30	52	672	213	52	327

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	29	885	450	7	808	5	33
Volume Left	29	0	0	7	0	3	9
Volume Right	0	0	7	0	12	2	24
cSH	813	1700	1700	771	1700	49	285
Volume to Capacity	0.04	0.52	0.26	0.01	0.48	0.10	0.12
Queue Length 95th (ft)	3	0	0	1	0	8	10
Control Delay (s)	9.6	0.0	0.0	9.7	0.0	86.1	19.3
Lane LOS	A			A		F	C
Approach Delay (s)	0.2			0.1		86.1	19.3
Approach LOS						F	C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2d: Zuma View Pl & PCH

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱		✥			✥	
Traffic Volume (veh/h)	5	1198	9	6	784	2	4	0	3	11	0	14
Future Volume (Veh/h)	5	1198	9	6	784	2	4	0	3	11	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	5	1302	10	7	852	2	4	0	3	12	0	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		833										
pX, platoon unblocked				0.83			0.83	0.83	0.83	0.83	0.83	
vC, conflicting volume	854			1312			2198	2185	656	1530	2188	852
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	854			977			2039	2023	190	1238	2027	852
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			85	100	100	89	100	95
cM capacity (veh/h)	781			586			26	47	684	108	47	303

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	5	868	444	7	852	2	7	27
Volume Left	5	0	0	7	0	0	4	12
Volume Right	0	0	10	0	0	2	3	15
cSH	781	1700	1700	586	1700	1700	44	168
Volume to Capacity	0.01	0.51	0.26	0.01	0.50	0.00	0.16	0.16
Queue Length 95th (ft)	0	0	0	1	0	0	13	14
Control Delay (s)	9.6	0.0	0.0	11.2	0.0	0.0	101.9	30.5
Lane LOS	A			B			F	D
Approach Delay (s)	0.0			0.1			101.9	30.5
Approach LOS							F	D

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

5-2e: PCH & Ramirez Mesa Rd

Movement	EBL	EBT	WBT	WBR	SBL	SBR
	↗	→	←	↖	↘	↙
Lane Configurations	↰	↑↑	↱		↰↱	
Traffic Volume (veh/h)	12	1192	772	5	25	31
Future Volume (Veh/h)	12	1192	772	5	25	31
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	1296	839	5	27	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	844				1516	842
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	844				1516	842
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				75	89
cM capacity (veh/h)	788				108	308

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	SB 1
Volume Total	13	648	648	844	61
Volume Left	13	0	0	0	27
Volume Right	0	0	0	5	34
cSH	788	1700	1700	1700	170
Volume to Capacity	0.02	0.38	0.38	0.50	0.36
Queue Length 95th (ft)	1	0	0	0	38
Control Delay (s)	9.6	0.0	0.0	0.0	37.7
Lane LOS	A				E
Approach Delay (s)	0.1			0.0	37.7
Approach LOS					E

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix D.3

2020 Signalized Intersection Afternoon (PM) Traffic Analysis

HCM Signalized Intersection Capacity Analysis
5-1a: PCH & Zumirez Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↱			↰	↱		✣	↱
Traffic Volume (vph)	12	1529	21	117	2007	16	28	4	100	11	5	7
Future Volume (vph)	12	1529	21	117	2007	16	28	4	100	11	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	12	14	12	12	12	12	11	12	12	12
Total Lost time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00			1.00	1.00		0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.99	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1888	3362	1583	1888	1675			1784	1531		1698	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.74	1.00		0.78	1.00
Satd. Flow (perm)	1888	3362	1583	1888	1675			1374	1531		1376	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	1662	23	127	2182	17	30	4	109	12	5	8
RTOR Reduction (vph)	0	0	7	0	0	0	0	0	101	0	1	7
Lane Group Flow (vph)	13	1662	16	127	2199	0	0	34	8	0	17	0
Parking (#/hr)		0			0							
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4		4	8		8
Actuated Green, G (s)	2.6	93.0	93.0	12.8	103.2			9.2	9.2		9.2	9.2
Effective Green, g (s)	2.6	93.0	93.0	12.8	103.2			9.2	9.2		9.2	9.2
Actuated g/C Ratio	0.02	0.71	0.71	0.10	0.79			0.07	0.07		0.07	0.07
Clearance Time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	5.0	5.0	1.5	5.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	37	2392	1126	184	1322			96	107		96	105
v/s Ratio Prot	0.01	0.49		c0.07	c1.31							
v/s Ratio Perm			0.01					c0.02	0.01		0.01	0.00
v/c Ratio	0.35	0.69	0.01	0.69	1.66			0.35	0.07		0.18	0.00
Uniform Delay, d1	63.2	10.8	5.5	57.0	13.7			57.9	56.8		57.2	56.5
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	1.7	0.0	8.7	301.9			2.2	0.3		0.9	0.0
Delay (s)	65.3	12.4	5.5	65.7	315.7			60.2	57.0		58.1	56.5
Level of Service	E	B	A	E	F			E	E		E	E
Approach Delay (s)		12.8			302.0			57.8			57.6	
Approach LOS		B			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	175.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.55		
Actuated Cycle Length (s)	130.7	Sum of lost time (s)	15.7
Intersection Capacity Utilization	133.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑	↰↱	
Traffic Volume (vph)	1595	38	40	2084	43	50
Future Volume (vph)	1595	38	40	2084	43	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	10	12	11	16	12
Total Lost time (s)	7.2		6.4	7.2	5.3	
Lane Util. Factor	0.95		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.93	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3239		1593	1621	1914	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	3239		1593	1621	1914	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1734	41	43	2265	47	54
RTOR Reduction (vph)	2	0	0	0	38	0
Lane Group Flow (vph)	1773	0	43	2265	63	0
Parking (#/hr)	0	0	0	0		
Turn Type	NA		Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases						
Actuated Green, G (s)	26.6		3.0	36.0	20.4	
Effective Green, g (s)	26.6		3.0	36.0	20.4	
Actuated g/C Ratio	0.39		0.04	0.52	0.30	
Clearance Time (s)	7.2		6.4	7.2	5.3	
Vehicle Extension (s)	4.0		2.0	4.0	3.0	
Lane Grp Cap (vph)	1250		69	846	566	
v/s Ratio Prot	0.55		0.03	c1.40	c0.03	
v/s Ratio Perm						
v/c Ratio	1.42		0.62	2.68	0.11	
Uniform Delay, d1	21.2		32.4	16.5	17.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	192.9		11.9	758.2	0.4	
Delay (s)	214.0		44.3	774.6	18.0	
Level of Service	F		D	F	B	
Approach Delay (s)	214.0			761.0	18.0	
Approach LOS	F			F	B	

Intersection Summary			
HCM 2000 Control Delay	511.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.97		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	18.9
Intersection Capacity Utilization	125.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Appendix D.4

2020 Stop Controlled Intersection Afternoon (PM) Traffic Analysis

HCM Unsignalized Intersection Capacity Analysis
5-2a: PCH & Meadows Ct

04/16/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
	↗	→	←	↖	↘	↙
Lane Configurations		↑↑	↱			↱
Traffic Volume (veh/h)	0	1853	1988	7	0	13
Future Volume (Veh/h)	0	1853	1988	7	0	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2014	2161	8	0	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2169				3172	2165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2169				3172	2165
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	64
cM capacity (veh/h)	243				8	39

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	1007	1007	2169	14
Volume Left	0	0	0	0
Volume Right	0	0	8	14
cSH	1700	1700	1700	39
Volume to Capacity	0.59	0.59	1.28	0.36
Queue Length 95th (ft)	0	0	0	31
Control Delay (s)	0.0	0.0	0.0	144.2
Lane LOS				F
Approach Delay (s)	0.0		0.0	144.2
Approach LOS				F

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2b: PCH & E Winding Way

04/16/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↱		↰↱	
Traffic Volume (veh/h)	6	1806	1895	20	19	12
Future Volume (Veh/h)	6	1806	1895	20	19	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1963	2060	22	21	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2082				3066	2071
vC1, stage 1 conf vol					2071	
vC2, stage 2 conf vol					996	
vCu, unblocked vol	2082				3066	2071
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				73	71
cM capacity (veh/h)	263				78	45

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	SB 1
Volume Total	7	982	982	2082	34
Volume Left	7	0	0	0	21
Volume Right	0	0	0	22	13
cSH	263	1700	1700	1700	61
Volume to Capacity	0.03	0.58	0.58	1.22	0.56
Queue Length 95th (ft)	2	0	0	0	57
Control Delay (s)	19.1	0.0	0.0	0.0	122.7
Lane LOS	C				F
Approach Delay (s)	0.1			0.0	122.7
Approach LOS					F

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2c: PCH & W Winding Way

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	15	1638	4	2	2087	17	2	0	9	7	0	14
Future Volume (Veh/h)	15	1638	4	2	2087	17	2	0	9	7	0	14
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	16	1780	4	2	2268	18	2	0	10	8	0	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)		970										
pX, platoon unblocked				0.64			0.64	0.64	0.64	0.64	0.64	
vC, conflicting volume	2286			1784			4101	4104	892	3213	4097	2277
vC1, stage 1 conf vol							1814	1814		2281	2281	
vC2, stage 2 conf vol							2287	2290		932	1816	
vCu, unblocked vol	2286			1111			4710	4715	0	3331	4704	2277
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			62	100	99	80	100	53
cM capacity (veh/h)	218			402			5	51	698	39	63	32

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	16	1187	597	2	2286	12	23
Volume Left	16	0	0	2	0	2	8
Volume Right	0	0	4	0	18	10	15
cSH	218	1700	1700	402	1700	30	34
Volume to Capacity	0.07	0.70	0.35	0.00	1.34	0.40	0.67
Queue Length 95th (ft)	6	0	0	0	0	32	58
Control Delay (s)	22.8	0.0	0.0	14.0	0.0	188.2	228.2
Lane LOS	C			B		F	F
Approach Delay (s)	0.2			0.0		188.2	228.2
Approach LOS						F	F

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	120.9%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2d: Zuma View Pl & PCH

04/16/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱		✥			✥	
Traffic Volume (veh/h)	0	1620	3	7	2103	0	0	0	6	8	0	16
Future Volume (Veh/h)	0	1620	3	7	2103	0	0	0	6	8	0	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	1761	3	8	2286	0	0	0	7	9	0	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		833										
pX, platoon unblocked				0.70			0.70	0.70	0.70	0.70	0.70	
vC, conflicting volume	2286			1764			4082	4064	882	3190	4066	2286
vC1, stage 1 conf vol							1762	1762		2302	2302	
vC2, stage 2 conf vol							2319	2302		888	1764	
vCu, unblocked vol	2286			1234			4545	4521	0	3271	4523	2286
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	99	76	100	46
cM capacity (veh/h)	218			392			17	62	759	37	61	32

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	1174	590	8	2286	0	7	26
Volume Left	0	0	0	8	0	0	0	9
Volume Right	0	0	3	0	0	0	7	17
cSH	1700	1700	1700	392	1700	1700	759	34
Volume to Capacity	0.00	0.69	0.35	0.02	1.34	0.00	0.01	0.78
Queue Length 95th (ft)	0	0	0	2	0	0	1	67
Control Delay (s)	0.0	0.0	0.0	14.4	0.0	0.0	9.8	262.2
Lane LOS				B			A	F
Approach Delay (s)	0.0			0.1			9.8	262.2
Approach LOS							A	F

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	125.4%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2e: PCH & Ramirez Mesa Rd

04/16/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↱		↰↱	
Traffic Volume (veh/h)	15	1606	2105	12	10	14
Future Volume (Veh/h)	15	1606	2105	12	10	14
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	1746	2288	13	11	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2301				3200	2294
vC1, stage 1 conf vol					2294	
vC2, stage 2 conf vol					905	
vCu, unblocked vol	2301				3200	2294
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	93				81	52
cM capacity (veh/h)	215				59	31

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	SB 1
Volume Total	16	873	873	2301	26
Volume Left	16	0	0	0	11
Volume Right	0	0	0	13	15
cSH	215	1700	1700	1700	39
Volume to Capacity	0.07	0.51	0.51	1.35	0.66
Queue Length 95th (ft)	6	0	0	0	60
Control Delay (s)	23.1	0.0	0.0	0.0	203.9
Lane LOS	C				F
Approach Delay (s)	0.2			0.0	203.9
Approach LOS					F

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	121.5%	ICU Level of Service	H
Analysis Period (min)	15		

APPENDIX E

Analysis Worksheets for Existing (2021) + Project Construction

Appendix E.1

2021 Signalized Intersection Morning (AM) Traffic Analysis

HCM Signalized Intersection Capacity Analysis
2-1a: PCH & Coastline Dr

04/18/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↱	↱
Traffic Volume (vph)	35	2566	1569	115	191	30
Future Volume (vph)	35	2566	1569	115	191	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	11
Total Lost time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.95
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	3250	3250	1583	1712	1454
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1711	3250	3250	1583	1712	1454
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	2789	1705	125	208	33
RTOR Reduction (vph)	0	0	0	23	0	6
Lane Group Flow (vph)	38	2789	1705	102	211	24
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	11.2	259.3	243.8	243.8	29.0	29.0
Effective Green, g (s)	11.2	259.3	243.8	243.8	29.0	29.0
Actuated g/C Ratio	0.04	0.87	0.82	0.82	0.10	0.10
Clearance Time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Vehicle Extension (s)	2.0	7.0	7.0	7.0	2.0	2.0
Lane Grp Cap (vph)	64	2819	2650	1291	166	141
v/s Ratio Prot	0.02	c0.86	0.52		c0.12	0.02
v/s Ratio Perm				0.06		
v/c Ratio	0.59	0.99	0.64	0.08	1.27	0.17
Uniform Delay, d1	141.6	18.5	10.7	5.4	134.9	123.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.5	14.6	1.2	0.1	160.6	0.2
Delay (s)	151.1	33.1	11.9	5.5	295.6	124.1
Level of Service	F	C	B	A	F	F
Approach Delay (s)		34.7	11.5		274.2	
Approach LOS		C	B		F	

Intersection Summary			
HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	298.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix E.2

2021 Stop Controlled Intersection Morning (AM) Traffic Analysis

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		Y	
Traffic Volume (veh/h)	2	182	106	41	42	0
Future Volume (Veh/h)	2	182	106	41	42	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	198	115	45	46	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			308			
pX, platoon unblocked						
vC, conflicting volume	160				340	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160				340	138
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				93	100
cM capacity (veh/h)	1419				655	911

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	200	160	46
Volume Left	2	0	46
Volume Right	0	45	0
cSH	1419	1700	655
Volume to Capacity	0.00	0.09	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.1	0.0	10.9
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	10.9
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2-2b: Coastline Dr & Castlerock Rd

04/18/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		Y	
Traffic Volume (veh/h)	5	31	26	64	118	3
Future Volume (Veh/h)	5	31	26	64	118	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	34	28	70	128	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	98				107	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98				107	63
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				86	100
cM capacity (veh/h)	1495				888	1002

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	39	98	131
Volume Left	5	0	128
Volume Right	0	70	3
cSH	1495	1700	890
Volume to Capacity	0.00	0.06	0.15
Queue Length 95th (ft)	0	0	13
Control Delay (s)	1.0	0.0	9.7
Lane LOS	A		A
Approach Delay (s)	1.0	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E.3

2021 Signalized Intersection Afternoon (PM) Traffic Analysis

HCM Signalized Intersection Capacity Analysis
2-1a: PCH & Coastline Dr

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↱	↱
Traffic Volume (vph)	39	2016	2730	115	107	48
Future Volume (vph)	39	2016	2730	115	107	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	11
Total Lost time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.95
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	3250	3250	1583	1708	1454
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1711	3250	3250	1583	1708	1454
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	2191	2967	125	116	52
RTOR Reduction (vph)	0	0	0	13	1	19
Lane Group Flow (vph)	42	2191	2967	112	120	28
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	11.6	263.8	247.9	247.9	24.5	24.5
Effective Green, g (s)	11.6	263.8	247.9	247.9	24.5	24.5
Actuated g/C Ratio	0.04	0.88	0.83	0.83	0.08	0.08
Clearance Time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Vehicle Extension (s)	2.0	7.0	7.0	7.0	2.0	2.0
Lane Grp Cap (vph)	66	2868	2695	1312	140	119
v/s Ratio Prot	0.02	c0.67	c0.91		c0.07	0.02
v/s Ratio Perm				0.07		
v/c Ratio	0.64	0.76	1.10	0.09	0.86	0.23
Uniform Delay, d1	141.6	6.3	25.5	4.7	135.5	128.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.8	2.0	51.8	0.1	36.2	0.4
Delay (s)	155.4	8.3	77.3	4.8	171.6	128.8
Level of Service	F	A	E	A	F	F
Approach Delay (s)		11.1	74.4		159.6	
Approach LOS		B	E		F	

Intersection Summary			
HCM 2000 Control Delay	51.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	298.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Appendix E.4

2021 Stop Controlled Intersection Afternoon (PM) Traffic Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		Y	
Traffic Volume (veh/h)	6	106	120	34	45	6
Future Volume (Veh/h)	6	106	120	34	45	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	115	130	37	49	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			309			
pX, platoon unblocked						
vC, conflicting volume	167				278	148
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	167				278	148
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				93	99
cM capacity (veh/h)	1411				709	898

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	122	167	56
Volume Left	7	0	49
Volume Right	0	37	7
cSH	1411	1700	728
Volume to Capacity	0.00	0.10	0.08
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.5	0.0	10.4
Lane LOS	A		B
Approach Delay (s)	0.5	0.0	10.4
Approach LOS			B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2-2b: Coastline Dr & Castlerock Rd

04/18/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		Y	
Traffic Volume (veh/h)	2	21	23	74	72	2
Future Volume (Veh/h)	2	21	23	74	72	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	23	25	80	78	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	105				92	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	105				92	65
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				91	100
cM capacity (veh/h)	1486				907	999

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	25	105	80
Volume Left	2	0	78
Volume Right	0	80	2
cSH	1486	1700	909
Volume to Capacity	0.00	0.06	0.09
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.6	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	16.5%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX F

Analysis Worksheets for Existing (2024) + Project Construction

Appendix F.1

2024 Signalized Intersection Morning (AM) Traffic Analysis

HCM Signalized Intersection Capacity Analysis
6-1a: Pacific Coast Highway & Carbon Canyon

04/18/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑	↱	↰	↱
Traffic Volume (vph)	13	1535	1376	5	9	15
Future Volume (vph)	13	1535	1376	5	9	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	12	12
Total Lost time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3362	1676	1794	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3362	1676	1794	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	1668	1496	5	10	16
RTOR Reduction (vph)	0	0	0	0	0	13
Lane Group Flow (vph)	14	1668	1496	5	10	3
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases				2		4
Actuated Green, G (s)	2.8	114.9	107.2	107.2	31.0	31.0
Effective Green, g (s)	2.8	114.9	107.2	107.2	31.0	31.0
Actuated g/C Ratio	0.02	0.73	0.68	0.68	0.20	0.20
Clearance Time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Vehicle Extension (s)	2.0	8.0	8.0	8.0	2.0	2.0
Lane Grp Cap (vph)	31	2462	1145	1225	349	312
v/s Ratio Prot	0.01	c0.50	c0.89		c0.01	
v/s Ratio Perm				0.00		0.00
v/c Ratio	0.45	0.68	1.31	0.00	0.03	0.01
Uniform Delay, d1	76.3	11.2	24.9	7.9	50.8	50.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	1.5	144.4	0.0	0.2	0.1
Delay (s)	80.1	12.7	169.2	7.9	51.0	50.7
Level of Service	F	B	F	A	D	D
Approach Delay (s)		13.2	168.7		50.8	
Approach LOS		B	F		D	

Intersection Summary			
HCM 2000 Control Delay	86.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	156.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1b: Signal (Unnamed U-Turn) (22725 PCH)

04/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱							
Traffic Volume (vph)	5	1636	0	0	1380	0	0	0	0	0	0	0
Future Volume (vph)	5	1636	0	0	1380	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	6.2			6.2							
Lane Util. Factor	1.00	0.95			1.00							
Frt	1.00	1.00			1.00							
Flt Protected	0.95	1.00			1.00							
Satd. Flow (prot)	1770	3362			1676							
Flt Permitted	0.04	1.00			1.00							
Satd. Flow (perm)	74	3362			1676							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1778	0	0	1500	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	5	1778	0	0	1500	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA							
Protected Phases	1	6		5	2							
Permitted Phases	6			2								
Actuated Green, G (s)	174.8	101.0			101.0							
Effective Green, g (s)	174.8	101.0			101.0							
Actuated g/C Ratio	0.94	0.54			0.54							
Clearance Time (s)	4.9	6.2			6.2							
Vehicle Extension (s)	2.0	8.0			8.0							
Lane Grp Cap (vph)	742	1826			910							
v/s Ratio Prot	c0.00	0.53			c0.89							
v/s Ratio Perm	0.00											
v/c Ratio	0.01	0.97			1.65							
Uniform Delay, d1	25.7	41.2			42.5							
Progression Factor	1.00	1.00			1.00							
Incremental Delay, d2	0.0	15.7			296.7							
Delay (s)	25.7	56.9			339.2							
Level of Service	C	E			F							
Approach Delay (s)		56.8			339.2			0.0			0.0	
Approach LOS		E			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	185.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	185.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6-1c: Pacific Coast Highway & Las Flores

04/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱		↰↑	↱		↰↑	↱
Traffic Volume (vph)	55	1420	51	22	1292	58	6	0	5	37	2	56
Future Volume (vph)	55	1420	51	22	1292	58	6	0	5	37	2	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	11	10	12	16	12	8	12	12
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1652	3122		1652	1621	1478		2006	1583		1778	1583
Flt Permitted	0.03	1.00		0.13	1.00	1.00		0.73	1.00		0.73	1.00
Satd. Flow (perm)	58	3122		233	1621	1478		1540	1583		1363	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	1543	55	24	1404	63	7	0	5	40	2	61
RTOR Reduction (vph)	0	1	0	0	0	13	0	0	0	0	0	0
Lane Group Flow (vph)	60	1597	0	24	1404	50	0	7	5	0	42	61
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	124.8	119.7		119.6	117.1	117.1		9.8	9.8		9.8	9.8
Effective Green, g (s)	124.8	119.7		119.6	117.1	117.1		9.8	9.8		9.8	9.8
Actuated g/C Ratio	0.83	0.80		0.80	0.78	0.78		0.07	0.07		0.07	0.07
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0		2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	102	2493		209	1266	1154		100	103		89	103
v/s Ratio Prot	c0.02	c0.51		0.00	c0.87							
v/s Ratio Perm	0.47			0.09		0.03		0.00	0.00		0.03	c0.04
v/c Ratio	0.59	0.64		0.11	1.11	0.04		0.07	0.05		0.47	0.59
Uniform Delay, d1	47.7	6.2		4.2	16.4	3.7		65.8	65.7		67.6	68.1
Progression Factor	1.75	0.23		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	4.4	1.0		0.1	60.7	0.1		0.1	0.1		3.9	8.8
Delay (s)	88.0	2.5		4.3	77.1	3.8		65.9	65.8		71.5	76.9
Level of Service	F	A		A	E	A		E	E		E	E
Approach Delay (s)		5.5			72.9			65.8			74.7	
Approach LOS		A			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1d: Pacific Coast Highway & Rambla Pacifico

04/18/2019

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱				↰		↱↱↱↱
Traffic Volume (vph)	5	1483	2	7	1328	31	0	0	0	32	0	12
Future Volume (vph)	5	1483	2	7	1328	31	0	0	0	32	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	11	12	12	12	12	11	12	11
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00		0.64
Frt	1.00	1.00		1.00	1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95		1.00
Satd. Flow (prot)	1652	3138		1770	1621	1583				1711		3918
Flt Permitted	0.03	1.00		0.13	1.00	1.00				0.95		1.00
Satd. Flow (perm)	58	3138		244	1621	1583				1711		3918
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1612	2	8	1443	34	0	0	0	35	0	13
RTOR Reduction (vph)	0	0	0	0	0	7	0	0	0	0	0	12
Lane Group Flow (vph)	5	1614	0	8	1443	27	0	0	0	35	0	1
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm		Prot
Protected Phases	5	2		1	6							4
Permitted Phases	2			6		6				4		
Actuated Green, G (s)	124.8	119.7		119.6	117.1	117.1				9.8		9.8
Effective Green, g (s)	124.8	119.7		119.6	117.1	117.1				9.8		9.8
Actuated g/C Ratio	0.83	0.80		0.80	0.78	0.78				0.07		0.07
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0				3.0		3.0
Lane Grp Cap (vph)	102	2505		220	1266	1236				111		256
v/s Ratio Prot	c0.00	c0.51		0.00	c0.89							0.00
v/s Ratio Perm	0.04			0.03		0.02				c0.02		
v/c Ratio	0.05	0.64		0.04	1.14	0.02				0.32		0.00
Uniform Delay, d1	46.9	6.3		4.1	16.4	3.6				66.8		65.5
Progression Factor	1.00	1.00		0.45	0.26	0.05				1.00		1.00
Incremental Delay, d2	0.1	1.3		0.0	63.9	0.0				1.6		0.0
Delay (s)	47.0	7.6		1.9	68.2	0.2				68.5		65.5
Level of Service	D	A		A	E	A				E		E
Approach Delay (s)		7.7			66.3			0.0			67.7	
Approach LOS		A			E			A			E	

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1e: Carbon Beach Estates & PCH (22333 PCH)

04/18/2019

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱							
Traffic Volume (vph)	0	1561	0	2	1394	0	0	0	0	0	0	0
Future Volume (vph)	0	1561	0	2	1394	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2		4.9	6.2							
Lane Util. Factor		0.95		1.00	1.00							
Frt		1.00		1.00	1.00							
Flt Protected		1.00		0.95	1.00							
Satd. Flow (prot)		3362		1770	1676							
Flt Permitted		1.00		0.04	1.00							
Satd. Flow (perm)		3362		75	1676							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1697	0	2	1515	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1697	0	2	1515	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA							
Protected Phases	1	6		5	2							
Permitted Phases	6			2								
Actuated Green, G (s)		100.0		173.8	100.0							
Effective Green, g (s)		100.0		173.8	100.0							
Actuated g/C Ratio		0.54		0.94	0.54							
Clearance Time (s)		6.2		4.9	6.2							
Vehicle Extension (s)		8.0		2.0	8.0							
Lane Grp Cap (vph)		1818		747	906							
v/s Ratio Prot		0.50		c0.00	c0.90							
v/s Ratio Perm				0.00								
v/c Ratio		0.93		0.00	1.67							
Uniform Delay, d1		39.4		16.6	42.5							
Progression Factor		1.00		1.00	1.00							
Incremental Delay, d2		10.3		0.0	307.3							
Delay (s)		49.7		16.6	349.8							
Level of Service		D		B	F							
Approach Delay (s)		49.7			349.4			0.0			0.0	
Approach LOS		D			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	191.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	184.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Appendix F.2

2024 Stop Controlled Intersection Morning (AM) Traffic Analysis

HCM Unsignalized Intersection Capacity Analysis
6-2a: Pacific Coast highway & Tuna Canyon Road

04/18/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↱		↲↳	
Traffic Volume (veh/h)	2	1652	1206	6	29	6
Future Volume (Veh/h)	2	1652	1206	6	29	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1796	1311	7	32	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1318				2216	1314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1318				2216	1314
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				13	95
cM capacity (veh/h)	520				37	148

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	601	1197	1318	39
Volume Left	2	0	0	32
Volume Right	0	0	7	7
cSH	520	1700	1700	43
Volume to Capacity	0.00	0.70	0.78	0.91
Queue Length 95th (ft)	0	0	0	90
Control Delay (s)	0.1	0.0	0.0	256.7
Lane LOS	A			F
Approach Delay (s)	0.0		0.0	256.7
Approach LOS				F

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(1): Pacific Coast Highway & Rambla Vista (East)

04/18/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↱		Y	
Traffic Volume (veh/h)	19	1545	1338	6	2	27
Future Volume (Veh/h)	19	1545	1338	6	2	27
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	1679	1454	7	2	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			411			
pX, platoon unblocked	0.23				0.23	0.23
vC, conflicting volume	1461				2339	1458
vC1, stage 1 conf vol					1458	
vC2, stage 2 conf vol					882	
vCu, unblocked vol	1327				5223	1311
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	82				96	14
cM capacity (veh/h)	116				47	34

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	SB 1
Volume Total	21	840	840	1461	31
Volume Left	21	0	0	0	2
Volume Right	0	0	0	7	29
cSH	116	1700	1700	1700	34
Volume to Capacity	0.18	0.49	0.49	0.86	0.91
Queue Length 95th (ft)	16	0	0	0	80
Control Delay (s)	42.6	0.0	0.0	0.0	297.0
Lane LOS	E				F
Approach Delay (s)	0.5			0.0	297.0
Approach LOS					F

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(2): Pacific Coast Highway & Rambla Vista (West)

04/18/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑	↱	↰↱	
Traffic Volume (veh/h)	24	1495	1315	8	2	25
Future Volume (Veh/h)	24	1495	1315	8	2	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	1625	1429	9	2	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		650				
pX, platoon unblocked					0.73	
vC, conflicting volume	1438				2294	1429
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1438				2028	1429
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				94	78
cM capacity (veh/h)	468				34	124

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	26	812	812	1429	9	29
Volume Left	26	0	0	0	0	2
Volume Right	0	0	0	0	9	27
cSH	468	1700	1700	1700	1700	105
Volume to Capacity	0.06	0.48	0.48	0.84	0.01	0.28
Queue Length 95th (ft)	4	0	0	0	0	26
Control Delay (s)	13.1	0.0	0.0	0.0	0.0	51.8
Lane LOS	B					F
Approach Delay (s)	0.2			0.0		51.8
Approach LOS						F

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

Appendix F.3

2024 Signalized Intersection Afternoon (PM) Traffic Analysis

HCM Signalized Intersection Capacity Analysis
6-1a: Pacific Coast Highway & Carbon Canyon

04/18/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑	↱	↰	↱
Traffic Volume (vph)	3	1949	2113	3	5	4
Future Volume (vph)	3	1949	2113	3	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	12	12
Total Lost time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3362	1676	1794	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3362	1676	1794	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	2118	2297	3	5	4
RTOR Reduction (vph)	0	0	0	0	0	3
Lane Group Flow (vph)	3	2118	2297	3	5	1
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases				2		4
Actuated Green, G (s)	1.1	118.4	112.4	112.4	27.5	27.5
Effective Green, g (s)	1.1	118.4	112.4	112.4	27.5	27.5
Actuated g/C Ratio	0.01	0.75	0.72	0.72	0.18	0.18
Clearance Time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Vehicle Extension (s)	2.0	8.0	8.0	8.0	2.0	2.0
Lane Grp Cap (vph)	12	2537	1200	1285	310	277
v/s Ratio Prot	0.00	c0.63	c1.37		c0.00	
v/s Ratio Perm				0.00		0.00
v/c Ratio	0.25	0.83	1.91	0.00	0.02	0.00
Uniform Delay, d1	77.5	12.8	22.2	6.3	53.5	53.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	3.2	414.5	0.0	0.1	0.0
Delay (s)	81.4	16.0	436.7	6.3	53.6	53.4
Level of Service	F	B	F	A	D	D
Approach Delay (s)		16.1	436.2		53.5	
Approach LOS		B	F		D	

Intersection Summary			
HCM 2000 Control Delay	234.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.55		
Actuated Cycle Length (s)	156.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	123.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1b: Signal (Unnamed U-Turn) (22725 PCH)

04/18/2019

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↑↱		↶	↱			✥			✥	
Traffic Volume (vph)	8	1965	0	7	2126	0	0	0	0	0	0	3
Future Volume (vph)	8	1965	0	7	2126	0	0	0	0	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	6.2		4.9	6.2						6.2	
Lane Util. Factor	1.00	0.95		1.00	1.00						1.00	
Frt	1.00	1.00		1.00	1.00						0.86	
Flt Protected	0.95	1.00		0.95	1.00						1.00	
Satd. Flow (prot)	1770	3362		1770	1676						1611	
Flt Permitted	0.04	1.00		0.04	1.00						1.00	
Satd. Flow (perm)	74	3362		74	1676						1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	2136	0	8	2311	0	0	0	0	0	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	9	2136	0	8	2311	0	0	0	0	0	2	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA						NA	
Protected Phases	1!	6!		5!	2!			2!			6!	
Permitted Phases	6!			2!			2!			6!		
Actuated Green, G (s)	174.8	101.0		174.8	101.0						101.0	
Effective Green, g (s)	174.8	101.0		174.8	101.0						101.0	
Actuated g/C Ratio	0.94	0.54		0.94	0.54						0.54	
Clearance Time (s)	4.9	6.2		4.9	6.2						6.2	
Vehicle Extension (s)	2.0	8.0		2.0	8.0						8.0	
Lane Grp Cap (vph)	742	1826		742	910						875	
v/s Ratio Prot	c0.00	0.64		0.00	c1.38						0.00	
v/s Ratio Perm	0.01			0.01								
v/c Ratio	0.01	1.17		0.01	2.54						0.00	
Uniform Delay, d1	25.8	42.5		25.7	42.5						19.4	
Progression Factor	1.00	1.00		1.00	1.00						1.00	
Incremental Delay, d2	0.0	82.7		0.0	696.0						0.0	
Delay (s)	25.8	125.1		25.8	738.5						19.4	
Level of Service	C	F		C	F						B	
Approach Delay (s)		124.7			736.0			0.0			19.4	
Approach LOS		F			F			A			B	

Intersection Summary			
HCM 2000 Control Delay	442.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.50		
Actuated Cycle Length (s)	185.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	138.9%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1c: Pacific Coast Highway & Las Flores

04/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱		↰	↱		↰	↱
Traffic Volume (vph)	42	1864	12	11	2016	39	9	0	10	46	3	37
Future Volume (vph)	42	1864	12	11	2016	39	9	0	10	46	3	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	11	10	12	16	12	8	12	12
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1652	3135		1652	1621	1478		2006	1583		1779	1583
Flt Permitted	0.03	1.00		0.07	1.00	1.00		0.72	1.00		0.73	1.00
Satd. Flow (perm)	58	3135		121	1621	1478		1525	1583		1362	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	2026	13	12	2191	42	10	0	11	50	3	40
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	0	0	0	0
Lane Group Flow (vph)	46	2039	0	12	2191	33	0	10	11	0	53	40
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	124.2	119.7		120.0	117.6	117.6		9.9	9.9		9.9	9.9
Effective Green, g (s)	124.2	119.7		120.0	117.6	117.6		9.9	9.9		9.9	9.9
Actuated g/C Ratio	0.83	0.80		0.80	0.78	0.78		0.07	0.07		0.07	0.07
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0		2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	95	2503		121	1271	1159		100	104		89	104
v/s Ratio Prot	c0.01	0.65		0.00	c1.35							
v/s Ratio Perm	0.38			0.08		0.02		0.01	0.01		c0.04	0.03
v/c Ratio	0.48	0.81		0.10	1.72	0.03		0.10	0.11		0.60	0.38
Uniform Delay, d1	48.1	8.7		7.6	16.2	3.6		65.8	65.8		68.1	67.1
Progression Factor	1.71	0.15		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.9	2.0		0.1	329.1	0.0		0.2	0.2		10.3	2.4
Delay (s)	83.2	3.3		7.7	345.2	3.6		66.0	66.0		78.3	69.4
Level of Service	F	A		A	F	A		E	E		E	E
Approach Delay (s)		5.1			337.0			66.0			74.5	
Approach LOS		A			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	174.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.60		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	133.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1d: Pacific Coast Highway & Rambla Pacifico

04/18/2019

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱				↰		↱↱↱↱
Traffic Volume (vph)	7	1850	3	9	2025	28	0	0	0	28	0	15
Future Volume (vph)	7	1850	3	9	2025	28	0	0	0	28	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	11	12	12	12	12	11	12	11
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00		0.64
Frt	1.00	1.00		1.00	1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95		1.00
Satd. Flow (prot)	1652	3137		1770	1621	1583				1711		3918
Flt Permitted	0.03	1.00		0.07	1.00	1.00				0.95		1.00
Satd. Flow (perm)	58	3137		135	1621	1583				1711		3918
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	2011	3	10	2201	30	0	0	0	30	0	16
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	15
Lane Group Flow (vph)	8	2014	0	10	2201	24	0	0	0	30	0	1
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm		Prot
Protected Phases	5	2		1	6							4
Permitted Phases	2			6		6				4		
Actuated Green, G (s)	124.2	119.7		120.0	117.6	117.6				9.9		9.9
Effective Green, g (s)	124.2	119.7		120.0	117.6	117.6				9.9		9.9
Actuated g/C Ratio	0.83	0.80		0.80	0.78	0.78				0.07		0.07
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0				3.0		3.0
Lane Grp Cap (vph)	95	2504		134	1271	1241				113		258
v/s Ratio Prot	c0.00	0.64		0.00	c1.36							0.00
v/s Ratio Perm	0.07			0.06		0.01				c0.02		
v/c Ratio	0.08	0.80		0.07	1.73	0.02				0.27		0.00
Uniform Delay, d1	47.1	8.5		7.2	16.2	3.5				66.5		65.4
Progression Factor	1.00	1.00		0.36	0.15	0.09				1.00		1.00
Incremental Delay, d2	0.1	2.9		0.0	329.6	0.0				1.3		0.0
Delay (s)	47.2	11.4		2.6	332.0	0.3				67.8		65.4
Level of Service	D	B		A	F	A				E		E
Approach Delay (s)		11.5			326.1			0.0			67.0	
Approach LOS		B			F			A			E	

Intersection Summary			
HCM 2000 Control Delay	175.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.56		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	123.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1e: Carbon Beach Estates & PCH (22333 PCH)

04/18/2019

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱							
Traffic Volume (vph)	2	1918	0	3	2104	0	0	0	0	0	0	0
Future Volume (vph)	2	1918	0	3	2104	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	6.2		4.9	6.2							
Lane Util. Factor	1.00	0.95		1.00	1.00							
Frt	1.00	1.00		1.00	1.00							
Flt Protected	0.95	1.00		0.95	1.00							
Satd. Flow (prot)	1770	3362		1770	1676							
Flt Permitted	0.04	1.00		0.04	1.00							
Satd. Flow (perm)	75	3362		75	1676							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	2085	0	3	2287	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2	2085	0	3	2287	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA							
Protected Phases	1	6		5	2							
Permitted Phases	6			2								
Actuated Green, G (s)	173.8	100.0		173.8	100.0							
Effective Green, g (s)	173.8	100.0		173.8	100.0							
Actuated g/C Ratio	0.94	0.54		0.94	0.54							
Clearance Time (s)	4.9	6.2		4.9	6.2							
Vehicle Extension (s)	2.0	8.0		2.0	8.0							
Lane Grp Cap (vph)	747	1818		747	906							
v/s Ratio Prot	0.00	0.62		c0.00	c1.36							
v/s Ratio Perm	0.00			0.00								
v/c Ratio	0.00	1.15		0.00	2.52							
Uniform Delay, d1	25.3	42.5		25.3	42.5							
Progression Factor	1.00	1.00		1.00	1.00							
Incremental Delay, d2	0.0	73.1		0.0	689.2							
Delay (s)	25.3	115.5		25.3	731.7							
Level of Service	C	F		C	F							
Approach Delay (s)		115.4			730.7			0.0			0.0	
Approach LOS		F			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	437.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.49		
Actuated Cycle Length (s)	184.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Appendix F.4

2024 Stop Controlled Intersection Afternoon (PM) Traffic Analysis

HCM Unsignalized Intersection Capacity Analysis
6-2a: Pacific Coast highway & Tuna Canyon Road

04/18/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↱		Y	
Traffic Volume (veh/h)	0	1973	2133	0	9	4
Future Volume (Veh/h)	0	1973	2133	0	9	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2145	2318	0	10	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2318				3390	2318
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2318				3390	2318
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				0	87
cM capacity (veh/h)	212				6	30

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	715	1430	2318	14
Volume Left	0	0	0	10
Volume Right	0	0	0	4
cSH	212	1700	1700	7
Volume to Capacity	0.00	0.84	1.36	1.92
Queue Length 95th (ft)	0	0	0	69
Control Delay (s)	0.0	0.0	0.0	1387.9
Lane LOS				F
Approach Delay (s)	0.0		0.0	1387.9
Approach LOS				F

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	122.3%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(1): Pacific Coast Highway & Rambla Vista (East)

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations	↰	↑↑	↱		↰↱	
Traffic Volume (veh/h)	20	1935	2102	6	3	12
Future Volume (Veh/h)	20	1935	2102	6	3	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	2103	2285	7	3	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2292				3384	2288
vC1, stage 1 conf vol					2288	
vC2, stage 2 conf vol					1096	
vCu, unblocked vol	2292				3384	2288
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	90				95	59
cM capacity (veh/h)	217				59	32

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	SE 1
Volume Total	22	1052	1052	2292	16
Volume Left	22	0	0	0	3
Volume Right	0	0	0	7	13
cSH	217	1700	1700	1700	35
Volume to Capacity	0.10	0.62	0.62	1.35	0.46
Queue Length 95th (ft)	8	0	0	0	39
Control Delay (s)	23.4	0.0	0.0	0.0	178.6
Lane LOS	C				F
Approach Delay (s)	0.2			0.0	178.6
Approach LOS					F

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	121.0%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(2): Pacific Coast Highway & Rambla Vista (West)

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑	↱	Y	
Traffic Volume (veh/h)	11	1890	2038	15	2	18
Future Volume (Veh/h)	11	1890	2038	15	2	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	2054	2215	16	2	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		650				
pX, platoon unblocked					0.26	
vC, conflicting volume	2231				3266	2215
vC1, stage 1 conf vol					2215	
vC2, stage 2 conf vol					1051	
vCu, unblocked vol	2231				4010	2215
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	95				97	44
cM capacity (veh/h)	229				64	36

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	12	1027	1027	2215	16	22
Volume Left	12	0	0	0	0	2
Volume Right	0	0	0	0	16	20
cSH	229	1700	1700	1700	1700	37
Volume to Capacity	0.05	0.60	0.60	1.30	0.01	0.59
Queue Length 95th (ft)	4	0	0	0	0	52
Control Delay (s)	21.6	0.0	0.0	0.0	0.0	195.9
Lane LOS	C					F
Approach Delay (s)	0.1			0.0		195.9
Approach LOS						F

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	117.3%	ICU Level of Service	H
Analysis Period (min)	15		

APPENDIX G

Analysis Worksheets for (2020) + Project Construction + Mitigation

Appendix G.1
2020 Signalized Intersection Morning (AM) Traffic Analysis with Mitigation

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↱			↰	↱		✣	↱
Traffic Volume (vph)	8	1159	50	73	731	2	56	2	62	5	0	10
Future Volume (vph)	8	1159	50	73	731	2	56	2	62	5	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	12	14	12	12	12	12	11	12	12	12
Total Lost time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.94	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.97	1.00
Satd. Flow (prot)	1888	3362	1583	1888	3361			1777	1531		1619	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.84	1.00
Satd. Flow (perm)	1888	3362	1583	1888	3361			1354	1531		1400	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	1260	54	79	795	2	61	2	67	5	0	11
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	61	0	7	7
Lane Group Flow (vph)	9	1260	39	79	797	0	0	63	6	0	1	1
Parking (#/hr)		0			0							
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4		4	8		8
Actuated Green, G (s)	1.3	95.0	95.0	8.4	102.1			11.6	11.6		11.6	11.6
Effective Green, g (s)	1.3	95.0	95.0	8.4	102.1			11.6	11.6		11.6	11.6
Actuated g/C Ratio	0.01	0.73	0.73	0.06	0.78			0.09	0.09		0.09	0.09
Clearance Time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	5.0	5.0	1.5	5.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	18	2443	1150	121	2625			120	135		124	133
v/s Ratio Prot	0.00	c0.37		c0.04	0.24							
v/s Ratio Perm			0.02					c0.05	0.00		0.00	0.00
v/c Ratio	0.50	0.52	0.03	0.65	0.30			0.53	0.04		0.01	0.01
Uniform Delay, d1	64.4	7.8	5.0	59.7	4.1			56.9	54.5		54.3	54.3
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	7.7	0.8	0.1	9.2	0.3			4.1	0.1		0.0	0.0
Delay (s)	72.1	8.6	5.1	69.0	4.4			61.0	54.6		54.3	54.3
Level of Service	E	A	A	E	A			E	D		D	D
Approach Delay (s)		8.9			10.2			57.7			54.3	
Approach LOS		A			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	130.7	Sum of lost time (s)	15.7
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5-1b: Paradise Cove Rd & PCH

06/26/2019

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑↑	↰↱	
Traffic Volume (vph)	1218	25	21	732	32	28
Future Volume (vph)	1218	25	21	732	32	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	10	12	11	16	12
Total Lost time (s)	7.2		6.4	7.2	5.3	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	1.00		1.00	1.00	0.94	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3240		1593	3250	1928	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3240		1593	3250	1928	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1324	27	23	796	35	30
RTOR Reduction (vph)	2	0	0	0	22	0
Lane Group Flow (vph)	1349	0	23	796	43	0
Parking (#/hr)	0	0	0	0		
Turn Type	NA		Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases						
Actuated Green, G (s)	28.8		2.0	37.2	19.2	
Effective Green, g (s)	28.8		2.0	37.2	19.2	
Actuated g/C Ratio	0.42		0.03	0.54	0.28	
Clearance Time (s)	7.2		6.4	7.2	5.3	
Vehicle Extension (s)	4.0		2.0	4.0	3.0	
Lane Grp Cap (vph)	1354		46	1754	537	
v/s Ratio Prot	c0.42		0.01	c0.24	c0.02	
v/s Ratio Perm						
v/c Ratio	1.00		0.50	0.45	0.08	
Uniform Delay, d1	20.0		33.0	9.7	18.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	23.5		3.1	0.3	0.3	
Delay (s)	43.5		36.0	9.9	18.6	
Level of Service	D		D	A	B	
Approach Delay (s)	43.5			10.6	18.6	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	18.9
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Appendix G.2

2020 Stop Controlled Intersection

Morning (AM) Traffic Analysis with Mitigation

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Volume (veh/h)	0	1203	739	17	0	6
Future Volume (Veh/h)	0	1203	739	17	0	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1308	803	18	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	821				1466	410
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	821				1466	410
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	804				119	590

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	654	654	535	286	7
Volume Left	0	0	0	0	0
Volume Right	0	0	0	18	7
cSH	1700	1700	1700	1700	590
Volume to Capacity	0.38	0.38	0.31	0.17	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	11.2
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.2
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰↱	
Traffic Volume (veh/h)	7	1199	726	15	7	14
Future Volume (Veh/h)	7	1199	726	15	7	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	1303	789	16	8	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	805				1464	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	805				1464	402
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				93	97
cM capacity (veh/h)	815				118	597

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	8	652	652	526	279	23
Volume Left	8	0	0	0	0	8
Volume Right	0	0	0	0	16	15
cSH	815	1700	1700	1700	1700	247
Volume to Capacity	0.01	0.38	0.38	0.31	0.16	0.09
Queue Length 95th (ft)	1	0	0	0	0	8
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	21.0
Lane LOS	A					C
Approach Delay (s)	0.1			0.0		21.0
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2c: PCH & W Winding Way

06/26/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Volume (veh/h)	27	1222	6	6	732	11	3	0	2	8	0	22
Future Volume (Veh/h)	27	1222	6	6	732	11	3	0	2	8	0	22
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	29	1328	7	7	796	12	3	0	2	9	0	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		970										
pX, platoon unblocked				0.62			0.62	0.62	0.62	0.62	0.62	
vC, conflicting volume	808			1335			1826	2212	668	1540	2209	404
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	808			314			1105	1728	0	645	1724	404
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			97	100	100	96	100	96
cM capacity (veh/h)	813			771			95	52	672	213	52	596

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	29	885	450	7	531	277	5	33
Volume Left	29	0	0	7	0	0	3	9
Volume Right	0	0	7	0	0	12	2	24
cSH	813	1700	1700	771	1700	1700	145	400
Volume to Capacity	0.04	0.52	0.26	0.01	0.31	0.16	0.03	0.08
Queue Length 95th (ft)	3	0	0	1	0	0	3	7
Control Delay (s)	9.6	0.0	0.0	9.7	0.0	0.0	30.8	14.8
Lane LOS	A			A			D	B
Approach Delay (s)	0.2			0.1			30.8	14.8
Approach LOS							D	B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2d: Zuma View Pl & PCH

06/26/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱		✥			✥	
Traffic Volume (veh/h)	5	1198	9	6	784	2	4	0	3	11	0	14
Future Volume (Veh/h)	5	1198	9	6	784	2	4	0	3	11	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	5	1302	10	7	852	2	4	0	3	12	0	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		833										
pX, platoon unblocked				0.83			0.83	0.83	0.83	0.83	0.83	
vC, conflicting volume	854			1312			1772	2185	656	1530	2188	426
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	854			977			1528	2023	190	1238	2027	426
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			94	100	100	89	100	97
cM capacity (veh/h)	781			586			64	47	684	108	47	577

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	868	444	7	426	426	2	7	27
Volume Left	5	0	0	7	0	0	0	4	12
Volume Right	0	0	10	0	0	0	2	3	15
cSH	781	1700	1700	586	1700	1700	1700	105	197
Volume to Capacity	0.01	0.51	0.26	0.01	0.25	0.25	0.00	0.07	0.14
Queue Length 95th (ft)	0	0	0	1	0	0	0	5	12
Control Delay (s)	9.6	0.0	0.0	11.2	0.0	0.0	0.0	41.7	26.2
Lane LOS	A			B				E	D
Approach Delay (s)	0.0			0.1				41.7	26.2
Approach LOS								E	D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰↱	
Traffic Volume (veh/h)	12	1192	772	5	25	31
Future Volume (Veh/h)	12	1192	772	5	25	31
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	1296	839	5	27	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	844				1516	422
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	844				1516	422
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				75	94
cM capacity (veh/h)	788				108	580

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	13	648	648	559	285	61
Volume Left	13	0	0	0	0	27
Volume Right	0	0	0	0	5	34
cSH	788	1700	1700	1700	1700	198
Volume to Capacity	0.02	0.38	0.38	0.33	0.17	0.31
Queue Length 95th (ft)	1	0	0	0	0	31
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	31.0
Lane LOS	A					D
Approach Delay (s)	0.1			0.0		31.0
Approach LOS						D

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G.3

2020 Signalized Intersection Afternoon (PM) Traffic Analysis with Mitigation

5-1a: PCH & Zumirez Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↱			↰	↱		✥	↱
Traffic Volume (vph)	12	1529	21	117	2007	16	28	4	100	11	5	7
Future Volume (vph)	12	1529	21	117	2007	16	28	4	100	11	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	12	14	12	12	12	12	11	12	12	12
Total Lost time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.99	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1888	3362	1583	1888	3358			1784	1531		1698	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.74	1.00		0.78	1.00
Satd. Flow (perm)	1888	3362	1583	1888	3358			1374	1531		1376	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	1662	23	127	2182	17	30	4	109	12	5	8
RTOR Reduction (vph)	0	0	7	0	0	0	0	0	101	0	1	7
Lane Group Flow (vph)	13	1662	16	127	2199	0	0	34	8	0	17	0
Parking (#/hr)		0			0							
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4		4	8		8
Actuated Green, G (s)	2.6	93.0	93.0	12.8	103.2			9.2	9.2		9.2	9.2
Effective Green, g (s)	2.6	93.0	93.0	12.8	103.2			9.2	9.2		9.2	9.2
Actuated g/C Ratio	0.02	0.71	0.71	0.10	0.79			0.07	0.07		0.07	0.07
Clearance Time (s)	4.6	5.8	5.8	4.6	5.8			5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	5.0	5.0	1.5	5.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	37	2392	1126	184	2651			96	107		96	105
v/s Ratio Prot	0.01	0.49		c0.07	c0.65							
v/s Ratio Perm			0.01					c0.02	0.01		0.01	0.00
v/c Ratio	0.35	0.69	0.01	0.69	0.83			0.35	0.07		0.18	0.00
Uniform Delay, d1	63.2	10.8	5.5	57.0	8.4			57.9	56.8		57.2	56.5
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	1.7	0.0	8.7	3.2			2.2	0.3		0.9	0.0
Delay (s)	65.3	12.4	5.5	65.7	11.6			60.2	57.0		58.1	56.5
Level of Service	E	B	A	E	B			E	E		E	E
Approach Delay (s)		12.8			14.5			57.8			57.6	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.7	Sum of lost time (s)	15.7
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑↑	↖↗	
Traffic Volume (vph)	1595	38	40	2084	43	50
Future Volume (vph)	1595	38	40	2084	43	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	10	12	11	16	12
Total Lost time (s)	7.2		6.4	7.2	5.3	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	1.00		1.00	1.00	0.93	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3239		1593	3250	1914	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	3239		1593	3250	1914	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1734	41	43	2265	47	54
RTOR Reduction (vph)	2	0	0	0	38	0
Lane Group Flow (vph)	1773	0	43	2265	63	0
Parking (#/hr)	0	0	0	0		
Turn Type	NA		Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases						
Actuated Green, G (s)	26.6		3.0	36.0	20.4	
Effective Green, g (s)	26.6		3.0	36.0	20.4	
Actuated g/C Ratio	0.39		0.04	0.52	0.30	
Clearance Time (s)	7.2		6.4	7.2	5.3	
Vehicle Extension (s)	4.0		2.0	4.0	3.0	
Lane Grp Cap (vph)	1250		69	1698	566	
v/s Ratio Prot	0.55		0.03	c0.70	c0.03	
v/s Ratio Perm						
v/c Ratio	1.42		0.62	1.33	0.11	
Uniform Delay, d1	21.2		32.4	16.5	17.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	192.9		11.9	154.4	0.4	
Delay (s)	214.0		44.3	170.8	18.0	
Level of Service	F		D	F	B	
Approach Delay (s)	214.0			168.5	18.0	
Approach LOS	F			F	B	

Intersection Summary			
HCM 2000 Control Delay	184.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	18.9
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Appendix G.4
2020 Stop Controlled Intersection Afternoon (PM) Traffic Analysis with Mitigation

HCM Unsignalized Intersection Capacity Analysis
5-2a: PCH & Meadows Ct

06/26/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Volume (veh/h)	0	1853	1988	7	0	13
Future Volume (Veh/h)	0	1853	1988	7	0	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2014	2161	8	0	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2169				3172	1084
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2169				3172	1084
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	93
cM capacity (veh/h)	243				8	212

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	1007	1007	1441	728	14
Volume Left	0	0	0	0	0
Volume Right	0	0	0	8	14
cSH	1700	1700	1700	1700	212
Volume to Capacity	0.59	0.59	0.85	0.43	0.07
Queue Length 95th (ft)	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	23.2
Lane LOS					C
Approach Delay (s)	0.0		0.0		23.2
Approach LOS					C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2b: PCH & E Winding Way

06/26/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		⋎	
Traffic Volume (veh/h)	6	1806	1895	20	19	12
Future Volume (Veh/h)	6	1806	1895	20	19	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1963	2060	22	21	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2082				3066	1041
vC1, stage 1 conf vol					2071	
vC2, stage 2 conf vol					996	
vCu, unblocked vol	2082				3066	1041
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				73	94
cM capacity (veh/h)	263				78	227

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	7	982	982	1373	709	34
Volume Left	7	0	0	0	0	21
Volume Right	0	0	0	0	22	13
cSH	263	1700	1700	1700	1700	104
Volume to Capacity	0.03	0.58	0.58	0.81	0.42	0.33
Queue Length 95th (ft)	2	0	0	0	0	32
Control Delay (s)	19.1	0.0	0.0	0.0	0.0	55.8
Lane LOS	C					F
Approach Delay (s)	0.1			0.0		55.8
Approach LOS						F

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Volume (veh/h)	15	1638	4	2	2087	17	2	0	9	7	0	14
Future Volume (Veh/h)	15	1638	4	2	2087	17	2	0	9	7	0	14
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	16	1780	4	2	2268	18	2	0	10	8	0	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)		970										
pX, platoon unblocked				0.64			0.64	0.64	0.64	0.64	0.64	
vC, conflicting volume	2286			1784			2967	4104	892	3213	4097	1143
vC1, stage 1 conf vol							1814	1814		2281	2281	
vC2, stage 2 conf vol							1153	2290		932	1816	
vCu, unblocked vol	2286			1111			2949	4715	0	3331	4704	1143
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			98	100	99	80	100	92
cM capacity (veh/h)	218			402			95	51	698	39	63	194

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	16	1187	597	2	1512	774	12	23
Volume Left	16	0	0	2	0	0	2	8
Volume Right	0	0	4	0	0	18	10	15
cSH	218	1700	1700	402	1700	1700	340	82
Volume to Capacity	0.07	0.70	0.35	0.00	0.89	0.46	0.04	0.28
Queue Length 95th (ft)	6	0	0	0	0	0	3	26
Control Delay (s)	22.8	0.0	0.0	14.0	0.0	0.0	16.0	65.4
Lane LOS	C			B			C	F
Approach Delay (s)	0.2			0.0			16.0	65.4
Approach LOS							C	F

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5-2d: Zuma View Pl & PCH

06/26/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱		✣			✣	
Traffic Volume (veh/h)	0	1620	3	7	2103	0	0	0	6	8	0	16
Future Volume (Veh/h)	0	1620	3	7	2103	0	0	0	6	8	0	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	1761	3	8	2286	0	0	0	7	9	0	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		833										
pX, platoon unblocked				0.70			0.70	0.70	0.70	0.70	0.70	
vC, conflicting volume	2286			1764			2938	4064	882	3190	4066	1143
vC1, stage 1 conf vol							1762	1762		2302	2302	
vC2, stage 2 conf vol							1176	2302		888	1764	
vCu, unblocked vol	2286			1234			2912	4521	0	3271	4523	1143
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	99	76	100	91
cM capacity (veh/h)	218			392			100	62	759	37	61	194

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	0	1174	590	8	1143	1143	0	7	26
Volume Left	0	0	0	8	0	0	0	0	9
Volume Right	0	0	3	0	0	0	0	7	17
cSH	1700	1700	1700	392	1700	1700	1700	759	79
Volume to Capacity	0.00	0.69	0.35	0.02	0.67	0.67	0.00	0.01	0.33
Queue Length 95th (ft)	0	0	0	2	0	0	0	1	31
Control Delay (s)	0.0	0.0	0.0	14.4	0.0	0.0	0.0	9.8	71.1
Lane LOS				B				A	F
Approach Delay (s)	0.0			0.1				9.8	71.1
Approach LOS								A	F

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

5-2e: PCH & Ramirez Mesa Rd

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰↱	
Traffic Volume (veh/h)	15	1606	2105	12	10	14
Future Volume (Veh/h)	15	1606	2105	12	10	14
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	1746	2288	13	11	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2301				3200	1150
vC1, stage 1 conf vol					2294	
vC2, stage 2 conf vol					905	
vCu, unblocked vol	2301				3200	1150
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	93				81	92
cM capacity (veh/h)	215				59	191

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	16	873	873	1525	776	26
Volume Left	16	0	0	0	0	11
Volume Right	0	0	0	0	13	15
cSH	215	1700	1700	1700	1700	99
Volume to Capacity	0.07	0.51	0.51	0.90	0.46	0.26
Queue Length 95th (ft)	6	0	0	0	0	24
Control Delay (s)	23.1	0.0	0.0	0.0	0.0	54.2
Lane LOS	C					F
Approach Delay (s)	0.2			0.0		54.2
Approach LOS						F

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

APPENDIX H

Analysis Worksheets for (2021) + Project Construction + Mitigation

Appendix H.1

2021 Signalized Intersection Morning (AM) Traffic Analysis with Mitigation

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↰	↱
Traffic Volume (vph)	35	2566	1569	115	191	30
Future Volume (vph)	35	2566	1569	115	191	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	11
Total Lost time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	3250	3250	1583	3322	1393
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1711	3250	3250	1583	3322	1393
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	2789	1705	125	208	33
RTOR Reduction (vph)	0	0	0	21	0	14
Lane Group Flow (vph)	38	2789	1705	104	211	16
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	11.2	265.0	249.5	249.5	23.3	23.3
Effective Green, g (s)	11.2	265.0	249.5	249.5	23.3	23.3
Actuated g/C Ratio	0.04	0.89	0.83	0.83	0.08	0.08
Clearance Time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Vehicle Extension (s)	2.0	7.0	7.0	7.0	2.0	2.0
Lane Grp Cap (vph)	64	2881	2712	1321	258	108
v/s Ratio Prot	0.02	c0.86	0.52		c0.06	0.01
v/s Ratio Perm				0.07		
v/c Ratio	0.59	0.97	0.63	0.08	0.82	0.15
Uniform Delay, d1	141.6	13.6	8.6	4.4	135.7	128.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.5	10.8	1.1	0.1	17.1	0.2
Delay (s)	151.1	24.4	9.7	4.5	152.8	128.8
Level of Service	F	C	A	A	F	F
Approach Delay (s)		26.1	9.4		149.8	
Approach LOS		C	A		F	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	298.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix H.2

2021 Stop Controlled Intersection

Morning (AM) Traffic Analysis with Mitigation

HCM Unsignalized Intersection Capacity Analysis
2-2a: Coastline Dr & Surfview Dr

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		↰↱	
Traffic Volume (veh/h)	2	182	106	41	42	0
Future Volume (Veh/h)	2	182	106	41	42	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	198	115	45	46	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			308			
pX, platoon unblocked						
vC, conflicting volume	160				240	80
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160				240	80
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1417				726	964

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	68	132	77	83	46
Volume Left	2	0	0	0	46
Volume Right	0	0	0	45	0
cSH	1417	1700	1700	1700	726
Volume to Capacity	0.00	0.08	0.05	0.05	0.06
Queue Length 95th (ft)	0	0	0	0	5
Control Delay (s)	0.2	0.0	0.0	0.0	10.3
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	16.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2-2b: Coastline Dr & Castlerock Rd

06/26/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		⋎	
Traffic Volume (veh/h)	5	31	26	64	118	3
Future Volume (Veh/h)	5	31	26	64	118	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	34	28	70	128	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	98				107	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98				107	63
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				86	100
cM capacity (veh/h)	1495				888	1002

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	39	98	131
Volume Left	5	0	128
Volume Right	0	70	3
cSH	1495	1700	890
Volume to Capacity	0.00	0.06	0.15
Queue Length 95th (ft)	0	0	13
Control Delay (s)	1.0	0.0	9.7
Lane LOS	A		A
Approach Delay (s)	1.0	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix H.3

2021 Signalized Intersection Afternoon (PM) Traffic Analysis with Mitigation

HCM Signalized Intersection Capacity Analysis
2-1a: PCH & Coastline Dr

06/26/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↰	↱
Traffic Volume (vph)	39	2016	2730	115	107	48
Future Volume (vph)	39	2016	2730	115	107	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	11
Total Lost time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	3250	3250	1583	3313	1393
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1711	3250	3250	1583	3313	1393
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	2191	2967	125	116	52
RTOR Reduction (vph)	0	0	0	11	1	41
Lane Group Flow (vph)	42	2191	2967	114	120	6
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	12.0	273.1	256.8	256.8	15.2	15.2
Effective Green, g (s)	12.0	273.1	256.8	256.8	15.2	15.2
Actuated g/C Ratio	0.04	0.91	0.86	0.86	0.05	0.05
Clearance Time (s)	4.3	5.8	5.8	5.8	4.8	4.8
Vehicle Extension (s)	2.0	7.0	7.0	7.0	2.0	2.0
Lane Grp Cap (vph)	68	2969	2792	1360	168	70
v/s Ratio Prot	0.02	c0.67	c0.91		c0.04	0.00
v/s Ratio Perm				0.07		
v/c Ratio	0.62	0.74	1.06	0.08	0.71	0.09
Uniform Delay, d1	141.2	3.4	21.0	3.2	139.7	135.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.2	1.7	36.6	0.1	11.3	0.2
Delay (s)	152.4	5.1	57.7	3.3	151.1	135.4
Level of Service	F	A	E	A	F	F
Approach Delay (s)		7.9	55.5		146.7	
Approach LOS		A	E		F	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	298.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix H.4

2021 Stop Controlled Intersection

Afternoon (PM) Traffic Analysis with Mitigation

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		↲↳	
Traffic Volume (veh/h)	6	106	120	34	45	6
Future Volume (Veh/h)	6	106	120	34	45	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	115	130	37	49	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			309			
pX, platoon unblocked						
vC, conflicting volume	167				220	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	167				220	84
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				93	99
cM capacity (veh/h)	1408				745	959

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	45	77	87	80	56
Volume Left	7	0	0	0	49
Volume Right	0	0	0	37	7
cSH	1408	1700	1700	1700	766
Volume to Capacity	0.00	0.05	0.05	0.05	0.07
Queue Length 95th (ft)	0	0	0	0	6
Control Delay (s)	1.2	0.0	0.0	0.0	10.1
Lane LOS	A				B
Approach Delay (s)	0.4		0.0		10.1
Approach LOS					B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		Y	
Traffic Volume (veh/h)	2	21	23	74	72	2
Future Volume (Veh/h)	2	21	23	74	72	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	23	25	80	78	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	105				92	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	105				92	65
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				91	100
cM capacity (veh/h)	1486				907	999

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	25	105	80
Volume Left	2	0	78
Volume Right	0	80	2
cSH	1486	1700	909
Volume to Capacity	0.00	0.06	0.09
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.6	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	16.5%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX I

Analysis Worksheets for (2026) + Project Construction + Mitigation

Appendix I.1

2024 Signalized Intersection Morning (AM) Traffic Analysis with Mitigation

HCM Signalized Intersection Capacity Analysis
6-1a: Pacific Coast Highway & Carbon Canyon

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	13	1535	1376	5	9	15
Future Volume (vph)	13	1535	1376	5	9	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	12	12
Total Lost time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3362	3362	1794	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3362	3362	1794	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	1668	1496	5	10	16
RTOR Reduction (vph)	0	0	0	1	0	12
Lane Group Flow (vph)	14	1668	1496	4	10	4
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases				2		4
Actuated Green, G (s)	2.8	111.3	103.6	103.6	34.6	34.6
Effective Green, g (s)	2.8	111.3	103.6	103.6	34.6	34.6
Actuated g/C Ratio	0.02	0.71	0.66	0.66	0.22	0.22
Clearance Time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Vehicle Extension (s)	2.0	8.0	8.0	8.0	2.0	2.0
Lane Grp Cap (vph)	31	2384	2219	1184	390	349
v/s Ratio Prot	0.01	c0.50	0.44		c0.01	
v/s Ratio Perm				0.00		0.00
v/c Ratio	0.45	0.70	0.67	0.00	0.03	0.01
Uniform Delay, d1	76.3	13.2	16.3	9.1	47.9	47.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	1.7	1.7	0.0	0.1	0.1
Delay (s)	80.1	14.9	18.0	9.1	48.1	47.8
Level of Service	F	B	B	A	D	D
Approach Delay (s)		15.4	17.9		47.9	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	156.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1b: Signal (unnamed U-Turn) (22725 PCH)

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱							
Traffic Volume (vph)	5	1636	0	0	1380	0	0	0	0	0	0	0
Future Volume (vph)	5	1636	0	0	1380	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	6.2			6.2							
Lane Util. Factor	1.00	0.95			0.95							
Frt	1.00	1.00			1.00							
Flt Protected	0.95	1.00			1.00							
Satd. Flow (prot)	1770	3362			3362							
Flt Permitted	0.07	1.00			1.00							
Satd. Flow (perm)	131	3362			3362							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1778	0	0	1500	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	5	1778	0	0	1500	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA							
Protected Phases	1	6		5	2							
Permitted Phases	6			2								
Actuated Green, G (s)	174.8	101.0			101.0							
Effective Green, g (s)	174.8	101.0			101.0							
Actuated g/C Ratio	0.94	0.54			0.54							
Clearance Time (s)	4.9	6.2			6.2							
Vehicle Extension (s)	2.0	8.0			8.0							
Lane Grp Cap (vph)	773	1826			1826							
v/s Ratio Prot	c0.00	c0.53			0.45							
v/s Ratio Perm	0.00											
v/c Ratio	0.01	0.97			0.82							
Uniform Delay, d1	10.2	41.2			35.0							
Progression Factor	1.00	1.00			1.00							
Incremental Delay, d2	0.0	15.7			4.0							
Delay (s)	10.2	56.9			39.0							
Level of Service	B	E			D							
Approach Delay (s)		56.7			39.0			0.0			0.0	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	48.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	185.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Configurations	↰	↑↱		↰	↑↑	↱		↰	↱		↰	↱
Traffic Volume (vph)	55	1420	51	22	1292	58	6	0	5	37	2	56
Future Volume (vph)	55	1420	51	22	1292	58	6	0	5	37	2	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	11	10	12	16	12	8	12	12
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1652	3122		1652	3250	1478		2006	1583		1778	1583
Flt Permitted	0.16	1.00		0.13	1.00	1.00		0.73	1.00		0.73	1.00
Satd. Flow (perm)	283	3122		232	3250	1478		1540	1583		1363	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	1543	55	24	1404	63	7	0	5	40	2	61
RTOR Reduction (vph)	0	1	0	0	0	13	0	0	0	0	0	0
Lane Group Flow (vph)	60	1597	0	24	1404	50	0	7	5	0	42	61
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	124.2	119.7		120.2	117.7	117.7		9.8	9.8		9.8	9.8
Effective Green, g (s)	124.2	119.7		120.2	117.7	117.7		9.8	9.8		9.8	9.8
Actuated g/C Ratio	0.83	0.80		0.80	0.79	0.79		0.07	0.07		0.07	0.07
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0		2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	275	2493		209	2551	1160		100	103		89	103
v/s Ratio Prot	c0.01	c0.51		0.00	0.43							
v/s Ratio Perm	0.17			0.09		0.03		0.00	0.00		0.03	c0.04
v/c Ratio	0.22	0.64		0.11	0.55	0.04		0.07	0.05		0.47	0.59
Uniform Delay, d1	3.6	6.2		4.1	6.1	3.6		65.8	65.7		67.6	68.1
Progression Factor	0.50	0.23		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	1.0		0.1	0.9	0.1		0.1	0.1		3.9	8.8
Delay (s)	1.9	2.5		4.2	7.0	3.6		65.9	65.8		71.5	76.9
Level of Service	A	A		A	A	A		E	E		E	E
Approach Delay (s)		2.4			6.8			65.8			74.7	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1d: Pacific Coast Highway & Rambla Pacifico

06/26/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱				↰		↱↱↱↱
Traffic Volume (vph)	5	1483	2	7	1328	31	0	0	0	32	0	12
Future Volume (vph)	5	1483	2	7	1328	31	0	0	0	32	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	11	12	12	12	12	11	12	11
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				1.00		0.64
Frt	1.00	1.00		1.00	1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95		1.00
Satd. Flow (prot)	1652	3138		1770	3250	1583				1711		3918
Flt Permitted	0.15	1.00		0.13	1.00	1.00				0.95		1.00
Satd. Flow (perm)	269	3138		243	3250	1583				1711		3918
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1612	2	8	1443	34	0	0	0	35	0	13
RTOR Reduction (vph)	0	0	0	0	0	7	0	0	0	0	0	12
Lane Group Flow (vph)	5	1614	0	8	1443	27	0	0	0	35	0	1
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm		Prot
Protected Phases	5	2		1	6							4
Permitted Phases	2			6		6				4		
Actuated Green, G (s)	124.2	119.7		120.2	117.7	117.7				9.8		9.8
Effective Green, g (s)	124.2	119.7		120.2	117.7	117.7				9.8		9.8
Actuated g/C Ratio	0.83	0.80		0.80	0.79	0.79				0.07		0.07
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0				3.0		3.0
Lane Grp Cap (vph)	264	2505		220	2551	1242				111		256
v/s Ratio Prot	0.00	c0.51		c0.00	0.44							0.00
v/s Ratio Perm	0.02			0.03		0.02				c0.02		
v/c Ratio	0.02	0.64		0.04	0.57	0.02				0.32		0.00
Uniform Delay, d1	3.4	6.3		4.1	6.2	3.5				66.8		65.5
Progression Factor	1.00	1.00		0.42	0.27	0.00				1.00		1.00
Incremental Delay, d2	0.0	1.3		0.0	0.8	0.0				1.6		0.0
Delay (s)	3.4	7.6		1.7	2.5	0.0				68.5		65.5
Level of Service	A	A		A	A	A				E		E
Approach Delay (s)		7.5			2.4			0.0			67.7	
Approach LOS		A			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1e: Carbon Beach Estates & PCH (22333 PCH)

06/26/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱							
Traffic Volume (vph)	0	1561	0	2	1394	0	0	0	0	0	0	0
Future Volume (vph)	0	1561	0	2	1394	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2		4.9	6.2							
Lane Util. Factor		0.95		1.00	0.95							
Frt		1.00		1.00	1.00							
Flt Protected		1.00		0.95	1.00							
Satd. Flow (prot)		3362		1770	3362							
Flt Permitted		1.00		0.04	1.00							
Satd. Flow (perm)		3362		75	3362							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1697	0	2	1515	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1697	0	2	1515	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA							
Protected Phases	1	6		5	2							
Permitted Phases	6			2								
Actuated Green, G (s)		100.0		173.8	100.0							
Effective Green, g (s)		100.0		173.8	100.0							
Actuated g/C Ratio		0.54		0.94	0.54							
Clearance Time (s)		6.2		4.9	6.2							
Vehicle Extension (s)		8.0		2.0	8.0							
Lane Grp Cap (vph)		1818		747	1818							
v/s Ratio Prot		c0.50		c0.00	0.45							
v/s Ratio Perm				0.00								
v/c Ratio		0.93		0.00	0.83							
Uniform Delay, d1		39.4		16.6	35.5							
Progression Factor		1.00		1.00	1.00							
Incremental Delay, d2		10.3		0.0	4.4							
Delay (s)		49.7		16.6	39.9							
Level of Service		D		B	D							
Approach Delay (s)		49.7			39.8			0.0			0.0	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	184.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix I.2

2024 Stop Controlled Intersection Morning (AM) Traffic Analysis with Mitigation

HCM Unsignalized Intersection Capacity Analysis
6-2a: Pacific Coast Highway & Tuna Canyon Road

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		Y	
Traffic Volume (veh/h)	2	1652	1206	6	29	6
Future Volume (Veh/h)	2	1652	1206	6	29	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1796	1311	7	32	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1318				2216	659
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1318				2216	659
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				13	98
cM capacity (veh/h)	520				37	406

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	601	1197	874	444	39
Volume Left	2	0	0	0	32
Volume Right	0	0	0	7	7
cSH	520	1700	1700	1700	44
Volume to Capacity	0.00	0.70	0.51	0.26	0.88
Queue Length 95th (ft)	0	0	0	0	88
Control Delay (s)	0.1	0.0	0.0	0.0	242.0
Lane LOS	A				F
Approach Delay (s)	0.0		0.0		242.0
Approach LOS					F

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(1): Pacific Coast Highway & Rambla Vista (East)

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		⅄	
Traffic Volume (veh/h)	19	1545	1338	6	2	27
Future Volume (Veh/h)	19	1545	1338	6	2	27
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	1679	1454	7	2	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			411			
pX, platoon unblocked	0.83				0.83	0.83
vC, conflicting volume	1461				2339	730
vC1, stage 1 conf vol					1458	
vC2, stage 2 conf vol					882	
vCu, unblocked vol	1135				2199	250
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				99	95
cM capacity (veh/h)	504				183	618

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	21	840	840	969	492	31
Volume Left	21	0	0	0	0	2
Volume Right	0	0	0	0	7	29
cSH	504	1700	1700	1700	1700	536
Volume to Capacity	0.04	0.49	0.49	0.57	0.29	0.06
Queue Length 95th (ft)	3	0	0	0	0	5
Control Delay (s)	12.4	0.0	0.0	0.0	0.0	12.1
Lane LOS	B					B
Approach Delay (s)	0.2			0.0		12.1
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

6-2b(2): Pacific Coast Highway & Rambla Vista (West)

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	Y	
Traffic Volume (veh/h)	24	1495	1315	8	2	25
Future Volume (Veh/h)	24	1495	1315	8	2	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	1625	1429	9	2	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		650				
pX, platoon unblocked					0.70	
vC, conflicting volume	1438				2294	714
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1438				1997	714
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				94	93
cM capacity (veh/h)	468				35	373

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	26	812	812	714	714	9	29
Volume Left	26	0	0	0	0	0	2
Volume Right	0	0	0	0	0	9	27
cSH	468	1700	1700	1700	1700	1700	224
Volume to Capacity	0.06	0.48	0.48	0.42	0.42	0.01	0.13
Queue Length 95th (ft)	4	0	0	0	0	0	11
Control Delay (s)	13.1	0.0	0.0	0.0	0.0	0.0	23.5
Lane LOS	B						C
Approach Delay (s)	0.2			0.0			23.5
Approach LOS							C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix I.3

2024 Signalized Intersection Afternoon (PM) Traffic Analysis with Mitigation

HCM Signalized Intersection Capacity Analysis
6-1a: Pacific Coast Highway & Carbon Canyon

06/26/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	3	1949	2113	3	5	4
Future Volume (vph)	3	1949	2113	3	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	12	12
Total Lost time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3362	3362	1794	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3362	3362	1794	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	2118	2297	3	5	4
RTOR Reduction (vph)	0	0	0	0	0	3
Lane Group Flow (vph)	3	2118	2297	3	5	1
Parking (#/hr)		0	0			
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases				2		4
Actuated Green, G (s)	1.1	118.4	112.4	112.4	27.5	27.5
Effective Green, g (s)	1.1	118.4	112.4	112.4	27.5	27.5
Actuated g/C Ratio	0.01	0.75	0.72	0.72	0.18	0.18
Clearance Time (s)	4.9	6.2	6.2	6.2	4.8	4.8
Vehicle Extension (s)	2.0	8.0	8.0	8.0	2.0	2.0
Lane Grp Cap (vph)	12	2537	2408	1285	310	277
v/s Ratio Prot	0.00	c0.63	c0.68		c0.00	
v/s Ratio Perm				0.00		0.00
v/c Ratio	0.25	0.83	0.95	0.00	0.02	0.00
Uniform Delay, d1	77.5	12.8	19.9	6.3	53.5	53.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	3.2	10.3	0.0	0.1	0.0
Delay (s)	81.4	16.0	30.3	6.3	53.6	53.4
Level of Service	F	B	C	A	D	D
Approach Delay (s)		16.1	30.2		53.5	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	156.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↑↱		↶	↑↱			✣			✣	
Traffic Volume (vph)	8	1965	0	7	2126	0	0	0	0	0	0	3
Future Volume (vph)	8	1965	0	7	2126	0	0	0	0	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	6.2		4.9	6.2						6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95						1.00	
Frt	1.00	1.00		1.00	1.00						0.86	
Flt Protected	0.95	1.00		0.95	1.00						1.00	
Satd. Flow (prot)	1770	3362		1770	3362						1611	
Flt Permitted	0.04	1.00		0.04	1.00						1.00	
Satd. Flow (perm)	74	3362		74	3362						1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	2136	0	8	2311	0	0	0	0	0	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	9	2136	0	8	2311	0	0	0	0	0	2	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA						NA	
Protected Phases	1!	6!		5!	2!			2!			6!	
Permitted Phases	6!			2!			2!			6!		
Actuated Green, G (s)	174.8	101.0		174.8	101.0						101.0	
Effective Green, g (s)	174.8	101.0		174.8	101.0						101.0	
Actuated g/C Ratio	0.94	0.54		0.94	0.54						0.54	
Clearance Time (s)	4.9	6.2		4.9	6.2						6.2	
Vehicle Extension (s)	2.0	8.0		2.0	8.0						8.0	
Lane Grp Cap (vph)	742	1826		742	1826						875	
v/s Ratio Prot	c0.00	0.64		0.00	c0.69						0.00	
v/s Ratio Perm	0.01			0.01								
v/c Ratio	0.01	1.17		0.01	1.27						0.00	
Uniform Delay, d1	25.8	42.5		25.7	42.5						19.4	
Progression Factor	1.00	1.00		1.00	1.00						1.00	
Incremental Delay, d2	0.0	82.7		0.0	124.0						0.0	
Delay (s)	25.8	125.1		25.8	166.5						19.4	
Level of Service	C	F		C	F						B	
Approach Delay (s)		124.7			166.0			0.0			19.4	
Approach LOS		F			F			A			B	

Intersection Summary			
HCM 2000 Control Delay	146.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	185.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1c: Pacific Coast Highway & Las Flores

06/26/2019

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱		↰↑	↱		↰↑	↱
Traffic Volume (vph)	42	1864	12	11	2016	39	9	0	10	46	3	37
Future Volume (vph)	42	1864	12	11	2016	39	9	0	10	46	3	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	11	10	12	16	12	8	12	12
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1652	3135		1652	3250	1478		2006	1583		1779	1583
Flt Permitted	0.05	1.00		0.07	1.00	1.00		0.72	1.00		0.73	1.00
Satd. Flow (perm)	82	3135		121	3250	1478		1525	1583		1362	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	2026	13	12	2191	42	10	0	11	50	3	40
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	0	0	0	0
Lane Group Flow (vph)	46	2039	0	12	2191	33	0	10	11	0	53	40
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	124.2	119.7		120.0	117.6	117.6		9.9	9.9		9.9	9.9
Effective Green, g (s)	124.2	119.7		120.0	117.6	117.6		9.9	9.9		9.9	9.9
Actuated g/C Ratio	0.83	0.80		0.80	0.78	0.78		0.07	0.07		0.07	0.07
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7		5.3	5.3		5.3	5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0		2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	115	2503		121	2549	1159		100	104		89	104
v/s Ratio Prot	c0.01	0.65		0.00	c0.67							
v/s Ratio Perm	0.32			0.08		0.02		0.01	0.01		c0.04	0.03
v/c Ratio	0.40	0.81		0.10	0.86	0.03		0.10	0.11		0.60	0.38
Uniform Delay, d1	15.9	8.7		7.6	10.7	3.6		65.8	65.8		68.1	67.1
Progression Factor	2.22	0.15		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	2.0		0.1	4.1	0.0		0.2	0.2		10.3	2.4
Delay (s)	35.7	3.3		7.7	14.7	3.6		66.0	66.0		78.3	69.4
Level of Service	D	A		A	B	A		E	E		E	E
Approach Delay (s)		4.0			14.5			66.0			74.5	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6-1d: Pacific Coast Highway & Rambla Pacifico

06/26/2019

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱				↰		↱↱↱↱
Traffic Volume (vph)	7	1850	3	9	2025	28	0	0	0	28	0	15
Future Volume (vph)	7	1850	3	9	2025	28	0	0	0	28	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	11	12	12	12	12	11	12	11
Total Lost time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				1.00		0.64
Frt	1.00	1.00		1.00	1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95		1.00
Satd. Flow (prot)	1652	3137		1770	3250	1583				1711		3918
Flt Permitted	0.05	1.00		0.07	1.00	1.00				0.95		1.00
Satd. Flow (perm)	81	3137		135	3250	1583				1711		3918
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	2011	3	10	2201	30	0	0	0	30	0	16
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	15
Lane Group Flow (vph)	8	2014	0	10	2201	24	0	0	0	30	0	1
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm		Prot
Protected Phases	5	2		1	6							4
Permitted Phases	2			6		6				4		
Actuated Green, G (s)	124.2	119.7		120.0	117.6	117.6				9.9		9.9
Effective Green, g (s)	124.2	119.7		120.0	117.6	117.6				9.9		9.9
Actuated g/C Ratio	0.83	0.80		0.80	0.78	0.78				0.07		0.07
Clearance Time (s)	5.9	6.7		5.9	6.7	6.7				5.3		5.3
Vehicle Extension (s)	2.0	7.0		1.0	7.0	7.0				3.0		3.0
Lane Grp Cap (vph)	114	2504		134	2549	1241				113		258
v/s Ratio Prot	c0.00	0.64		0.00	c0.68							0.00
v/s Ratio Perm	0.06			0.06		0.01				c0.02		
v/c Ratio	0.07	0.80		0.07	0.86	0.02				0.27		0.00
Uniform Delay, d1	12.4	8.5		7.2	10.8	3.5				66.5		65.4
Progression Factor	1.00	1.00		0.33	0.13	0.09				1.00		1.00
Incremental Delay, d2	0.1	2.9		0.0	2.4	0.0				1.3		0.0
Delay (s)	12.5	11.4		2.4	3.7	0.3				67.8		65.4
Level of Service	B	B		A	A	A				E		E
Approach Delay (s)		11.4			3.7			0.0			67.0	
Approach LOS		B			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱							
Traffic Volume (vph)	2	1918	0	3	2104	0	0	0	0	0	0	0
Future Volume (vph)	2	1918	0	3	2104	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	6.2		4.9	6.2							
Lane Util. Factor	1.00	0.95		1.00	0.95							
Frt	1.00	1.00		1.00	1.00							
Flt Protected	0.95	1.00		0.95	1.00							
Satd. Flow (prot)	1770	3362		1770	3362							
Flt Permitted	0.04	1.00		0.04	1.00							
Satd. Flow (perm)	75	3362		75	3362							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	2085	0	3	2287	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2	2085	0	3	2287	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt	NA		pm+pt	NA							
Protected Phases	1	6		5	2							
Permitted Phases	6			2								
Actuated Green, G (s)	173.8	100.0		173.8	100.0							
Effective Green, g (s)	173.8	100.0		173.8	100.0							
Actuated g/C Ratio	0.94	0.54		0.94	0.54							
Clearance Time (s)	4.9	6.2		4.9	6.2							
Vehicle Extension (s)	2.0	8.0		2.0	8.0							
Lane Grp Cap (vph)	747	1818		747	1818							
v/s Ratio Prot	0.00	0.62		c0.00	c0.68							
v/s Ratio Perm	0.00			0.00								
v/c Ratio	0.00	1.15		0.00	1.26							
Uniform Delay, d1	25.3	42.5		25.3	42.5							
Progression Factor	1.00	1.00		1.00	1.00							
Incremental Delay, d2	0.0	73.1		0.0	120.7							
Delay (s)	25.3	115.5		25.3	163.2							
Level of Service	C	F		C	F							
Approach Delay (s)		115.4			163.0			0.0			0.0	
Approach LOS		F			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	140.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	184.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Appendix I.4

2024 Stop Controlled Intersection Afternoon (PM) Traffic Analysis with Mitigation

HCM Unsignalized Intersection Capacity Analysis
6-2a: Pacific Coast highway & Tuna Canyon Road

06/26/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		↲↳	
Traffic Volume (veh/h)	0	1973	2133	0	9	4
Future Volume (Veh/h)	0	1973	2133	0	9	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2145	2318	0	10	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2318				3390	1159
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2318				3390	1159
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				0	98
cM capacity (veh/h)	212				6	189

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	715	1430	1545	773	14
Volume Left	0	0	0	0	10
Volume Right	0	0	0	0	4
cSH	212	1700	1700	1700	8
Volume to Capacity	0.00	0.84	0.91	0.45	1.81
Queue Length 95th (ft)	0	0	0	0	68
Control Delay (s)	0.0	0.0	0.0	0.0	1290.5
Lane LOS					F
Approach Delay (s)	0.0		0.0		1290.5
Approach LOS					F

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(1): Pacific Coast Highway & Rambla Vista (East)

06/26/2019

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations	↰	↑↑	↑↱		↰↱	
Traffic Volume (veh/h)	20	1935	2102	6	3	12
Future Volume (Veh/h)	20	1935	2102	6	3	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	2103	2285	7	3	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2292				3384	1146
vC1, stage 1 conf vol					2288	
vC2, stage 2 conf vol					1096	
vCu, unblocked vol	2292				3384	1146
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	90				95	93
cM capacity (veh/h)	217				59	193

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SE 1
Volume Total	22	1052	1052	1523	769	16
Volume Left	22	0	0	0	0	3
Volume Right	0	0	0	0	7	13
cSH	217	1700	1700	1700	1700	135
Volume to Capacity	0.10	0.62	0.62	0.90	0.45	0.12
Queue Length 95th (ft)	8	0	0	0	0	10
Control Delay (s)	23.4	0.0	0.0	0.0	0.0	35.2
Lane LOS	C					E
Approach Delay (s)	0.2			0.0		35.2
Approach LOS						E

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6-2b(2): Pacific Coast Highway & Rambla Vista (West)

06/26/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	Y	
Traffic Volume (veh/h)	11	1890	2038	15	2	18
Future Volume (Veh/h)	11	1890	2038	15	2	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	2054	2215	16	2	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		650				
pX, platoon unblocked					0.26	
vC, conflicting volume	2231				3266	1108
vC1, stage 1 conf vol					2215	
vC2, stage 2 conf vol					1051	
vCu, unblocked vol	2231				4010	1108
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	95				97	90
cM capacity (veh/h)	229				64	205

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	12	1027	1027	1108	1108	16	22
Volume Left	12	0	0	0	0	0	2
Volume Right	0	0	0	0	0	16	20
cSH	229	1700	1700	1700	1700	1700	170
Volume to Capacity	0.05	0.60	0.60	0.65	0.65	0.01	0.13
Queue Length 95th (ft)	4	0	0	0	0	0	11
Control Delay (s)	21.6	0.0	0.0	0.0	0.0	0.0	29.2
Lane LOS	C						D
Approach Delay (s)	0.1			0.0			29.2
Approach LOS							D

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

APPENDIX J

Roadway Segment Significant Impact

ROADWAY SEGMENT SIGNIFICANT IMPACT
MALIBU WATERWORKS DIST. 29

AM Calcs (Ambient Growth 1.054%)

	Existing Values								Existing + Construction Year										Existing + Construction Year + Mitigation									
Project #	**BFFS**	**V (peak)**	**PHF**	**FFS**	**S**	**Vp**	**D**	**LOS**	**Project Year**	**BFFS2**	**V (Peak)2**	**PHF2**	**FFS2**	**S2**	**Vp2**	**D2**	**Project LOS**	**Project Related Increase in Density**	**Project Year**	**BFFS2**	**V (Peak)2**	**PHF2**	**FFS2**	**S2**	**Vp2**	**D2**	**Project LOS**	**Project Related Increase in Density**
1a	35	28	0.867	30.9	30	32	1.1	A	2021	35	28	0.867	30.9	30	65	2.2	A	102%	2021	35	28	0.867	30.9	30	33	1.1	A	1%
3a	45	1,676	0.959	33.4	35	874	25.0	C	2020	45	1,684	0.959	33.4	30	1756	58.5	**F**	135%	2020	45	1,684	0.959	33.4	30	878	29.3	D	17%
3b	45	1,844	0.958	38.1	40	962	24.1	C	2020	45	1,853	0.958	38.1	35	1934	55.3	**F**	130%	2020	45	1,853	0.958	38.1	35	967	27.6	D	15%
3c	45	1,826	0.961	28.4	30	950	31.7	D	2020	45	1,835	0.961	28.4	30	1910	63.7	**F**	101%	2020	45	1,835	0.961	28.4	30	955	31.8	D	0%
3d	45	1,772	0.982	40.0	40	902	22.6	C	2020	45	1,781	0.982	40.0	40	1814	45.3	**F**	101%	2020	45	1,781	0.982	40.0	40	907	22.7	C	0%
3e	45	1,243	0.911	42.5	40	682	17.1	B	2020	45	1,249	0.911	42.5	40	1371	34.3	D	101%	2020	45	1,249	0.911	42.5	40	686	17.1	B	1%
3f	45	1,212	0.902	40.6	40	672	16.8	B	2020	45	1,218	0.902	40.6	40	1350	33.8	D	101%	2020	45	1,218	0.902	40.6	40	675	16.9	B	0%
3g	50	1,113	0.872	47.5	50	638	12.8	B	2020	50	1,119	0.872	47.5	50	1283	25.7	C	101%	2020	50	1,119	0.872	47.5	50	641	12.8	B	0%
3h	50	972	0.880	47.5	50	552	11.0	A	2020	50	977	0.880	47.5	50	1110	22.2	C	101%	2020	50	977	0.880	47.5	50	555	11.1	B	0%
4a	35	44	0.786	16.8	15	56	3.7	A	2022	35	45	0.786	16.8	15	114	7.6	A	103%	2022	35	45	0.786	16.8	15	57	3.8	A	2%
7a	45	59	0.868	40.9	40	68	1.7	A	2025	45	61	0.868	40.9	40	140	3.5	A	106%	2025	45	61	0.868	40.9	40	70	1.8	A	3%
8a	45	1,866	0.986	40.6	40	946	23.7	C	2026	45	1,932	0.986	40.6	40	1960	49.0	**F**	107%	2026	45	1,932	0.986	40.6	40	980	24.5	C	4%

PM Calcs (Ambient Growth 1.054%)

	Existing Values								Existing + Construction Year										Existing + Construction Year + Mitigation									
Project #	**BFFS**	**V (peak)**	**PHF**	**FFS**	**S**	**Vp**	**D**	**LOS**	**Project Year**	**BFFS2**	**V (Peak)2**	**PHF2**	**FFS2**	**S2**	**Vp2**	**D2**	**Project LOS**	**Project Related Increase in Density**	**Project Year**	**BFFS2**	**V (Peak)2**	**PHF2**	**FFS2**	**S2**	**Vp2**	**D2**	**Project LOS**	**Project Related Increase in Density**
1a	35	29	0.846	30.9	30	34	1.1	A	2021	35	29	0.846	30.9	30	69	2.3	A	102%	2021	35	29	0.846	30.9	30	35	1.2	A	1%
3a	45	2,137	0.961	33.4	35	1112	31.8	D	2020	45	2,148	0.961	33.4	30	2235	74.5	**F**	135%	2020	45	2,148	0.961	33.4	30	1117	37.2	E	17%
3b	45	2,106	0.956	38.1	40	1101	27.5	D	2020	45	2,117	0.956	38.1	35	2214	63.3	**F**	130%	2020	45	2,117	0.956	38.1	35	1107	31.6	D	15%
3c	45	2,037	0.947	28.4	30	1076	35.9	E	2020	45	2,047	0.947	28.4	30	2162	72.1	**F**	101%	2020	45	2,047	0.947	28.4	30	1081	36.0	E	0%
3d	45	2,050	0.978	40.0	40	1048	26.2	D	2020	45	2,060	0.978	40.0	40	2107	52.7	**F**	101%	2020	45	2,060	0.978	40.0	40	1053	26.3	D	1%
3e	45	2,046	0.967	42.5	40	1058	26.4	D	2020	45	2,056	0.967	42.5	40	2126	53.2	**F**	101%	2020	45	2,056	0.967	42.5	40	1063	26.6	D	0%
3f	45	1,987	0.910	40.6	40	1092	27.3	D	2020	45	1,997	0.910	40.6	40	2194	54.9	**F**	101%	2020	45	1,997	0.910	40.6	40	1097	27.4	D	0%
3g	50	1,532	0.936	47.5	50	818	16.4	B	2020	50	1,540	0.936	47.5	50	1645	32.9	D	101%	2020	50	1,540	0.936	47.5	50	822	16.4	B	0%
3h	50	1,427	0.972	47.5	50	734	14.7	B	2020	50	1,434	0.972	47.5	50	1475	29.5	D	101%	2020	50	1,434	0.972	47.5	50	738	14.8	B	0%
4a	35	50	0.781	16.8	15	64	4.3	A	2022	35	51	0.781	16.8	15	130	8.7	A	103%	2022	35	51	0.781	16.8	15	65	4.3	A	2%
7a	45	86	0.935	40.9	40	92	2.3	A	2025	45	89	0.935	40.9	40	190	4.7	A	106%	2025	45	89	0.935	40.9	40	95	2.4	A	3%
8a	45	2,089	0.957	40.6	40	1091	27.3	D	2026	45	2,163	0.957	40.6	40	2260	56.5	**F**	107%	2026	45	2,163	0.957	40.6	40	1130	28.3	D	4%

Source: HCM 2010 Vol. 2, Ch. 14 Multilane Highways

Automobile level of service (**LOS**) for multilane highway segments are defined by density (**D**), which is a measure of the proximity of vehicles to each other in the traffic stream or passenger cars per mile per hour.
Peak hour vehicle volumes(**V**) are used to define the roadway density along a segment. The density level coresponds to the LOS grade. A LOS of F is the point at which demand exceeds capacity.

Appendix G

Resumes of Key Preparers

MARIO BARRERA

Senior Associate

Mario Barrera has more than 14 years of experience in the environmental consulting field, including remediation system operation and maintenance; collection of wastewater, groundwater, and soil samples; field data collection and management; National Pollutant Discharge Elimination System (NPDES) rules and regulations enforcement and implementation; Phase I and Phase II assessments; California Environmental Quality Act (CEQA) hazardous material impact analysis for environmental impact reports (EIRs), transportation agency sustainability; and stormwater and industrial waste site Inspections and permitting. He also assists with project management.

Years of Experience

- Professional start date: 10/2001
- ICF start date: 07/2004

Education

- BS, Engineering Technology, Environmental Technology; California State University, Long Beach, 2003

Certifications

- First-Aid and CPR Certification

Professional Development

- 40-Hour HAZWOPER Training

Project Experience

Energy and Fuels

SEPA EIS (Third-Party) for Imperium and Westway Oil Terminals—City of Hoquiam, Grays Harbor County, Washington, 12/2014 – 02/2015

Hazardous Materials Specialist. Provided support to ICF's project manager on the project. Responsibilities included preparation of the hazards and hazardous materials sections of Environmental Impact Statement (EIS) document under the purview of the State of Washington's State Environmental Policy Act (SEPA). Currently the Westway facility is used for storage of methanol. The proposed project called for expansion of the facility to include five additional 200,000-gallon tanks for the storage of crude oil. Team also considered the chemical properties of the existing and proposed materials and their chemical fate and transport if released to the environment in an Environmental Health Technical Report.

Cuyama Solar Array Project—County of Santa Barbara, California, December 2012

Hazardous Materials Specialist. Mario provided support to ICF's project manager on the project. His responsibilities included analyzing environmental and historical land use information found in various technical documents along with the preparation of a Hazards and Hazardous Materials CEQA EIR section. The EIR document was prepared not only to analyze potentially significant environmental effects associated with the Cuyama Solar Array Project, but also potential environmental effects of a proposed amendment to the County Land Use and Development Code (LUDC) Project. The proposed amendment to the LUDC, allowed for utility-scale solar photovoltaic (PV) power-generating facilities in a district that is zoned Agriculture II (AG-II). The project goal was to provide the County of Santa Barbara with appropriate technical environmental information prior to construction.

FRV Valley Solar Project—County of Kern, California, April 2012

Hazardous Materials Specialist. Mario provided support to ICF’s project manager on the project. His responsibilities included analyzing environmental and historical land use information for preparation of a Hazards and Hazardous Materials CEQA EIR section. The Hazards and Hazardous Materials analysis encompassed three distinct locations for construction of new solar facility infrastructure. The EIR document was prepared to analyze potentially significant environmental effects associated with the FRV Valley Solar Project. The project goal was to provide the County of Kern with appropriate technical environmental information prior to construction.

Blackwell Solar Park EIR—Kern County Planning and Community Development Department, California, January 2014

Hazardous Materials/Geology Specialist. Provided support to ICF’s project manager on the project. Responsibilities included analyzing geotechnical, environmental and historical land use information found in technical documents along with the preparation of both a Hazards and Hazardous Materials and Geology and Soils CEQA EIR sections. The EIR sections were prepared to analyze potentially significant environmental effects associated with the Blackwell Solar Park Project. The project goal was to provide the County of Kern with appropriate technical environmental information prior to construction.

Lancaster Antelope Solar Power Project—TUUSSO Energy LLC, Antelope Valley, California, January 2010

Hazardous Materials Specialist. Provided support to ICF’s project manager. Responsibilities included analyzing environmental and historical land use information during the completion of a Phase I environmental site assessment and including it in the Phase I report. ICF has performed preliminary assessment studies on a variety of different site locations in the Antelope Valley. For a selected project location in the western portion of the City of Lancaster, ICF managed a variety of different technical studies in support of CEQA environmental documentation for a proposed 20MW solar power plant across more than 200 acres. The project goal was to provide the City of Lancaster Planning Department with sufficient technical environmental information to prepare a CEQA IS or EIR, depending on the issues found to be present.

Landfills

Santa Monica Landfill Gas Control System Services—City of Santa Monica, California, 01/2006 – 08/2016

Project Team Member, Project Coordinator and Deputy Project Manager. Serving as a project team member and later as deputy project manager for a landfill gas (LFG) collection, treatment, and control system. The system is composed of a well field with 10 vertical LFG extraction wells; conveyance piping; extraction blowers; treatment equipment with vapor-phase carbon vessels; and subsurface monitoring probe network. Responsible for oversight of the operation and maintenance activities required for system compliance with regulatory permits. Managed vapor sample collecting and probe network monitoring to ensure system compliance. Managed the required permitting, report writing, and field work at site.

Ports and Harbors

YTI Container Terminal Expansion EIR/EIS—Port of Los Angeles, California, 07/2014 – 08/2014

Technical Lead. Responsibilities included analyzing geologic, environmental and historical land use information along with the preparation of both Groundwater and Soils and Geology CEQA EIR sections. The project goal was to provide the Los Angeles Harbor Department with appropriate technical environmental information prior to terminal improvements.

National City Marine Terminal Improvement Project—Port of San Diego, National City, California, 01/2014

Hazardous Materials Specialist. Provided support to ICF's project manager on the project. Responsibilities included analyzing environmental and historical land use information along with the preparation of a Hazards and Hazardous Materials CEQA EIR section. The project goal was to provide the San Diego Unified Port District with appropriate technical environmental information prior to construction.

Climate Change

2010 - 2012 Metro Sustainability Report—Los Angeles County Metropolitan Transportation Authority (LA Metro), California, 12/2010 – 12/2012

Deputy Project Manager. Served as deputy project manager for the development of the 2010, 2011 and 2012 edition of the L.A. County Metro sustainability report. Responsible for proposal preparation, as well as budget development and tracking along with coordination of support staff. Also responsible for compilation, manipulation and analysis of Metro data for inclusion in the report.

Communication Facilities

Hermosa Beach SEA-US Cable System Work Order 1—RAM Telecom International, Inc., Hermosa Beach, California.

Transportation—Rail and Transit

SAMTRANS Electrification Project—San Mateo County Transit District-Penninsula Corridor Joint Powers Board, California, 03/2013

Hazardous Materials Specialist. Provided support to ICF's project manager on the project. Responsibilities included analyzing environmental and historical land use information for preparation of a Hazards and Hazardous Materials CEQA EIR section. The EIR document was prepared to analyze potentially significant environmental effects associated with the SAMTRANS Electrification Project. The project goal was to provide the San Mateo County Transit District-Peninsula Corridor Joint Powers Board with appropriate technical environmental information prior to construction.

Municipal Bus Line Maintenance Facility—Southern California Municipality, California, 02/2006 – MM/2012

Project Team Member and Project Coordinator. Provided support and coordination for a soil and ground water remediation system for a fuel spill originating from gasoline and diesel fuel underground storage tanks (USTs) that has contaminated the underlying soil and ground water with MTBE, gasoline, and diesel fuel. Performed the operation and maintenance for the ground water extraction and treatment system consisting of pneumatic pumps, a low-profile air stripper, and activated carbon filters. Was responsible for maintaining system operations in compliance with the conditions outlined in the regulatory permits. Performed collection of ground water, vapor, and wastewater samples for laboratory analysis to confirm system compliance. Collected all required system and field data. Coordinated, managed and performed most of the required permitting, quarterly report writing, and field work at site.

Municipal Bus Line Maintenance Facility—Southern California Municipality, California, 02/2009 – 06/2009

Soils management specialist. Mario provided environmental support during excavation activities for the facility's expansion project. Due to the historic use of the property, there was a potential that soils contaminated with diesel fuel, gasoline, oil, or solvents may be encountered. The environmental support services throughout the excavation process included excavation monitoring, stockpiled soil management, and sampling and analysis.

EIS for the Sound Transit Link Operations and Maintenance Satellite Facility Project—Sound Transit, Bellevue/Lynwood, Washington, 07/2015 – 08/2015

Hazardous Materials Specialist. Mario provided support to ICF's project manager on the project. His responsibilities included analyzing environmental and historical land use information for preparation of a Hazardous Materials SEPA EIS section. The Hazardous Materials analysis encompassed four alternatives for construction of a new Light Rail Vehicle (LRV) maintenance facility. The EIS document was prepared to analyze potentially significant environmental effects associated with the Sound Transit Link Operations and Maintenance Satellite Facility Project's four alternatives. The project goal was to provide Sound Transit with appropriate technical environmental information prior to construction of the new facility.

California High-Speed Train, Anaheim to Los Angeles—California High-Speed Rail Authority/ STV Incorporated, California, 07/2010

Project Team Member. Mario provided support to ICF's project manager. His responsibilities included searching for and analyzing environmental and historical land use information. The analysis was prepared in support of the CEQA environmental documentation. The project goal was to provide the California High-Speed Rail Authority with appropriate technical environmental information prior to construction.

Development and Redevelopment

San Antonio Phase II Development EIR—City of Mountain View, California, 11/2013 – 02/2014

Hazardous Materials/Geology Specialist. Provided support to ICF's project manager on the project. Responsibilities included analyzing geotechnical, environmental and historical land use information found in technical documents along with the preparation of both a Hazards and Hazardous Materials and Geology and Soils CEQA EIR sections. The EIR document was prepared to analyze potentially significant environmental effects associated with the San Antonio Phase II Development. The project goal was to provide the City of Mountain View with appropriate technical environmental information prior to construction.

Pistoria Apartments CEQA Addendum—City of Irvine, California, 11/2014 – 03/2015

Hazardous Materials Specialist. Provided support to ICF's project manager on the project. Responsibilities included analyzing environmental and historical land use information for preparation of a Hazards and Hazardous Materials CEQA EIR addendum section. Tasks also included the preparation of a Compatibility Screening Analysis to determine whether potential incompatibility issues would occur between surrounding land uses and the Pistoia Residential Project. The project goal was to provide the City of Irvine with appropriate technical environmental information prior to project implementation.

360 Fusion Apartments Addendum to EIR for Infill Apartment Project—City of Irvine, California, 03/2014 – 09/2014

Hazardous materials specialist. Provided support to ICF's project manager on the project. Responsibilities included peer reviewing the Hazards and Hazardous Materials CEQA EIR addendum section for the project. Tasks also included the preparation of a Compatibility Screening Analysis to determine whether potential incompatibility issues would occur between surrounding land uses and the 360 Fusion Project. The project goal was to provide the City of Irvine with appropriate technical environmental information prior to project implementation.

Santa Monica Corporate Yard Professional Services—City of Santa Monica, California, 8/2004 – 05/2007

Project Team Member and Project Coordinator. Mario provided support and coordination for a groundwater remediation system for a fuel spill originating from gasoline and diesel fuel underground storage tanks that has contaminated the underlying ground water with MTBE, gasoline, and diesel fuel. He performed the O&M for an ozone injection sparging system consisting of an ozone producing panel with associated ozone sparging well points. He was responsible for maintaining system operations in compliance with the conditions outlined in the regulatory permits. Mario collected all required system and field data. He coordinated, managed, and performed most of the required permitting, quarterly report writing, and fieldwork at site.

EIR for the San Diego Convention Center Phase III Expansion and Expansion Hotel Project—Port of San Diego, California, 03/2011 – 04/2011

Project Team Member. Mario provided support to ICF's project manager on the project. His responsibilities included analyzing environmental and historical land use information during the completion of a Phase I environmental site assessment, along with the preparation of a hazards and hazardous materials CEQA EIR section. The Phase I study was prepared in support of the CEQA environmental documentation. The project goal was to provide the San Diego Unified Port District with appropriate technical environmental information prior to construction.

Parks, Trails and Open Space

Palo Alto Municipal Golf Course Reconfiguration and Baylands Athletic Center Expansion Project—City of Palo Alto, California, 07/2011

Hazardous Materials Specialist. Mario provided peer review support to ICF staff on the project. His responsibilities included review and recommendations in preparation of a Hazards and Hazardous Materials CEQA EIR section. The EIR document was prepared to analyze potentially significant environmental effects associated with the Palo Alto Municipal Golf Course Reconfiguration and Baylands Athletic Center Expansion Project.

Critical Areas Services—City of Algona, Washington.

Transportation—Airports

Dual-Phase Remediation System—Southern California Municipal Airport, Santa Monica, California, 08/2004 – 10/2006

Project Team Member. Soil and groundwater remediation system at a municipal airport property in Southern California. System consisted of vacuum dewatering and soil vapor extraction. Mario performed collection of groundwater, vapor, and wastewater samples for laboratory analysis to confirm system compliance. He also collected required system and field data.

Transportation—Roads, Bridges, and Highways

State Route 120 (SR-210) Additional Lanes—San Bernardino Associated Governments (SANBAG)/URS Corporation, Location, 06/2014 – 01/2015

Project Team Member. Mario's responsibilities included analyzing environmental information to support the preparation of several CEQA IS/MND sections. The IS/MND sections included hazardous materials, geology, air quality, and biology. The IS/MND document was prepared to analyze potentially significant environmental effects associated with the SR-210 additional lanes project. The project goal was to provide SANBAG with appropriate technical environmental information prior to construction.

SR-99 Hosking Commercial Center Project EIR—City of Bakersfield, California.

I-605 Corridor Improvement Project—Caltrans District 7, Cities of Baldwin Park, El Monte, Industry, Pico Rivera, South El Monte, Whittier, Downey, Norwalk, Santa Fe Springs, and unincorporated areas in Los Angeles County, California, 06/2017 – Present

Hazardous Materials Specialist/Generalist. Mario responsibilities included analyzing hazardous materials technical data for the project's environmental analysis. He also conducted coordination of various tasks and participated in the preparation of the Alternatives chapter, Cumulative Impact Assessment and Visual sections as part of the environmental documentation for the project.

SeaCliff Siding Extension Project EIR/EA Services (Contract 75A0398 TO 2)—Caltrans District 7, Ventura County, California, 06/2016 – Present

Hazardous Materials Specialist. Mario's responsibilities included peer reviewing hazardous waste/materials content and conclusions included in the Preliminary Environmental Analysis Report (PEAR) for the project. The project consists of the construction of approximately 9,000 feet of new track siding on the existing UPRR Santa Barbara Subdivision main in unincorporated Ventura County.

On-Call Environmental Services (Contract 08A2597)—Caltrans District 8, Riverside and San Bernardino Counties, California, 12/2017 – Present

Hazardous Materials Specialist/Project Coordinator. Mario is supporting two task orders under this contract, to date:

- **TO 5, Environmental Document for Highway 95, San Bernardino County.** Mario provided support to ICF's project manager. His responsibilities included review of pertinent technical material and preparation of the hazardous materials section of an Initial Study/Mitigated Negative Declaration (IS/MND). In addition, he completed introductory sections of the IS/MND and coordinated completion of other technical sections. The IS/MND was prepared in support of the CEQA environmental documentation for the project.
- **TO 7, SR-62, San Bernardino County.** Mario provided support to ICF's project manager. He served as a translator for several outreach materials. The materials were being prepared in support of the project's CEQA environmental process.

Hacienda Boulevard at Gale Avenue Widening EIR—Los Angeles County Department of Public Works (LACDPW), 01/2014 – 03/2014

Hazardous Materials Specialist. Mario's responsibilities included analyzing environmental and historical land use information for preparation of a hazards and hazardous materials CEQA EIR section. The EIR document was prepared to analyze potentially significant environmental effects associated with the Hacienda/Gale widening. The project goal was to provide LACDPW with appropriate technical environmental information prior to construction.

Desert Area On-Call Environmental Generalist Services—Caltrans District 7, Los Angeles County, California, 11/2015 – Present

Project Team Member. Mario provides water quality and hazardous materials/waste consulting for this contract. The proposed High Desert Corridor (HDC) project is a 63-mile new expressway that would extend from Palmdale in Los Angeles County to Victorville in San Bernardino County. The project will also accommodate expansion of the DesertXpress high-speed rail service from Palmdale to Victorville.

Slauson Avenue Revitalization Project—LACDPW, Los Angeles, California, 02/2013 – 04/2013

Hazardous Materials Specialist. Mario provided support to ICF's project manager on the project. His responsibilities included analyzing environmental and historical land use information for preparation of a Hazards and Hazardous Materials CEQA EIR section. The EIR document was prepared to analyze potentially significant environmental effects associated with the Slauson Avenue Revitalization Project. The project goal was to provide LACDPW with appropriate technical environmental information prior to construction.

South Santa Fe Avenue HPSR/ASR/HRER Phase II—County of San Diego, Vista, California, 12/2010 – 03/2011

Project Team Member and Project Coordinator. Mario served as project team member and project coordinator for this Phase II environmental site assessment. He coordinated all subcontractors in the field during drilling and sampling activities, as well as prepared a Phase II environmental site assessment. The environmental site assessment was performed with the purpose of determining if the soil within the project's limits of disturbance was likely to present worker health and safety issues. Seventy-two subsurface soil samples at 42 boring locations and 25 surface soil samples were collected from 18 parcels along a 1.1-mile stretch of South Santa Fe Avenue.

Water and Wastewater

As-Needed Environmental Services—County of San Diego DPW, Various Locations in San Diego County, California.

Project Team Member. Mario provides water quality and hazardous materials/waste consulting for this contract to provide environmental services to the County of San Diego DPW. He specifically performed these services on the South Santa Fe Road Widening project.

Owen Tank Replacement IS/MND—Los Angeles County DPW, California

Hazardous Materials Specialist. Mario provided support to ICF's project manager on the project. Responsibilities included analyzing environmental and historical land use information for preparation of a Hazards and Hazardous Materials CEQA IS/MND section. The IS/MND document was prepared to analyze potentially significant environmental effects associated with the Owen Tank project. The project goal was to provide the Los Angeles County DPW with appropriate technical environmental information prior to tank replacement.

Orange County Feeder Extension Pipeline—Metropolitan Water District of Southern California, Orange County, California.

Project Team Member. Mario provided support to ICF's project manager on the project. His responsibilities included analyzing environmental and historical land use information along with the preparation of a hazards and hazardous materials CEQA MND section. The project goal was to provide the Metropolitan Water District of Southern California with appropriate technical environmental information prior to construction.

Second Lower Feeder PCCP Long-Term Rehabilitation—Metropolitan Water District of Southern California, Los Angeles and Orange County, California.

Noise Technician. Mario's responsibilities include conducting field noise measurements and drafting noise documents.

Employment History

ICF. Associate. Irvine, California. 2008 – Present.

ICF. Analyst. Irvine, California. 2006 – 2008.

ICF. Research Assistant. Irvine, California. 2004 – 2006.

Hunter Kennedy and Associates. Environmental Protection Specialist. Santa Fe Springs, California. 2001 – 2003.

DAVID DUNCAN

GIS Analyst

David Duncan is a GIS and GPS analyst focusing on environmental-based projects. He has experience handling multiple task requests and deliverables, using Trimble Yuma units with ArcPad software and the ArcGIS software suite (ArcMap, ArcCatalog, ArcToolbox, and MapGuide) to produce analysis and figure requests. David's software expertise includes ESRI ArcMap 9.3.1, ArcCatalog 9.3.1, ArcPad 7.1.1, ArcToolbox, Adobe Acrobat Standard, GPS Pathfinder Office 4.10, and Microsoft Office Suite (Access, Word, Excel, PowerPoint, and Outlook).

Years of Experience

- Professional start date: 06/1997
- ICF start date: 06/2010

Education

- BA, Geography, Bowling Green State University, 1997

Professional Development

- Trimble Yuma Units with ArcPad Software
- ESRI ArcMap 10.2.2, ArcCatalog 10.2.2, ArcPad 10.2, ArcToolBox
- Adobe Acrobat Standard
- GPS Pathfinder Office 4.10
- Microsoft Office Suite (Access, Word, Excel, Power Point, Outlook)

Project Experience

Energy and Fuels

Tehachapi Renewable Transmission Project (TRTP) Biological Consulting and Regulatory Compliance Services—Southern California Edison (SCE), Kern, Los Angeles, and San Bernardino Counties, California.

David analyzed data and gave planners spreadsheet outputs for their reports. He also imported and exported Google Earth format files. David assisted in SCE's biological resource execution phase of the TRTP. The TRTP proposes to construct a series of transmission system improvements to deliver electricity from new wind energy projects in eastern Kern County to the Los Angeles Basin.

TRTP Restoration Program Management—SCE, Kern, Los Angeles, and San Bernardino Counties, California.

Solar Energy Potential Analysis at Major Department of Defense (DoD) Installations in the Colorado and Mojave Deserts—DoD Strategic

Environmental Research and Development Program, Colorado and Mojave Deserts, California.

Site Constraints and Miscellaneous Environmental Master Agreement—Iberdrola Renewables, California.

Maricopa Sun Solar Complex—County of Kern/Maricopa Sun, LLC, Kern County, California.

Kern Solar Ranch EIR—Kern County, California.

Site Constraints and Miscellaneous Environmental Master Agreement—Iberdrola Renewables.

TRTP Chino Hills Biological Services—SCE, Chino Hills, California.

FRV Valley Solar Project—Kern County, California.

Ports and Harbors

YTI Container Terminal Expansion EIR/EIS—Port of Los Angeles, California

GIS Analyst. David provided graphic and data analysis support. He also managed the GIS database, collecting and organizing various spatial data.

Various Projects and Task Orders—San Diego Unified Port District, California

GIS Specialist. David provided GIS services including GIS mapping and analysis and data management.

National City Marine Terminal Improvement Project—Port of San Diego, California.

Transportation—Rail and Transit

California High-Speed Rail from Burbank to Anaheim—California High-Speed Rail Authority/STV, Burbank to Anaheim, California.

California High-Speed Rail from Palmdale to Burbank—California High-Speed Rail Authority/CirclePoint, Palmdale to Burbank, California.

Pacheco Pass Corridor EIR/EIS—California High-Speed Rail Authority/Parsons Transportation Group, California.

California High-Speed Rail from San Jose to Merced—California High-Speed Rail Authority/Parsons Transportation Group, San Jose to Merced, California.

David provided GIS services for this contract. The project is intended to help the State of California meet ever-growing demands on its transportation infrastructure.

California High-Speed Rail from Merced to Fresno Wyes SEIR/SEIS—California High-Speed Rail Authority/Parsons Transportation Group, Merced to Fresno, California.

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Downtown San Bernardino Rail Project—San Bernardino Association of Governments (SANBAG)/HDR Engineering, San Bernardino, California.

California Pacific Coast Corridor Coast Daylight Tier 1 EIS/EIR—San Luis Obispo Council of Governments/CirclePoint, San Luis Obispo, California.

Metro Restoration of Los Angeles Streetcar—Los Angeles County Metropolitan Transportation Authority/HDR Engineering, California.

Gold Line Foothill Extension NEPA and CEQA Clearance of Phase 2B—Los Angeles County Metropolitan Transportation Authority/Parsons Brinckerhoff, California.

Schools

Glen Mor 2 Student Housing EIR—University of California, Riverside

GIS Specialist. David provided jurisdictional delineation data and figure requests towards reports. The university proposed to establish a new apartment-style student housing development of 800 beds on approximately 6 acres on the East Campus, generally northwest of Valencia Hill Drive and Big Springs Road.

Water and Wastewater

As-Needed Environmental Services—Otay Water District, San Diego, California.

GIS Analyst. David's responsibilities included providing jurisdictional delineation GIS data analysis and GIS figure mapping. The data analysis includes providing total acreages disturbed by a jurisdictional water feature.

Orange County Feeder Extension Pipeline—Metropolitan Water District of Southern California, Orange County, California.

Air Quality Report for Lake Mathews and Technical Review and Assistance with Real-Time Management Issues Related to SWP—Metropolitan Water District of Southern California.

Clearwater Master Facilities Plan and New Ocean Discharge System EIS/EIR—County Sanitation Districts of Los Angeles County, California.

Master Facilities Plan and Tunnel Joint Outfall EIS/EIR—County Sanitation Districts of Los Angeles County, California.

GIS Specialist. David calibrated and created a route from outfall lines, showing noise data at various depths along the route. He also imported data into figures on an aerial background, showing possible affected parcels/houses. ICF managed a program EIR and tiered EIS for the 428 million gallons per day (mgd) joint outfall system master plan for the Los Angeles County Sanitation District Master Facilities Plan.

Second Lower Feeder PCCP Long-Term Rehabilitation—Metropolitan Water District of Southern California.

Transportation—Roads, Bridges, and Highways

State Route 60 (SR-60) Truck Lanes Project (Contract 08A2107 TO 11)—Caltrans District 8, California.

Via Vera Cruz Bridge Replacement Project—City of San Marcos/Parsons Transportation Group, San Marcos, California.

GIS Specialist. David provided GIS services, including import/export of engineering data for GIS mapping and analysis and data management.

U.S. 395 Shoulder Widening and Median Buffer (Contract 08A2107 TO 9)—Caltrans District 8, , California.

On-Call Environmental Services (Contract 08A1169)—Caltrans District 8, Riverside and San Bernardino Counties, California.

GIS Specialist. David provided GIS support for the Caltrans District 8 on-call environmental services contract. His duties included importing design/engineering data into GIS mapping data. The data was used for both analysis and figure display.

Cajalco Road Widening from Harvill Avenue to Temescal Canyon Road—Riverside County Transportation Department (RCTD), Corona, California.

GIS Specialist. David provided GIS services for this roadway-widening project. Cajalco Road will be widened from two lanes to three lanes in each direction (east and west) from Harvill Avenue to I-215, a distance of approximately 16 miles.

Clinton Keith Road Extension Jurisdictional Delineation Services—RCTD, Riverside County, California.

SR-210/Pepper Avenue Interchange Project—SANBAG/Civil Works Engineers, San Bernardino, California.

GIS Analyst. David's duties included graphic mapping. His other duties included data management of GIS data and file management of graphic outputs.

Clinton Keith Road Extension Complete Jurisdictional Delineation—RCTD, Riverside County, California.

GIS Analyst. David's responsibilities included providing jurisdictional delineation GIS data analysis and GIS figure mapping. The data analysis included providing total acreages disturbed by a jurisdictional water feature.

1st Avenue Bridge Replacement Project—City of Barstow/Simon Wong, California.

I-15 Widening from San Bernardino to I-215 EIR/EIS—Riverside County Transportation Commission (RCTC), Riverside, California.

Parks, Trails, and Open Space

Canyon Lake Biological Assessments—Bureau of Land Management, California.

Santa Ana River Trail—RCTD, Riverside County, California.

Institutional Facilities

Corona Hospital CEQA Compliance and Project Management—Universal Health Services of DE, Inc., Corona, California.

Van Nuys Fire Station CEQA EIR—City of Los Angeles Bureau of Engineering, Van Nuys, California.

Development and Redevelopment

West Valley Logistics Center EIR—City of Fontana, California.

Otay Ranch Regulatory Support—Otay Land Company, San Diego County, California.

Military

Endangered Quino Checkerspot Butterfly Survey at Marine Corps Base Camp Pendleton—NAVFAC Southwest, Oceanside, California.

Natural Resource Inventory at Coronado Naval Base—U.S. Department of the Navy, Coronado, California.

Employment History

ICF. GIS Analyst. Irvine, California. 06/2010 – Present.

CH2M HILL/Critigen. GIS Analyst. Santa Ana, California. 12/2006 – 02/2010.

Rand McNally Inc. GIS Specialist/Quality Assurance Editor. Skokie, Illinois. 03/1998 – 12/2006.

Motorola. GIS Technician (Contractor). Rolling Meadows, Illinois. 07/1997 – 02/1998.

MERIS GUERRERO

Senior Environmental Regulatory Specialist

Meris Guerrero is a senior environmental regulatory specialist and Southern California Regulatory Team Lead. She has extensive experience with federal individual, general, and programmatic permitting efforts, including assessing and evaluating project effects on aquatic resources, federally threatened and endangered species, essential fish habitat, coastal resources, and historic properties. She has more than ten years of experience implementing or complying with regulatory program legal authorities, including section 404 of the Clean Water Act (CWA), section 10 of the Rivers and Harbors Act (RHA), and the National Environmental Policy Act (NEPA). Meris is experienced with conducting jurisdictional delineations (JD), completing both preliminary and approved jurisdictional determinations; writing and reviewing the full range of regulatory permit applications (e.g., 401 Water Quality Certification, ENG 4345, Pre-Construction Notification, and Coastal Development Permit), 404(b)(1) alternatives analyses, environmental assessments (EA), public interest reviews, and compensatory mitigation proposals; and has led and negotiated dozens of endangered species, essential fish habitat, and cultural resource consultations. Prior to joining ICF in 2016, Meris was a Senior Project Manager at the U.S. Army Corps of Engineers (Corps) Los Angeles District, Regulatory Division. Meris uses her thorough understanding of the regulatory review process to provide strategic guidance to clients and facilitate issuance of regulatory permits.

Project Experience

Otay River Restoration and Otay Village 8 West Projects — HomeFed, California

Regulatory Specialist. The Otay River Restoration Project serves as both permittee responsible mitigation for several large scale residential and industrial development projects as well as a compensatory mitigation bank. As a regulatory specialist, Meris provided regulatory compliance support services for the permittee responsible mitigation phase of the project, including writing an addendum to the agency approved mitigation plan, as well as supported the development of the mitigation banking compliance documents. Meris also lead the update of the Otay Village 8 West, a mixed-use development, EA including revising the 404(b)(1) alternatives analysis and updating form and content to meet the Corps' 2018 EA template. Meris closely coordinated with the Corps to finalize the EA, negotiate the Otay River Restoration's site protection mechanism and get the Corps permit issued. Meris is currently providing permit compliance support ensuring the project remains in compliance with all necessary regulatory agency permits.

Years of Experience

- Professional start date: 01/2007
- ICF start date: 09/2016

Education

- MS, Natural Resources and Environmental Management, University of Hawaii, Manoa, 2008
- BS, Environmental Systems (specialization in Ecology, Behavior, and Evolution), University of California, San Diego, 2004

Professional Development

- Interagency Wetland Identification and Delineation (Arid West), May 2016
- California Rapid Assessment Method (CRAM) Trained Practitioner, General, September 2014
- Ordinary High Water Mark (OHWM) Delineation in Rivers and Streams in the Arid West, May 2014
- CRAM Trained Practitioner, Vernal Pools, April 2013
- Hydric Soils in the Arid West, March 2013
- Identification of the OHWM in Arid West Streams, September 2011
- CRAM Trainer Practitioner, Riverine, May 2011

West of Devers Upgrade 220 T/L Project – Southern California Edison (SCE), California,

Regulatory Specialist and Project Manager. Meris co-led the update of the formal jurisdictional delineation along the 50-mile transmission line corridor as well as prepared the permit application packages for submittal to the Corps, State Water Resources Control Board (SWRCB), California Department of Fish and Wildlife (CDFW), and the Environmental Protection Agency (EPA). Project activities also included the review of existing project documentation and field studies, conducting the impact analysis, drafting the Corps Nationwide Permit decision document and mitigation ratio-setting checklist, and coordinating with regulatory agencies to negotiate final permit conditions, including mitigation ratios, to obtain final regulatory permits.

Upper Santa Ana River Watershed Programmatic Permitting and Mitigation Strategy – San Bernardino Valley Municipal Water District, California

Project Manager and Senior Regulatory Specialist. ICF is developing a programmatic permit strategy for a comprehensive set of aquatic resource permits from the Federal and State regulatory agencies in conjunction with the Upper Santa Ana River (Upper SAR) Habitat Conservation Plan. In addition, ICF is developing a combination of mitigation banks and advance permittee responsible mitigation sites to facilitate compensatory mitigation for aquatic resources to offset impacts to HCP covered activities and the programmatic permitting strategy. Meris is the Project Manager for the Programmatic Permitting Project and is serving a Senior Regulatory Specialist, supporting the development of the mitigation banks and advance permittee responsible approaches.

Waters of the U.S. Revised Definition and California State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State – County of San Diego, California

Senior Regulatory Specialist. Due to Meris' in depth understanding of federal and state Clean Water Act permitting and review processes, the County of San Diego contracted with ICF to provide regulatory assistance with reviewing the proposed changes to the federal Clean Water Act definition of waters of the U.S. and the state's procedures for regulating the discharge of fill material into waters of the state. Meris reviewed the proposed changes to the regulations, identified key issues or concerns, compared the proposed regulations to current regulations, and identified how the proposed regulations could affect (both positive and negative) projects requiring permits from the Corps and Regional Water Quality Control Board (RWQCB) within southern California. Finally, Meris prepared graphical materials and memos that were used to brief County management.

Tijuana River Valley Regional Park Campground – County of San Diego, California

Senior Regulatory Specialist. Meris led the jurisdictional delineation of the Tijuana River Valley Regional Park Campground site and the adjacent Spooner's Mesa area identifying and mapping the limits and distribution of aquatic resource features potentially subject to Corps, RWQCB, CDFW, California Coastal Commission (CCC), and the City of San Diego. The jurisdictional delineation included the identification of wetland resources using the methods and protocols established in the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* and the 2008 *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*.

PETER HARDIE

Noise Analyst

Peter Hardie has experience in acoustical analysis for a wide array of projects, including transportation, residential development, master plan development, and rail projects throughout southern California. He has conducted and participated in noise and vibration analyses for numerous transportation, commercial, industrial, and residential development projects throughout California. Peter is also experienced in modeling existing and future conditions to determine potential project-related noise impacts using the FHWA Traffic Noise Model (TNM®). He conducts railroad noise modeling using the methods developed for the FTA and FRA. Peter is also experienced in environmental planning, environmental analysis, and impact assessments for transportation and development projects subject to CEQA.

Years of Experience

- Professional start date: 01/2005
- ICF start date: 01/2005

Education

- MESM, Environmental Science and Management, University of California, Santa Barbara, 2004
- BA, Environmental Science, Rollins College, 1999

Professional Development

- FHWA TNM® 2.5 Training Course
- Principles of Acoustics
- Environmental Noise Analysis

Key Skills

Noise Analysis. Peter analyzes noise-related impacts to and from proposed projects in accordance with CEQA.

Transportation Acoustics. Peter determines and designs sound walls located along Caltrans and FHWA roadway construction projects.

Project Experience

Mines and Quarries

Rosemary's Mountain Quarry Noise Compliance—County of San Diego/Granite Construction, California.

Noise Specialist. Peter conducted noise measurements and wrote technical memoranda outlining the noise profile associated with an active quarry located in San Diego County. He analyzed potential impacts to County of San Diego noise thresholds from quarry construction equipment. Peter also conducted blast noise measurements for rock blasting at the quarry.

Development and Redevelopment

IS/MND for 200 East First American Way, The Met at South Coast Multifamily Residential Project—City of Santa Ana, California.

Buddhist Temple EIR—City of Santa Ana, California.

Tejon Mountain Village Draft EIR—County of Kern, California.

Noise Analyst and Author. Peter conducted noise analyses for low-density in a residential community with commercial and recreational land use components. Noise analysis included noise measurements of ambient conditions and traffic noise impact analysis to estimate potential noise effects at both existing noise-sensitive land uses and proposed on-site receptors. He summarized the results of the noise studies in noise technical reports and the EIR.

Thomas Ranch Mixed-Use Development—BKM Development Company, Corona, California.

Noise Analyst and Author. Peter conducted noise analyses for low density in a residential community with commercial and recreational land use components. Noise analysis included noise measurements of ambient conditions and traffic noise impact analysis to estimate potential noise effects at both existing noise-sensitive land uses and proposed on-site receptors. He summarized the results of the noise studies in noise technical reports and the EIR.

Rider Distribution Warehouse Technical Studies and EIR—Alere Property Group, Perris, California.

Noise Analyst and Author. Peter conducted noise analyses for the development of a distribution warehouse in the City of Perris. The noise analysis included noise measurements conducted at local residences and noise modeling (TNM® Version 2.5) to assess the changes in future traffic noise levels resulting from increased traffic volumes on local roadways. On-site noise associated with heating, ventilation, and air conditioning (HVAC) systems and on-site vehicles associated with the proposed distribution warehouse was also analyzed. He summarized results of the noise analysis and any proposed mitigation in noise technical reports and the EIR.

75-Acre Business Park Project—Western Realco, Moreno Valley, California.

Noise Analyst and Author. Peter conducted noise analyses for the development of a distribution warehouse in the City of Moreno Valley. The noise analysis included noise measurements conducted at local residences and noise modeling (TNM® Version 2.5) to assess the changes in future traffic noise levels resulting from increased traffic volumes on local roadways. On-site noise associated with HVAC systems and on-site vehicles associated with the proposed distribution warehouse was also analyzed. He summarized results of the noise analysis and any proposed mitigation in noise technical reports and the EIR.

Alessandro Business Park EIR—City of Riverside, Riverside County, California.

Noise Analyst and Author. Peter conducted noise analyses for the development of a distribution warehouse in the City of Riverside. The noise analysis included noise measurements conducted at local residences and noise modeling (TNM® Version 2.5) to assess the changes in future traffic noise levels resulting from increased traffic volumes on local roadways. On-site noise associated with HVAC systems and on-site vehicles associated with the proposed distribution warehouse was also analyzed. He summarized results of the noise analysis and any proposed mitigation in noise technical reports and the EIR.

Supplemental EIR 1278/EIR 1716 for the Santiago Hills II and East Orange Planned Communities—The Irvine Company, Orange County, California.

Noise Analyst and Author. Peter assisted in writing the environmental documents for a proposed project area for the Santiago Hills II and East Orange planned communities occupying approximately 6,800 acres at the eastern edge of the City of Orange. The project's land use components consisted of residential, recreational, commercial, and open space uses.

Institutional Facilities

Corona Hospital CEQA Compliance and Project Management—Universal Health Services of Delaware, Inc., Corona, California.

California Health Care Facility Environmental Document—California Prison Health Care Receivership/URS-BLL JV, Chino, California.

Noise Analyst and Author. Peter conducted noise analyses for low-density in a residential community with commercial and recreational land use components. Noise analysis included noise measurements of ambient conditions and traffic noise impact analysis to estimate potential noise effects at both existing noise-sensitive land uses and proposed on-site receptors. He summarized the results of the noise studies in noise technical reports and the EIR.

San Diego Civic Center Improvements—Port of San Diego, California.

Noise Specialist. Peter analyzed potential noise impacts associated with construction, increased traffic, and general operation for the improvements proposed at the Civic Center In downtown San Diego. He conducted noise measurements at sensitive noise receivers located throughout surrounding the project site. Peter modeled construction and operational impacts associated with the projects. The findings were presented in the noise section of the EIR.

Energy and Fuels

Cuyama Solar Array Project—County of Santa Barbara, California.

Tehachapi Renewable Transmission Project Biological Consulting Services—Southern California Edison, Various Locations, California.

Noise Analyst and Coordinator. Peter coordinated the staff and project needs for noise monitoring at construction sites. He trained staff to conduct noise monitoring at the construction sites.

Solar EIR for Recurrent Valley Projects—Kern County, California.

Noise Analyst and Author. Peter conducted noise analysis for a proposed solar power plant. The analyses included identifying noise-sensitive receptors and reporting potential impacts based on state, regional, and local (including city and county) regulations. Environmental impacts included operational noise and construction noise associated with the proposed project. He summarized the results of the noise analysis in a noise IS/MND.

OceanWay Secure Energy Project EIS/EIR for Woodside Natural Gas Deepwater Port—AMEC, Los Angeles County, California.

Noise Analyst and Author. Peter conducted noise analyses for a proposed LNG deep water port and onshore support infrastructure and pipeline. The analyses included identifying noise-sensitive receptors and conducting ambient measurements at locations surrounding the proposed pipeline alignments and identifying state, regional, and local (including city and county) regulations directed at construction noise surrounding the proposed project. He summarized the results of the noise analysis in noise technical reports and EIRs.

Land Use Planning

EIR for State Enterprise Zone—City of Los Angeles Community Development Department, California.

Noise Analyst and Author. Peter wrote the EIR section on noise. ICF prepared the EIR for the state enterprise zone project. The proposed project involves the implementation of a state enterprise zone designation for the Central, East Valley, and Hollywood areas in the City of Los Angeles to provide a business incentive zone designed to attract new business and retain existing businesses and jobs. The project would permit businesses located within the zone to take state tax credits and deductions and City benefits, including an LADWP electric rate subsidy. The zone designation, in and of itself, would not result in any specific construction projects, land acquisition projects, or other development projects. As a result of ICF's efforts, the City expected and received final approval of the state enterprise zone designation from the California Department of Housing and Community Development.

General Plan and Program EIR—City of Vista, California.

Noise Analyst and Author. Peter conducted the noise analysis, including analyzing and preparing the noise element for the City of Vista's proposed general plan and drafting the noise section of the EIR which covered the proposed general plan. During the preparation of the general plan noise element, he identified goals, objectives, and policies to help control and minimize the effects of excessive amounts of noise to residences and sensitive receptors within the City. For the EIR noise section, Peter identified sensitive noise receptors within the general plan project boundary and conducted ambient short- and long-term (24 hours or greater) noise measurements. He quantified and delineated the 70, 65 and 60 dBA CNEL noise contours for existing, future no-project, and future with project scenarios for noise features, such as SR 76, local roadways, and other noise sources such as the Sprinter line throughout the project site. Peter determined project-specific noise contributions to the 70, 65, and 60 dBA CNEL noise contours and analyzed the potential impacts from these contributions to determine significance.

General Plan and Program EIR—City of La Cañada Flintridge, California.

Noise Analyst and Author. Peter conducted the noise analysis, including analyzing and preparing the noise element for the City of La Cañada Flintridge's proposed general plan and drafting the noise section of the EIR which covered the proposed general plan. During the preparation of the general plan noise element, he identified goals, objectives, and policies to help control and minimize the effects of excessive amounts of noise to residences and sensitive receptors within the City. For the EIR noise section, Peter identified sensitive noise receptors within the general plan project boundary and conducted ambient short- and long-term (24 hours or greater) noise measurements. He quantified and delineated the 70, 65 and 60 dBA CNEL noise contours for existing, future no-project, and future with project scenarios for noise features, such as I-210, SR 2, local roadways, and other noise sources throughout the project site. Peter determined project-specific noise contributions to the 70, 65, and 60 dBA CNEL noise contours and analyzed the potential impacts from these contributions to determine significance.

Westside Specific Plan EIR—City of National City, California.

Noise Analyst and Author. Peter conducted the noise analysis, including analyzing and drafting the noise section of the EIR. He identified sensitive noise receptors within the specific plan area and conducted ambient short-term noise measurements. Peter quantified and delineated the 65 dBA CNEL noise contours for existing, future no-project, and future with project scenarios for noise features, such as I-5, local roadways, and other noise sources surrounding the project site. He determined project-specific noise contributions to the 65 dBA CNEL noise contour and analyzed the potential impacts from these contributions to determine significance.

Coastal

Grunion Run Monitoring at Poche and Aliso Creeks—Orange County Resources and Development Management Department, California.

Peter monitored grunion spawning at Orange County beaches during the spawning season. He documented, photographed, and reported spawning events at beaches to County staff to allow them to unblock channels and make informed decisions about when to move heavy machinery into the spawning grounds to dredge the outlet channels.

Parks, Trails, and Open Space

Several Proposed Park Projects—City of Los Angeles Department of Parks and Recreation, California.

Noise Analyst and Author. Peter conducted noise analyses of proposed park projects as part of ICF's on-call environmental consulting contract. Noise analyses included measuring ambient conditions at sensitive receptors surrounding the proposed project sites and designing noise models using the FHWA's TNM® Version 2.5 to assess changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases. Additionally, noise analysis included analysis of construction noise and operational noise (such rail line noise impacts to park users or crowd noise to surrounding sensitive land uses). He summarized the results of the noise studies in noise technical reports and related CEQA documents.

Peters Canyon Regional Park Restroom Project—Orange County Public Works, California.

Noise Analyst and Author. Peter conducted noise analyses of proposed removal of an existing restroom facility and reconstruction of a new permanent facility located in Peters Canyon as part of ICF's on-call environmental consulting contract. Noise analyses included analyzing construction related noise and vibration levels at sensitive receptors surrounding the proposed project sites. The analysis was used in an IS/MND.

Orange County Parks Maintenance Facility—Orange County Public Works/Orange County Planning, California.

Noise Analyst and Author. Peter conducted noise analyses of proposed demolition and construction of buildings within Irvine Regional Park as part of ICF's on-call environmental consulting contract. Noise analyses included analyzing construction related noise and vibration levels at sensitive receptors surrounding the proposed project sites. The analysis was used in an IS/MND.

Riverside Outdoor Park Improvements IS/MND—City of Los Angeles Department of Recreation and Parks, California.

Noise Analyst and Author. Peter analyzed the potential impacts from construction and operation of the proposed Riverside Park to sensitive receivers surrounding the project site. He analyzed potential impacts to sensitive receivers located in the park from noise sources (such as I-5). Peter wrote the IS/MND noise section. The proposed project involved the construction and operation of both active and passive recreational facilities on an approximately 18-acre site near Elysian Park. It aimed to create opportunities for the local community to recreate, as well as provide a venue that would increase opportunities for social interaction between community members. The park would provide educational and recreational opportunities for the general neighborhood and includes a community building, playgrounds, multipurpose game courts and sports fields, picnic areas, and other passive areas.

Brand Park Community Center IS/MND—City of Los Angeles Department of Recreation and Parks, California.

Noise Analyst and Author. Peter analyzed the potential impacts from construction and operation of the proposed Brand Park Community Center to sensitive receivers surrounding the project site. He analyzed potential impacts to sensitive receivers located in the park from noise sources (such as I-5). Peter wrote the IS/MND noise section. The project involved construction and operation of a 3,000-square-foot, one-story community building for activities such as classes, games, discussions, political organizing and voting, and social events. It was also intended to heighten the visual appeal of the park and surrounding community by adding visually appealing amenities.

Transportation—Roads, Bridges, and Highways

I-605 Corridor Improvement Project, Cities of Baldwin Park, El Monte, Industry, Pico Rivera, South El Monte, Whittier, Downey, Norwalk , Santa Fe Springs, and unincorporated areas in Los Angeles County—Caltrans District 7, Los Angeles County, California, 01/2017 – Present

Lead Noise Analyst. Peter conducted noise modeling of improvements along the I-605 Corridor including improvements along I-105 and I-5 in the County of Los Angeles, in coordination with Caltrans District 7 and LA Metro. The analysis included putting together a work plan for Caltrans review, modeling noise-sensitive receptors using ambient noise measurements. CAD files provided by the project engineers were used to design noise models for future no-build, and future build conditions, which were analyzed using the FHWA’s TNM® Version 2.5. Changes in traffic noise levels resulting from proposed geometric changes to the proposed alignment, were summarized in a noise technical report spreadsheets.

I-15 Express Lanes Project—SBCTA/Caltrans District 8, San Bernardino County, California, 01/2016 – Present

Lead Noise Analyst. Peter conducted noise measurements and modeled the proposed 15 mile addition of two express lanes to I-15 in the Cities of Ontario, Fontana, and Rancho Cucamonga. Noise levels at the noise-sensitive uses were predicted and compared with relevant Caltrans/FHWA noise abatement criteria, and findings were reported in a NSR consistent with the requirements of CFR 772. Abatement in the form of noise barriers was recommended based on feasibility and reasonableness of the analyzed noise walls.

SR-22 Noise Study (Contract 12A1488 TO 23)—Caltrans District 12, Orange County, California, 08/2016 – 12/2016

Lead Noise Analyst. Peter conducted noise modeling of improvements along the SR-22 Corridor including improvements along SR-57 and I-5 interchange in the County of Orange, in coordination with Caltrans District 12. The analysis included putting together a work plan for Caltrans review, modeling noise-sensitive receptors using ambient noise measurements. CAD files provided by the project engineers were used to design noise models for existing and future no-build and build conditions, which were analyzed using the FHWA’s TNM® Version 2.5. Changes in traffic noise levels resulting from proposed geometric changes to the proposed alignment, were summarized in a noise study report.

SR-91 CIP Revalidation—RCTC/Caltrans District 8, Riverside County, California, 04/2013 – 03/2017

Lead Noise Analyst. Peter conducted noise measurements and modeled the proposed design changes to the SR-91 corridor improvement projects along a 3-4 mile stretch of SR-91 in the City of Corona. Noise levels at the noise-sensitive uses were predicted and compared with relevant Caltrans/FHWA noise abatement criteria, and findings were reported in a supplemental NSR consistent with the requirements of CFR 772. Abatement in the form of noise walls was recommended based on feasibility and reasonableness of the analyzed noise walls.

Via Vera Cruz Bridge Replacement and New Bent Avenue Bridge Project Noise Study Report.

Noise Analyst. Peter conducted field measurements and modeling for the proposed bridge replacements along Bent Avenue and Via Vera Cruz in the City of San Marcos Ca. He designed TNM modeling for both bridge replacements along the Bent and Via Vera Cruz alignments. Peter helped in the writing of the noise study report.

State Route 91 (SR-91) Design-Build—Riverside County Transportation Commission (RCTC)/URS Corporation, California.

Slauson Avenue Revitalization Project EIR—Los Angeles County Department of Public Works, California.

SR-210 Additional Lanes—San Bernardino Associated Governments (SANBAG)/URS Corporation, San Bernardino, California.

SR-210 Base Line Interchange—SANBAG/URS Corporation, San Bernardino, California.

SR-125/SR-94 Traffic Noise Study—Caltrans District 11/Parsons Transportation Group, La Mesa, California.

Noise Analyst and Author. Peter conducted noise analysis for a highway widening in the County of San Diego, in coordination with Caltrans District 12. The analyses included modeling noise-sensitive receptors using ambient noise measurements from Parsons Transportation Group. CAD files provided by the project engineers were used to design noise models for existing, future no-project, and future with project condition, which were analyzed using the FHWA's TNM® Version 2.5. He summarized changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases and any proposed mitigation, in a noise technical report.

Interstate 70 (I-710) Corridor Project Sound Wall Feasibility Study—CH2M HILL, Location, California.

Pepper Avenue Interchange Project—SANBAG/Civil Works Engineers, California.

SR-125 Noise Study—Caltrans District 11/Parsons Transportation Group, San Diego, California, 04/2013 – 09/2013

Noise Specialist. Peter conducted noise modeling for a new highway connector in the County of San Diego, in coordination with Caltrans District 11. The analysis included modeling noise-sensitive receptors using ambient noise measurements from Parsons Transportation Group. CAD files provided by the project engineers were used to design noise models for existing, future no-build, and future build conditions, which were analyzed using the FHWA's TNM® Version 2.5. Changes in traffic noise levels resulting from proposed geometric changes to the proposed alignment were summarized in a noise technical report spreadsheets.

SR-91 Auxiliary Lanes Construction—Orange County Transportation Authority/Daniel, Mann, Johnson, and Mendenhall Harris, California.

Noise Analyst and Author. Peter conducted noise analysis for a highway widening in the County of Orange, in coordination with Caltrans District 8. The analyses included modeling noise-sensitive receptors using ambient noise measurements from HDR. CAD files provided by the project engineers were used to design noise models for existing, future no-project, and future with project conditions, which were analyzed using the FHWA's TNM® Version 2.5. He summarized changes from in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases and any proposed mitigation, in a noise technical report.

I-15 Widening from San Bernardino to I-215 EIR/EIS—Riverside County Transportation Commission/HDR Engineering, Riverside, California.

Noise Analyst and Author. Peter conducted noise analysis for a highway widening in the County of Riverside, in coordination with Caltrans District 8. The analyses included modeling noise-sensitive receptors using ambient noise measurements from HDR. CAD files provided by the project engineers were used to design noise models for existing, future no-project, and future with project conditions, which were analyzed using the FHWA's TNM® Version 2.5. He summarized changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases and any proposed mitigation, in a noise technical report.

Hageman Road Extension Environmental Document—City of Bakersfield/LAN Engineering, California.

Noise Analyst and Author. Peter conducted noise analyses for a roadway extension, in coordination with the City of Bakersfield and Caltrans. The analyses included identifying noise-sensitive receptors and conducting ambient measurements (both short-term 15-minute and long-term 24-hour) on residential and commercial sensitive land uses surrounding the proposed project sites. CAD files provided by the project engineers were used to design noise models for existing, future no-project, and future with project conditions, which were analyzed using the FHWA's TNM® Version 2.5. He summarized changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases and any proposed mitigation, in noise technical reports and EIRs.

SR-94 Noise Study—Caltrans District 11/Parsons Transportation Group, San Diego, California.

Noise Analyst and Author. Peter conducted noise analysis for a highway widening in the County of San Diego, in coordination with Caltrans District 12. The analyses included modeling noise-sensitive receptors using ambient noise measurements from Parsons Transportation Group. CAD files provided by the project engineers were used to design noise models for existing, future no-project, and future with project condition, which were analyzed using the FHWA's TNM® Version 2.5. He summarized changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases and any proposed mitigation, in a noise technical report.

Summit Valley Road Widening from SR-138 to Ranchero Road Environmental Documents—Stantec Consulting, San Bernardino County, California.

Noise Analyst. Peter conducted noise analysis for a roadway widening in the City of Indio/County of Riverside, in coordination with the Riverside County Transportation District. The analysis included conducting noise measurements (both short-term 15-minute and long-term 24-hour or more) at sensitive receivers along the project alignment. CAD files provided by the project engineers were used to design noise models for existing, future no-project, and future with project conditions, which were analyzed using the FHWA's TNM® Version 2.5. He summarized changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases and any proposed mitigation, in a noise technical report.

Fred Waring Drive Improvements—Riverside County Transportation Department, City of La Quinta, California.

Noise Analyst. Peter conducted noise analysis for a roadway widening in the City of Indio/County of Riverside, in coordination with Riverside County Transportation Department. The analysis included conducting noise measurements (both short-term 15-minute and long-term 24-hour or more) at sensitive receivers along the project alignment. CAD files provided by the project engineers were used to design noise models for existing, future no-project, and future with project conditions, which were analyzed using the FHWA's TNM® Version 2.5. He summarized changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases and any proposed mitigation, in a noise technical report.

I-805 South Segments 9 and 10 Traffic Noise Study—Caltrans/Parsons Transportation Group, San Diego County, California.

Noise Analyst. Peter conducted noise analysis for a highway widening in the County of San Diego, in coordination with Caltrans District 12. The analyses included modeling noise-sensitive receptors using ambient noise measurements from Parsons Transportation Group. CAD files provided by the project engineers were used to design noise models for existing, future no-project, and future with project conditions, which were analyzed using the FHWA's TNM® Version 2.5. He summarized changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases and any proposed mitigation, in a noise technical report.

Multiple Transportation Projects—Caltrans, Southern California.

Noise Analyst and Author. Peter conducted noise analyses for multiple Caltrans highway projects located throughout southern California. Projects included realignments, widening, and interchange realignments. Noise measurements were conducted at sensitive receptors including residences, parks, schools, hotels, and other sensitive land uses located along proposed alignments. Noise modeling was conducted using the FHWA's TNM® Version 2.5 to assess changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment as well as future traffic volume increases. He summarized the results of the noise studies in noise technical reports and the EIR. The Caltrans-related projects included the following:

- **SR-58 via Hinkley Widening and Realignment, Hinkley.** Peter conducted noise measurements and modeled three proposed alternatives for a proposed widening or realignment of SR 58 in Hinkley. Noise levels at the noise-sensitive uses were predicted and compared with relevant Caltrans thresholds of significance, and findings were reported in a Caltrans noise study report. Mitigation in the form of noise walls was recommended based on feasibility and reasonableness of potential noise walls.
- **I-15 Corridor Improvements, Riverside County.** Peter modeled two proposed alternatives for a proposed widening of I-15 in Riverside County. Noise levels at the noise-sensitive land uses were predicted and compared with relevant Caltrans thresholds of significance, and findings were reported in a Caltrans noise study report. Mitigation in the form of noise walls was recommended based on feasibility and reasonableness of potential noise walls.
- **I-805 Improvements, San Diego County, (subconsultant to Parsons).** Peter modeled the proposed widening of I-805 in San Diego County. Noise levels at the noise-sensitive land uses were predicted and compared with relevant Caltrans thresholds of significance, and findings were reported in a Caltrans noise study report. Mitigation in the form of noise walls was recommended based on feasibility and reasonableness of potential noise walls.
- **SR-91 from SR-241 to SR-57 Widening and Improvements, Orange County.** Peter conducted noise measurements and aided in the modeling for a proposed widening of SR 91 in Orange County. Noise levels at the noise-sensitive uses were predicted and compared with relevant Caltrans thresholds of significance, and findings were reported in a Caltrans noise study

report. Mitigation in the form of noise walls was recommended based on feasibility and reasonableness of potential noise walls.

I-215 Median Lanes Widening, Murrieta Hot Springs Road-to-Scott Road—Caltrans District 8/Riverside County Transportation Commission, California.

Noise Analyst. Peter conducted noise analysis for a roadway widening along I-215. The analysis included identifying noise-sensitive receptors and conducting ambient measurements at locations surrounding the proposed project sites. He aided in modeling using the FHWA's TNM® Version 2.5.

Meadowpass Road Extension—City of Walnut, California.

Noise Analyst and Author. Peter conducted noise analyses for a road extension of Meadowpass Road. The noise analysis included noise measurements conducted at local residences and behind existing residential walls. Noise modeling (TNM® Version 2.5) was conducted to assess the changes in future traffic noise levels resulting from proposed geometric changes to the interchange, as well as future traffic volume increases. He summarized the results of the noise analysis and any proposed mitigation in noise technical reports and an EIR.

Perris Boulevard Widening—City of Moreno Valley, California.

Noise Analyst and Author. Peter conducted noise analyses for a road widening of Perris Boulevard. The noise analysis included noise measurements conducted at local residences and behind existing residential walls surrounding the proposed project alignment. Noise modeling (TNM® Version 2.5) was conducted to assess the changes in future traffic noise levels resulting from proposed geometric changes to the interchange, as well as future traffic volume increases. He summarized the results of the noise analysis and any proposed mitigation in noise technical reports and an EIR/EIS.

Bradley Avenue/SR-67 Widening Project—County of San Diego Department of Public Works, El Cajon, California.

Noise Analyst and Author. Peter assisted in writing the relocation impact reports for the proposed Bradley Avenue/SR 67 widening project located east of the City of El Cajon. ICF prepared technical studies for the SR 67 and Bradley Avenue interchange improvements proposed by the County of San Diego Department of Public Works. The County and Caltrans District 11 proposed to improve the existing interchange, construct a new Bradley Avenue Bridge over SR 67, and improve existing freeway ramps. The environmental technical studies were prepared to meet CEQA and NEPA requirements.

Flintwash Bridge IS/MND/CE—City of Pasadena, Los Angeles, California.

Noise Analyst and Author. Peter assisted with the MND for the proposed construction of a pedestrian/bicycle/equestrian bridge over Flintwash. The project was needed to provide an east-west connection at the south end of the park to comply with the Arroyo Seco Master Plan (Hahamongna Watershed Park Master Plan) and to reestablish this important link within the park trails system, which was severed when the previous bridge over Flintwash was removed in 1987. Two bridge alignments were evaluated. ICF was responsible for preparing the NEPA CE and CEQA IS/MND, as well as technical studies including an NES, visual impact assessment, air quality technical memorandum, Section 4(f) evaluation, hazardous materials technical memorandum, and floodplain evaluation. The project required extensive coordination with Caltrans, the Corps, CDFW, and RWQCB.

Cypress Avenue Overcrossing Project—City of Fontana, San Bernardino County, California.

CEQA Analyst and Author. Peter assisted in writing the relocation impact reports for the proposed Cypress Avenue overpass project. The proposed project would construct an overpass over I-10 to relieve substandard levels of service on two adjacent interstate overpasses.

Ports and Harbors

City Dock #1 Marine Research Center Project—Port of Los Angeles, California.

Noise Analyst and Author. Peter conducted noise analyses as part of ICF's on-call environmental consulting contract with the Port of Los Angeles. Noise analyses included measuring ambient noise conditions at sensitive receptors surrounding the proposed project sites and designing noise models using the FHWA's TNM® Version 2.5 to assess changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment. He also analyzed the effects of future traffic volume increases on existing noise-sensitive land uses and proposed onsite receptors (new recreational park) and analyzed construction and operational noise.

Wilmington Waterfront EIR—Port of Los Angeles, California.

Noise Analyst and Author. Peter conducted noise analyses as part of ICF's on-call environmental consulting contract with the Port of Los Angeles. Noise analyses included noise measurements measuring ambient conditions at sensitive receptors surrounding the proposed project sites and designing noise models using the FHWA's TNM® Version 2.5 to assess changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases to existing noise-sensitive land uses and proposed on-site receptors (proposed park). Additionally, noise analysis included analysis of construction noise and operational noise (such as noise impacts to park users from existing "peaker" power plants and existing rail traffic). He summarized the results of the noise studies in noise technical reports and related CEQA documents.

Schools

Flintridge Sacred Heart Academy IS/MND—City of La Cañada Flintridge, California.

Lead Noise Analyst and Author. Peter conducted noise analyses of a proposed expansion of the Sacred Heart School in La Canada Flintridge. Noise analyses included measurements of ambient conditions at surrounding sensitive land uses and modeling using the FHWA's TNM® Version 2.5 to assess changes in future traffic noise levels and quantify noise increases at both existing noise-sensitive land uses and proposed on-site receptors. Additional noise analyses included analysis of construction and operational noise (such as from athletic fields nearby on the surrounding environment and traffic noise). He summarized the results of the noise studies in an EIR noise section.

Crawford High School and Mann Middle School Noise Technical Study and EIR—City of San Diego, California.

Noise Analyst and Author. Peter conducted noise analyses of a proposed construction of a new football stadium on the campus of Crawford High School and Mann Middle School. Noise analyses included measurements of ambient conditions at surrounding sensitive land uses and conducting a stadium analysis of a similar football stadium at an existing football stadium at a similar high school. The noise analysis in the technical study was summarized in the EIR section of the environmental document and included as an appendix of the EIR.

Bell Middle School—San Diego Unified School District, California.

Mission Bay High School—San Diego Unified School District, California.

Noise Analyst and Author. Peter conducted noise analyses of a proposed construction of a new football stadium on the campus of Mission Bay High School. Noise analyses included measurements of ambient conditions at surrounding sensitive land uses and conducting a stadium analysis of a similar football stadium at an existing football stadium at a similar high school. The noise analysis in the technical study was summarized in the EIR section of the environmental document and included as an appendix of the EIR.

Glen Mor 2 Student Housing EIR—University of California, Riverside.

Noise Analyst and Author. Peter conducted noise analyses of a proposed housing extension on the campus of the University of California, Riverside. Noise analyses included measurements of ambient conditions at surrounding sensitive land uses and modeling using the FHWA's TNM® Version 2.5 to assess changes in future traffic noise levels and quantify noise increases at both existing noise-sensitive land uses and proposed on-site receptors. Additional noise analyses included analysis of construction and operational noise (such as from athletic fields nearby on the surrounding environment and traffic noise). He summarized the results of the noise studies in an EIR noise section.

New School Projects—Los Angeles Unified School District, California.

Noise Analyst and Author. Peter conducted noise analyses for several proposed school construction projects as part of ICF's on-call environmental consulting contract with the Los Angeles Unified School District. Noise studies were conducted for high schools 9, 11, 12, 13, 15, and elementary school 12. Noise analyses included measurements of ambient conditions at surrounding sensitive land uses and modeling using the FHWA's TNM® Version 2.5 to assess changes in future traffic noise levels and quantify noise increases at both existing noise-sensitive land uses and proposed on-site receptors. Additional noise analyses included analysis of construction and operational noise (such as from school athletic fields and stadium noise on the surrounding environment and rail line noise impacts to the students on the proposed project site). He summarized the results of the noise studies in noise technical reports and EIRs. 2006 –2010.

Transportation—Rail and Transit

Monte Vista Grade Separation—City of Montclair/AECOM, Montclair, California.

San Diego Bell Noise Survey—Civic San Diego, San Diego, California.

Noise Specialist. Peter prepared a technical studies pedestrian bell noise at at-grade crossings located in downtown San Diego. He designed the field methodology to measures bell noise at the pedestrian bells located at the crossings and designed the modeling of the bells. Peter outlined the findings of the modeling in a technical report, along with suggestions regarding how to decrease noise exposure to residents at the crossings.

Santa Ana Avenue Grade Separation—Caltrans District 12 and City of Santa Ana, Orange County, California.

Noise Analyst. Peter conducted a noise analysis for an at-grade rail road crossing in coordination with the City of Santa Ana and Caltrans District 12. The analysis included identifying noise sensitive receptors and conducting ambient measurements (both short-term 15 minute and long-term 24 hour) at locations surrounding the proposed project sites. CAD files provided by the project engineers were used to design noise models for existing, future no-build, and future build conditions, which were analyzed using the FHWA’s TNM® Version 2.5. Changes in traffic noise levels resulting from proposed geometric changes to the alignment, and proposed mitigation, were summarized in a noise technical report in support of ICF, which is preparing the necessary NEPA documents for approval by Caltrans as the NEPA lead agency under NEPA delegation.

Magnolia Grade Separation Environmental Document—BNSF Railroad/LAN Engineering, Riverside County, California.

Noise Analyst and Author. Peter conducted noise analyses for an at-grade rail road crossing in coordination with Riverside County and Caltrans District 8. The analyses included identifying noise-sensitive receptors and conducting ambient measurements (both short-term 15-minute and long-term 24-hour) at locations surrounding the proposed project sites. Client-provided CAD files were used to digitize and design noise models for existing, future no-project, and future with project conduction. These models were analyzed using the FHWA’s TNM® Version 2.5 to assess changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases. He summarized the results of the noise analysis and any proposed mitigation in noise technical reports and EIRs.

Streeter Avenue and Union Pacific Railroad Grade Separation Environmental Document—City of Riverside/T.Y. Lin International, California.

Noise Analyst and Author. Peter conducted noise analyses for an at-grade rail road crossing in coordination with the City of Riverside and Caltrans District 8. The analyses included identifying noise-sensitive receptors and conducting ambient measurements (both short-term 15-minute and long-term 24-hour) at locations surrounding the proposed project sites. Client-provided CAD files were used to digitize and design noise models for existing, future no-project, and future with project conduction. These models were analyzed using the FHWA’s TNM® Version 2.5 to assess changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases. He summarized the results of the noise analysis and any proposed mitigation in noise technical reports and EIRs.

Riverside Avenue Grade Separation at Union Pacific Railroad Crossing—City of Riverside/Moffatt & Nichol, California.

Noise Analyst and Author. Peter conducted noise analyses for two at-grade rail road crossings in coordination with City of Riverside and Caltrans District 8. The analyses included identifying noise-sensitive receptors and conducting ambient measurements (both short-term 15-minute and long-term 24-hour) at locations surrounding the proposed project sites. Client-provided CAD files were used to digitize and design noise models for existing, future no-project, and future with project conduction. These models were analyzed using the FHWA’s TNM® Version 2.5 to assess changes in future traffic noise levels resulting from proposed geometric changes to the proposed alignment, as well as future traffic volume increases. He summarized the results of the noise analysis and any proposed mitigation in noise technical reports and EIRs.

Railroad Crossing Warning Bell Noise Analysis—City of San Diego, California.

Noise Analyst and Primary Author. Peter conducted noise analysis of railroad crossing bells at three at-grade crossings in the City of San Diego. The analysis included performing noise measurements to gather based line data of noise levels at the crossings. He analyzed bell noise levels on surrounding sensitive land uses using SoundPLAN. Peter analyzed alternatives designed to reduce noise levels from existing bells at the sensitive receivers surrounding the crossings. He summarized the results of the noise analysis in a noise technical report.

Railroad Horn Quiet Zone Preliminary Benefit Area Noise Study—City of San Diego, California.

Noise Analyst and Author. Peter conducted noise analysis for a proposed rail line quiet zone. The analysis included performing noise measurements to estimate the area of potential noise effects from rail horn noise located at at-grade rail crossings. He summarized the results of the noise studies in a noise technical report.

Water and Wastewater

New Evans Reservoir IS/MND—City of Riverside Public Utilities Department, California.

Noise Analyst and Author. Peter identified noise-sensitive receivers, which included residences, public parks, and other locations which could be impacted by the proposed alignments and conducted ambient noise measurements at these locations to quantify existing noise levels. He analyzed the proposed projects impact to the noise environment, including discussions of construction noise and vibration impacts and any potential operation noise or vibration impacts associated with operation of the proposed pipeline and reservoir. Peter wrote the findings in an IS/MND noise section consistent with CEQA.

Fiber-Optic Cable

Hermosa Beach SEA-US Cable System Work Order 1—RAM Telecom International, Inc., Hermosa Beach, California.

Employment History

ICF. Noise Analyst. Irvine, California. 01/2005 – Present.

The Nature Conservancy. Intern. 05/2003 – 08/2003.

GREG HOISINGTON

Principal Biologist

Greg's technical experience includes a broad range of interdisciplinary projects in biological resource identification and assessment; aquatic resource delineation; biological permitting and compliance; and environmental document preparation. He has performed, led, and managed natural resource field surveys and delineations for a wide range of projects in a diversity of habitats within California, Nevada, Arizona, and Utah. Greg's experience includes preparation of environmental documents for compliance with the California Environmental Quality Act/ National Environmental Policy Act (CEQA/NEPA), California Endangered Species Act/Federal Endangered Species Act (CESA/FESA), Caltrans Standard Environmental Reference (SER), Western Riverside County Multi-Species Habitat Conservation Plan (MSHCP), Orange County Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP), Coachella Valley MSHCP, California Energy Commission, and Federal Energy Regulatory Commission. He has acquired natural resource permits and led consultations and negotiations with regulating agencies including the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), and California Coastal Commission (CCC). Greg has also facilitated on- and off-site mitigation, conducted restoration and reporting, and implemented adaptive management strategies in collaboration with restoration specialists.

Years of Experience

- Professional start date: 04/2004
- ICF start date: 11/2015

Education

- MS, Biology, California State University, Long Beach, 2004
- BS, Ecology and Environmental Biology, California State University, Long Beach, 2001

Certifications

- Certified California Rapid Assessment Method (CRAM) Practitioner – Riverine and Depressional Wetlands, MJ Klinefelter, California, 2014

Professional Development

- Wetland Delineation Certification, Richard Chinn Environmental Training, California, 2005
- Desert Tortoise Surveying, Monitoring and Handling Techniques, Desert Tortoise Council, 2007
- Flat Tailed Horned Lizard Monitor Training, CDFW, 2007
- CEQA 16-Hour Training Workshop

Project Experience

Transportation—Road, Bridges, and Highways

SR-25 La Gloria Rd Curve Correction—Caltrans District 5, Unincorporated San Luis Obispo Co, California

Project manager for this $330,000 project providing pre-construction surveys for California tiger salamander and red-legged frog, nest surveys, and construction monitoring. Coordinated extensively with biological staff, Caltrans, and contractor to perform burrow excavations in advance of ground disturbance. Managed relocation plans, worker training, monthly and quarterly reporting as well as staff, schedule, and budget. *2019-present.*

Multiple Task Orders—Caltrans District 5, Unincorporated San Luis Obispo Co, California

Greg served as Biological Task Order Manager for task orders under two On-Call Services Contracts with District 5. Select task orders include:

Contract 06A2106 TO 12, Linden and Casitas Pass Interchange Biological Surveys and Construction Monitoring. Served as biological task manager for construction monitoring.

Contract 06A2498 TO 1, Salinas River Bridge Seismic Retrofit. Served as biological task order manager for construction monitoring. Managed subconsultants and deliverables.

Contract 06A2498 TO 2, Salsipuedes Creek Bridge Scour Mitigation. Served as biological task order manager for construction monitoring. Managed subconsultants and deliverables.

Contract 06A2498 TO 3, Highway 46 Corridor Improvement Project - Wye Segment. Served as a project biologist and assistant task order manager.

Contract 06A2498 TO 4, Highway 46 Corridor Improvement Project - Antelope Grade Segment. Served as a project biologist and assistant task order manager.

Contract 06A2498 TO 6, Pismo Creek Scour Repair Project. Served as biological task order manager managing subconsultants for construction monitoring work.

SR-39 Slope, Drainage, and Roadway Repair Project—Caltrans District 7, Unincorporated Los Angeles Co, California

Project manager for this $37,000 project providing pre-construction rare plant surveys, nest surveys, sensitive biological surveys, and construction monitoring. Coordinating with biological staff, Caltrans, and contractor to perform surveys in advance of work. Managing biological staff, schedule, and budget. *2019-present.*

Hamner Avenue Bridge Replacement Project—Riverside County Transportation Department, City of Norco, California

Task manager for this $1,395,000 project. Managed wetlands and waters delineation and biological studies including vegetation mapping, flora and fauna inventories, protocol riparian bird and burrowing owl surveys, and Santa Ana sucker habitat assessment for the project. Managed a Jurisdictional Delineation report, NES and MSHCP consistency document with a Determination of Biological Equivalent or Superior Preservation (DBESP). Managing 404, 401, and 1602 permitting as well as HMMP and landscape plan development. *2017-present.*

I-405 Improvement Project—Orange County Transportation Agency, Orange County, California

Task manager for this $1,200,000 project. Designated project biologist managing construction monitoring and permit compliance for this 16-mile design-build widening from SR-73 to I-605. Construction includes the widening and/or replacement of approximately 30 freeway bridge crossings, the construction of approximately 165 new walls (retaining and sound walls), and the construction of large 5 culvert extensions. Managing compliance document preparation and GIS analysis for preconstruction burrowing owl habitat assessments and surveys, bat surveys, nesting bird surveys, wildlife crossings, and rare plant surveys. Working with the construction team to implement proactive management strategies to minimize schedule impacts from nesting birds and bats. Managing Biological staff and budget. *2017–present.*

Gilman Springs Safety Improvement Project—Riverside County Transportation Department, Riverside County, California

Project Manager for this $75,000 project to improve safety along an approximate 4.5 mile alignment. Managing burrowing owl, small mammal trapping, rare plants, waters delineation, wildlife corridors, and NESMI production. *2017-present.*

Clark Street Sidewalk Construction Project—Riverside County Transportation Department, Riverside County, California

Project Manager for this $45,000 project to improve safety along an approximate 4.5 mile alignment. Managing biological surveys and delineation, wildlife corridors, and NESMI production. *2017-present.*

I-605 CIP—OCTA, Multiple Cities, Los Angeles County, California

Biologist/Task Manager. Managed jurisdictional delineation, habitat assessments, vegetation mapping, LBV protocol surveys, burrowing owl protocol surveys, and NES documentation. Managed biological staff, schedule, and budget. *06/2016–present*.

Cites of Highland and Redlands Regional Connector—Highland and Redlands, San Bernardino County, CA

Task Manager for this $200,000 project. Managing field work for general biological resources, vegetation mapping, protocol burrowing owl surveys, rare plant surveys, San Bernardino Kangaroo Rat trapping, GIS mapping, NES, BA and Section 7 Consultation, and Jurisdictional Delineation along the alignment adjacent to Orange Street over the Santa Ana River and Plunge Creek on SBVWCD lands. Coordinated with SBVWCD and Cities of Highland and Redlands regarding the applicability and requirements for the Upper Santa Ana River Habitat Conservation Plan. *Duration on Contract:* 07/2017–Present.

Orange Street Bridge Replacement – City of Highland, San Bernardino County, CA

Task Manager for this $170,000 project. Managing field work for general biological resources, vegetation mapping, protocol burrowing owl surveys, rare plant surveys, jurisdictional delineation, San Bernardino Kangaroo Rat trapping, GIS mapping, NES, and Jurisdictional Delineation at the Orange Street Bridge over Plunge Creek. Coordinated with SBVWCD and City of Highland regarding the applicability and requirements for the Upper Santa Ana River Habitat Conservation Plan. *Duration on Contract:* 02/2017–Present.

I-15 Corridor Improvement Project—SANBAG, Riverside and San Bernardino County, California

Task Manager for this $800,000 project. Managed field work for general biological resources, vegetation mapping, protocol burrowing owl and California gnatcatcher surveys, jurisdictional delineation, GIS mapping, and NES, Jurisdictional Delineation, and Biological Assessment. Managed subcontractors for year 1 Delhi sands flower-loving fly surveys. Performed wetlands and waters delineation along the 14-mile alignment and authored the jurisdictional determination report. Managed staff, scheduling, and budget. Coordinated with SANBAG and Caltrans District 8 staff, as well as USFWS. *Duration on Contract:* 11/2015–11/2019.

SR 91/55 Improvement Project—OCTA, Orange County, California

Biological Task Manager for this $60,000 project. Managed field work for general biological resources, vegetation mapping, jurisdictional delineation, GIS mapping, and reports: NES and Jurisdictional Delineation. Managed staff, scheduling, and budget. Coordinated with OCTA and Caltrans District 12 staff. *Duration on Contract:* 11/2016–Nov/2018.

Soledad Canyon Road Bridge—LACDPW, Los Angeles County, California

Project Manager for this $55,000 project. Managing biological and cultural resources for this bridge replacement project. Managed and provided senior review of an NESMI. Managed staff, scheduling, and budget. *Duration on Contract:* 7/2016–Present.

Avenue K—LACDPW, Los Angeles County, California

Task Manager for this $54,000 project. Managed biological resource assessments for this Interchange Improvement project CEQA addendum. Managed and provided senior review of an NESMI. Managed staff, scheduling, and budget. *Duration on Contract:* 3/2016–Present.

On-Call Biological Task Orders—Caltrans District 7, Ventura, California

Project Manager for task orders under GPA Consulting Inc.'s On-Call Services Contract with Caltrans District 7. Selected task orders include:

TO 4, San Antonio Creek bridge Scour Mitigation Riparian Bird Surveys. Managed staff, scheduling, reporting, and budget for the task order requiring least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo protocol surveys.

TO 8, SR-118 Arroyo Simi Bridge Riparian Bird Surveys. Managed staff, scheduling, reporting, and budget for the task order requiring least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo protocol surveys.

TO 10, SR-33 North Fork Matilija Riparian Bird Surveys. Managed staff, scheduling, reporting, and budget for the task order requiring least Bell's vireo protocol surveys.

TO 12, Ven-150. Managed staff, scheduling, reporting, and budget for the task order requiring least Bell's vireo and southwestern willow flycatcher protocol surveys; southwestern pond turtle, two-striped garter snake and CA red-legged frog surveys; and acoustic bat surveys.

Duration on Contract: 03/2016–12/2017.

Clinton Keith Road Extension Project—Riverside County Transportation Department, Menifee, Riverside County, California

Project Manager for this $450,000 project that is an extension of Clinton Keith Road between Whitewood Road to Trois Valley Street. Managing biological construction monitoring for the construction phase of the project, permit compliance and reporting, environmental awareness training, preconstruction nesting bird and bat surveys, and Habitat Mitigation Monitoring Plans for on- and off-site mitigation. *2016-present*

Limonite Road Widening Project—City of Jarupa Valley, Jarupa Valley, Riverside County, California

Task Manager for this $120,000 project that is widening approximately one mile of Limonite Avenue between Etiwanda Avenue and Bain Street from two to four lanes. Managing biological construction monitoring, permit compliance and reporting, environmental awareness training, preconstruction nesting bird and bat surveys, developing Habitat Mitigation Monitoring. *2016-present*

I-5/I-215 Interchange Improvement Project—Atkinson Construction, Devore, San Bernardino County, California

While employed by URS, served as task manager. Designated project biologist that managed permitting, construction monitoring, permit compliance, and biological budget ($1.2 million) for this large and complex design-build project at the I-15 and I-215 intersection that has 22 new or modified bridges, federal and state listed species, critical habitat, and waters of the U.S. and state. Managed preparation of a Worker Environmental Awareness Program (WEAP), speckled dace and two-striped garter snake relocation plans, bird/bat exclusion plans, invasive weed control plan, San Bernardino Kangaroo Rat Restoration Plan, CDFW Habitat Mitigation Monitoring Program (HMMP), and associated geographic information systems (GIS) analysis. Performed biological review of 65%, 95%, and 100% design plans for Release for Construction. Prepared USACE 404 Nationwide Permit (NWP) Pre Construction Notification (PCN) and acquired 404 permit, consulted with agencies and Caltrans for as-needed permit amendments. Procured and managed biological subcontractors, worked with design engineers to reduce jurisdiction impacts where possible, and provided agencies with weekly and monthly reports. *2012–2015.*

State Route (SR) 210 Lane Addition—San Bernardino Associated Governments (SANBAG), Highland, California

Serving as Project manager for this $580,000 project. Managing biological resource tasks along an approximate 7-mile stretch of SR 210 that has federal and state listed species and critical habitat. Managed habitat assessments, rare plant surveys, and protocol surveys for California gnatcatcher, least Bell's vireo, and San Bernardino kangaroo rat. Coauthored a Natural Environmental Study (NES), Biological Assessment (BA), and Jurisdictional Delineation (JD). Consulted with USFWS, Caltrans, and SANBAG; worked with design engineers to reduce jurisdiction impacts where possible and responded to comments on the Final IS/MND. Developed permit application packages for geotechnical investigations and also for project construction. Obtained a CDFW 2081 Incidental Take Permit, BO, 404, 401 and 1602 for geotechnical and construction phases. Managed biological staff and budget. *2012–present.*

SR 91 Corridor Improvement Project—Atkinson/Walsh Joint Venture, Riverside and Orange Counties, California

While employed by URS, served as task manager for this $1.4 million project. Designated project biologist that managed construction monitoring and permit compliance, aquatic resource permitting and amendments, and paleontological plans and monitoring for this large, 11-mile design-build widening of SR 91 from SR 241 to west of I-15 having 26 new or modified bridges, federal and state listed species, critical habitat, and waters of the U.S. and state. Managed compliance document preparation and GIS analysis for preconstruction burrowing owl habitat assessments and surveys, bat surveys and panel installation, nesting bird surveys, wildlife crossings, tree inventory, lighting/noise plans, and on-site mitigation implementation. Procured and managing biological subcontractors. Prepared USACE 404 NWP PCN and acquired permit, prepared independent utility 404 PCNs for Oak Street Channel (a Section 408 facility) and

Wardlow Wash; prepared and acquired a RWQCB 401 amendment; prepared a CDFW Lake and Streambed Alteration Agreement (LSAA) permit amendment for Southern California Edison (SCE) utilities, and consulted with agencies and Riverside County Transportation Commission (RCTC)/Caltrans as needed. Managed Biological and Paleontological staff and budgets. *2013–2015.*

Palomar Street Improvement Project—City of Wildomar, California

While employed by URS, served as task manager for this $95,000 project. Performed wetlands and waters delineation and managed biological studies including vegetation mapping, flora and fauna inventories, protocol riparian bird and burrowing owl surveys for the street widening project. Authored a jurisdictional delineation report and managed a MSHCP consistency document with Determination of Biological Equivalent or Superior Preservation (DBESP). Managed biological staff and budget. *2014.*

Frank Sinatra Drive at Whitewater River—City of Rancho Mirage, California

While employed by URS, served as task manager for this $38,000 project. Managed habitat assessments, rare plant survey, vegetation mapping, jurisdictional assessment, and production of an NES-MI and CVMSHCP consistency document. Consulted with the Agua Caliente Band of Cahuilla Indians, Bureau of Indian Affairs, USFWS, and Caltrans for impacts on tribal lands. Managed biological budget. *2014.*

I-215/Newport Road Interchange Improvement Project—Riverside County Transportation Department (RCTD), Menifee, California

While employed by URS, served as task manager for this $450,000 project. Performed wetlands and waters delineation and biological studies for the interchange project. Authored a jurisdictional determination report, NES MI, and MSHCP consistency document. Prepared aquatic resource permit applications for USACE, RWQCB, and CDFW and acquired permits. Consulted with agencies, Caltrans, and RCTD. Prepared Conceptual Mitigation plans and secured mitigation through Santa Ana Watershed Association and Riverside County Resource Conservation District. Managed biological budget. *2007–2015.*

I-215 Widening from Scott Road to Nuevo Road—RCTC, Menifee, California

While employed by URS, served as task manager for this $60,000 project. Prepared and acquired aquatic resource permits from USACE, RWQCB, and CDFW for impacts to jurisdictional aquatic resources. Consulted with agencies, Caltrans, and RCTC. Worked with design engineers to reduce jurisdiction impacts where possible, co-authored a 404(b)(1) analysis, and assisted USACE with their EA document and responses to public comments. Received an Individual Permit in 4 months. *2011–2012.*

SR 47 Shuyler Helm Bridge Replacement Project—Port of Los Angeles, California

While employed by URS, served as task manager for this $350,000 project. Performed wetlands and other waters jurisdictional determination and authored the jurisdictional determination report. Performed site biological assessments and authored an Essential Fish Habitat Assessment for submittal to the NMFS for Section 7 consultation. Prepared and acquired USACE, RWQCB, CDFW, and CCC permit applications. Performed peregrine falcon construction monitoring. Managing biological budget. *2009–2015.*

I-405 Improvement Project—Orange County Transportation Agency (OCTA), Orange County, California

While employed by URS, served as task manager for this $95,000 project. Performed a wetlands and waters delineation along a 17-mile alignment and authored the jurisdictional determination report. Performed site biological assessments for common and special status plant and wildlife species and authored an NES MI. *2009–2012.*

Santiago Road Culvert Replacement Project—Orange County Department of Public Works, Anaheim Hills, California

While employed by URS, served as lead biologist for this $25,000 project. Performed a wetlands and other waters jurisdictional determination and biological resource evaluation for a culvert replacement along Santiago Road. Authored a jurisdictional determination report and prepared and acquired USACE, RWQCB, and CDFW permits. *2010.*

Fairmont Avenue Bridge Extension Project—City of Glendale, California

While employed by URS, served as lead biologist for this $640,000 project. Performed wetlands and waters jurisdictional determination and prepared and acquired CDFW, USACE, and RWQCB permits for the roadway extension, which spans Verdugo Wash and the Los Angeles River. Conducted biological surveys and authored a Biological Technical Report. Authored a WEAP and performed Migratory Bird Treaty Act preconstruction clearance surveys as well as biological monitoring for permit compliance throughout the duration of the project. *2008–2010.*

Murrieta Hot Springs Road Improvement Project—Caltrans, Murrieta, California

While employed by URS, served as task manager for this $41,000 project. Managed habitat assessments, plant survey, vegetation mapping, jurisdictional assessment, and production of an NES MI and MSHCP consistency document. Managed biological budget. *2014.*

Highway Expansion Projects—Caltrans, Riverside County, California

While employed by URS, served as lead field biologist. Performed site biological assessments according to Caltrans SER for common and special status plant and wildlife species for independent transportation improvement projects for Redlands Boulevard improvement and Gilman Springs Road improvements. Authored NES MIs. *2008–2010.*

US 101/SR 46 W and US 101/SR 46 E Overpass Improvement Projects—Caltrans, Paso Robles, California

While employed by URS, served as lead field biologist. Identified required biological surveys, performed biological surveys for sensitive wildlife and botanical species, authored NES MIs. *2006–2008.*

Bristol Street and Grand Avenue Widening Projects—Caltrans, Santa Ana, California

While employed by URS, served as lead field biologist for this $65,000 project. Performed site biological assessments and authored NES MI. *2007–2008.*

Clinton Keith Road Widening and Clinton Keith Road Interchange Projects—Caltrans, Wildomar, California

While employed by URS, served as lead field biologist for this $95,000 project. Performed site biological assessments and prepared NES MI and MSHCP Consistency Documents. Performed wetlands and waters jurisdictional determination and authored USACE, RWQCB, and CDFW permit applications. *2008–2010.*

Lenwood Road Grade Separation Project—Caltrans, Barstow, California

While employed by URS, served as lead field biologist. Performed site biological assessments and authored NES MI. *2008.*

Clay Street Road Grade Separation Project—Caltrans, Riverside, California

While employed by URS, served as lead field biologist for this $65,000 project. Performed site biological assessments and authored NES MI and MSHCP consistency document. *2009.*

I-15 and Ranchero Road Interchange—Caltrans, Hesperia, California

While employed by URS, served as lead field biologist. Performed site biological assessment an authored the biology portion of the Preliminary Environmental Assessment report (PEAR). *2006.*

Tuna Canyon Road Repair and Culvert Replacement Project—Los Angeles County Department of Public Works, California

While employed by URS, served as biologist for this $65,000 project. Performed and authored a jurisdictional delineation and prepared USACE, RWQCB, and CDFW permit applications. *2008.*

SR 22 Improvement Project—Caltrans, Santa Ana, California

While employed by URS, served as biologist for this $55,000 project. Implemented CDFW, USACE, and RWQCB permit conditions for the SR 22 Improvement project. Inspected work site performed construction monitoring for compliance with permit conditions. *2007.*

I-15 Land Addition Project—Utah Department of Transportation (UDOT), St. George, Utah

While employed by URS, served as lead biologist for this $25,000 project. Performed protocol desert tortoise surveys along a 2-mile stretch of I-15 proposed for lane additions. Authored a biotechnical report for submittal to USFWS. *2009.*

Transportation—Rail and Transit

Tehachapi Pass Second Main Track—BNSF, Tehachapi, California

While employed by URS, served as task manager for this $350,000 project. Performed a wetlands and waters delineation along a 25-mile stretch of tracks proposed for expansion. Authored a jurisdictional determination report and acquired CDFW 1602 and RWQCB Waste Discharge Report, and consulted with agencies. Drafted the Biological Resources section of the EIR and responded to comments. Managed preconstruction rare plant surveys, nesting bird surveys, and bat habitat assessment. Managed biological budget. *2008–2015.*

California High-Speed Rail Project, from Palmdale to Los Angeles—California High-Speed Rail Authority, Palmdale to Los Angeles, California

While employed by URS, served as task manager for this $1.5 million project. Performed wetlands and waters delineation along the Palmdale to Los Angeles proposed high-speed rail alignments. Authored a Jurisdictional Determination Report and co-authored a Biological Technical Report. Managed biological staff and budget. *2009–2015.*

California High-Speed Rail Project, from Fresno to Bakersfield—California High-Speed Rail Authority, Fresno to Bakersfield, California

While employed by URS, served as technical task lead for wetlands and waters delineation for this $3.5 million project along the Fresno to Bakersfield proposed high-speed rail route. *2009–2011.*

Cajon Subdivision Summit to Keenbrook Third Main Track Project—BNSF, San Bernardino, California

While employed by URS, served as project biologist for this $150,000 project. Supported the preparation of reports and assessments to authorize Incidental Take for the Third Main Track project. Assisted with USFWS Section 7 consultation and State Consistency Determination that included least Bell's vireo, southwestern willow flycatcher, San Bernardino kangaroo rat, and arroyo toad. *2007.*

Mesquite Railway Project—Union Pacific Railroad, Mesquite, Nevada

While employed by URS, served as field biologist for this $45,000 project. Performed wetland and waters delineations along a proposed 32-mile railroad line extending northwest from Mesquite, Nevada. *2006.*

Water and Wastewater

Venice Auxiliary Pumping Plant— City of Los Angeles Bureau of Engineering, Los Angeles County. Serving as Task Manager for this $125,000 project consisting of environmental documentation supporting the construction of an auxiliary pumping facility to supplement capacity to the existing Venice Pumping Plant. Managed biological surveys and biological section of the CEQA IS/MND. Managing development of a Habitat Mitigation Monitoring Plan for on-site restoration. 2015-present.

Talbert Outlet Excavation— OCPW, Orange County. Serving as Task Manager for this $18,000 project consisting of pre-construction grunion surveys, snowy plover and least tern surveys, and construction monitoring . Managing staff, budget, and schedule. *4/2019 to present.*

Trabuco Canyon Emergency Road Repair— OCPW, Orange County. Serving as Task Manager for this $15,000 project consisting of pre-construction nesting bird surveys and construction monitoring. Managing staff, budget, and schedule. *4/2019 to present.*

Santa Ana River Excavation— OCPW, Orange County. Serving as Task Manager for this $15,000 project consisting of pre-construction nesting bird surveys and periodic construction monitoring . Managing staff, budget, and schedule. *4/2019 to present.*

Avenue K Transmission Main Phase IV Project —LACDPW, Los Angeles County, California
Task Manager for this $7,000 project. Managed pre-construction nesting bird and burrowing owl surveys. Managed staff, scheduling, and budget. *Duration on Contract:* 5/2019.

Oso Creek Biological Studies — Orange County Department of Public Works, Orange County, California. Served as Project Manager for this $19,000 project that included a biological technical report and jurisdictional delineation. *2018.*

Talbert Outlet Excavation— OCPW, Orange County. Served as Manager for this $18,000 project consisting of pre-construction grunion surveys, snowy plover and least tern surveys, and construction monitoring. Managed staff, budget, and schedule. *4/2019 to 8/2019.*

Santa Ana River Excavation— OCPW, Orange County. Serving as Task Manager for this $15,000 project consisting of pre-construction nesting bird surveysand periodic construction monitoring . Managing staff, budget, and schedule. *4/2019 to present.*

East Garden Grove Wintersburg Channel Sheet Pile Project — Orange County Department of Public Works, Orange County, California. Serving as Deputy Project Manager for this $65,000 Initial Study/Mitigated Negative Declaration for sheet pile installation along an approximate 1.5 mile alignment of flood channel from Warner Avenue to Goldenwest Street. Managing biological resources study, jurisdictional delineation, and IS/MND biology section. 2017-present.

East Garden Grove Wintersburg Channel Sheet Pile Project — Orange County Department of Public Works, Orange County, California. Serving as Project Director for this $25,000 project involving a consistency analysis to determine whether project modifications are fully covered in the original Final EIR No. 560 and Addendum. This alignment of extends from Woodruff Street to the confluence with C06. Managing biological resources consistency analysis. 6/*2019-present*.

Oso Detention Basin Biological Studies — Orange County Department of Public Works, Orange County, California. Served as Project Manager for this $14,000 project that included protocol least Bell's vireo and California gnatcatcher surveys and a jurisdictional delineation. *2018.*

San Diego Creek Channel Maintenance — Orange County Department of Public Works, Orange County, California. Served as Project Manager for this $10,000 project that included a jurisdictional delineation and biological survey. *2016.*

Ocean Outlets Maintenance – Talbert Channel — Orange County Department of Public Works, Orange County, California. Served as Project Manager for this $17,000 project that included grunion surveys and construction monitoring for sand removal at the Talbert Channel mouth pursuant to the Ocean Outlets Maintenance Program and associated permits. *2017.*

Los Alamitos and East Garden Grove Channels CRAM Assessment— Orange County Department of Public Works, Orange County, California. Served as Project Manager for this $11,000 project and conducted riverine and estuarine CRAM analysis at 7 locations within two flood control channels as a post construction permit condition requirement. CRAM scores were determined and analyzed relative to pre-construction CRAM scores and a CRAM report was prepared for agency submittal. *2016.*

Ocean Outlets Maintenance Permit Renewals— Orange County Department of Public Works, Orange County, California. Served as Project Manager for this $15,000 project and developed a CCC CDP amendment application, RWQCB 401 amendment package, and USACE extension letter for a five year extension of the ocean outlet program. *2016.*

Emergency Permitting Services— Orange County Department of Public Works, Orange County, California. Served as Project Manager for this $25,000 project and provided emergency permit applications for San Diego Creek, Santa Ana River, East Garden Grove

Wintersburg Channel, and five other facilities in anticipation of El Nino winter rains that threatened flood damage to flood-control facilities and surrounding infrastructure. *2016.*

San Joaquin Channel Restoration and Repair Project— Orange County Department of Public Works, Irvine, California. Served as Project Manager for this $35,000 project and performed a jurisdictional delineation and biological survey for the project. Managed a cultural resource review of this facility planned for sediment removal and erosion repair. Permit applications were also prepared and submitted to agencies. *2016.*

Barranca Channel Restoration and Repair Project— Orange County Department of Public Works, Irvine, California. Served as Project Manager for this $25,000 project completing permit applications for submittal to agencies in support of the project that will repair erosion and remove sediment to approximately 6,300 linear feet of channel. *2016.*

Lane Channel Restoration and Repair Project— Orange County Department of Public Works, Irvine, California. Serving as Project Manager for this $12,000 project that includes a cultural review and permit applications for submittal to agencies in support of this project that will repair erosion and remove sediment within the channel. Construction work includes a pre-construction CRAM and annual monitoring. *2016-Present.*

Delhi Channel Low Flow Recapture Project—City of Santa Ana, Orange County, California

While employed by URS, served as task manager for this $25,000 project. Managed biological field assessment, Biological Technical Report, and jurisdictional delineation. Prepared CDFW, USACE, and RWQCB permit applications. *2015–2015.*

Argo Channel Long-Term Maintenance Project—Los Angeles World Airports, Los Angeles County, California

While employed by URS, served as task manager for this $25,000 project. Prepared CDFW, USACE, and RWQCB permit applications. *2015–2015.*

County-Wide Regulatory Flood Control Facility Regulatory Permitting Project— Orange County Department of Public Works, Orange County California

While employed by URS, served as project manager for this $25,000 project. Assisted Operations and Maintenance Staff with regulatory review and applicability of county-wide flood control facilities. Accompanied O&M staff during field and office review of facilities and brainstorming approaches to performing critical maintenance activities that have not yet received regulatory permits. Obtaining permits for projects not yet permitted and implementing permits for permitted projects. *2014*.

Weir Canyon to Santiago Creek Levee Inspection—Orange County Department of Public Works, California

While employed by URS, served as project manager for this $4,000 project. Assisted Operations and Maintenance Staff with a biological constraints analysis for vegetation removal along the base of the Santa Ana River levees from Weir Canyon to Santiago Creek, approximately 12 miles. Prepared a Biological Constraints Analysis Report. Managed staff and budget. *2014*.

Talbert Channel Rubber Dam Project—Orange County Department of Public Works, Huntington Beach, California

While employed by URS, served as project manager for this $20,000 project. Performed a jurisdictional delineation and biological resource evaluation for a rubber dam replacement within Talbert Channel. Authored the jurisdictional determination report and prepared USACE, RWQCB, and CDFW permit applications. *2014*.

Villa Park Dam Subdrain Modification Project—Orange County Department of Public Works, Unincorporated Orange County, California

While employed by URS, served as project manager for this $35,000 project. Performed a jurisdictional delineation and managed a biological resource evaluation for a subdrain modification within Villa Park Dam. Authored a jurisdictional determination report and prepared USACE, RWQCB, and CDFW permit applications. *2014*.

El Dorado Pond Lake Restoration Project—City of Long Beach, California

While employed by URS, served as task manager for this $25,000 project. Performed and authored an aquatic resource permitting constraints analysis for a proposed pond redesign and restoration project. Prepared CDFW and RWQCB permit applications and USACE AJD. Managed biological staff and budget. *2014–2015.*

North Norco Channel Line NB—Riverside County Flood Control and Water Conservation District, Riverside County, California

While employed by URS, served as task manager for this $14,000 project. Conducted a biological field assessment and authored a Biological Technical Report that included site applicability of MSHCP plan area and cells, burrowing owl, narrow endemic plant survey area, riparian/riverine, amphibian, and Stephens' kangaroo rat fee area. Conducted and authored a Jurisdictional Delineation Report that included MSHCP Riparian/Riverine policy requirements. Managed Biological budget. *2014*.

Lakeview/Nuevo Master Drainage Plan—Riverside County Flood Control and Water Conservation District, Riverside County, California

While employed by URS, served as task manager for this $20,000 project. Conducted a biological field assessment for applicability of MSHCP plan area and cells, burrowing owl, narrow endemic plant survey area, riparian/riverine, amphibian, Stephens' kangaroo rat fee area, and other MSHCP-required surveys. Conducted a Jurisdictional Delineation Report for aquatic resource and MSHCP Riparian/Riverine policy requirements. Managed Biological budget. *2014*.

Temescal Creek/Foster Road Storm Drain - Stage 1 Project—Riverside County Flood Control and Water Conservation District, Riverside County, California

While employed by URS, served as task manager for this $43,000 project. Managed preconstruction burrowing owl and nesting bird surveys, Nesting Bird Plan, and biological monitoring for the project. Conducted CRAM and co-authored the report. *2014–2015.*

Santa Ana River Reach 1 and 2 Biological Monitoring—Orange County Department of Public Works, Orange County, California

While employed by URS, served as project manager for this $26,000 project. Managed biological monitoring and permit compliance for an approximate 1-mile stretch of vegetation clearing within the river. *2014*.

Regulatory and Environmental On-Call—Orange County Department of Public Works, California

While employed by URS, served as project manager for this $25,000 project. Assisting OCPW with miscellaneous regulatory compliance and biological work tasks across the County as needed. Managing staff and budget. *2014–2015.*

Huntington Beach and Talbert Channel Cathodic Protection Project—Orange County Department of Public Works, Huntington Beach, California

While employed by URS, served as lead field biologist for this $125,000 project. Performed a jurisdictional delineation and biological resource evaluation. Performed an eelgrass survey within tidally-influenced portions of the channel and authored an eelgrass survey report. Authored a jurisdictional determination report and prepared USACE, RWQCB, CDFW, and CCC permit applications. *2009–2011.*

Live Oak Reservoir Dewatering—Metropolitan Water District, San Bernardino County, California

While employed by URS, served as task manager for this $5,000 project. Performed a literature review and biological field survey of the project area prior to work initiation. Identified avifauna present and potential permitting constraints. Provided a summary of applicability of USFWS Critical Habitat, listed species, and waters of the U.S. and state. *2014*.

Realto Feeder Maintenance—Metropolitan Water District, San Bernardino County, California

While employed by URS, served as task manager for this $5,000 project. Performed a literature review and biological field survey of the project area prior to work initiation. Identified avifauna present and potential permitting constraints. Provided a summary of applicability of USFWS Critical Habitat, listed species, and waters of the U.S. and state. *2014*.

Orange County Feeder Maintenance—Metropolitan Water District, Orange County, California

While employed by URS, served as task manager for this $5,000 project. Performed a literature review and biological field survey of the project area prior to work initiation. Identified avifauna present and potential permitting constraints. Provided a summary of applicability of USFWS Critical Habitat, listed species, and waters of the U.S. and state. *2015*.

Shadow Rock Detention Basin Urban Water Recovery—Trabuco Canyon Water District, Orange County, California

While employed by URS, served as task manager for this $30,000 project. Performed a jurisdictional delineation and biological survey of the District’s basin. Authored a Jurisdictional

Delineation, Biological Technical Report, and drafted and acquired USACE Letter of Permission, CDFW 1602, and RWQCB 401 permit. Managed biological staff and budget. *2012-2015.*

Island Way Bridge Cathodic Protection Project—Orange County Department of Public Works, Dana Point, California

While employed by URS, served as project manager for this $6,000 project. Performed an eelgrass and caulerpa survey around Island Way Bridge prior to construction and authored an eelgrass survey report in support of USACE, RWQCB, CDFW, and CCC permit conditions. *2014*.

Edinger Bridge Replacement Project—Orange County Department of Public Works, California

While employed by URS, served as project manager for this $6,000 project. Performed an eelgrass and caulerpa survey around Edinger Bridge prior to construction and authored an eelgrass survey report in support of USACE, RWQCB, CDFW, and CCC permit conditions. *2015*.

Deer Creek and Hillside Channel Project—San Bernardino County Flood Control District, Rancho Cucamonga, California

While employed by URS, served as proejct manager for this $4,000 project. Managed focused protocol surveys for California gnatcatcher within 35 acres of suitable habitat. Provided QA/QC review of the survey report. Managed staff and budget. *2014*.

Rose Canyon 8-inch Transmission Line Creek Crossing—Trabuco Canyon Water District, Orange County, California

While employed by URS, served as permitting biologist for this $25,000 project. Performed jurisdictional delineation and biological survey of a water pipeline damaged during FEMA-1952-DR-CA winter storms. Authored a Preliminary Jurisdictional Delineation, Biological Technical Report, and drafted and acquired CDFW, RWQCB, and USACE permits. *2011*.

Otay Mesa Watershed Special Area Management Plan (SAMP)—USACE, Otay, California

While employed by URS, served as project biologist for this $78,000 project. Authored a baseline condition report on aquatic, wetland, and riparian habitats within a proposed Otay Mesa SAMP. The document included a Planning Level Delineation and Landscape Level Functional Assessment within the Otay Watershed. The USACE and County of San Diego are corroborating on the development of the SAMP in order to streamline the CWA permitting process within the Otay watershed. *2008*.

Laguna Water and Sewer Upgrade Project—South Coast Water District (SCWD), Laguna, California

While employed by Tetra Tech, served as biologist for this $160,000 project. Prepared three CEQA IS biology sections for the installation of a new water line, the replacement of an existing water line, and for the maintenance of two sanitary sewer lines. Identified required biological surveys, biological sampling events, and required environmental permits. *2006*.

Marina del Rey Tide Gate Rehabilitation Project—Los Angeles Department of Public Works, Marina del Rey, California

While employed by URS, served as biologist for this $65,000 project. Performed an eelgrass, Caulerpa spp., and sensitive marine biological resource survey for the Marina del Rey tide gate improvement project pursuant to Coastal Development Permit conditions. The survey consisted of benthic surveying and mapping along transects within an approximate 50,000 sq. ft. project area. Authored a letter report of findings for submittal to the California Coastal Commission. *2009–2011.*

Fish Identification and Relocation Project—Santa Barbara Airport, Santa Barbara, California

While employed by URS, served as biologist for this $80,000 project. Assisted in a fish identification and relocation project to relocate estuarine fishes from two intertidal wetland sites planned for runway construction disturbance to an undisturbed, adjacent wetland location. Assisted with the relocation of fishes, including the listed tidewater goby. *2006*.

Energy and Fuels

Big Beau Solar Project—EDF Renewables, Kern County, California

Deputy project manager managing surveys for desert tortoise, burrowing owl, Swainson's hawk, rare plant surveys, and native cactus mapping on 3200 acres of lands and 15 miles of linears proposed for solar development. Managing development of a Biological Technical Report. *2018*.

Center Power Project—Terra-Gen, LLC, Pico Rivera, California

While employed by URS, served as task manager for this $45,000 project. Performed biological studies and wetlands and waters delineation for a proposed natural gas power plant and transmission line, water, and natural gas linear appurtenances. Authored the jurisdictional delineation report and AFC biology section. Managed biological budget. *2014*.

Pio Pico Energy Center Project—Pio Pico Energy, LLC, Otay, California

While employed by URS, served as lead field biologist for this $180,000 project. Performed wetlands and waters delineation for a proposed natural gas power plant and transmission line, water, and natural gas linear appurtenances. Authored the jurisdictional delineation report and AFC biology section. Responded to CEC data requests. *2010–2012.*

CALNEV Pipeline Project—Kinder Morgan Energy Partners, California and Nevada

While employed by URS, served as field biologist task lead for this $1.1 million project. Performed protocol desert tortoise surveys, rare plant surveys, and wetlands and other waters delineation along portions of a proposed 280-mile jet fuel pipeline from Colton, California to Las Vegas, Nevada. Led crew of 8-15 people. *2009*.

Leatherneck Substation Project—Southern California Edison (SCE), San Bernardino and Riverside Counties, California

While employed by URS, served as permitting biologist for this $175,000 project. Prepared applications and acquired USACE, RWQCB, and CDFW permits. *2010–2012.*

Soda Mountain Solar Project—Caithness Solar, LLC, Baker, California

While employed by URS, served as lead field biologist for this $220,000 project. Performed protocol desert tortoise surveys, rare plant surveys, and wetlands and other waters delineation for a 6,500 acre solar generating facility. Authored the Jurisdictional Delineation Report and Biological Resources Report. Led a crew ranging from 8-14 people. *2010–2011.*

Solar Project—Sunpower, LLC, Carizzo Plain, California

While employed by URS, served as lead field biologist for this $180,000 project. Performed protocol adult blunt nose leopard lizard surveys for a 4,500 acre solar generating facility. *2009–2010.*

Solar Project—Ausra Energy, San Luis Obispo County, California

While employed by URS, served as field biologist for this $240,000 project. Performed rare plant surveys, vegetation community mapping, and initial kit fox and blunt nose leopard lizard habitat suitability assessments for a proposed solar generating facility. Performed subsequent protocol blunt nose leopard lizard surveys. *2008–2009.*

Solar Project—Ausra Energy, Imperial County, California

While employed by URS, served as field biologist for this $380,000 project. Performed protocol flat tail horned lizard surveys, vegetation community mapping, rare plant surveys, and wetland and other waters delineation for a proposed 7000 acre solar generating facility. *2007–2009.*

Solar Project—Ausra Energy, San Bernardino County, California

While employed by URS, served as field biologist for this $475,000 project. Performed protocol desert tortoise surveys, vegetation community mapping, rare plant surveys, and wetland and other waters delineation for a proposed 15,000 acre solar generating facility. *2007–2010.*

Transmission Line Upgrade—Florida Power and Light, Blythe, California

While employed by Tetra Tech, served as lead field biologist for this $160,000 project. Performed protocol desert tortoise surveys, rare plant surveys, and wetlands and other waters delineation along a 67-mile transmission line alignment. Drafted the Biology Application for Certification (AFC) section for the FERC filing, Biological Assessment, CEC Data Requests, and Mitigation and Monitoring plans. *2004–2005.*

Natural Gas Pipeline—TransCanada and Imperial Irrigation District, Riverside County, California

While employed by Tetra Tech, served as field biologist for this $440,000 project. Performed desert tortoise and rare plant species and wetlands and other waters delineation along a proposed 80-mile and separate 45-mile liquefied natural gas pipelines. Authored the Biology and Hydrology AFC sections, and responded to data requests. *2005–2006.*

Pipeline Anomaly Program—Kinder Morgan Energy Partners (KMEP), Orange, California

While employed by URS, served as seconded employee for this $50,000 project. Provided in-house biological and permitting support within the KMEP Orange, California office. Provided initial site biological and special aquatic resource constraints analyses for Pipeline Integrity/ Anomaly sites requiring pipeline excavation/repair along KMEP's extensive pipeline network spanning several thousands of miles within California, Arizona, Texas, Nevada, and Washington. Identified potential USACE, RWQCB, CDFW, CCC, and Bay Conservation Development Commission (BCDC) permitting requirements for aquatic resources at pipeline inspection sites. Coordinated biological and permitting requirements and timelines with KMEP project managers to facilitate pipeline inspection and repair within mandated, time-sensitive DOT pipeline repair constraints. Assigned and coordinated project consultants, coordinated site biological and special aquatic resource assessments and reporting, and reviewed consultant reports. *2009–2010.*

P-1093 and P-1094 Facility Upgrade Project—U.S. Marine Corps, Camp Pendleton, California

While employed by URS, served as permitting biologist for this $850,000 project. Prepared permit applications and supporting materials submitted to the USACE and RWQCB for two linear projects to improve aging electrical, telecommunications, water, wastewater, and natural gas distribution infrastructure within Marine Corps Base Camp Pendleton. *2010*.

Transmission Line Upgrade—Florida Power and Light, Palmdale, California

While employed by Tetra Tech, served as lead biologist for this $220,000 project. Performed a rare plant survey and vegetation community mapping along a 60-mile transmission line proposed for upgrade. Developed and implemented field methods, coordinated field efforts, led field surveys, and coordinated with regulators including CDFW and USFWS regarding field survey methods. *2008*.

Calpine Energy Plant—Calpine Energy, Riverside, California

While employed by Tetra Tech, served as project biologist for this $40,000 project. Prepared a biological resources mitigation implementation and monitoring plan (BRMIMP), as well as a WEAP. Assisted with biological resource monitoring for construction activities associated with an Electric Generating Facility installation. Performed construction monitoring for sensitive biological resources. *2005*.

Wind Development—PPM Energy, Inc., San Diego County, California

While employed by Tetra Tech, served as field biologist for this $110,000 project. Performed site feasibility surveys and flora/fauna surveys to identify common and sensitive wildlife and plant species on BLM-administered land proposed for a large-scale wind-energy development project. Identified required biological surveys, planned biological sampling events, and identified relevant environmental studies required for NEPA/CEQA compliance. Developed avian field sampling protocols including point count observation areas and coverage, and completed avian data collection at all project observation locations every two weeks for one year. *2005*.

San Ardo Crude Pipeline—Chevron, Coalinga, California

While employed by URS, served as field biologist for this $310,000 project. Performed biological monitoring for California tiger salamander, California red- legged frog, and San Joaquin kitfox during geotechnical drilling investigations along a proposed 57-mile pipeline. *2009*.

Wind Development—PPM Energy, Palm Springs, California

While employed by Tetra Tech, served as field biologist for this $65,000 project. Developed and implemented field methods for protocol desert tortoise surveys and special status plant and animal surveys. Coordinated field efforts and performed sensitive species surveys on approximately 6 acres slated for wind development. Coordinated with CDFW and USFWS. *2006*.

Panoche Energy Center Project—Panoche Energy, LLC, Fresno, California

While employed by URS, served as project biologist for this $90,000 project. Drafted a Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP) and Worker Environmental Awareness Plan (WEAP) for a 20-acre site proposed for a new gas-fired power plant. Performed preconstruction clearance and biological monitoring for initial site clearing and grading. *2009*.

Marine Mammal Monitoring Surveys—Arctic Slope Regional Corporation (ASRC Lynx, Inc.), Prudhoe Bay, Alaska

While employed by Tetra Tech, served as biologist for this $250,000 project. Performed marine mammal monitoring surveys for shipping operations associated with oil exploration activities along the north slope of Alaska in the Arctic Ocean. Documented all observed mammals in accordance with the conditions stipulated by the NOAA Incidental Harassment Authority Permit under the Marine Mammal Protection Act. *2006*.

Guadalupe Restoration Project—Chevron, Guadalupe, California

While employed by URS, served as field biologist for this $2 million project. Assisted with California red-legged frog eyeshine surveys within an estuarine habitat along the Santa Maria River and performed construction monitoring for areas containing state and federally listed plants. *2008*.

Restoration

Wagon Wheel Creek Restoration Project—Orange County Parks, Orange County, California

Project Director for this $353,000 project. Managed construction monitoring and restoration efforts along several areas of the highly-eroded creek. Managed preconstruction efforts (CRAM, mitigation reference sites, ESA boundary establishment), biological and cultural resource construction monitoring, restoration site implementation and monitoring, arborist services, and project budget. Managing post-construction mitigation site annual monitoring and reporting for 5 years. 10/*2016 – present*.

Fairview Park Restoration Project—Orange County Parks, Orange County, California

Project manager for this $24,000 project. Managing annual monitoring and reporting for a mitigation restoration site that have not met success criteria. Managing field staff, document production, and project budget. *2018*.

Mason Regional Park Restoration Project—Orange County Department of Public Works, Orange County, California

While employed by URS, served as project manager for this $171,000 project. Managed restoration efforts for mitigation restoration sites that have not met success criteria. Managed field staff, document production, and project budget. *2014*.

Antonio Park Restoration Project—Orange County Department of Public Works, Orange County, California

While employed by URS, served as project manager for this $159,000 project. Managed restoration efforts at Mason Park for mitigation restoration sites that have not met success criteria. Managed field staff, document production, and project budget. *2014*.

Galivan Basin Restoration Project—Orange County Department of Public Works, Orange County, California

While employed by URS, served as project manager for this $10,000 project. Performed an annual mitigation monitoring and developed adaptive management strategies to get the failing site closer to sign off. Managing field staff, document production, and project budget. *2015*.

Laguna Canyon Wetland and Riparian Restoration Project—Orange County Department of Public Works, Laguna, California

While employed by URS, served as field biologist for this $160,000 project. Monitored creation, enhancement, and management activities. Monthly field visits were conducted for three years to determine the Project's progress toward meeting established success criteria. Quarterly monitoring visits were also performed and included soil and water table measurements, in addition to other data collection and analysis activities, as well as annual quantitative monitoring surveys to collect vegetation community data. *2009–2012.*

North Baja Natural Gas Pipeline—Pacific Gas and Electric Company (PG&E), Riverside County, California

While employed by Tetra Tech, served as lead biologist for this $110,000 project. Led field monitoring of experimental vegetative seeding plots and bi-annual botanical surveys for revegetation along a constructed 87-mile pipeline corridor pursuant to CDFW Streambed Alteration Agreement, USFWS BO, and FERC and California State Lands Commission (CSLC) FEIS requirements. Compiled and analyzed data and authored botanical reports. *2006*.

Development and Redevelopment

Olive View-UCLA Medical Center Campus Master Plan Project—County of Los Angeles Department of Public Works.

Task Manger. Managed biological studies in support of the proposed Olive View-UCLA Medical Center Campus Master Plan that intended to guide development of the campus over time and the delivery of health care services and health related community programs. Managed general biological surveys, California gnatcatcher protocol surveys, rare plant surveys, and co-authored the biological section of the Teir II programmatic EIR. *2016-Present.*

Convention Center Project—City of Lake Forest.

Project Director. Providing construction monitoring and restoration monitoring support for this $400K project that will develop a new convention center on undeveloped lands. Overseeing biological and archaeological construction monitoring during the initial construction phase of the Lake Forest Civic Center project which entailed coordination with USFWS and CDFW to address the presence of nesting California gnatcatcher and to prepare and implement a nesting bird monitoring plan. Other biological monitoring duties included implementing and insuring compliance with the CDFW 1602 permit, USACE 404 and RWQCB 401 permits. Overseeing restoration monitoring support for the onsite Lake Forest Civic Center mitigation maintenance and monitoring project. The project recently completed Year 1 and is performing well and meeting or exceeding many of the final success criteria.

Natural Resource Evaluations—First Industrial Realty Trust, Riverside and San Diego Counties, California

While employed by URS, served as project manager for this $380,000 project. Managed habitat field efforts for special-status plant and animals, wetland and other waters delineations for numerous independent commercial business distribution centers (Rider Street, First Apache, First Indian, First Nandina Center, Grove View, La Pacifica II, First 215, San Michelle). Managed protocol MSHCP burrowing owl surveys, biotechnical and MSHCP Compliance document reports, and authored jurisdictional delineations. Managed Cultural, Paleontological, and Phase I tasks and project budgets. *2012–2015.*

Natural Resource Evaluations—First Industrial Realty Trust, Riverside County, California

While employed by URS, served as field biologist for this $350,000 project. Performed habitat analyses for special-status plants and animals, and wetland and other waters delineations for seven, 40-500 acre proposed commercial business distribution centers. Performed protocol MSHCP burrowing owl surveys, drafted biotechnical and Riverside County MSHCP Compliance document reports, and authored jurisdictional delineations. *2006–2012.*

Site Evaluation and Natural Resources Field Survey—Casden Properties, Santa Clarita, California

While employed by Tetra Tech, served as biologist for this $35,000 project. Performed a site evaluation and natural resources field survey of an approximately 90 acre undeveloped open space parcel in the city of Santa Clarita. Prepared a Biotechnical and Compliance Constraints document. *2006*.

Parks, Trails, and Open Space

Chatsworth Park South Remedial Action Plan—Los Angeles Department of Parks and Recreation, Chatsworth, California

While employed by URS, served as task manager for this $45,000 project. Managed biological field efforts and Biological Technical Report, Rare Plant Survey Report, Arroyo Toad Habitat Assessment, and California Gnatcatcher Survey Report for a soil remediation site. Prepared a Jurisdictional Delineation, prepared applications and acquired USACE, RWQCB, and CDFW permits, and corresponded with agencies. Facilitated procurement of mitigation through an in-lieu fee program. Managed biological staff and budget. *2013–2015.*

Orange County Great Park Project—City of Irvine, California

While employed by URS, served as lead field biologist for this $20,000 project. Performed protocol burrowing owl surveys, rare plant surveys, and provided construction monitoring. Prepared a WEAP and administered the training. *2009–2013.*

Military

Migratory Bird Inventory—U.S. Air Force, Edwards Air Force Base, California

While employed by URS, served as task manager for this $100,000 project. Implemented an avian point count survey to provide baseline avian abundance and distribution associated with operational flight lines. The study spanned two years with data collected at each of 30 point count stations 5 times per year during all seasons and at several day periods. Data were analyzed and peak avian abundance was determined in order to try and reduce bird aircraft strikes (BASH) by providing optimum times to schedule flights. The study provides data that may serve to improve management strategies for birds and bird habitat on a base-wide scale and also to reduce bird strikes on aircraft. Managed biological budget. *2009–2012.*

Raven Predation Study—U.S. Air Force, Edwards Air Force Base, California

While employed by URS, served as field biologist for this $55,000 project. Prepared and implemented a field research plan to address predation of the desert tortoise by the common raven. Performed population density estimates of ravens, movement patterns, and nest searches for tortoise remains. *2006*.

Schools

Los Angeles Mission College Expansion—Sylmar, California

While employed by URS, served as biologist for this $250,000 project. Authored the Biology section of an EIR prepared for an expansion of the Los Angeles Mission College. Performed biological resource assessments and delineated wetlands and other waters. Authored a jurisdictional delineation report and responded to public comments. *2008–2009.*

Emergency Response

Emergency Site Assessments—Federal Emergency Management Agency (FEMA), Sonoma/ Sacramento/Napa Counties, California

While employed by URS, served as biologist for this $350,000 project. Performed site assessments for Federally-listed flora and fauna species on four river projects that received extensive flood damage. Site assessments consisted of habitat suitability and presence/ absence surveys for federally-listed species including central California steelhead ESU, California red-legged frog, California Freshwater shrimp, bald eagle, and northern spotted owl. Species effects determinations for each site were determined, and recommendations for inclusion in a Programmatic Biological Assessment or individual Section 7 Endangered Species Act consultation with NMFS and/or USFWS were made. Authored Biological Assessments for two projects for submittal in Section 7 ESA consultation. *2008*.

Emergency Site Assessments—FEMA, Marin County, California

While employed by URS, served as biologist for this $200,000 project. Performed site assessments for federally listed threatened or endangered flora and fauna species on 12 marine and freshwater projects within Marin County, California. Site assessments consisted of habitat suitability assessments and presence/absence surveys for federally-listed species including central California steelhead ESU, Coho Salmon, California red-legged frog, California freshwater shrimp, clapper rail, and Baker's larkspur. Species effects determinations were made for each site and recommendations for inclusion in a Programmatic Biological Assessment or individual Section 7 Endangered Species Act consultation with National Marine Fisheries Service and/or US Fish and Wildlife Service were made. Authored Biological Assessments for six projects requiring Section 7 ESA consultation. *2009*.

Mines and Quarries

Seales Mineral Project Site Reconnaissance and Biological Permit Compliance Analysis—Tronas, California

While employed by URS, served as biologist for this $150,000 project. Performed site reconnaissance and biological permit compliance analysis for a borax and sodium sulfate mining operation that impacts avian species protected by state and federal ESAs, MBTA, and CDFW Code Sections. Presented data and fatal flaws analysis to perspective buyers of the mining operation. *2008*.

Publications

Lowe, C., G. Moss, G. Hoisington, J. Vaudo, D. Cartamil, M. Marcotte, Y. Papastamatiou. Caudal spine shedding periodicity and site fidelity of round stingrays, *Urobatis halleri* (Cooper), at Seal Beach, California: implications for stingray-related injury management. Bulletin of the Southern California Academy of Sciences. 2007.

Hoisington, G. and C. Lowe. Distribution, abundance, and population structure of the round stingray, *Urolophus halleri*, near a thermal discharge at Seal Beach, California. Marine Environmental Research. 2005.

Employment History

ICF International. Biologist, Irvine Regional Biology Manager. Irvine, California. 11/2015–Present.

AECOM. Biologist, Biology Team Lead. Orange, California. 10/2014–10/2015.

URS (purchased by AECOM 10/2014). Biologist, Biology Department Manager. Santa Ana, California. 04/2006–10/2014.

Tetra Tech. Associate Biologist. Irvine, California. 04/2004–04/2006.

SARAH HORWATH

Fisheries Biologist and Aquatic Ecologist

Sarah Horwath specializes in fisheries biology and aquatic ecology spanning freshwater and marine environments. Sarah has worked with sensitive fish, amphibian, reptile, avian, and invertebrate species, including species listed as threatened and endangered under the federal Endangered Species Act (ESA) and California Endangered Species Act (CESA). As a fisheries biologist and aquatic ecologist, she plans and implements projects, conducts analyses and reporting, and synthesizes information. Sarah has conducted population and habitat assessments, presence/absence surveys, sensitive species rescues, and environmental compliance monitoring for freshwater, anadromous, and estuarine species.

Project Experience

ESA Section 7 Reconsultation Support and State Water Resources Control Board Hearing Support for the Cachuma Project—Downey Brand and Cachuma Conservation Release Board, Santa Barbara County, California, 08/2016 – Present

Biologist. Sarah provides ongoing fisheries support to the Cachuma Conservation Release Board (CCRB), including analyses for inclusion in comments on National Marine Fisheries Service's (NMFS) draft Biological Opinion (BO) for the Operation and Maintenance of the Cachuma Project on the Santa Ynez River. She previously supported CCRB in developing the Biological Assessment for the Cachuma Project which was submitted to NMFS by the U.S. Bureau of Reclamation, and provided support for the Cachuma Project's water rights hearing with the State Water Resources Control Board (SWRCB).

Support for Response to Protests on Extension of Time to Perfect Water Rights Permit—Zone 7 Water Agency, Alameda County, California, 06/2016 – Present

Biologist. Sarah supports Zone 7 in ongoing development of a response to protests on its application for extension of time to perfect water rights permit 11319, which allows for diversion of water from Arroyo del Valle for beneficial use. She assists with development of potential management actions to benefit native minnows and California red-legged frog and native fishes.

Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta

Areas of Expertise

- Fisheries Biology
- Aquatic Ecology
- Environmental Impact Analysis
- Geographic Information Systems

Years of Experience

- Professional start date: 07/2010
- ICF start date: 06/2016

Education

- BS, Aquatic Biology, University of California, Santa Barbara, 2009

Professional Memberships

- American Academy of Underwater Sciences
- American Fisheries Society
- Salmonid Restoration Federation

Certifications

- CDFW Scientific Collecting Permit, No. 9656
- Scientific Diver, American Academy of Underwater Sciences, California, 2007
- 40-hour HAZWOPER
- CPR/First Aid

Professional Development

- Basic Wetland Delineation, Wetland Training Institute, 2017
- Ecology of the California Red-legged Frog Workshop, NOAA Coastal Training Program, 2016
- CDFW California Natural Diversity Database (CNDDB)/BIOS Database Training, 2015

Estuary—State Water Resources Control Board, Sacramento, California, 09/2017 – 10/2018

Biologist. Sarah provided support to the State Water Board by responding to public comments on the recirculated Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary (Bay-Delta Plan), which is proposing to update two elements of the 2006 Bay-Delta Plan: (1) San Joaquin River flow objectives for the protection of fish and wildlife and (2) Southern Delta salinity objectives for the protection of agriculture. She primarily addresses issues concerning potential impacts to fisheries of the lower San Joaquin River system that may result from implementation of the Plan Amendments.

Upper Santa Ana River Early HCP Implementation—San Bernardino Valley Municipal Water District, Riverside County, California, 07/2016 – preseent

Biologist. Sarah conducted a sensitive aquatic species habitat assessment (focused on habitat for Santa Ana sucker, Santa Ana speckled dace, and arroyo chub, two-striped garter snake, and southern western pond turtle) of the Santa Ana River and tributaries within northwestern Riverside County to collect baseline data at future habitat restoration sites. She co-authored technical memo of results, assisted with wetland delineation and California Rapid Assessment Method (CRAM) survey of aquatic resources at project sites, and co-authored Jurisdictional Delineation Report.

On-Call Environmental Services for Various Projects—Caltrans District 5, Santa Cruz, Monterey, and Santa Barbara Counties, and Caltrans District 7, Los Angeles County, California, 06/2017 – present

Biologist. For District 5, Sarah prepared Natural Environment Study documents to analyze biological impacts of various Caltrans highway improvement projects along State Route 1 in Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara counties. She coordinated impact analyses, evaluated potential for sensitive species and biological resources to occur at project locations and evaluation of impacts, and made recommendations. Sarah conducted a snorkel survey of Toro Creek (San Luis Opispo) in the vicinity of a bridge replacement project to evaluate the steelhead population, to inform impact analysis and evaluation of anticipated incidental take. She assisted District 7 with pre-construction surveys and biological monitoring at highway maintenance sites.

Clean Water Action (CWA) Section 404, Section 401, and California Fish and Game Code Section 1602 Permitting for the National City CarMax Project—CenterPoint, San Diego County, California, 07/2016 – Present

Reviewer and Regulatory Specialist. Sarah served as reviewer of the Biological Resources Technical Report, an attachment to the project’s draft Environmental Impact Review. She co-authored CWA Section 404(b)(1) Alternatives Analysis per the Section 404 individual permit requirements of the USACE. Sarah evaluated the potential environmental impacts at, and weighed the costs and challenges of, development at alternative locations to determine the Least Environmentally Damaging and Practicable Alternative. She assisted with preparation of RWQCB 404 water quality certification application package and CDFW 1602 notification package.

Santa Barbara County Reliability Project—Southern California Edison (SCE), Santa Barbara and Ventura Counties, 05/2017 – 04/2018

Biologist. The Santa Barbara County Reliability Project involves reconstruction of an existing Southern California Edison Company’s 66 kilovolt subtransmission system in Ventura and Santa Barbara Counties, part of which would be located within the Santa Barbara and Ojai Ranger Districts of the Los Padres National Forest. Sarah revised the project’s Biological Assessment/Biological Evaluation to evaluate project effects on sensitive and listed species, including those federally-listed as endangered and threatened and U.S. Forest Services sensitive species. She addressed SCE and U.S. Forest Service requests and comments.

MEGAN JAMESON

Senior Regulatory Specialist

Megan Jameson has 16 years of overall project management experience and 13 years of experience in regulatory compliance under Sections 404 and 401 of the CWA, the Porter-Cologne Water Quality Control Act, and California Fish & Game Code Sections 1600–1616. She is experienced in writing and reviewing regulatory permit applications, jurisdictional delineation reports, mitigation and monitoring plans, and associated compliance documents and has managed a wide variety of projects. Megan has provided project and task management services to a wide variety of clients, including OCTA, Caltrans, the Los Angeles County Department of Public Works, City of Los Angeles Bureau of Engineering, Orange County Public Works, Orange County Community Resources, Southern California Edison, and City of San Bernardino, managing permitting, restoration and mitigation projects, overseeing required maintenance, surveys, and reporting and ensuring compliance with regulatory permits.

Megan has held the role of project manager for many projects, including the San Joaquin Cross Valley Line Transmission Project for Southern California Edison (SCE), a 23-mile project which crossed more than 30 jurisdictional features, and the Orange County Parks Ocean Outlets Maintenance Project, for which she obtained a regional general permit (RGP). The project included preparing a public notice for use by the USACE, responding to comments received on the public notice, and preparing an EA as part of the USACE NEPA compliance requirement.

Years of Experience

- Professional start date: 08/2005
- ICF start date: 11/2009

Education

- MS, Environmental Studies, California State University, Fullerton, 2007
- BS, Conservation and Natural Resources, University of California, Berkeley, 1999

Certifications

- Wetland Delineator Certification, Wetland Training Institute, 08/2006
- Plant Identification for Coastal Southern California Certification, Wetland Training Institute, 06/2006

Project Experience

San Diego Freeway I-405 Improvement Project (Measure M Project K)—OCTA, California

Task Lead for Regulatory Permitting. Megan managed the regulatory permitting for the 14-mile freeway improvement project under the OCTA M2 Freeway Program, which consists of 13 capital improvement projects. She obtained aquatic resource permits from the U.S. Army Corps of Engineers, State Water Resources Control Board and California Department of Fish and Wildlife in time to meet the projects stringent schedule. Additional project activities included coordination with the regulatory agencies, preparation of regulatory permit applications, overseeing additional jurisdictional delineation survey work, developing impact analyses to support the applications, and developing and obtaining the additional information needed to support each permit. Specifically, she has been coordinated with the USACE on the first M2 project to be authorized under Department of the Army Permit (File No. SPL-2012-00830-VCL), which authorizes the specific activities associated with the construction of Measure M2 freeway projects to be authorized individually in the future with letters of permission (LOP). This included development of application content consistent with the NCCP/HCP LOP conditions that had previously been agreed to and the NCCP/HCP Appendix E Streambed Program Guidelines.

Upper Santa Ana River Restoration Project – San Bernardino Valley Municipal Water District, Riverside County, California

Task Lead for Regulatory Permitting. Megan is managing the regulatory permitting for four tributary restoration projects. The projects consist of improvements to each of the four Santa Ana River tributary sites, including restoring existing channels, creating new channels, restoring the associated floodplain, enhancing the existing riparian and floodplain habitats, and controlling nonnative invasive species. Significant issues from the project include impacts to biological resources, groundwater pumping and water rights, issues associated with homeless encampments, construction noise and air quality impacts on nearby residents, and tribal cultural resources.

Tehachapi Renewable Transmission Project (TRTP) Restoration Project—SCE, Los Angeles, California

Task Lead for Monitoring, Reporting, and Permit Compliance. Megan managed development of the restoration monitoring programs, the reporting program, and the permit compliance program, including the development of all draft program and template materials, implementation of all programs, and coordination of all staff contributing to the monitoring, reporting and permit compliance tasks. ICF assisted in SCE's restoration of the TRTP temporary impact areas. The TRTP consisted of constructing a series of transmission system improvements to deliver electricity from new wind energy projects in eastern Kern County to the Los Angeles Basin and is located in Kern, Los Angeles, and San Bernardino Counties.

Old Waterman Canyon Road Bridge Rehabilitation Project—City of San Bernardino, California

Project Manager. Megan oversaw all activities necessary to obtain regulatory permits for the bridge repair project, located in critical habitat. Project activities included a supplemental jurisdictional delineation; an updated BA; a primary constituent element analysis; biological surveys, including bat surveys, least Bell's vireo, and southwestern willow flycatcher protocol surveys and fish and amphibian surveys; installation of bat and bird exclusion netting; Section 7 consultation; coordination with the regulatory agencies; mitigation strategy development; and extensions and amendments to the issued permits to address changes in the project schedule and design. She is coordinating ongoing permit compliance requirements.

San Joaquin Cross Valley Line Transmission Project—SCE, Visalia, California

Project Manager. Oversaw the regulatory permitting for the 23-mile transmission line project. Project activities included reviewing project documentation, conducting supplemental jurisdictional delineations in newly-identified project areas, conducting the impact analysis, preparing and submitting the regulatory permit applications, coordinating with the regulatory agencies to obtain the final regulatory permits, and overseeing compliance with the regulatory permits during and following construction. Megan worked closely with the USACE (Sacramento office), Central Valley RWQCB, and CDFW (Fresno office) to facilitate Section 7 and Section 106 consultations and to obtain the permits in time to meet SCE's stringent schedule.

Ocean Outlets Maintenance Project – Orange County Parks, Dana Point, CA

Project Manager. The project consisted of recurring and as-needed maintenance of two ocean outlets in Orange County. Obtained Coastal Development Permit from the California Coastal Commission, a Regional General Permit from the USACE, a 401 Water Quality Certification and a 401 Amendment. Environmental issues for this project included its location on a heavily used public beach, biological resources and water quality, as well as working with each agency very closely to ensure consistent and reasonable permit conditions, including notification requirements, reporting requirements and biological survey and monitoring requirements.

KRISTEN KLINEFELTER

Biologist/Wetland Ecologist

Years of Experience

- Professional start date: 09/2014
- ICF start date: 09/2014

Education

- MSc, Applied Environmental Science, University College Dublin, Ireland, 2012
- BA, Biology, University of California, Santa Barbara, 2011

Certifications/Training

- California Rapid Assessment Method (CRAM) 5-day General Practitioner (Riverine and Depressional) (4/2014) and 3-day Vernal Pool (4/2015)
- Wetland Training Institute Basic Wetland Delineation Training, February 2017

Kristen Klinefelter has 5 years of experience as a professional biologist in Southern California. Ms. Klinefelter has a diverse skill set enabling her to conduct biological monitoring, vegetation removal monitoring, nesting bird surveys, wetland delineations, California Rapid Assessment Method (CRAM) assessments, botanical surveys, and restoration implementation. In addition, Ms. Klinefelter prepares regulatory permit applications to fulfill local, state and federal environmental regulations involving wetlands.

Project Experience

Ventura County US 101 Improvement Project, Ventura County Transportation Commission (VCTC)—Ventura, Ventura County, California

Delineator and Field Lead (2019, in progress). Served as field lead for a crew of eight conducting jurisdictional delineations over an approximately 100-mile stretch of the US-101. Work required planning and organizing field work over multiple weeks for a large group, preparing data collection methods, conducting jurisdictional delineations, and organizing and analyzing a large datast. Data collection involved Ordinary High Water Mark (OHWM) forms, wetland data forms for the arid west, and mapping using the Collector app.

Interstate 10 (I-10)/Mount Vernon Interchange Project, San Bernardino County Transportation Authority—Colton, San Bernardino County, California

Delineator (2019). Organized and conducted jurisdictional delineation field work to identify the extent of potential federal and state jurisdiction within and adjacent to the project site. Work also required organizing preparing field data for report figures and appendices. Data collection involved using the Collector app and OHWM forms.

California High-Speed Rail Authority Evaluation of Wetland, San Jose to Merced Section and Merced to Fresno Section: Central Valley Wye—Cities of Chowchilla, San Jose, and Merced, San Jose and Merced Counties, California

Aquatic Biologist (2016 – 2019). Conducted California Rapid Assessment Method (CRAM) on approximately 40 aquatic features to evaluate wetland condition to assess potential impacts of the High-Speed Rail in the Central Valley. In addition to a desktop analysis of these sites, fieldwork involved identifying wetland vegetation, assessing hydrology, assessing buffer condition, identifying potential stressors to each aquatic feature, and working in teams to come to these conclusions. Drafted the report for the High-Speed Rail Authority analyzing the findings from the Central Valley Wye fieldwork.

Willits Bypass Project, Caltrans—Willits, Mendocino County, California

Field Biologist (2018). Conducted the California Rapid Assessment Method for wetlands (CRAM) on wet meadow, forested wet meadow, and riverine systems on approximately forty assessment areas, conducted invasive plant surveys, and organized and quality checked all the CRAM data.

Machado Lake Ecosystem Rehabilitation Project—City of Los Angeles Bureau of Engineering (LABOE), California

Restoration Biologist (2014 – 2017). Organized plant layout for creation of native vegetation habitats and monitored planting. Selected areas of *Centromadia parri* ssp. *australis* (southern tarplant) throughout the project site to be managed specifically as restoration areas. Monitored weed management and created an invasive plant key to be used on site during weed removal. Conducted nesting bird surveys and monitored nesting birds on the entire project site.

Highland/Redlands Regional Connector Project—County of Riverside Transportation Department (County), California

Delineator (2017). Independently conducted a jurisdictional delineation to identify the extent of potential federal and state jurisdiction within and adjacent to the project site, a distance of approximately 4.7 contiguous miles that included the Santa Ana River. Work also required drafting the jurisdictional delineation report.

Hamner Avenue Bridge Replacement Project—County of Riverside Transportation Department (County), Cities of Norco and Eastvale, California

Delineator (2017). Conducted a jurisdictional delineation to identify the extent of potential federal and state jurisdiction within and adjacent to the project site, a distance of approximately 0.7 miles that included the Santa Ana River. Work also required assisting in drafting the jurisdictional delineation report.

SDG&E Fanita Junction Enhancement Project—San Diego County, California

Aquatics Resource Specialist and Aquatics Monitor (2014 – 2015). Performed an informal jurisdictional determination on all water conveyances potentially impacted by the Tie Line enhancement project and assisted in preparation of the memorandum to provide guidance regarding the type of construction activities that could occur in and around these features. Served as the primary aquatics monitor during construction in and around any aquatic features and provided on-site guidance to avoid any impacts to these features.

Otay Water District Cathodic Protection Rehabilitation Project—Chula Vista, San Diego County, California

Delineator and Regulatory Assistance (2015). Surveyed project impact sites along a Reclaimed Water Force Main for potential impacts to jurisdictional waters and wetlands and conducted jurisdictional delineations at seven of these sites. Work also required preparation of the jurisdictional delineation memorandum, USACE Nationwide Permit PCN Form, California RWQCB Application For Clean Water Act Section 401 Water Quality Certification, and Department of Fish and Wildlife Notification of Lake or Streambed Alteration.

DONNA McCORMICK

Principal and Project Manager

Donna McCormick is a task order project manager, specializing in environmental planning, environmental analysis, and visual assessments for transportation (roadway, highway, transit, etc.) projects, as well as for utility alignments, surface mining, campus master planning, land use, and coastal zone projects. In this role, she manages the preparation of multidisciplinary environmental documents, and provides aesthetics and visual quality assessments for California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and joint documents. Further, Donna provides independent quality control (QC) for visual quality and general CEQA/NEPA adequacy.

Donna provides environmental services related to large-scale private development, and is currently preparing a NEPA document for a highly controversial Multiple Species Habitat Conservation Plan (MSHCP) involving 27 species and over 220 square miles, which will be the first Habitat Conservation Plan (HCP) in critical habitat for the California condor.

She also provides visual assessment training using the Federal Highway Administration (FHWA) methodology, and regularly teaches CEQA/NEPA classes through the University of California Extension Programs and custom workshops for clients. Donna's expertise includes analysis in sensitive areas such as National Park Service (NPS) properties and wilderness areas, visual simulations using various graphic arts programs, project management, and CEQA and NEPA training.

Years of Experience

- Professional start date: 05/1987
- ICF start date: 02/2002

Education/

- BLA, Landscape Architecture, California State Polytechnic University, Pomona, 1987

Professional Memberships

- Association of Environmental Planners (former Administrative Vice President of Orange County Chapter)
- American Planning Association

Areas of Expertise

- Coastal Zone Projects
- Aesthetics and Visual Quality Assessments

Project Experience

Conservation Planning

Tehachapi Uplands MSHCP Environmental Impact Statement (EIS)—Tejon Ranch/Tejon Mountain Village LLC (under agreement with US Fish and Wildlife Service [USFWS]), Kern and Los Angeles Counties, California.

Project Manager. The Tehachapi Uplands MSHCP has been prepared for 27 federal- and state-listed and unlisted species, including the California condor, Tehachapi slender salamander, and a newly discovered species, Tehachapi buckwheat. The covered lands that are included in the plan include 141,886 acres in the Tehachapi Mountains in Kern and Los Angeles counties. If approved, the plan and the associated Incidental Take Permit (ITP) would allow development of a low-density resort development within the critical habitat of the California condor project manager for the EIS, and is working in close cooperation with the USFWS. A draft EIS was made available to the public. Donna led the effort to provide responses to comments received and prepared the final EIS. The project was highly controversial and garnered comments from around the world, both in support and opposition to the proposed MSHCP.

Water and Wastewater

Independent Review of Lake Canyon Dam Environmental Impact Review (EIR)—Ventura County Watershed Protection District, Ventura County, California.

Project Manager. Donna provided independent review of the EIR. She provided guidance on implementing CEQA, especially for issues related to noise and special-status species.

Pre-stressed Concrete Cylinder Pipe (PCCP) Rehabilitation Program EIR (formerly named Second Lower Feeder PCCP Long-Term Rehabilitation)—Metropolitan Water District of Southern California, Location.

Project Manager. Donna managed the Program-level EIR for the Metropolitan Water District of Southern California to assess potential environmental impacts of rehabilitating over 100 miles of five feeder lines in Southern California. The Program EIR covered pipelines in approximately 35 jurisdictions in three counties. The PCCP Rehabilitation Program EIR had an aggressive schedule, with rehabilitation projects awaiting approval of the program EIR. In order to streamline future project-level reviews under CEQA, Donna developed a forward-looking Program EIR, incorporating assumptions and performance-style mitigation measures that allowed many projects in the program to move forward quickly without additional CEQA documents as long as they were consistent with the assumptions and incorporated the mitigation measures into the projects..

Ballona Wetlands EIS/EIR and Permit Assistance—California State Coastal Conservancy, Los Angeles, California.

Project Manager. Donna is managing the preparation of a joint EIS/EIR for the restoration of the 600-acre Ballona Wetlands in Los Angeles, California. Situated between Los Angeles International Airport and Marina Del Rey in the heart of coastal Los Angeles, the project site was once part of a complex of historic wetlands that covered more than 2,000 acres. Donna is overseeing all aspects of the work. This includes directing 10 specialized subconsultants, overseeing public outreach and agency coordination, preparing reports, and securing all regulatory permits for the successful restoration of these important public lands.

The Clearwater Master Facilities Plan and New Ocean Discharge System EIR/EIS—Sanitation Districts of Los Angeles County, California.

Project Manager. Donna served as project manager on a joint document for the Sanitation Districts of Los Angeles County and the US Army Corps of Engineers (USACE) that included a programmatic CEQA analysis of a new master facilities plan for the joint outfall system through 2050 and a project-level CEQA/NEPA analysis of a new ocean discharge system, part of the Clearwater Program. The Clearwater Program required coordination with multiple federal, state, and local agencies as part of the CEQA/NEPA analysis as well as the regulatory-permitting aspects of the project. These agencies included the National Marine Fisheries Service (NMFS), California Conservation Corps, US Mineral Management Service, Port of Los Angeles, US Environmental Protection Agency (EPA), and USFWS, among others. The final EIR/EIS was certified/approved in November 2012.

Parks, Trails, and Open Space

Malibu Road Beach Accessway Initial Study/Mitigated Negative Declaration (IS/MND)—California State Coastal Conservancy, Malibu, California.

Project Manager. Donna managed the preparation of an IS/MND for a high-profile, controversial new beach accessway. Major issues included slope stability, traffic and parking, visual quality, and land use compatibility. The IS/MND was completed within a very short time frame and unanimously approved without changes by the Coastal Conservancy Board, receiving praise from the Secretary of the California Department of Resources for its thoroughness and CEQA adequacy.

Bikeways Master Plan EIR—Los Angeles County Department of Public Works (LACDPW), Los Angeles County, California.

Project Manager. ICF provided environmental services for this large master plan program EIR covering approximately 700 miles of new bikeways in Los Angeles County. This project was funded through the County Department of Public Health and ultimately, the Center for Disease Control. Because of the federal funding, the project had a mandated schedule in order to secure the funding and ICF successfully met the aggressive schedule. ICF provided all environmental services for the EIR. Primary issues included impacts on traffic from bike lanes and bike routes and impacts on water resources and biological resources from bike paths adjacent to waterways. As a program EIR, the document looked at the cumulative impacts of 700 miles of bikeways, as well as other projects within Los Angeles County, and provided a roadmap for project-level analysis and mitigation once individual projects are implemented.

Ports and Harbors

CEQA Review of Policy and Procedures—Port of Los Angeles, San Pedro, California.

Peer Reviewer. Donna assisted in the review of the Port of Los Angeles' CEQA policies and procedures. The analyses included a review of eight past environmental documents in light of the requirements of CEQA guidelines, city significance criteria, and recent case law and legislation related to CEQA. In addition, ICF reviewed the Port's CEQA manual, findings of fact, and resolutions. Based on evaluations of Port documents, ICF recommended improvements to current policies and procedures and presented these recommendations to an environmental review committee and lead environmental staff.

Recirculated Supplemental EIR for the Cabrillo Way Marina Development Project—Port of Los Angeles, San Pedro, California.

QC Reviewer. Donna provided QC for an EIR prepared for the second phase of improvements within the West Channel/Cabrillo Beach Recreational Complex. The goal of the improvements is to provide a unified continuous waterfront and to reconstruct waterside infrastructure within the West Channel Development Area. Cabrillo Way Marina covers a total of 49 acres of land and 37 acres of water.

Rio Doce Pasha Expansion Project—Port of Los Angeles, San Pedro, California.

Project Manager. Donna managed the EIR for the expansion of terminal facilities at Berths 171 through 181 on Mormon Island at the Port of Los Angeles. The project involved decommissioning and remediation of tank farms, relocation of the Harbor Department's construction and maintenance facility, and infrastructure improvements, including wharf construction, backland improvements, street closures and realignments, railroad installation and realignment, utility relocations, environmental mitigation construction, and off-site improvements.

Visual Assessment of Gantry Cranes—Port of Los Angeles, San Pedro, California.

Project Manager. This project assessed the visual impacts of new, larger cranes that would be capable of unloading the newest cargo vessels, which are 22 containers wide. The visual assessment evaluates the visibility of the cranes from sensitive viewing locations and analyzes the effect of the larger cranes on viewers at these locations. The analysis employed the following technologies: GIS, remote blimp-based cameras, and visual simulations.

Transportation—Roads, Bridges, and Highways

State Route 39 (SR-39) Reopening CEQA/NEPA Document Review (Contract 07A2269 TO 9)—Caltrans District 7, Los Angeles County, California, 08/2007 – 01/2009

Project Manager. Donna provided document review for CEQA and NEPA documents and technical reports related to the reopening of SR-39 in the San Gabriel Mountains, which has been closed for several years due to damage from landslides and other geologic factors. Issues included roadway safety, visual impacts, biological impacts, and traffic.

SR-58 via Hinkley EIR/EIS (Contract 08A1521 TO 4)—Caltrans District 8, Hinkley, California, 02/2009 – 06/2014

Document Author and QC. ICF prepared an EIS/EIR for the SR-58 via Hinkley project in San Bernardino County, as well as a water quality report, CIA, relocation impact study, and VIA. Document preparation involved coordination with BLM, USFWS, and PG&E. The proposed gap-closure project involved widening and realignment of approximately 10 miles of SR-58 from a two-lane conventional highway to a four-lane expressway/freeway.

SR-58 Kramer Junction EIR/EIS (Contract 08A1521 TO 8)—Caltrans District 8, California, 02/2013 – 09/2014

Document Author and QC. ICF prepared an EIS/EIR for the Kramer Junction Expressway Project, which would realign and widen an existing 13.3-mile segment of SR-58 in Kern and San Bernardino counties. Key environmental issues included community character/cohesion, relocations, land use, utilities and service systems, traffic, visual resources, cultural resources, water resources, geology, paleontology, hazardous waste/materials, air quality, noise, and biological resources

Belardo Bridge and Road IS/Environmental Assessment (EA)—Agua Caliente Band of Cahuilla Indians and City of Palm Springs, Palm Springs, California.

Project Manager. Donna managed the preparation of an IS/EA for this bridge and roadway improvements project. This project will widen and extend Belardo Road, construct a new bridge across Tahquitz Creek, widen Mesquite Avenue, and provide a new scenic access road to the Tribal Interpretive Center. The Agua Caliente Band of Cahuilla Indians and the City of Palm Springs are working jointly to implement the project, using the Public Lands Highway Discretionary Program, a federal funding source administered by FHWA and Caltrans.

Big Bear Lake Dam Replacement Project Response to Comments and FEIR/EIS (Contract 08A1169 TO 32)—Caltrans District 8, San Bernardino County, California.

QC Reviewer. Donna provided the analysis, response to comments, coordination, and advice to complete a long-delayed project for Caltrans District 8 within a very short timeframe. *Not only was the work completed in a timely manner, but it won awards within ICF (Project Excellence Award) and Caltrans.* Significant issues included impacts to bald eagles, traffic, safety of the existing bridge over Big Bear Dam, and coordination with the USDA Forest Service (Forest Service).

SR-22 Major Investment Study/Draft EIR/EIS—Orange County Transportation Authority (OCTA), Orange County, California.

Environmental Task Manager and Visual Quality Analyst. While employed by Parsons Brinckerhoff, Donna provided QC. She coordinated with OCTA, Caltrans District 12, and FHWA to provide an environmental document meeting the needs of both CEQA and NEPA on a fast-track project with a very small budget. Donna mediated a multiday working session at Caltrans to resolve lingering issues among the three agencies. This reached consensus and approved the document for circulation to the public. Donna developed innovative mitigation measures to meet the requirements of a design-build process that led to rapid construction.

SR-68 Tier I EIS/EIR—Caltrans District 5, Monterey County, California.

Project Manager. While employed by Parsons Brinckerhoff, Donna managed several technical reports and EIS/EIR sections, including noise, socioeconomics, land use, energy, air quality, water quality, floodplain evaluation, Section 4(f) evaluation, relocation, farmlands conversion, and historic architectural surveys.

San Miguel Parkway EIR/EIS—Caltrans District 11, San Diego County, California.

Document Author. While employed by Parsons Brinckerhoff, Donna provided technical reports, including visual impact assessment, water quality analysis, and Section 4(f) evaluation; QC for socioeconomics and noise impact technical reports; and visual simulations.

San Miguel Parkway Visual Concept Plan—Caltrans District 11, San Diego County, California.

While employed by Parsons Brinckerhoff, Donna provided visual and landscape concept plan.

San Miguel Parkway Alternatives Visual Simulations—Caltrans District 11, San Diego County, California

While employed by Parsons Brinckerhoff, Donna provided visual simulations.

SR-120 EIR/EIS—Caltrans District 10, Oakdale, California.

While employed by Parsons Brinckerhoff, Donna provided visual impact analysis, including visual simulations, and QC of socioeconomic, growth inducement, cumulative impacts, and historical properties analysis.

I-215 Improvements EIR/EIS—Riverside County Transportation Commission (RCTC), Riverside County, California.

While employed by Parsons Brinckerhoff, Donna prepared visual impact analysis, including visual simulations. She provided QC for other reports.

Sonoma Creek Bridge Seismic Retrofit and Barrier Replacement Project—Caltrans District 4, Sonoma and Solano Counties, California.

While employed by Parsons Brinckerhoff, Donna provided visual impact assessment, including visual simulations.

Galena Street and I-15 Interchange IS/EA—County of Riverside, Riverside County, California.

.While employed by Parsons Brinckerhoff, Donna prepared visual impact assessment and provided QC of environmental document and several technical reports.

Barham Cahuenga Corridor Improvement Project EIR/EA—Caltrans District 7, Burbank and Los Angeles, California.

While employed by Parsons Brinckerhoff, Donna provided and/or managed technical reports/ sections, including air quality, noise, circulation impacts, water quality, floodplain, hazardous materials, visual quality, and public utilities.

SR-55/Alton Avenue Overcrossing EIR/EA—Cities of Santa Ana and Irvine, Santa Ana and Irvine, California.

Environmental Task Manager and Visual Quality Analyst. While employed by Parsons Brinckerhoff, Donna provided analysis existing and with project conditions for a new high occupancy vehicle (HOV) interchange on the border of Santa Ana and the Irvine Business Complex.

SR-47 at Seaside Avenue/Navy Way Landscaping and Irrigation Plans—Port of Los Angeles, Los Angeles, California.

While employed by Parsons Brinckerhoff, Donna provided landscaping and irrigation designs.

I-5 Major Investment Study—Caltrans District 7, Los Angeles and Orange Counties, California.

While employed by Parsons Brinckerhoff, Donna prepared visual simulations and provided QC.

Western Transportation Corridor Major Investment Study—FHWA, Weber, Salt Lake, and Davis Counties, Utah.

While employed by Parsons Brinckerhoff, Donna provided QC.

SR-30 Improvements EIR/EIS—San Bernardino Associated Governments, Los Angeles and San Bernardino Counties, California.

While employed by Parsons Brinckerhoff, Donna wrote responses to comments for the final EIR/EIS for land use, aesthetics, cultural resources, public services and utilities, socioeconomics impacts, hazardous materials, growth inducement, and cumulative impacts. She prepared visual simulations.

The Corridor Major Investment Study—OCTA, Orange County, California.

While employed by Parsons Brinckerhoff, Donna provided aerial and ground-level photography and created photo-simulations.

SR-101 Improvement Project EIR/EIS—Caltrans District 7, Ventura County, California.

Project Manager. While employed by Parsons Brinckerhoff, Donna managed the EIR/EIS and technical studies for improvements to US 101 improvements in the cities of Oxnard and San Buenavenura.

Rice Avenue/SR-101 Interchange EIR/EA—Caltrans District 7, Oxnard, California

While employed by Parsons Brinckerhoff, Donna provided visual impact assessment quality control for the remainder of the document.

I-73 Location Study EIS—FHWA, Roanoke Valley, Virginia.

While employed by Parsons Brinckerhoff, Donna provided independent review of several technical reports. Wrote several sections of the EIS. She trained staff and provided management for visual analysis, including impacts to the Blue Ridge Parkway, a National Park Service property.

College Avenue/Canyon Crest Drive Traffic Mitigation Study—San Diego State University, California.

Project Manager. While employed by Parsons Brinckerhoff, Donna provided the alternatives analysis for mitigating significant traffic problems on the San Diego State University campus, including multi-level viaducts and super-streets.

Santa Ana Circulation Element Update EIR—City of Santa Ana, California.

While employed by Parsons Brinckerhoff, Donna compiled the draft EIR, provided QC, and performed various technical analyses.

Civic Center Drive/Santa Ana Boulevard Couplet Study—City of Santa Ana, California.

Environmental Task Manager. While employed by Parsons Brinckerhoff, Donna provided an early environmental evaluation.

SR-78/Las Posas Road Interchange Re-evaluation—Caltrans District 11, San Diego County, California.

QC Manager. While employed by Parsons Brinckerhoff, Donna provided QC for reports and environmental documentation.

Mt. Vernon Avenue Bridge Replacement Project EA—San Bernardino Associated Governments (SANBAG), San Bernardino, California.

QC Manager. While employed by Parsons Brinckerhoff, Donna provided QC for reports and environmental documentation.

I-10/Date Palm Drive Interchange IS/EA—County of Riverside, Riverside County, California.

QC Manager and Visual Quality Analyst. While employed by Parsons Brinckerhoff, Donna provided visual quality assessment for interchange improvements in the Palm Springs area, and provided QC for other reports and documentation.

I-10/Palm Drive/Gene Autry Trail Interchange IS/EA—County of Riverside, Riverside County, California.

QC Manager and Visual Quality Analyst. While employed by Parsons Brinckerhoff, Donna provided visual quality assessment for interchange improvements in the Palm Springs area, and provided QC for other reports and documentation.

I-710 Major Corridor Study Preliminary EA Report—Caltrans District 7, Los Angeles County, California.

Environmental Task Manager and Visual Quality Analyst. While employed by Parsons Brinckerhoff, Donna provided alternatives analysis and visual quality assessment for widening of the I-710, including possible truck-only lanes and HOV lanes.

US 101 Freeway Corridor Study—Caltrans District 7, Los Angeles and Ventura Counties, California.

Environmental Task Manager and Visual Quality Analyst. While employed by Parsons Brinckerhoff, Donna provided alternatives analysis for widening and interchange improvements of US 101, including visual assessment and simulations.

Parking Structure V EIR—San Diego State University, San Diego, California.

Project Manager/Primary Author. While employed by Parsons Brinckerhoff, Donna managed an EIR for a new parking structure at San Diego State University, which included a roof-top soccer field and related commercial land uses. Primary issues were traffic and visual quality.

Event Management Plan Mitigation Monitoring—San Diego State University, San Diego, California.

Project Manager. While employed by Parsons Brinckerhoff, Donna provided the field analysis of existing mitigation program for event management. She developed alternative mitigation to meet or exceed the effectiveness of the existing program.

Primary Corridor Transportation Project Major Investment Study/EIS—FHWA, Honolulu, Hawaii.

While employed by Parsons Brinckerhoff, Donna authored several sections and technical reports. Provided QC.

Transportation—Rail and Transit

Downtown San Bernardino Passenger Rail Project—SANBAG/HDR Engineering, San Bernardino, California.

King County Metro 8th Transit Base Environmental Documents—King County Metro/AECOM, King County, Washington

Project Manager. To support the expanded fleet, Metro needs to site and construct one new transit base to add an eighth base to Metro's current network of seven bases. Donna is managing the environmental analyses, including an anticipated NEPA Environmental Assessment for FTA and Washington State Environmental Policy Act Determination of Non-Significance, along with environmental input for the alternatives analysis, site screening, site planning, and public outreach.

Anaheim Fixed-Guideway (Anaheim Rapid Connection or ARC) Project Management Consultant—City of Anaheim/IBI Group, Anaheim, California

Project Manager. Donna is providing peer review of all environmental documents, notices, and other materials related to the CEQA and NEPA process. She is also providing guidance to the City of Anaheim on the CEQA process and the NEPA process as implemented by the Federal Transit Administration (FTA).

Anaheim Regional Transportation Intermodal Center (ARTIC) Program/Project EIS/EIR—OCTA, Orange County, California.

Project Manager. Donna is serving as project manager for the environmental analysis and documentation, as well as the 30% conceptual engineering. ARTIC will provide a hub for numerous transit modes, including commuter train (Metrolink), passenger train (Amtrak), local transit (Anaheim Fixed Guideway), California High-Speed Train, and bus rapid transit. The site will also include a transportation communication center and transit-oriented, along with outdoor civic space. The site is located within walking distance of both the Anaheim Stadium and Honda Center to also provide alternative transportation to baseball, hockey games, and other sports and entertainment events. The project has an extremely short time frame and requires analysis of many challenging issues, including the adjacent Santa Ana River, traffic volumes and geometrics, design constraints imposed by the nearby SR-57 overpass and other rail geometric concerns, and re-use of a previously contaminated site.

California High-Speed Train Program EIS/EIR—California High-Speed Rail Authority/Parsons Brinckerhoff, throughout California.

QC Manager and Visual Assessment Lead. Donna is responsible for assisting with the development of methodologies for this project. ICF is assisting in the program management of regional technical studies, preparation of environmental methodologies, and preparation of the Program EIS/EIR.

California High-Speed Train Los Angeles to Anaheim Section EIR/EIS—California High-Speed Rail Authority/STV Incorporated, Los Angeles and Orange Counties, California.

QC Manager and Visual Assessment Lead. Donna is responsible for providing the visual impact assessment, as well as for QC for all sections and technical reports of the EIR/EIS. ICF is preparing the EIR/EIS for the Los Angeles to Anaheim section of the California High-Speed Train.

CenterLine Light Rail SDEIS/RDEIR and FEIS/EIR—OCTA, Orange County, California.

Deputy Project Manager and Document Coordinator. Donna served as deputy project manager and document coordinator for a supplemental draft EIS/revised draft EIR and final EIS/EIR for a new light rail transit system in Santa Ana, Costa Mesa, and Irvine, California. The CenterLine will be the first light rail system in Orange County and will connect major activity centers such as the Santa Ana Regional Transportation Center, the Santa Ana Civic Center, South Coast Plaza, the Orange County Performing Arts Center, John Wayne Airport, and the Irvine Business Complex. Donna also prepared the visual quality and aesthetics section for the SDEIS/RDEIR.

Warm Springs Extension Supplemental EIR—San Francisco Bay Area Rapid Transit District, Freemont, California.

QC Reviewer. This project involves the preparation of a supplemental EIR for the proposed extension of the Bay Area Rapid Transit (BART), from its current terminus in the City of Fremont to the Santa Clara County line. This extension included the development of approximately five miles of light-rail facilities and two stations in the Fremont area.

Capitol Corridor Passenger Rail Station Study—City of Union City, California.

Task Leader, Visual Impact Assessment. Donna conducted a constraints-level visual assessment of alternative station designs for a new intermodal transit station in Union City.

Rancho Bernardo Transit Center IS/MND—City of San Diego, California.

Environmental Task Manager and Visual Quality Analyst. While employed by Parsons Brinckerhoff, Donna provided analysis of existing and with project conditions for a new transit center.

Dulles Corridor Rapid Transit Project EIS—Washington Metropolitan Area Transit Authority, Fairfax and Loudoun Counties, Virginia.

While employed by Parsons Brinckerhoff, Donna wrote technical reports/EIS sections for visual resources, environmental justice, and Section 4(f) resources. She provided QC for the remainder of the EIS, alternatives analysis, and several technical reports.

Santa Monica Mountains National Recreation Area Shuttle Bus System EA/IS/FONSI/ND—National Park Service, Los Angeles County, California.

Environmental Task Manager and Visual Quality Analyst. While employed by Parsons Brinckerhoff, Donna provided alternatives analysis and environmental documentation for a demonstration project to provide access within the Santa Monica Mountains National Recreation Area.

Los Angeles Eastside Corridor Light Rail Extension EIR/EIS—LA Metro, Los Angeles, California.

While employed by Parsons Brinckerhoff, Donna authored the visual analysis technical report and sections. She provided QC of various sections and findings.

Pasadena Blue Line Extension Alternatives Analysis—Metro, San Gabriel Valley, California.

Deputy Project Manager. While employed by Parsons Brinckerhoff, Donna provided the alternatives analysis research and documentation for the extension of the Blue Line (now the Gold Line) to Pomona.

Las Vegas Resort Corridor Monorail EIS—Regional Transportation Commission of Southern Nevada, Las Vegas, Nevada.

Environmental Task Manager. While employed by Parsons Brinckerhoff, Donna provided the NEPA documentation (EIS) for the extension of the Las Vegas Monorail to Downtown Las Vegas.

California High-Speed Rail Program Management Contract—California High-Speed Rail Authority, California.

QC Coordinator and Visual Analyst. While employed by Parsons Brinckerhoff, Donna provided visual quality assessment for the California High-Speed Rail statewide alternatives analysis. She also provided QC for other reports and documents for the project.

Sabre Springs Transit Center IS/MND—City of San Diego, California.

QC Manager. While employed by Parsons Brinckerhoff, Donna provided QC for reports and environmental documentation.

CenterLine Conceptual Engineering Study and Draft EIR/EIS—OCTA, Orange County, California.

While employed by Parsons Brinckerhoff, Donna provided visual impact analysis and QC of other technical reports.

Metro Red Line Segment 3 Vent Structure Landscaping and Irrigation Plans—LA Metro, Los Angeles, California

While employed by Parsons Brinckerhoff, Donna provided landscaping and irrigation designs.

Los Angeles-Bakersfield High-Speed Ground Transportation Feasibility Study—California High Speed Rail Authority, California

While employed by Parsons Brinckerhoff, Donna was responsible for QC for various reports, including visual quality and electromagnetic fields. She also participated in public involvement workshops.

Amtrak California Passenger Rail Project—Amtrak, California

While employed by Parsons Brinckerhoff, Donna provided QC for various planning and environmental products, including information for the project’s website.

Guideway Demonstration Project EIR—City of Irvine, California

While employed by Parsons Brinckerhoff, Donna prepared visual analysis and QC for the entire EIR.

Communications Facilities

Level 3 Telecommunication Long-Haul Network—Level 3, Statewide California

Southern California Environmental and Permit Coordinator. While employed by Parsons Brinckerhoff, Donna's duties included preparation of CEQA documents and multiple permits.

Emergency Response

Federal Emergency Management Agency Disaster Response Services—FEMA, Western United States

Environmental Reviewer/Analyst. This project involved the 1994 Northridge earthquake and the January and March 1995 California floods disaster relief. While employed by Parsons Brinckerhoff, Donna provided initial environmental review. She prepared an EA and EISs for public and private institutional projects resulting from the disaster.

Military

Temporary Duty Housing Alternatives Study—US Army, Kwajalein Atoll, Republic of the Marshall Islands

While employed by Parsons Brinckerhoff, Donna identified and analyzed temporary duty housing solutions, including economic feasibility.

Mines and Quarries

Temescal Canyon Quarry Surface Mining Permit, Reclamation Plan, and EIR—Boral Mining, Riverside County, California

Project Manager. While employed by Florian Martinez Associates, Donna provided documentation for a Surface Mining Permit and Reclamation Plan, consistent with the California Surface Mining and Reclamation Act, and an EIR, consistent with CEQA, for a new hard-rock aggregate mine, concrete batch plant, and asphalt batch plant. This EIR was used as the model for Riverside County EIRs for mining projects for many years.

Santa Ana River Rock Surface Mining Permit, Reclamation Plan, and IS/ND—Fontana Paving, Corona, California

Project Manager. While employed by Florian Martinez Associates, Donna provided the documentation for a Surface Mining Permit and Reclamation Plan, consistent with the California Surface Mining and Reclamation Act, and an IS/ND, consistent with CEQA, for an expansion of a hard-rock aggregate mine.

All American Asphalt Surface Mining Permit, Reclamation Plan, and IS/ND—All American Asphalt, Corona, California

Project Manager. While employed by Florian Martinez Associates, Donna provided documentation for a Surface Mining Permit and Reclamation Plan, consistent with the California Surface Mining and Reclamation Act, and an IS/ND, consistent with CEQA, for a expansion of a hard-rock aggregate mine.

Corona Quarry Surface Mining Permit, Reclamation Plan, and EIR—Calmat Corporation, Corona, California

Project Manager. While employed by Florian Martinez Associates, Donna provided documentation for a Surface Mining Permit and Reclamation Plan, consistent with the California Surface Mining and

Reclamation Act, and an EIR, consistent with CEQA, for an expansion of a hard-rock aggregate mine.

Mescal Creek Surface Mining Permit, Reclamation Plan, and EIR— Calmat Corporation, Los Angeles County, California

Project Manager. While employed by Florian Martinez Associates, Donna provided documentation for a Surface Mining Permit and Reclamation Plan, consistent with the California Surface Mining and Reclamation Act, and an IS/ND, consistent with CEQA, for a new hard-rock aggregate mine and concrete batch plant.

Fontana Paving Surface Mine Reclamation Plan and IS/ND—Fontana Paving, San Bernardino County, California

Project Manager. While employed by Florian Martinez Associates, Donna provided a reclamation plan for an existing surface mine, in compliance with the California Surface Mining and Reclamation Act.

Irvine Lake Desilting Plan, Reclamation Plan, Revegetation Plan, and IS/MND—Calmat Corporation, Orange County, California

Project Manager. While employed by Florian Martinez Associates, Donna managed the preparation of a Desilting (mining) Plan and a Reclamation Plan, consistent with the requirements of the California Surface Mining and Reclamation Act, an IS/MND, consistent with CEQA, and a revegetation plan, per the requirements of the Irvine Ranch Water District and The Irvine Company.

Schools

Events Center Site Selection and Analysis—California State University, Fresno, California

Project Manager. While employed by Parsons Brinckerhoff, Donna provided the alternatives studies and public visioning process for the selection of a future event center, including a new basketball arena.

Development and Redevelopment

Tejon Mountain Village EIR—Tejon Mountain Village LLC, Kern County, California

Project Manager/Primary Author. Donna managed the preparation of an EIR for a mixed-use resort and retirement community in the Tehachapi Mountains. This highly controversial project was designed to avoid impacts whenever possible and include many innovative mitigation measures. Key issues include threatened and endangered species, multiple archaeological resources, visual quality, conversion of agricultural lands, seismic safety related to two major earthquake faults, impacts to and availability of water resources, fire risks, wildlife corridors, transportation impacts, air quality, and impacts to and from major utilities (high-pressure gas lines and large electrical transmission lines).

EIR and Supporting Studies for East Orange Projects—City of Orange, California

Principal-in-Charge. Donna provided senior leadership and oversight for a very controversial EIR for the East Orange General Plan (EOGP) and the Santiago Hills II development, which proceeded on an aggressive one-year schedule. The current proposal involved a comprehensive amendment to the EOGP, pre-zoning of the largely undeveloped 7,110-acre planning area, and a specific development proposal involving a tentative tract map for Santiago Hills II on an approximate 494-acre portion of the EOGP. Additional project components included a runoff management plan (ROMP), modifications to the master plan of arterial highways (MPAH), annexation of the property to the City from the County of Orange, possible development agreements, and a tentative tract map for a portion of the EOGP. For the purposes of environmental review, these projects were considered together within one EIR, with the EOGP components to be analyzed on a “program” level, and the Santiago Hills II components to be analyzed on a “project” level.

Preissman Property Specific Plan and EIR—Preissman Family, Riverside County, California

Project Manager. While employed by Florian Martinez Associates, Donna managed the development of a specific plan and EIR for a large development near Perris, California.

Creekside Specific Plan and EIR—County of Riverside, California

Project Manager. While employed by Florian Martinez Associates, Donna managed the development of a specific plan and EIR for a large development near Perris, California.

Rancho del Rio Specific Plan and EIR—County of Riverside, California

Project Manager. While employed by Florian Martinez Associates, Donna managed the development of a specific plan and EIR for a large development near Perris, California.

Green Valley Specific Plan and EIR—County of Riverside, Perris, California

Project Manager. While employed by Florian Martinez Associates, Donna managed development of a Specific Plan and EIR for a large development near Perris, California.

Sun Valley Specific Plan, EIR, and Habitat Conservation Plan—City of Barstow, California

Project Manager. While employed by Florian Martinez Associates, Donna managed the preparation of a Specific Plan, EIR, and Habitat Conservation Plan (for desert tortoise) for a new development in the Barstow sphere of influence.

Rose Hills Memorial Park Expansion Plan and IS/ND—Rose Hill Memorial Park, Los Angeles County, California

Project Manager. While employed by Florian Martinez Associates, Donna managed the preparation of a cemetery expansion plan and an IS/ND consistent with CEQA for expansion of the Rose Hills Cemetery.

Los Alamos National Laboratories Sitewide EIS—US Department of Energy (DOE), Los Alamos, New Mexico

While employed by Parsons Brinckerhoff, Donna provided land use and visual quality technical reports and EIS sections.

Environmental Education

CEQA Project Management: 9-week On-line and In-person Course. University of California San Diego Extension. CEQA Certificate Program

Instructor. Donna develop and instructions a 9-week course that focuses on project management, specifically for CEQA projects. The curriculum includes effective communication, team management and teaming skills, scope/schedule/budgets, managing clients and business development, ethics, and CEQA law.

Successful CEQA Compliance: An Intensive Two-Day Workshop—University of California, Los Angeles, California, 07/2005 – 07/2005

Instructor. Donna instructed a two-day course that covered CEQA environmental review. The curriculum provided an introduction to CEQA, the CEQA law and guidelines, the preliminary review process, determining which document to use, the method for documenting analysis, mitigating impacts, and judicial review.

CEQA Step-by-Step—University of California, Davis for Caltrans, Ontario, California, 03/2005 – 03/2005

Instructor. Donna instructed a two-day course that covered CEQA environmental review. The curriculum provided an introduction to CEQA, the CEQA law and guidelines, the preliminary review process, determining which document to use, the method for documenting analysis, mitigating impacts, and judicial review.

Successful CEQA Compliance: And Intensive Two-Day Workshop—University of California, Los Angeles, California, 12/2004 – 12/2004

Instructor. Donna instructed a two-day course that covered CEQA environmental review. The curriculum provided an introduction to CEQA, the CEQA law and guidelines, the preliminary review process, determining which document to use, the method for documenting analysis, mitigating impacts, and judicial review.

CEQA Workshop—City of San Diego, California, 11/2004 – 11/2004

Instructor. This annual course covered the ramifications of legislation and litigation during the previous year.

Introduction to Air Quality and Traffic Impact Assessments for CEQA and NEPA—University of California, Los Angeles, California, 03/2004 – 03/2004

Instructor. The course content discussed how traffic and air quality impacts are analyzed and reported in NEPA and CEQA documents.

Successful CEQA Workshop—University of California, Los Angeles, California, 07/2003 – 07/2003

Instructor. Donna instructed a two-day course that covered CEQA environmental review. The curriculum provided an introduction to CEQA, the CEQA law and guidelines, the preliminary review process, determining which document to use, the method for documenting analysis, mitigating impacts, and judicial review.

CEQA Update, Issues, and Trends—University of California, Santa Barbara, Ventura, California, 09/2002 – 09/2002

Instructor. This annual course covered the ramifications of legislation and litigation during the previous year.

CEQA: Update, Issues, and Trends—University of California, Los Angeles, California, 12/2002 – 12/2002

Instructor. This annual course covered the ramifications of legislation and litigation during the previous year.

Understanding NEPA and CEQA Environmental Review—University of California, Santa Barbara, Ventura, California, 05/2002 – 05/2002

Instructor. Donna instructed a two-day course that covered NEPA and CEQA environmental review. The curriculum provided an introduction to CEQA and NEPA. Content regarding the NEPA portion of the class included explanations of the law and CEQ regulations, implementation by agencies, methods of analysis, procedural requirements, and common mistakes made with the NEPA process.

NEPA and CEQA Processes for the CenterLine Project—OCTA, Orange County, California, 07/2002 – 07/2002

Instructor. Donna developed a custom client-specific class for OCTA. The class covered the CEQA and NEPA processes necessary for a proposed new light-rail system.

Recognition and Commendations

Commendations

EIR and Supporting Studies for East Orange Projects—City of Orange, California

“As the Assistant Community Development Director for the City of Orange, I am happy to provide this letter of appreciation for the environmental analysis that ICF provided for the Santiago Hills II and East Orange Planned Communities EIR. This was a challenging project that required thorough and careful environmental analysis, excellent project management skills, and sensitive coordination and negotiation skills to successfully complete the project on schedule and within budget. The Santiago Hills II and East Orange Planned Communities EIR was challenging for a number of reasons. The project was a combined project-level EIR, supplementing a previous EIR, for Santiago Hills II, and a program-level EIR for the remainder of the East Orange Planned Communities. This required a high level of organizational and writing skills to produce a document that met the requirements of CEQA, while remaining understandable to the decision-makers and the general public. This was a complex and controversial development proposal for Orange, which, as anticipated throughout the environmental process, was challenged in court after the EIR was certified. However, the thorough and professional work done by ICF allowed the City to prevail in court and survive litigation. Another challenge of the project was the close coordination that ICF was required to undertake. As a consultant to the City of Orange, your firm had to prepare an EIR in close coordination with the applicant’s staff (The Irvine Company), several City Departments, environmental consultants, and attorneys. This often created additional levels of reviews and multiple positions to be considered, while serving the interest of your client, the City of Orange. You used various review and tracking techniques to keep us all on track and complete the document within the time required and with the minimum of conflict. Without your leadership and negotiation skills, this could not have been accomplished. The City of Orange looks forward to future opportunities to work with the ICF in the future. Please convey our thanks to your management and staff for a job well done.” —Edward M. Knight, Assistant Community Development Director, City of Orange

PCCP Rehabilitation Program EIR—Metropolitan Water District of Southern California

“Thank you for meeting/beating our schedule. This marks a major milestone. I'm very appreciative of all of you who worked so hard in completing the PCCP EIR. It couldn't have been done without your commitment, cooperation & teamwork.” —Arleen Arita, Manager, Program Management Unit, Engineering Services Section, Metropolitan Water District of Southern California

Employment History

ICF. Principal and Project Manager. Los Angeles, California. 02/2002 – Present.

Parsons Brinckerhoff Quade & Douglas, Inc. Senior Environmental Planner. Orange, California. 10/1992 – 02/2002.

Florian Martinez Associates. Environmental Planner. Tustin, California. 06/1987 – 10/1992.

Paul Schwartz

Senior Biologist/Restoration Ecologist

Paul Schwartz has over 15 years of experience as a professional biologist, 11 of which have been as an environmental consultant in Southern California. Mr. Schwartz has a diverse skill set which enables him to excel in a variety of roles including technical disciplines and task and project management. Paul's focus is on restoration monitoring and jurisdictional delineation. Paul currently manages several restoration projects that entail both aquatic and upland restoration components, qualitative and quantitative data collection, data analysis, and annual reporting. Paul is also a journeyman trainer for the California Rapid Assessment Method (CRAM) wetland monitoring program and regularly conducts CRAM assessments and has prepared several CRAM monitoring plans for restoration sites. In addition, Mr. Schwartz also conducts botanical surveys and vegetation mapping and prepares a wide variety of reports to fulfill local, state and federal environmental compliance. As a senior biologist at ICF, Mr. Schwartz focuses on project and task management for various biology and restoration projects and helps to develop the skill sets of younger and/or less experienced biologists.

Years of Experience

- Professional start date: 05/2003
- ICF start date: 06/2010

Education

- BA, Biology, Idaho State University, 2003

Professional Memberships

- California Native Plant Society, Orange County Chapter
- Western Field Ornithologists

Certifications

- California Rapid Assessment Method (CRAM) 3-day Riverine (3/2012) 2-day Depressional (9/2013) –Fully Certified

Project Experience

Lake Forest Civic Center Project—City of Lake Forest, Orange County, California

Lead Biologist and Restoration Ecologist (2017 – Present): Serves as lead biologist and restoration ecologist for this City facility project. Paul served as lead biologist and led the biological monitoring for the construction portion of the project. Paul currently serves as lead restoration ecologist for the 2.5-acre aquatic and upland mitigation project. Paul managed the site preparation including grading of a perennial creek, installation of the irrigation system, installation of the container plants and hydroseeding for the project. Paul is currently managing the 5-year mitigation monitoring and reporting program for the approximately 2.5-acre mitigation project. Monitoring entails regular qualitative and annual quantitative data collection and analysis and the preparation of annual monitoring reports to be submitted to USACE, CDFW, and RWQCB. The project was recently installed and is currently in the first quarter of year one.

Wagon Wheel Creek Restoration & Storm Water Management Project—Orange County Parks, Orange County, California

Lead Restoration Ecologist (2017 – Present): Paul serves as lead restoration ecologist for this complex creek restoration and stormwater management project in Orange County. Paul conducted 2016 baseline vegetation surveys and CRAM assessments and prepared a CRAM monitoring plan for the project. Paul also managed the site preparation and restoration installation and worked closely with OC Parks staff and contractors to adaptively manage several environmental and contractual difficulties during the installation phase. Paul is currently managing the 5-year mitigation monitoring and reporting program for the approximately 3-acre aquatic and upland mitigation project. Monitoring entails regular qualitative and annual quantitative data collection, analysis, and the preparation of annual monitoring reports to be submitted to USACE, CDFW, and RWQCB. The project recently entered year two and is on track to meet year two performance standards.

Glen Mor 2 Student Housing Project—University of California, Riverside, Riverside County, California
Lead Restoration Ecologist (2016 – Present): Lead restoration ecologist for this 4+-acre riparian and upland habitat restoration project. Project work entails conducting regular qualitative monitoring and annual quantitative monitoring of the mitigation sites, annual CRAM assessments, vegetation monitoring, and annual reporting. Additional work entails working closely with the universities restoration maintenance staff to ensure that the mitigation sites are successful, conducting annual qualitative and quantitative assessments, and the preparation of annual monitoring reports to be submitted to USACE, CDFW, and RWQCB. The project recently entered year five and is on track to meet year five success criteria.

Professional Development

- Journeyman California Rapid Assessment Method (CRAM Trainer (2018-present)
- Workshop on Restoration of Streams and Riparian Areas for Water Quality and Ecological Functions. River Research and Design, USACE, Marine Corps Base Camp Pendleton. July 19-21, 2016
- Desert Washes and Waters in the Coachella Valley Area, CA. Instructor: James W. Teaford. 1/2013.
- Wetland Training Institute – Advanced Hydric Soils. 2/2015
- Basic Wetland Delineation, Wetland Training Institute, 08/2012

Upper Oso Reservoir Restoration Project—City of Rancho Santa Margarita, Orange County, California
Restoration Ecologist (2014 – Present): Project work entails serving as an extension of City staff assisting with managing the 80+ acre Upper Oso Reservoir Restoration Project. Paul regularly coordinates with City staff and the City restoration ecologists and restoration maintenance contractors to ensure that the project is consistent with the approved restoration plan. This work entails conducting regular site visits to monitor the progress of restoration activities, reviewing submittals from the City's restoration implementation contractors, maintaining a document filing system for the project, and facilitating coordination between the City, its restoration implementation contractors, and resource agencies. The project recently entered year five and is on track to meet year five success criteria.

Line D and D-1 Realignment Project—City of Murrieta, Riverside County, California
Project Manager and Lead Restoration Ecologist (2013 – 2018): Paul served as lead restoration ecologist for this riparian and upland habitat restoration project. Project work entailed conducting regular qualitative and annual quantitative monitoring of the mitigation sites. Additional work entailed working closely with ICF restoration maintenance sub-contractors to ensure that the mitigation sites achieved performance and success standards, conducting CRAM assessments, and the preparation of annual monitoring reports to be submitted to USACE, CDFW, and RWQCB. The project achieved buy off from resource agencies and was deemed successful.

Meadowpass Road Extension—City of Walnut, Los Angeles County, California
Restoration Ecologist (2011 – 2017): Primary field restoration biologist for this wetland, riparian and upland habitat restoration project for the City of Walnut. Work entailed regular qualitative monitoring and annual quantitative monitoring of the mitigation sites to ensure consistency with the project's Habitat Mitigation Monitoring Plan. Additional work entailed conducting annual California Rapid Assessment Method (CRAM) assessments, annual vegetation monitoring to evaluate the success of the mitigation, and the preparation of annual monitoring reports to be submitted to the USACE, CDFW, RWQCB, and USFWS.

RYAN WINKLEMAN

Biologist

Ryan Winkleman is a wildlife biologist with experience in field and laboratory research, environmental data acquisition, construction monitoring, and regulatory compliance. His specific areas of expertise are in herpetological and ornithological ecology and identification. He has conducted field surveys and research for a wide range of transmission, solar, aqueduct, and housing projects, as well as for scientific research, to identify and inventory native species, including conducting protocol surveys for several listed species. Ryan is experienced in conducting resource impact assessments under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). He has prepared various sections for CEQA and NEPA environmental documents, including environmental impact statements (EISs) and environmental impact reports (EIRs), biological technical reports, biological assessments (BAs), biological evaluations (BEs), biological monitoring reports, and biological survey reports.

Project Experience

Interstate 605 Corridor Improvement Project—Los Angeles County Metropolitan Transit Authority, California, 01/2017 – Present

Biologist. Ryan managed the staffing and budget for biological resources studies and a jurisdictional delineation for the widening of several freeway segments along Interstates 5 and 605 in Los Angeles County. He was directly involved in initial biological resource surveys, including least Bell's vireo and burrowing owl, and assisted with all aspects of the jurisdictional delineation, including wetland and non-wetland determinations. He wrote the Caltrans Natural Environment Study documenting the survey results as well as the jurisdictional delineation report.

State Route 91 Improvement Project—Orange County Transportation Authority, California, 12/2016 – Present

Biologist. Ryan managed the staffing and budget for biological resources studies and a jurisdictional delineation for proposed improvements to State Routes 91 and 57 in Orange County. He conducted an initial biological resources reconnaissance survey and vegetation mapping, and assisted with the jurisdictional delineation. He wrote the Caltrans Natural Environment Study documenting the survey results as well as the jurisdictional delineation report.

Years of Experience

- Professional start date: 02/2005
- ICF start date: 12/2016

Education

- BS, Ecology and Evolutionary Biology, University of California, Irvine, 2007

Professional Memberships

- American Birding Association
- Ecological Society of America
- Society for the Study of Amphibians and Reptiles
- Western Field Ornithologists
- The Wildlife Society, Western Section
- Sea and Sage Audubon Society

Certifications

- USFWS Recovery Permit for California red-legged frog, California Gnatcatcher, and Yellow-billed Cuckoo
- CDFW Scientific Collecting Permit
- Senior Ecologist, Ecological Society of America

Professional Development

- Yellow-billed Cuckoo Field Camp, Great Basin Bird Observatory, 2018

Interstate 405 Improvement Project—Orange County Transportation Authority, California, 04/2017 – Present

Biologist. Ryan oversaw and managed a crew of biologists conducting preconstruction nesting bird clearance surveys over the nesting bird seasons (roughly March to September) from 2017-2019 for construction related to a corridor improvement project along Interstate 405. In 2019 he conducted regular nest monitoring for Swainson's Hawks that were nesting in close proximity to the project and arranged for seasonal avoidance. He also led a feature-by-feature verification of a previous jurisdictional delineation and personally delineated several new drainage features that had been constructed in the interim. Finally, he performed periodic checks of the active construction sites along the freeway corridor to confirm that project permits and avoidance measures were being satisfied, and provided recommendations for resolution when they weren't.

San Simeon Well Field Emergency Water Supply Facilities—Cambria Community Services District, Cambria, California, 04/2014 – 11/2016

Biologist. While employed by Michael Baker International, Ryan conducted a field survey of the project site and wrote a biological habitat assessment of the survey results. He conducted focused mark-recapture surveys for the federally threatened species California red-legged frog. Ryan also wrote a BA, Adaptive Management Plan, and Biological Technical Report for the project. Michael Baker provided environmental services for the construction and operation of emergency water facilities at the San Simeon well field. Michael Baker's services included an IS and MND, preparation of a coastal development permit application, and federal and state agency consultation.

Clean Water Factory EIS and EIR—City of San Bernardino, California, 04/2014 – 08/2015

Biologist. While employed by Michael Baker International, Ryan was responsible for conducting multiple general field surveys, writing the biological habitat assessment report, writing the adaptive management plan, leading mapping and surveying efforts for downstream impacts in the Santa Ana River, contributing to focused rare plant surveys, and conducting surveys for the endangered least Bell's vireo. Michael Baker is preparing and processing a joint environmental impact statement and environmental impact report for the Clean Water Factory, a treated wastewater diversion facility. Key issues include potential impacts to endangered species, impacts on groundwater quality, and potential construction-related impacts associated with the construction of the pipeline conveyance system.

Professional Development (Cont'd)

- California Tiger Salamander Workshop, Elkhorn Slough Coastal Training Program, 2016
- California Rapid Assessment Method (CRAM), San Francisco Estuary Institute, 2016
- Santa Ana Sucker Training, Riverside-Corona Resource Conservation District, Riverside, California, 2016
- Basic Wetland Delineation, Wetland Training Institute, San Diego, California, 2015
- Learning Desert Bird Sounds, Sea and Sage Audubon Society, 2014
- Southwestern Willow Flycatcher Survey Training Workshop, Southern Sierra Research Station, Lake Isabella, California, 2013
- Field Ornithology Specialized Study Program, University of California, Riverside Extension, 2012
- Learning California Bird Sounds, Sea and Sage Audubon Society, 2012
- Western Pond Turtle Workshop, Elkhorn Slough Coastal Training Program, 2011
- Workshop on the Biology and Management of the California Red-legged Frog, Alameda County Resource Conservation District, 2010
- Flat-tailed Horned Lizard Workshop, BLM and CDFW, El Centro, California, 2010
- Herpetology, Eastern Oregon University, Online, 2010
- Rare Pond Species Workshop, Laguna de Santa Rosa Foundation, 2009

Areas of Expertise

- Herpetology, Ornithology
- eBird Regional Reviewer, Orange County, California
- *North American Birds* Quarterly Subregional Report Compiler, Orange County, California