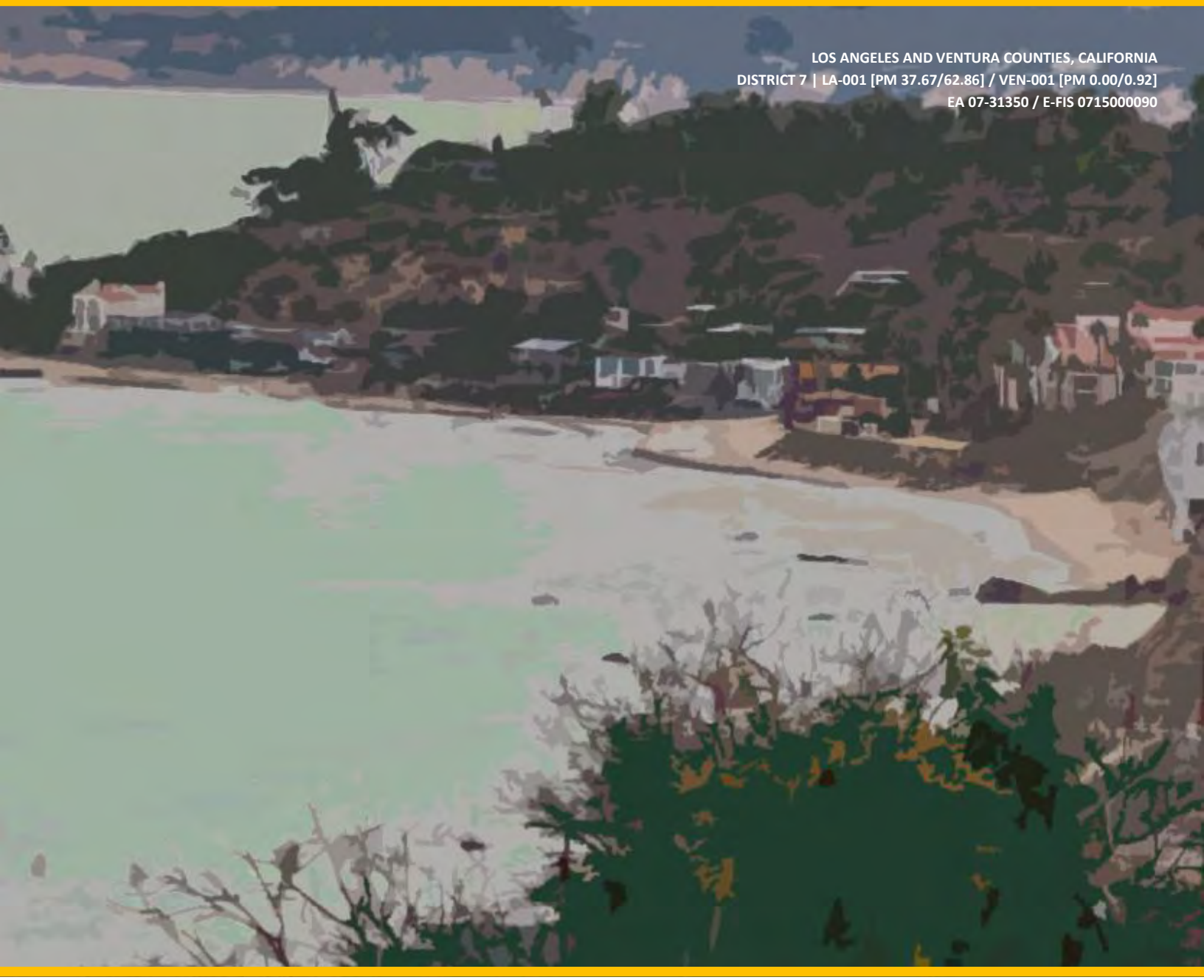
Agenda Item 9(b)
SMMC
12/10/18

STATE ROUTE 1 (PACIFIC COAST HIGHWAY) DRAINAGE RESTORATION PROJECT AND BRIDGE REPLACEMENT AT SOLSTICE CANYON CREEK



LOS ANGELES AND VENTURA COUNTIES, CALIFORNIA
DISTRICT 7 | LA-001 [PM 37.67/62.86] / VEN-001 [PM 0.00/0.92]
EA 07-31350 / E-FIS 0715000090

DRAFT INITIAL STUDY WITH PROPOSED MITIGATED NEGATIVE DECLARATION / ENVIRONMENTAL ASSESSMENT [IS/EA]

Prepared by the State of California Department of Transportation

OCTOBER 2018

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.

Caltrans

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DISTRICT 7-LA-001 [PM 37.67/62.86] / VEN-001 [PM 0.0/0.92]
EA 07-31350 / E-FIS 0715000090

State Route 1 (Pacific Coast Highway) Drainage Restoration Project
From Temescal Canyon Road to just north of the Ventura County Line
In the Cities of Los Angeles, and Malibu, and
Unincorporated Areas within Los Angeles County (post miles 37.6 to 62.86) and
Ventura County (post miles 0.0 to 0.92)

DRAFT INITIAL STUDY WITH PROPOSED MITIGATED NEGATIVE DECLARATION / ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C), 49 USC 303, and/or 23 USC 138

THE STATE OF CALIFORNIA
Department of Transportation

Oct 26, 2018
Date of Approval

Ron Kosinski
Deputy District Director
Division of Environmental Planning
California Department of Transportation
District 7 – Los Angeles

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PROPOSED MITIGATED NEGATIVE DECLARATION

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Caltrans) proposes a drainage restoration project at nineteen (19) locations on State Route 1 (Pacific Coast Highway) in the cities of Los Angeles, Malibu, and unincorporated areas within Los Angeles County (post miles 37.67 to 62.86) and Ventura County (post miles 0.00 to 0.92). The proposed improvements include repair and rehabilitation of existing drainage facilities along the route to restore full functionality, to prevent further deterioration, and ensure proper drainage in an area subject to erosion. The proposed improvements also include the replacement of the existing bridge/culvert at Solstice Canyon Creek with a new bridge structure with an underlying natural slope creek bottom to provide improved flood water conveyance, and to improve hydraulic conditions to facilitate movement of the endangered Southern steelhead trout population in the project study area.

Determination

This proposed Mitigated Negative Declaration (MND) is included to give notice to interested agencies and the public that it is Caltrans' intent to adopt an MND for this project. This does not mean that the Caltrans' decision regarding the project is final. This MND is subject to change based on new information and comments received by interested agencies and the public.

Caltrans has prepared an Initial Study for this project, and pending public review, expects to determine from this study that the proposed project would not have a significant effect on the environment for the following reasons:

The proposed project would have no effect on aesthetics, agriculture/forest resources, cultural resources, geology/soils, land use and planning, mineral resources, population and housing, recreation, tribal cultural resources, and utilities/service systems.

In addition, the proposed project would have less than significant effects to air quality, biological resources, hazards/hazardous materials, hydrology/water quality, noise, public services, and transportation/traffic.

Ron Kosinski
Deputy District Director
Division of Environmental Planning
California Department of Transportation
District 7 – Los Angeles

Date

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SUMMARY

California participated in the "Surface Transportation Project Delivery Pilot Program" (Pilot Program) pursuant to 23 USC 327, for more than five years, beginning July 1, 2007, and ending September 30, 2012. MAP-21 (P.L. 112-141), signed by President Obama on July 6, 2012, amended 23 USC 327 to establish a permanent Surface Transportation Project Delivery Program. As a result, the Department entered into a Memorandum of Understanding pursuant to 23 USC 327 (NEPA Assignment MOU) with FHWA. The NEPA Assignment MOU became effective October 1, 2012, and was renewed on December 23, 2016 for a term of five years. In summary, the Department continues to assume FHWA responsibilities under NEPA and other federal environmental laws in the same manner as was assigned under the Pilot Program, with minor changes. With NEPA Assignment, FHWA assigned and the Department assumed all of the United States Department of Transportation (USDOT) Secretary's responsibilities under NEPA. This assignment includes projects on the State Highway System and Local Assistance Projects off of the State Highway System within the State of California, except for certain categorical exclusions that FHWA assigned to the Department under the 23 USC 326 CE Assignment MOU, projects excluded by definition, and specific project exclusions.

The project as proposed and presented in this Initial Study/Environmental Assessment (IS/EA) by Caltrans is subject to state and federal environmental review requirements. The project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency under CEQA and NEPA. The Federal Highways Administration's (FHWA's) responsibility for environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

Following receipt of public comments on this Draft IS/EA and distribution of the Final IS/EA, Caltrans will determine whether to certify the IS by issuing a Negative Declaration (ND) or Mitigated Negative Declaration (MND) under CEQA, and determine if it is appropriate to certify the EA with a Finding of No Significant Impact (FONSI) under NEPA.

Proposed Project. The California Department of Transportation (Caltrans) proposes a drainage restoration project at nineteen (19) locations on State Route 1 (Pacific Coast Highway) in the cities of Los Angeles, Malibu, and unincorporated areas within Los Angeles County (post miles 37.67 to 62.86) and Ventura County (post miles 0.00 to 0.92). The proposed improvements include repair and rehabilitation of existing drainage facilities along the route to restore full functionality, to prevent further deterioration, and ensure proper drainage in an area subject to erosion. The proposed improvements also include the replacement of the existing bridge/culvert at Solstice Canyon Creek with a new bridge structure with an underlying natural slope creek bottom to provide improved flood water conveyance, and to improve hydraulic conditions to facilitate movement of the endangered Southern steelhead trout population in the project study area.

Project Purpose. The purpose of the proposed project is to achieve the following objectives:

- Restore and rehabilitate damaged drainage and culvert facilities to return to full functionality and ensure proper drainage, thereby preventing the need for frequent maintenance
- Extend service life, and prevent further deterioration of facilities
- Improve flood water conveyance and hydraulic conditions at the Solstice Canyon Creek Bridge (Bridge No. 53-0030) while restoring natural features of Solstice Canyon Creek to enable fish passage and facilitate movement for endangered Southern steelhead trout

Project Need. The need for the proposed project is based on the Caltrans District 7 Culvert Inspection Program that continually assesses the conditions of drainage facilities on SR-1/PCH. Inspection data showed evidence of joint separation, misalignment of culverts, concrete spalls at reinforced concrete pipe joints, and circumferential and longitudinal cracking at some facilities. Further deterioration of these drainage facilities is expected if not repaired or rehabilitated as proposed by this project.

The existing culvert at SR-1/PCH at Solstice Canyon Creek currently impedes the movement of the self-sustaining Southern steelhead trout population, and it is the last remaining barrier and component in a multi-agency habitat fish passage restoration effort. In 2010, the National Park Service and the Resource Conservation District of the Santa Monica Mountains removed eight in-stream barriers in Solstice Canyon Creek (4 low-water Arizona crossings and 4 check dams), which opened up approximately 1.5 miles of perennial stream habitat that will be available to the endangered Southern steelhead trout once the existing culvert at SR-1/PCH at Solstice Canyon Creek are removed and replaced with a new bridge structure. The existing culvert at SR-1/PCH at Solstice Canyon Creek is a concrete, tunnel-like structure that carries the stream under the roadway, but this design prevents trout from accessing and spawning in the rearing habitat upstream. Subsequently, the inability of the trout to move back-and-forth between the Pacific Ocean and Solstice Canyon Creek has resulted in the population becoming locally extinct. Recognizing the fact that the population of trout is in danger of extinction throughout all significant portions of its range (Santa Barbara County south to the U.S./Mexico border), the National Marine Fisheries Service (NMFS) declared this population an endangered species (August 1997) under the Endangered Species Act of 1973.

Proposed Action and Alternatives Under Consideration. The proposed alternatives were developed to meet the identified purpose and need of the project, which avoiding or minimizing environmental impacts. The proposed alternatives are Alternative 1 (No-Build Alternative), and Alternative 2 [Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope creek bottom (Location No. 10)]

> **Alternative 1 | No Build-Alternative.** With the "No-Build Alternative," none of the proposed improvements would be implemented or constructed and continued deterioration of the existing drainage system would present challenges that may compromise the safety of the roadway. Additionally, the existing concrete culvert at Solstice Canyon Creek would continue to be an impediment to the movement of endangered species, and would not fulfil commitments in the implementation of a riparian restoration project and recovery plan for the endangered Southern steelhead trout in Solstice Canyon Creek.

Alternative 2 | Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope creek bottom (Location No. 10). Alternative 2 proposes drainage and culvert restoration and/or replacement at 19 locations, removal of the existing, 70-year-old bridge/culvert at Location No. 10 (Bridge No. 53-0030), and construction of a new bridge structure with a smaller geomorphic footprint to allow a more natural channel to form at the crossing. The natural channel would be graded and lined with a natural slope and bottom (gravel, cobble, and boulders similar in size and composition to Solstice Canyon Creek upstream of this location).

Summary of Potential Project Impacts

ENVIRONMENTAL RESOURCE	ALTERNATIVE 1 (NO-BUILD)	ALTERNATIVE 2
HUMAN ENVIRONMENT		
Land Use	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding land use.	While the acquisition of the parcel adjacent to project Location No. 10 is proposed, these actions would not cause any changes in land use, zoning, or activities, and would not create any meaningful alterations to existing land use patterns in the project study area.
Coastal Zone	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding the Coastal Zone.	The proposed project is subject to review and approval by the California Coastal Commission, and the City of Malibu and Ventura County, who are responsible for carrying out the goals of the Coastal Act through the Malibu Local Coastal Program and the Ventura County Local Coastal Program. The proposed undertaking would be consistent with the goals and guidelines set forth in the Coastal Act, and restoration of fish passage and habitat at proposed project Location No. 10 at Solstice Canyon Creek would provide a net benefit to the coastal area within the vicinity of the coastal zone. Therefore, no impacts are anticipated within this context.
Parks and Recreation Facilities	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated on parks and recreational facilities.	The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure, and does not pose any significant effects on parks and recreational facilities in the project study area. No permanent or full acquisition, or displacement of any parks and recreation facilities is required. Therefore, no impacts are anticipated within this context.
Relocations and Real Property Acquisitions	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding relocations and real property acquisition.	The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, none of the proposed alternatives require displacement or relocation of any persons or businesses, but the proposed project does have the potential to affect one property in terms of real property acquisition at Location No. 10. The parcel (AIN No. 4459-008-001) is currently occupied by the Calimigos Beach Club (26023 Pacific Coast Highway), which is satellite facility of the Calimigos Guest Ranch approximately 9.5 miles north west of the parcel on Latigo Canyon Road.

Summary of Potential Project Impacts (continued)

ENVIRONMENTAL RESOURCE	ALTERNATIVE 1 (NO-BUILD)	ALTERNATIVE 2
Utilities and Emergency Services	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding utilities and emergency services.	The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure at project Location No. 10. Temporary, construction-related effects to utilities and emergency services are anticipated, particularly as they pertain to relocation of utilities.
Cultural Resources	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding cultural resources.	A potential for encountering intact cultural/archaeological deposits exists at proposed project Locations No. 9 and 10, particularly as it pertains to excavation associated with construction of the new bridge structure at Solstice Canyon Creek, though the potential is low in consideration of an estimated maximum excavation depth of 15 feet – intact deposits are suspected at depths between 23 and 33 feet.
PHYSICAL ENVIRONMENT		
Hydrology and Floodplain	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding hydrology and floodplains.	In general, the proposed replacement of the bridge at SR-1/PCH/Solstice Canyon Creek with a lengthened span structure will provide an increase in conveyance to the waterway with increased river flow underneath the structure that would push against coastal flooding effects and thus dampen its influence on upstream flooding. While modeling and analyses show a general increase in water surface elevation relative to the existing condition, the increases are not anticipated to inundate the roadway or significantly affect the proposed structure from properly conveying flows outside of the floodway and onto the beach environment and are thus considered insignificant.
Water Quality and Storm Water Runoff	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding water quality and storm water runoff.	It is anticipated that the proposed project operations would slightly increase runoff volume, but it is not anticipated to affect downstream flow, discharge to lined channels, potential sediment loading, or cause other hydraulic changes to the storm drain system affecting downstream channel stability as a result of increases in Disturbed Soil Areas (DSAs) and Net Additional Impervious Areas (AIA).
Geology/Soils/ Seismic/Topography	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding geology, soils, seismicity, or topography.	Based on subsurface exploration information, the proposed bridge at Location No. 10 can be supported by spread footings, with bearing capacity of the spread footing to be determined once structural design requirements are refined. Groundwater elevation was measured at an elevation of 10.8 feet during subsurface exploration. The proposed footing bottom elevations vary from 3-to-5 feet, which is below measured groundwater elevation.

Summary of Potential Project Impacts (continued)

ENVIRONMENTAL RESOURCE	ALTERNATIVE 1 (NO-BUILD)	ALTERNATIVE 2
Hazardous Waste/ Materials	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding hazardous waste and/or materials.	It was determined that there is low potential of hazardous waste contamination associated with the scope of work for proposed Project Locations No. 1-9 and Project Locations No. 11-19. Soil excavation and earth-moving activities associated with proposed Project Location No. 10 present concerns regarding worker exposure to residual contamination in soil and groundwater due to Leaking Underground Storage Tanks (LUST). The contaminants include petroleum hydrocarbons, and heavy metals such as cadmium, chromium, copper, lead, zinc, etc. in groundwater. Based upon these findings, groundwater at this site is not expected to meet the National Pollution Discharge Elimination System (NPDES) permit discharge limitations and all groundwater will require treatment before discharge to comply with Regional Water Quality Control Board (RWQCB) regulations.
BIOLOGICAL ENVIRONMENT		
Natural Communities	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding natural communities.	Due to the project being located directly along the coast, the potential for adverse effects on habitat connectivity is extremely low. The proposed project will not decrease or otherwise impede wildlife connectivity in the area.
Wetlands and Other Waters	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding wetlands and other waters.	At Solstice Canyon Creek, approximately 12,600 sq. ft. (0.29 Acres) of Waters of the U.S. will be temporarily impacted by this project. Approximately 3,300 sq. ft. of riparian woodland habitat will be temporarily impacted by the project.
Plant Species	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding plant species.	The proposed project has the potential to impact approximately 3,300 square feet (0.08 acres) of Alder/Sycamore Riparian habitat, and 50,200 square feet (1.15 acres) of coastal scrub.
Animal Species	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding animal species.	Only minimal effects to animal species are anticipated as a result of implementation of the proposed project as many of the proposed project locations have experienced substantial human activity and disturbance, primarily due to typical beach activities and existing vehicular traffic on SR-1/PCH. Those potential effects are; disturbance of foraging, roosting, and nesting due to construction activities; temporary loss of habitat; potential relocation of individuals within construction footprints; disturbance due to noise, dust, and other construction activities, including dewatering within Solstice Canyon Creek.

Summary of Potential Project Impacts (continued)

ENVIRONMENTAL RESOURCE	ALTERNATIVE 1 (NO-BUILD)	ALTERNATIVE 2
Threatened and Endangered Species	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, no impacts would be anticipated regarding threatened and endangered species.	The project study area immediate to proposed project Location No. 10 at Solstice Canyon Creek has been identified as potential habitat (non-breeding) for the federal listed California Red-Legged frog, though individual species are not expected to be present within the project study area, and long-term modification to the habitat is expected to be positive. Therefore, Caltrans has made a determination of "May Affect, but not likely to Adversely Effect" this species.
Invasive Species	If the proposed project were not built, there would be no alterations or improvements to the existing highway drainage facilities or the culvert at Solstice Canyon Creek, posing no changes to the existing environment. Therefore, the spread of invasive species would not be intensified through construction activities.	It is possible that construction activities could cause the disturbance and spread of the identified invasive species in adjacent areas. These species, however, are not part of the California Noxious Weed List.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF TECHNICAL STUDIES

- Archaeological Survey Report (ASR) | Caltrans Division of Environmental Planning, Cultural Resources Unit (September 2018)
- District Preliminary Geotechnical Report (DPGR) | Caltrans Division of Design – Office of Geotechnical Services (June 2018)
- Geologic and Geotechnical Memorandum | Caltrans Office of Geotechnical Design (February 2005)
- Historic Properties Survey Report (HPSR) | Caltrans Division of Environmental Planning, Cultural Resources Unit (September 2018)
- Initial Site Assessment for Hazardous Waste/Materials | Caltrans Division of Environmental Planning, Office of Environmental Engineering
- (November 2016, revised December 2017, and May 2018)
- Natural Environment Study (NES) Caltrans Division of Environmental Planning, Maintenance Biology Unit (September 2018)
- Preliminary Geotechnical Report | Caltrans Office of Geotechnical Design South – Mets and Geotechnical Services (November 2017)
- Preliminary Hydraulic Evaluation Report | Caltrans Division of Engineering Services – Office of Bridge Design Central (January 2018)
- Preliminary Storm Water Data Report (SWDR) | Caltrans Office of Design (June 2018)

CHAPTER 1 | PROPOSED PROJECT

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1.1 INTRODUCTION

The California Department of Transportation (Caltrans) proposes a drainage restoration project at nineteen (19) locations on State Route 1 (Pacific Coast Highway) in the cities of Los Angeles, Malibu, and unincorporated areas within Los Angeles County (post miles 37.67 to 62.86) and Ventura County (post miles 0.00 to 0.92). The proposed improvements include repair and rehabilitation of existing drainage facilities along the route to restore full functionality, to prevent further deterioration, and ensure proper drainage in an area subject to erosion. The proposed improvements also include the replacement of the existing bridge/culvert at Solstice Canyon Creek with a new bridge structure with an underlying natural slope creek bottom to provide improved flood water conveyance, and to improve hydraulic conditions to facilitate movement of the endangered Southern steelhead trout population in the project study area.

Caltrans is the lead agency under the National Environmental Policy Act (NEPA) under Caltrans' assumption of responsibility pursuant to 23 U.S.C. 327, and the lead agency under the California Environmental Quality Act (CEQA). The proposed project is eligible for Federal funding and is thus listed in the Federal Transportation Improvement Program (FTIP ID: LALS02) and is included in the current 2016 Southern California Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), though the proposed undertaking is not "capacity-increasing" by nature, and therefore not required to conform to or achieve Federal air quality standards. Because the proposed project is exempt from air quality conformity finding contingencies associated with approval for Federal funding, it is not required for inclusion in SCAG's regional air quality model for non-attainment areas, and therefore not listed or designated a unique RTP ID in the 2016 SCAG RTP/SCS.

State Route 1 (SR-1), or Pacific Coast Highway (SR-1/PCH), is a major north-south state highway that runs along most of the California-Pacific coastline and originates at Interstate 5 (I-5) near Dana Point in Orange County, with the most northerly terminus at U.S. Highway 101 (US-101) near Leggett in Mendocino County. Through Los Angeles and Ventura Counties, SR-1/PCH serves the City of Long Beach on the south, and traverses the Los Angeles Harbor Region, South Bay Cities, Los Angeles International Airport, Venice/Santa Monica (intermittently as Lincoln Boulevard), and Pacific Palisades/Malibu as it approaches the Ventura County line and Point Mugu/Oxnard at the north.

Within project limits, the SR-1/PCH highway facility lays between the Pacific coastline and the Santa Monica Mountains, which are roughly 45 miles long and form an east-west range of low mountains along the coast from the City of Los Angeles to the Oxnard Plane. They are particularly characterized by long, south-draining canyons on their south flank, and north-draining canyons to U.S. Route 101 on their north flank. State Route 27 (SR-27/Topanga Canyon Boulevard), State Route 23 (SR-23), Malibu Canyon Road, and Kanan Dume Road are the main north-south passes through the Santa Monica Mountains between U.S. 101 and SR-1/PCH within project limits. The SR-1/PCH highway facility provides interregional, recreational, and local commuter service through a semi-urban, partly rural corridor, and consists of four lanes (two in each direction) within the proposed project limits. From Santa Monica, SR-1/PCH curves west through the Pacific Palisades neighborhood of Los Angeles before becoming Malibu's main thoroughfare to the Ventura County Line.

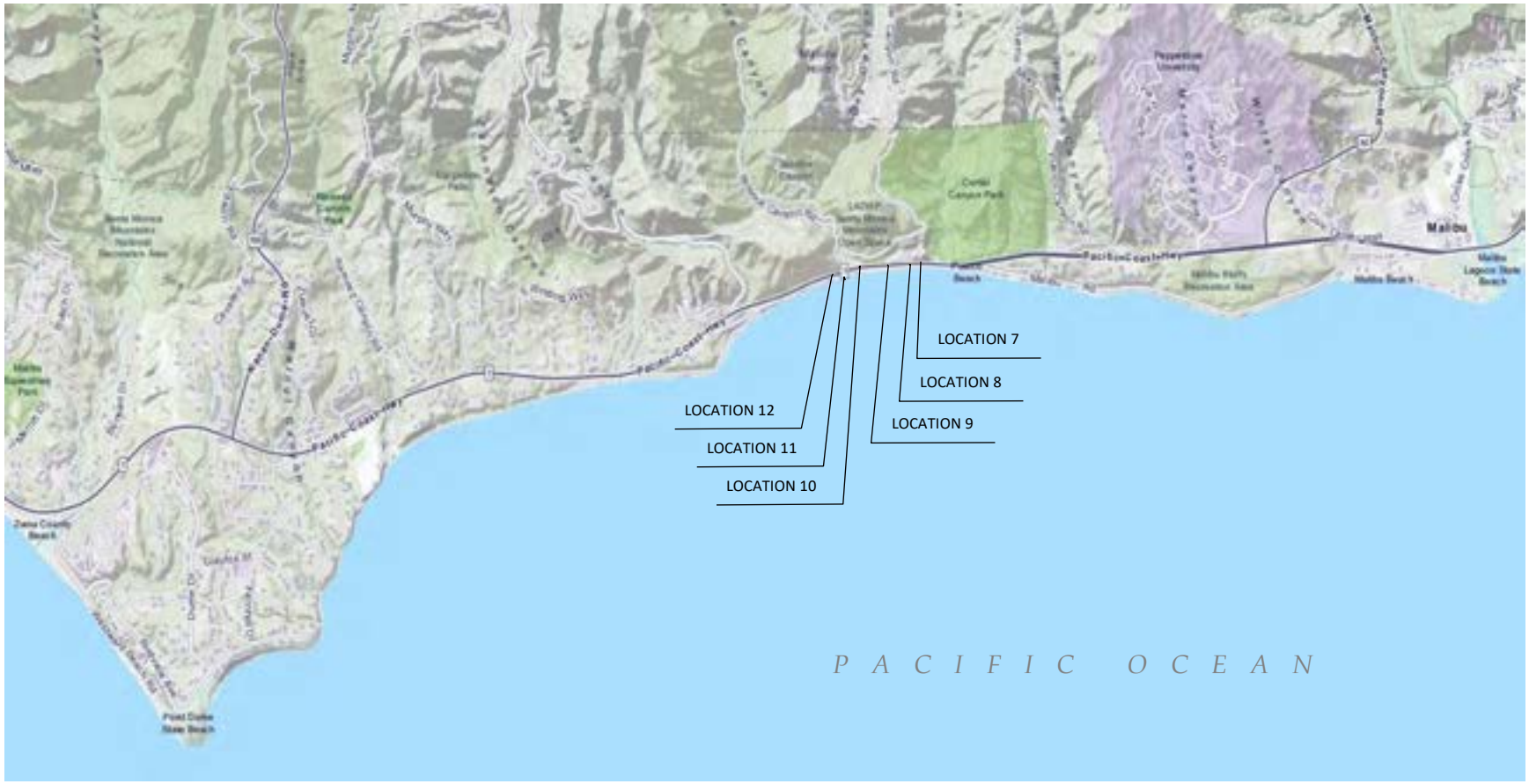
Figure 1.1-a Proposed Project Location and Vicinity

Figure 1.1-b Locations of Construction | Western Segment – Locations No. 1-6

Location No.	Post Mile	Activity
1	LA 37.67	Remove debris from corrugated steel drainage pipe, replace cured-in place pipe lining
2	LA 39.08	Replace existing pipe with 24" RCP
3	LA 40.16	Replace 36" CMP
4	LA 40.18	Install culvert barrel lining (CIP) in upstream section of pipe, replace in-kind 24" RCP middle section of downstream pipe using Cut-and-Cover method, install culvert barrel lining downstream (CIP) section of pipe
5	LA 40.23	Remove debris from corrugated steel drainage pipe, replace cured-in place pipe lining
6	LA 40.24	Replace 36" RCP and 18" CMP sections

CMP = Corrugated Metal Pipe CSP = Corrugated Steel Pipe RCP = Reinforced Concrete Pipe CIP = Cured-In-Place pipe lining

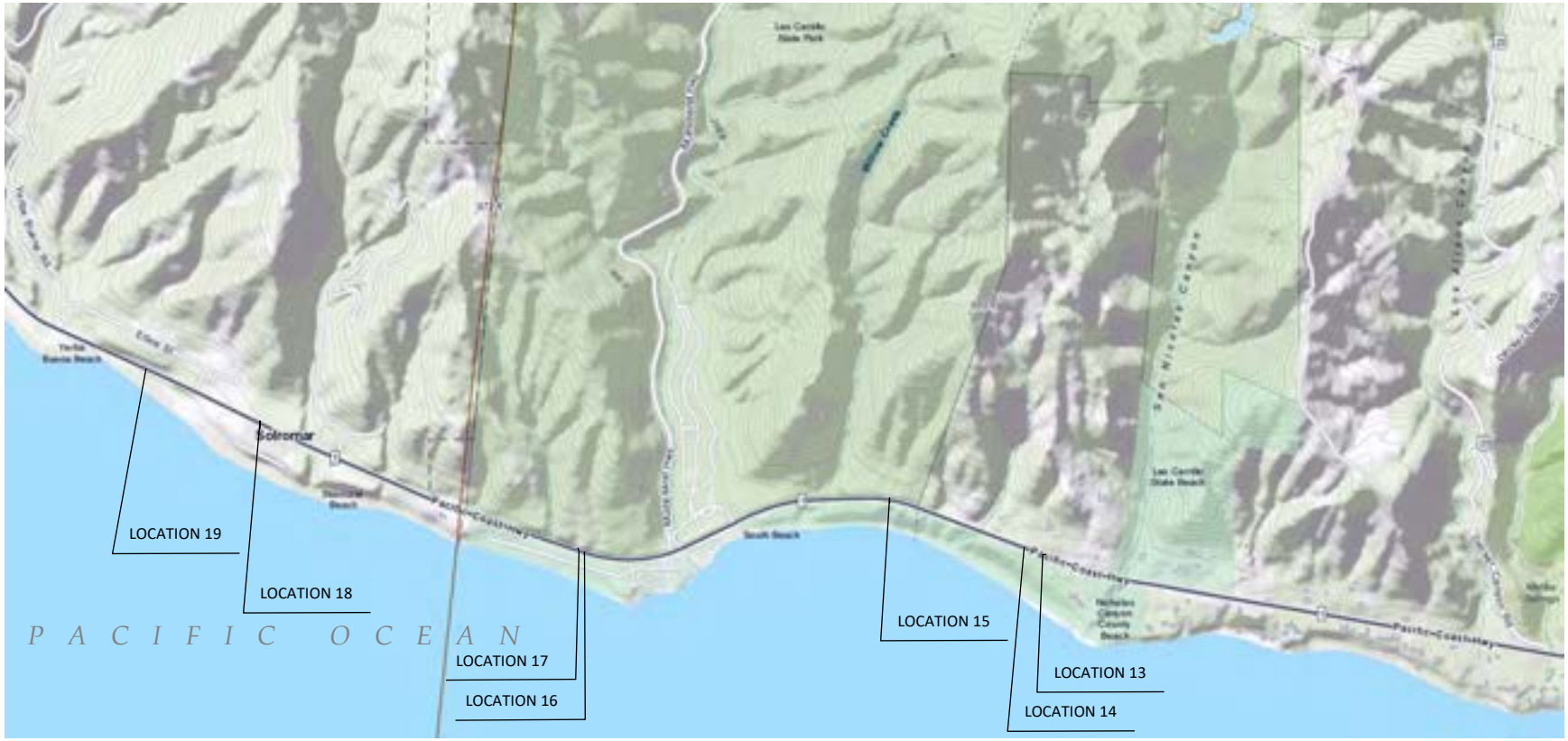
Figure 1.1-c Locations of Construction | Central Segment – Locations No. 7-12



Location No.	Post Mile	Activity
7	LA 50.05	Replace 18" RCP
8	LA 50.08	Replace 24" CMP
9	LA 50.28	Install culvert barrel lining (CIP), repair joint seals at headwall and pipe, regrade channel and remove debris and vegetation at outlet
10	LA 50.36	Replace bridge/culvert with new bridge with an underlying natural slope creek bottom
11	LA 50.39	Remove debris from drainage pipe, replace cured-in place pipe lining
12	LA 50.42	Install culvert barrel lining (CIP) in upstream section of existing pipe, replace 20" RCP on downstream end

CMP = Corrugated Metal Pipe CSP = Corrugated Steel Pipe RCP = Reinforced Concrete Pipe CIP = Cured-In-Place pipe lining

Figure 1.1-d Locations of Construction | Eastern Segment – Locations No. 13-19



Location No.	Post Mile	Activity
13	LA 61.29	Replace 30" RCP
14	LA 61.35	Replace 24" RCP
15	LA 61.68	Replace 24" RCP
16	LA 62.51	Replace 24" RCP on upstream section, joint seal manhole
17	LA 62.55	Install culvert barrel lining (CIP), remove debris and clear manhole, and replace 18" CMP on downstream section
18	VEN 0.67	Install culvert barrel lining (CIP), replace lid/grate for upstream drop inlet
19	VEN 0.92	Install culvert barrel lining (CIP)

CMP = Corrugated Metal Pipe CSP = Corrugated Steel Pipe RCP = Reinforced Concrete Pipe CIP = Cured-In-Place pipe lining

1.2 PURPOSE AND NEED

Project Purpose. The purpose of the proposed project is to achieve the following objectives:

- Restore and rehabilitate damaged drainage and culvert facilities to return to full functionality and ensure proper drainage, thereby preventing the need for frequent maintenance
- Extend service life, and prevent further deterioration of facilities
- Improve flood water conveyance and hydraulic conditions at the Solstice Canyon Creek Bridge (Bridge No. 53-0030) while restoring natural features of Solstice Canyon Creek to enable fish passage and facilitate movement for endangered Southern steelhead trout

Project Need. The need for the proposed project is based on the Caltrans District 7 Culvert Inspection Program that continually assesses the conditions of drainage facilities on SR-1/PCH. Inspection data showed evidence of joint separation, misalignment of culverts, concrete spalls at reinforced concrete pipe joints, and circumferential and longitudinal cracking at some facilities. Further deterioration of these drainage facilities is expected if not repaired or rehabilitated as proposed by this project.

The existing culvert at SR-1/PCH at Solstice Canyon Creek currently impedes the movement of the self-sustaining Southern steelhead trout population, and it is the last remaining barrier and component in a multi-agency habitat fish passage restoration effort. In 2010, the National Park Service and the Resource Conservation District of the Santa Monica Mountains removed seven (7) in-stream barriers in Solstice Canyon Creek (3 low-water Arizona crossings and 4 check dams), which opened up approximately 1.5 miles of perennial stream habitat that will be available to the endangered Southern steelhead trout once the existing culvert at SR-1/PCH at Solstice Canyon Creek are removed and replaced with a new bridge structure. The existing culvert at SR-1/PCH at Solstice Canyon Creek is a concrete, tunnel-like structure that carries the stream under the roadway, but this design prevents trout from accessing and spawning in the rearing habitat upstream. Subsequently, the inability of the trout to move back-and-forth between the Pacific Ocean and Solstice Canyon Creek has resulted in the population becoming locally extinct. Recognizing the fact that the population of trout is in danger of extinction throughout all significant portions of its range (Santa Barbara County south to the U.S./Mexico border), the National Marine Fisheries Service (NMFS) declared this population an endangered species (August 1997) under the Endangered Species Act of 1973.

Independent Utility and Logical Termini. Federal Highway Administration (FHWA) regulations [23 CFR 771.111(f)] require that this evaluation of the proposed undertaking connects logical termini and be of sufficient length to address environmental matters on a broad scope. Further, it stipulates that the proposed project have independent utility or independent significance, in that it be usable and require a reasonable expenditure even if no additional transportation improvements in the area are made. Lastly, it stipulates that the proposed project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The proposed project is a stand-alone project intended to restore and rehabilitate damaged drainage and culvert facilities and to replace a culvert structure with a bridge to assist in the implementation of a mandated fish passage restoration project and recovery plan for the endangered Southern steelhead trout. It is independent of other Caltrans projects on SR-1/PCH, and its purpose and need cannot be fulfilled by any other Caltrans project. Furthermore, the proposed project is in no way dependent on the implementation of other Caltrans projects on SR-1/PCH, prior or subsequent, to this proposed

undertaking. This environmental document studies the entire project area, and is in no way dependent on the environmental document or mitigation proposals of any other project. Lastly, the proposed project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. Based on the aforementioned, and pursuant to 23 CFR 771.11(f), this project has independent utility and logical termini.

1.3 PROJECT DESCRIPTION

This section describes the proposed actions and project alternatives that were developed to meet the identified purpose and need of the project. The proposed alternatives are Alternative 1 (No-Build Alternative), and Alternative 2 (Build Alternative). This project contains a number of standardized project measures which are employed on most, if not all, Caltrans projects and were not developed in response to any specific environmental impact resulting from the proposed project. These measures are addressed in more detail in the Environmental Consequences sections found in Chapter 2.

Alternative 1 | No Build-Alternative. With the "No-Build Alternative," none of the proposed improvements would be implemented or constructed and continued deterioration of the existing drainage system would compromise the safety of the roadway. Additionally, the existing concrete culvert at Solstice Canyon Creek would continue to be an impediment to the movement of endangered fish and would not fulfil Caltrans' commitments to implement a fish passage restoration project for the endangered Southern steelhead trout in Solstice Canyon Creek.

Alternative 2 | Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope creek bottom (Location No. 10). Alternative 2 proposes drainage and culvert restoration and/or replacement at 19 locations, as well as removal and replacement of the existing 70-year-old bridge/culvert at Location No. 10 (Bridge No. 53-0030), with a new bridge structure with a smaller geomorphic footprint to allow a more natural stream channel to form at the crossing. The natural stream channel would be graded and lined with a natural slope and bottom (gravel, cobble, and boulders similar in size and composition to Solstice Canyon Creek upstream of this location). Preliminary estimate of cost of the proposed project is currently $34,350,000 for the current year. The proposed scope of work for all locations is detailed in the following table.

Table. 1.3-a Proposed Locations of Repair/Construction

County	Location No.	Post Mile	Culvert System No.	Diameter Size (in)	Material	Scope of Work
LA	1	37.67	530010003767	48	CMP	Remove debris from corrugated steel drainage pipe, replace cured-in place pipe lining
LA	2	39.08	530010003913	22.44	PPC	Replace existing pipe with 24" RCP
LA	3	40.16	530010004024	36	CMP	Replace 36" CMP
LA	4	40.18	530010004017	24	RCP	Install culvert barrel lining (CIP) in upstream section of pipe, replace in-kind 24" RCP middle section of downstream pipe using Cut-and-Cover method, install culvert barrel lining downstream (CIP) section of pipe
LA	5	40.23	530010004021	18	CMP	Remove debris from corrugated steel drainage pipe, replace cured-in place pipe lining
LA	6	40.24	530010004022	36/18	RCP/CMP	Replace 36" RCP and 18" CMP sections
LA	7	50.05	530010004995	18	RCP	Replace 18" RCP
LA	8	50.08	530010005000	24	CMP	Replace 24" CMP
LA	9	50.28	530010005028	24	RCP	Install culvert barrel lining (CIP), repair joint seals at headwall and pipe, regrade channel and remove debris and vegetation at outlet
LA	10	50.36	530014005036/ Solstice Canyon Creek Bridge No 53-0030	Arch 21' wide, 13.8'high	Concrete	Replace bridge/culvert with new bridge with underlying natural slope creek bottom
LA	11	50.39	530010005039	18	CMP	Remove debris from drainage pipe, replace cured-in place pipe lining
LA	12	50.42	530010005042	24	RCP	Install culvert barrel lining (CIP) in upstream section of existing pipe, replace 20" RCP on downstream end
LA	13	61.29	530010006150	30	RCP	Replace 24" RCP
LA	14	61.35	530010006155	24	RCP	Replace 24" RCP
LA	15	61.68	530010006170	24	RCP	Replace 24" RCP
LA	16	62.51	530010006251	24	RCP	Replace 24" RCP on upstream section, joint seal manhole
LA	17	62.55	530010006260	18	CSP	Install culvert barrel lining (CIP), remove debris and clear manhole, and replace 18" CMP on downstream section
VEN	18	0.67	520010000067	18	RCP	Install culvert barrel lining (CIP), replace lid/grate for upstream drop inlet
VEN	19	0.92	520010000092	18	RCP	Install culvert barrel lining (CIP)

CMP = Corrugated Metal Pipe CSP = Corrugated Steel Pipe RCP = Reinforced Concrete Pipe CIP = Cured-In-Place pipe lining

Alternatives Previously Considered but Eliminated from Further Discussion

Rehabilitate Drainage at 20 Locations, Including Modification of Culvert at Solstice Canyon Creek. Initially, Caltrans had proposed rehabilitation of drainage facilities at 20 locations largely through a relining of existing drainage structures along the route, and a modification of the existing culvert at Solstice Canyon Creek to provide improved flood water conveyance, and to improve hydraulic conditions to facilitate movement of the endangered Southern steelhead trout population in the project study area. The scope of work for the 19 locations outside of the Solstice Canyon Creek facility was modified after a culvert assessment was initiated to confirm the need for rehabilitation and repair. The assessment showed that some of the existing drainage and culvert facilities required full or partial pipe replacements, and that a relining of existing structures would be insufficient. The scope of work for the 19 locations outside of Solstice Canyon Creek was then updated to reflect the current scope of work. In consultation with the National Marine Fisheries Service (NMFS), a Steelhead Passage Stability Study (August 2017) was initiated to review the proposed Caltrans design for the modification of the culvert at Solstice Canyon Creek, address any deficiencies, and develop concepts to improve the design.

At the time, the Caltrans proposed a design which included the removal of the existing flat, concrete bottom of the culvert, and replacement with a trapezoidal, rock-lined channel. Upstream and downstream from the culvert, a rock-lined step-pool channel would be constructed, and downstream from the culvert, the rock-lined channel would follow a straight alignment to become perpendicular to the beach. The Steelhead Passage Stability Study showed that the Caltrans proposed modification of the culvert at Solstice Canyon Creek would be insufficient in facilitating the movement of endangered Southern steelhead trout.

With the proposed modification of the culvert at Solstice Canyon Creek, the Steelhead Passage Stability Study showed that design flow depths would be too shallow for swimming, and concerns arose regarding the structural integrity of the 70-year old culvert during and following construction. Upstream and downstream of the proposed culvert modification, the flow depths within the step-pool structures were deemed too shallow for leaping in some flow ranges, the head drop from pool-to-pool exceeded standards for upstream passage, and accumulation of sediment was also a concern. The study also showed that there would be a risk of the creek bypassing the rock-filled structure where the creek exits the culvert on the downstream end, and the design of the structure would not look like a natural feature on the beach. As a result, the study recommended three alternatives to the proposed Caltrans design for the modification of the culvert at Solstice Canyon Creek:

1. **Modified Caltrans Design** – modification of the proposed Caltrans design to address concerns as previously discussed.
2. **Natural Slope Concept** – removal of the bottom of the culvert, and regrading of the creek to mimic a natural slope through the culvert.
3. **Replace Culvert with Bridge** – replacement of bridge/culvert with new bridge structure with a smaller geomorphic footprint, allowing a more natural channel to form at the crossing.

The current iteration of the proposed improvements at Solstice Canyon Creek (replace existing bridge/culvert with a new bridge structure with an underlying natural slope creek bottom) is a hybrid of all three proposed alternatives as outlined in the Steelhead Passage Stability Study, combining features to provide optimum hydraulic conditions for flood water conveyance, and facilitation of movement of the endangered Southern steelhead trout population in the project study area.

1.4 PERMITS AND APPROVALS NEEDED

The following permits, licenses, agreements, and certifications (PLACs) are required for project construction:

Agency	PLAC	Status
California Department of Fish and Wildlife (CDFW)	1602 Agreement for Streambed Alteration	Application for 1602 permit expected after Final IS/EA approval
California Coastal Commission	Federal Coastal Consistency Certification	Consistency Certification expected after Draft IS/EA distribution
California Water Resources Board	Section 401 Water Discharge Permit/Certification	Application for Section 401 permit/certification expected after Final IS/EA approval
City of Malibu, Ventura County	Coastal Development Permit (CDP)	Application for CDP expected after Draft IS/EA distribution
Multiple Agencies	Right-of-Entry permitting for temporary construction easements and temporary access roads	Applications for Right-of-Entry expected after final IS/EA approval
United States Army Corps of Engineers	Section 404 Permit for filing or dredging waters of the United States	Application for Section 404 permit expected after Final IS/EA approval

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CHAPTER 2 | AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MINIMIZATION AND/OR MITIGATION MEASURES

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2.1 ENVIRONMENTAL TOPICS CONSIDERED BUT DETERMINED NOT TO BE RELEVANT

As part of the scoping and environmental analysis carried out for the proposed project, the following environmental issues were considered but no adverse impacts were identified. As a result, there is no further discussion about these issues in this document.

AIR QUALITY | CONTEXT FOR OMISSION

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and is not capacity-increasing by nature, and in consideration of the scope of the proposed work, regional and/or project-level air quality conformity is not required and is exempt from the respective analyses.

> ***Regulatory Setting.*** *The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act (CCAA) is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), particulate matter (PM)—which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM10) and particles of 2.5 micrometers and smaller (PM2.5)—and sulfur dioxide (SO2). In addition, national and state standards exist for lead (PB), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.*
>
> *Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.*
>
> *The conformity requirement is based on FCAA Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. "Transportation Conformity" applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The proposed project must conform at both levels to be approved.*
>
> *Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 Code of Federal Regulations (CFR) 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.*
>
> *Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), particulate matter*

(PM10 and PM2.5), and in some areas (although not in California), sulfur dioxide (SO2). California has nonattainment or maintenance areas for all of these transportation-related "criteria pollutants" except SO2, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and scope that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and EPA-approved emissions models; and in PM areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts.

COMMUNITY IMPACTS – COMMUNITY CHARACTER AND COHESION | CONTEXT FOR OMISSION

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential to affect social or economic change in the project study area.

Regulatory Setting. *The National Environmental Policy Act of 1969 (NEPA), as amended, established that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). The Federal Highway Administration in its implementation of NEPA (23 United States Code [USC] 109[h]) directs that final decisions on projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.*

Under the California Environmental Quality Act (CEQA), an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

COMMUNITY IMPACTS – ENVIRONMENTAL JUSTICE | CONTEXT FOR OMISSION

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential to affect social or economic change on minority and/or low-income populations in the project study area.

> ***Regulatory Setting.*** *All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President William J. Clinton on February 11, 1994. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines.*
>
> *All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. The Department's commitment to upholding the mandates of Title VI is demonstrated by its Title VI Policy Statement, signed by the Director, which can be found in the appendices of this document.*

FARMLANDS/TIMBERLANDS | CONTEXT FOR OMISSION

The proposed project is located in a semi-urban, somewhat rural setting, but consists only of improvements to existing roadway drainage facilities, and no potential exists for direct or indirect irreversible conversion of protected farmlands or timberlands.

> ***Regulatory Setting.*** *The National Environmental Policy Act (NEPA) and the Farmland Protection Policy Act (FPPA, 7 United States Code [USC] 4201-4209; and its regulations, 7 Code of Federal Regulations [CFR] Part 658) require federal agencies, such as the Federal Highway Administration (FHWA), to coordinate with the Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.*
>
> *The California Environmental Quality Act (CEQA) requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to discourage the early conversion of agricultural and open space lands to other uses.*

GROWTH | CONTEXT FOR OMISSION

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential to affect growth in the project study area.

> ***Regulatory Setting.*** *The Council on Environmental Quality (CEQ) regulations, which established the steps necessary to comply with the National Environmental Policy Act (NEPA) of 1969, require evaluation of the potential environmental effects of all proposed federal activities and programs. This provision includes a*

requirement to examine indirect consequences, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations (40 Code of Federal Regulations [CFR] 1508.8) refer to these consequences as indirect impacts. Indirect impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

The California Environmental Quality Act (CEQA) also requires the analysis of a project's potential to induce growth. The CEQA guidelines (Section 15126.2[d]) require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…"

NOISE | CONTEXT FOR OMISSION

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential for adverse effects in terms of noise in the project study area.

Regulatory Setting. *The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.*

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The CEQA noise analysis is included at the end of this section.

For highway transportation projects with FHWA (and the Department, as assigned) involvement, the federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA).

PALEONTOLOGY | CONTEXT FOR OMISSION

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, type and extent of excavation, and the geologic setting (e.g. proximity of fossiliferous strata), it was determined that paleontological resources are not any issue of concern.

Regulatory Setting. *Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized or funded projects. 23 United States Code (USC) 1.9(a) requires that the use of federal-aid funds must be in conformity with federal and state law. 23 United States Code (USC) 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any*

state, in compliance with 16 USC 431-433 above and state law. Under California law, paleontological resources are protected by the California Environmental Quality Act (CEQA).

TRAFFIC AND TRANSPORTATION/PEDESTRIAN AND BICYCLE FACILITIES | CONTEXT FOR OMISSION

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential to adversely affect traffic and transportation and/or pedestrian and bicycle facilities in the project study area.

Regulatory Setting. *The Department, as assigned by FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 Code of Federal Regulations [CFR] 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.*

In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the USDOT regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 United States Code [USC] 794). FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to federal-aid projects, including Transportation Enhancement Activities.

VISUAL/AESTHETICS | CONTEXT FOR OMISSION

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential to adversely affect visual resources or aesthetics in the project study area.

Regulatory Setting. *The National Environmental Policy Act of 1969 as amended (NEPA) establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically (emphasis added) and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA) in its implementation of NEPA (23 USC 109[h]) directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.*

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities" (CA Public Resources Code [PRC] Section 21001[b]).

WILD AND SCENIC RIVERS | CONTEXT FOR OMISSION

No Wild and/or Scenic Designated rivers exist with the project study area, therefore the proposed project does not have the potential to adversely affect resources protected by the National Wild and Scenic Rivers Act (16 United States Code ([USC] 1271) and the California Wild and Scenic Rivers Act (CA Public Resources Code [PRC] Section 5093.50 et seq.).

> ***Regulatory Setting.*** *Projects affecting Wild and Scenic Rivers are subject to the National Wild and Scenic Rivers Act (16 United States Code ([USC] 1271) and the California Wild and Scenic Rivers Act (CA Public Resources Code [PRC] Section 5093.50 et seq.).*
>
> *There are three possible Wild and Scenic Designations:*
>
> 1. *Wild: undeveloped, with river access by trail only.*
> 2. *Scenic: undeveloped, with occasional river access by road.*
> 3. *Recreational: some development is allowed, with road access.*

2.2 HUMAN ENVIONRMENT

2.2.1 LAND USE

Existing and Future Land Use

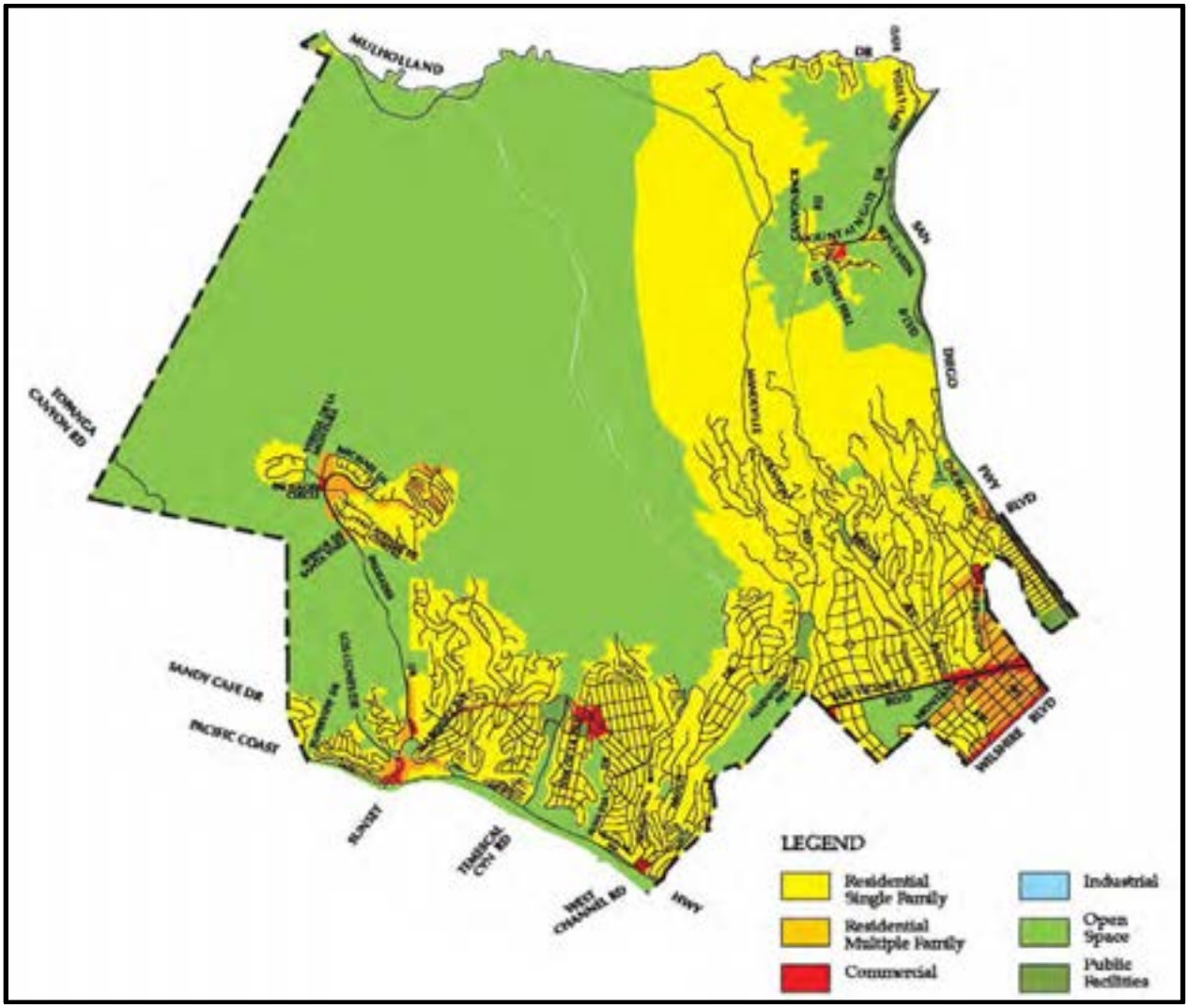
Within project limits, the SR-1/PCH facility sits between the Pacific coastline and the Santa Monica mountains and spans a number of municipalities with a portion of the City of Los Angeles (Pacific Palisades neighborhood) at the easternmost limits, through the City of Malibu, and unincorporated areas of Los Angeles and Ventura Counties for the remainder of the westerly project limits. The SR-1/PCH facility provides interregional, recreation, and local commuter service through a generally semi-urban, partly rural corridor that serves as the main thoroughfare for the City of Malibu.

Pacific Palisades (City of Los Angeles). Only one proposed project location (Location No. 1 at post mile 37.67) exists within the project study area as centered on the Pacific Palisades neighborhood which comprises only a portion of the Brentwood-Pacific Palisades Community Plan – a component of the City of Los Angeles General Plan (2006-2014). The community planning area contains approximately 24,163 acres, or about eight percent of the City of Los Angeles planning area, bordered on the southwest by the Pacific Ocean; on the south by the City of Santa Monica and Wilshire Boulevard; on the east by Interstate 405 (San Diego Freeway); and on the north by Mulholland Drive. The western border is adjacent to an unincorporated area of Los Angeles County which abuts the City of Malibu. A large portion of the acreage contained within the community plan is mountainous, with public open space accounting for approximately 55 percent of land area (gross area). The predominant land use within the Pacific Palisades neighborhood is "Residential Single Family," with "Residential Multiple Family" land uses clustered around areas zoned as "Commercial" in the vicinity of Palisades Circle on Palisades Drive, Sunset Boulevard at Pacific Coast Highway, and on Sunset Boulevard and Via de la Paz in what is considered the central business district (locally referred to as Palisades Village).

Development in the Pacific Palisades neighborhood has been centered on Palisades Village, where redevelopment of the shopping core received approval from the Los Angeles City Council in 2016. The 116,000-square-foot complex on Swarthmore Avenue bordering Sunset Boulevard will include a movie theater, community space, retail, and some residential multiple family units. The development project aims to revitalize this central business district, and is scheduled to open in 2018. Development in other areas of Pacific Palisades is less rampant, due to the physical geography of the area, and a process for development approval that aims to preserve the general coastal habitat. Pacific Palisades sits between the Pacific coastline and the Santa Monica Mountains, and development adjacent to the edges of hillsides and bluffs is inherently hazardous. Because of this, development is restricted by the City of Los Angeles Department of City Planning and conditions are often required for adherence to special geotechnical specifications, appropriate set-backs from landforms, and erosion protection measures to minimize risk to life and property that are associated with development on hillsides and bluffs. A large portion of Pacific Palisades also lies within the jurisdiction of the California Coastal Commission, in which a Coastal Development Permit (CDP) and preparation of a Local Coastal Program (LCP) that is in conformity with the Coastal Act is also required, though to date, no LCP for the Pacific Palisades coastal zone has been adopted or certified by the California Coastal Commission, so development is reviewed and approved on a case-by-case basis. The following figure illustrates the current land use planning

designations as outlined in the 2006 Brentwood – Pacific Palisades Community Plan (a component of the City of Los Angeles General Plan).

Figure 2.2.1-a Generalized Land Use, Brentwood – Pacific Palisades



Source: City of Los Angeles General Plan – Generalized Land Use, Brentwood – Pacific Palisades Community Plan, 2006

City of Malibu. Project Locations No. 2 through 17 exist within project limits that encompass the jurisdiction of the City of Malibu, with unincorporated areas of Los Angeles County interspersed within. Malibu, as a city, was developed as a primarily residential community with occasional neighborhood service facilities located on or adjacent to SR-1/PCH, and while it continues to maintain a coastal, semi-rural characteristic, development continues to expand into the canyons and hillside, though it is severely limited by land that is not suitable for development because of steep terrain, unstable geological conditions, fire hazards, and sensitive environmental resources. The General Plan of the City of Malibu (1995), supplemented and updated through March 2016, was established to guide development and direct growth, and the Land Use Element, in particular, establishes zoning by desired land use types and

includes standards for population and building density. The city planning area contains approximately 12,252 acres, and approximately 60 percent of the land is vacant and undeveloped because of the aforementioned constraints. The dominant land use in the project study area is "Residential," which comprises 21.6 percent of the land area, followed by "Open Space" at roughly 15 percent, which includes local/regional parks, wildlife preserves, arboreta, beach parks, and open space/recreation.

Like the Pacific Palisades neighborhood, Malibu is located within the California coastal zone, and all development and activity occurring within city limits is subject to the Malibu Local Coastal Program (LCP), which was adopted and certified by the California Coastal Commission in 2002. The Malibu LCP is an extension of State law (i.e. the California Coastal Act) implemented at the local level, and is intended to guide zoning, land use, and development in the protection of sensitive coastal resources and maintenance of public access along the Pacific coastline. The policies and regulations of the LCP supersede any policy or regulation of the General Plan of the City of Malibu and zoning code, though the City is granted the authority to review and approve Coastal Development Permits (CDPs).

Development and land use patterns vary considerably in the City of Malibu, and commercial and residential development flanks SR-1/PCH from Topanga to Point Dume. The Malibu Civic Center, located at the base of Malibu Canyon, and Point Dume Plaza, at the intersection of Heathercliff Road and SR-1/PCH, comprise the major commercial areas within the City. The following figures as excerpted from the City of Malibu Local Coastal Program – Land Use Plan (2002) illustrate the current land use planning designation and current development patterns in the City of Malibu.

Figure 2.2.1-b Malibu Land Use Map 1 – Nicholas Canyon to Trancas Beach

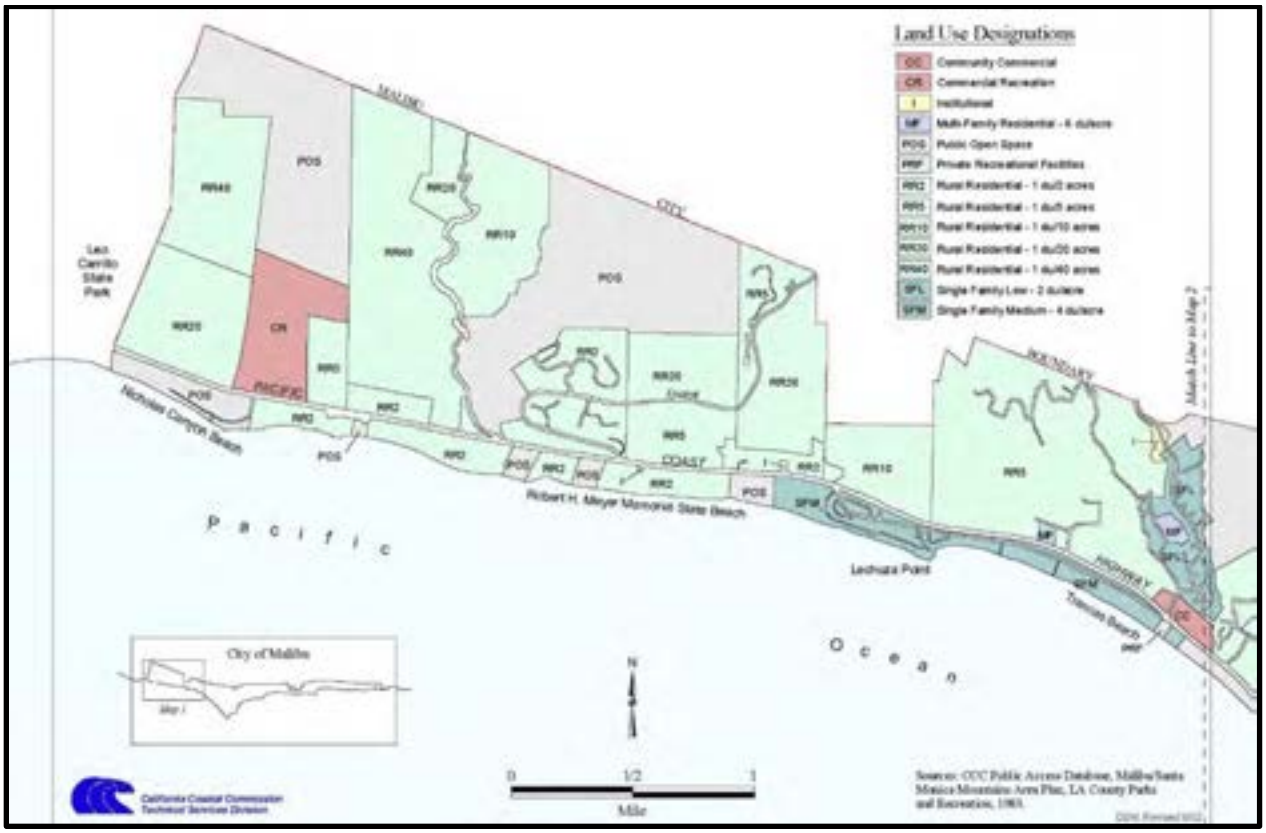


Figure 2.2.1-c Malibu Land Use Map 2 – Zuma Beach to Escondido Beach

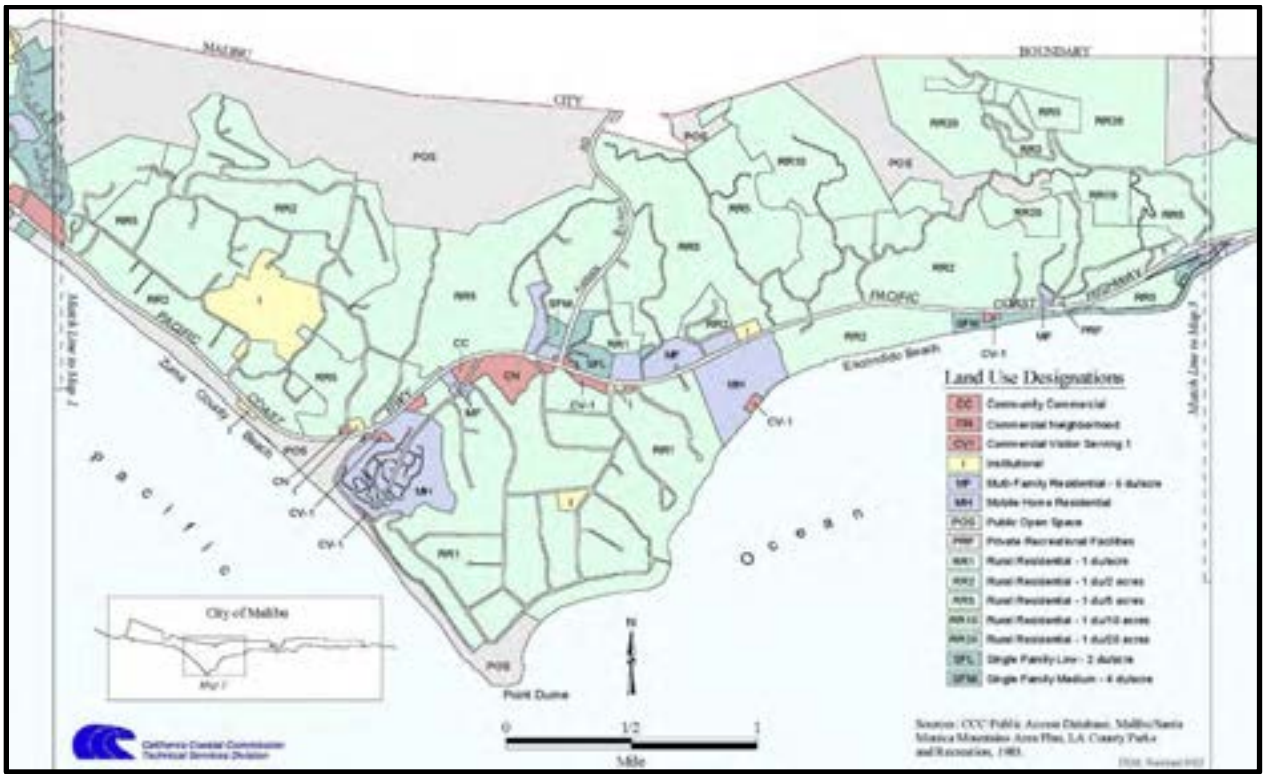


Figure 2.2.1-d Malibu Land Use Map 3 – Dan Blocker to Malibu Pier

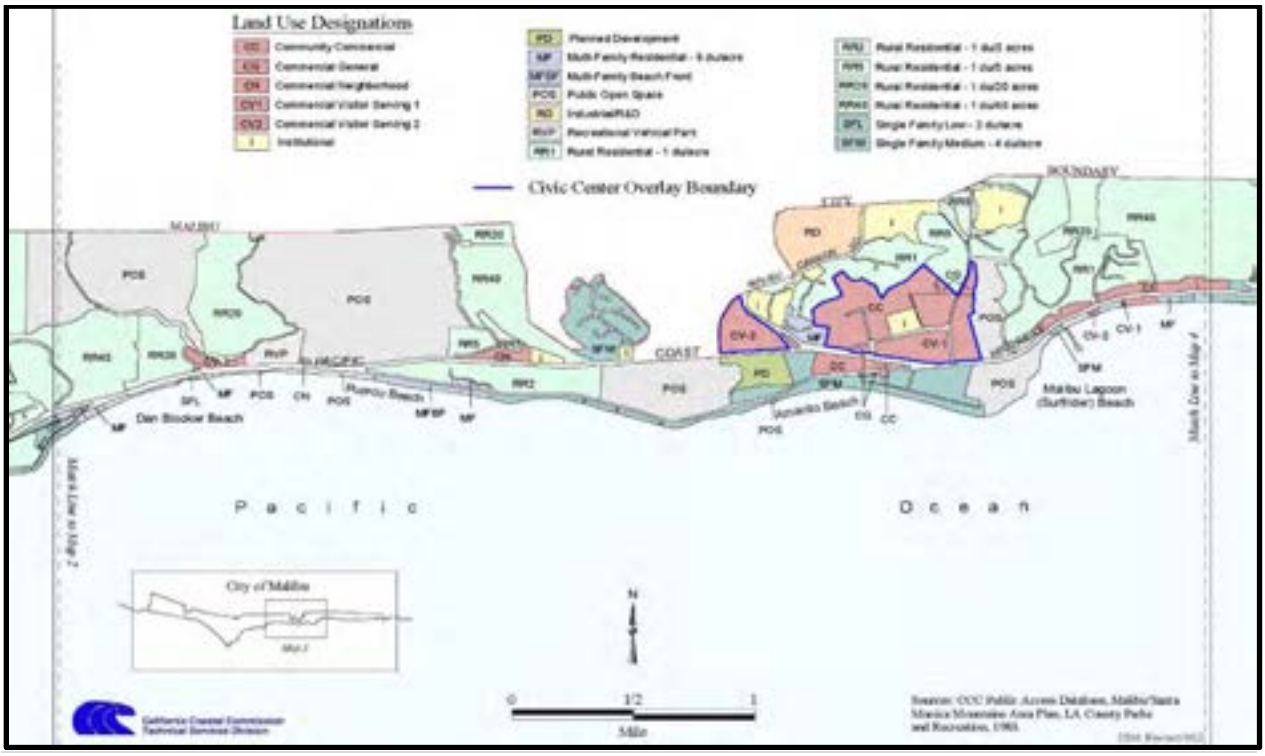


Figure 2.2.1-e Malibu Land Use Map 4 – Carbon Beach to Topanga Beach

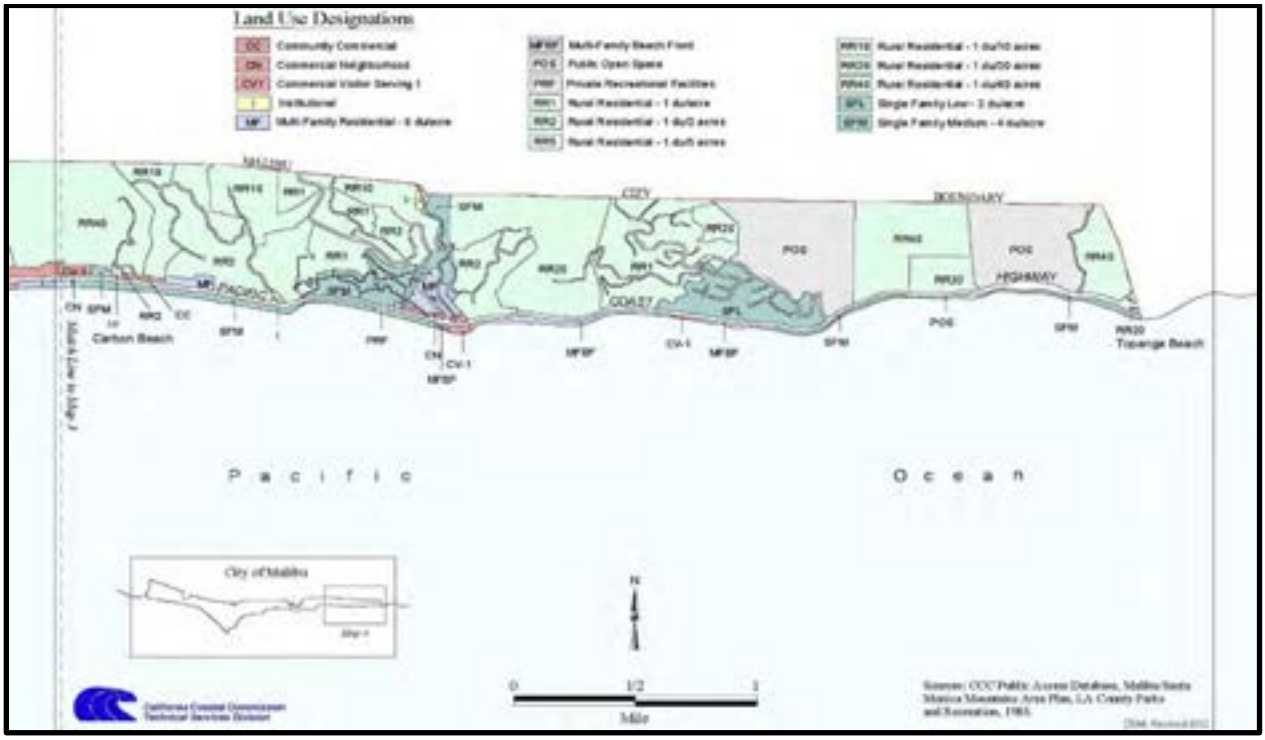


Figure 2.2.1-f Malibu Land Use Map 5 – Civic Center Overlay Area

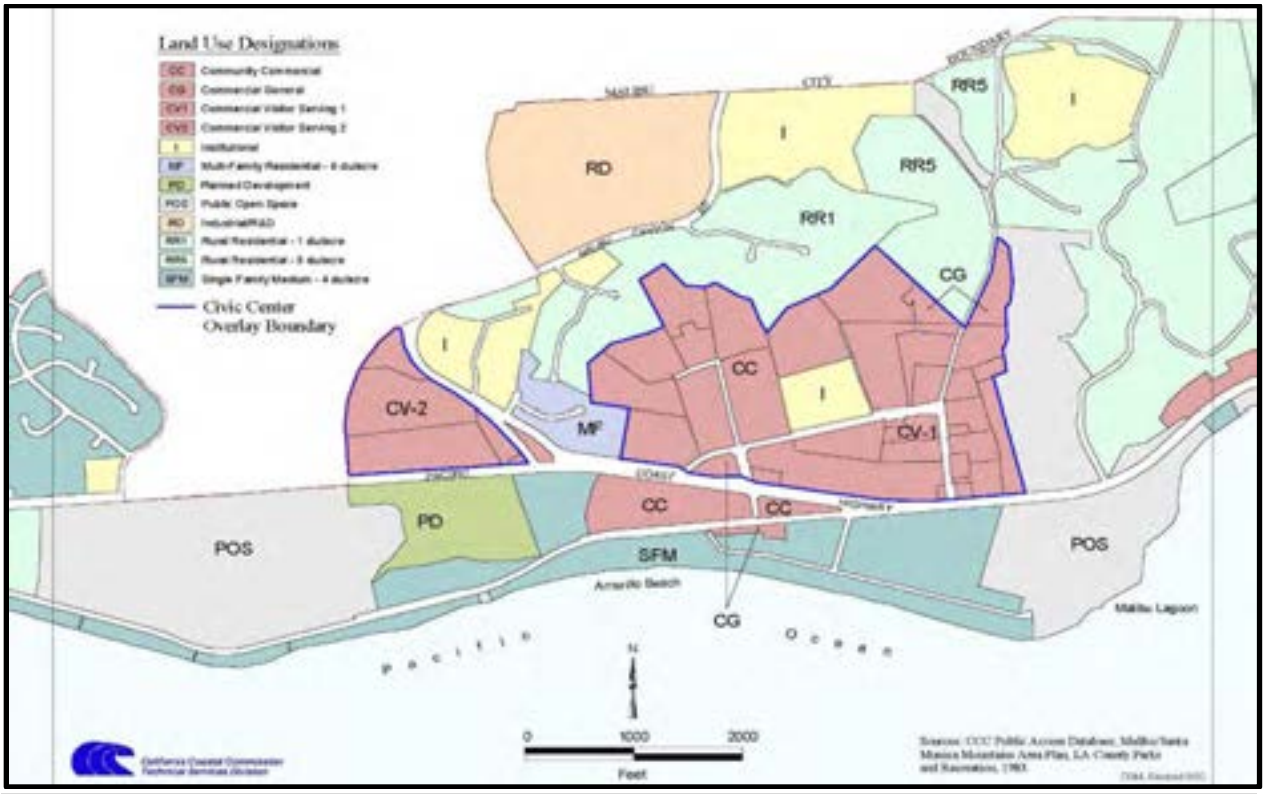


Table 2.2.1-a Development Trends in Malibu

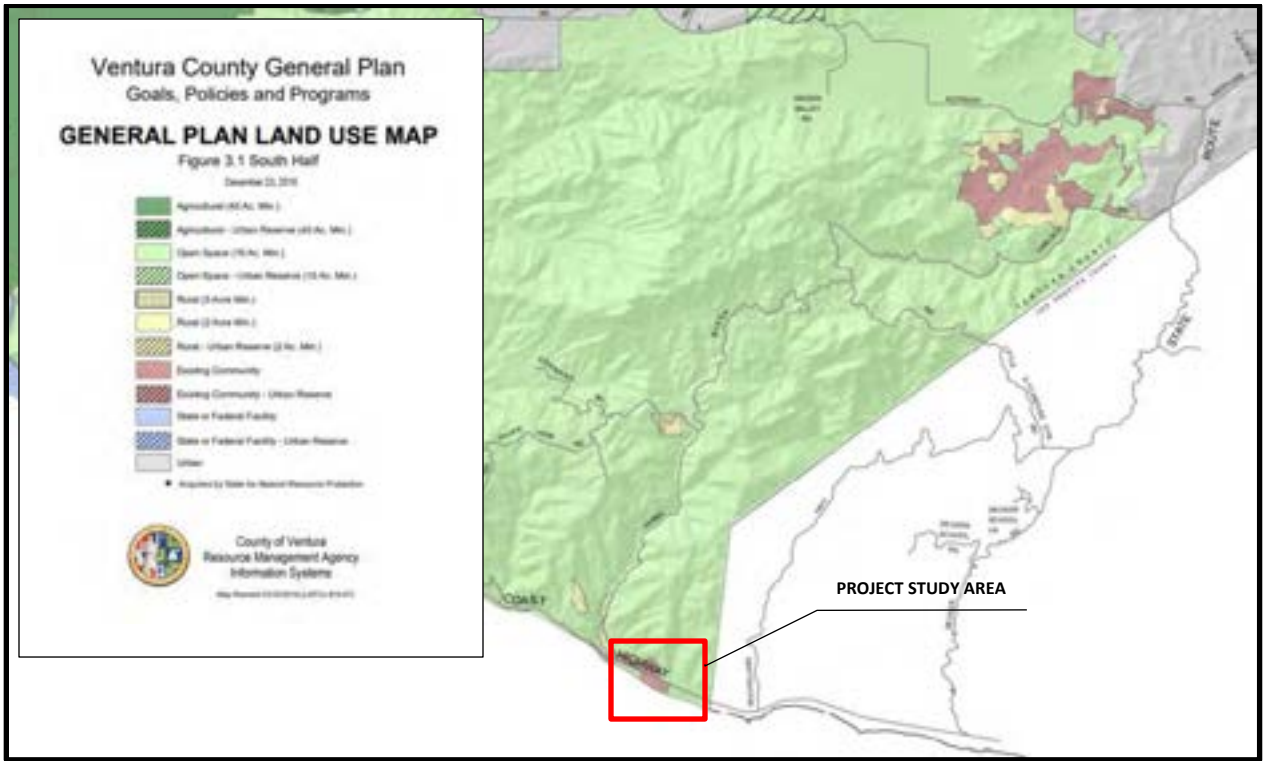
Name of Development/ Location	Lead Agency/ Jurisdiction	Proposed Use	Current Status
Malibu Institute, The *Encinal Canyon Road at Clubhouse Drive*	Los Angeles County	Sports-oriented educational retreat to complement remodeled 18-hole golf course on 650-acre property. Construction of a combined 224,760 square feet of structures.	Draft environmental studies complete. Development on-hold.
Malibu Memorial Park *Pacific Coast Highway and Malibu Canyon Road*	City of Malibu	Memorial park consisting of a chapel, 176 parking spaces, 47 mausoleum structures with a total square footage of 9,400, approximately 28,265 in-ground burial plot spaces, 3,644 interments/well crypt structures, and approximately 65,036 square feet of walking trails on approximately 21 acres of the 27.8-acre site.	Final City Approval on June 5, 2017.
Malibu Surfrider Plaza *Pacific Coast Highway and Sweetwater Canyon Drive*	City of Malibu	Demolition of existing surface parking lot and construction of new commercial plaza providing 7,713 gross square feet of floor area between two buildings, and 82 surface and subterranean parking spaces.	Draft environmental studies complete.
Rancho Malibu Hotel Project *Malibu Canyon road and Civic Center Way*	City of Malibu	Development of a 146-room luxury hotel resort, with approximately 274,775 square feet for both the main hotel building and the 21 detached, two-story secondary hotel buildings.	Draft environmental studies complete.
Santa Monica College – Malibu Campus *Civic Center Way and Webb Way*	Santa Monica Community College District	Demolition of existing building, and construction of a new 25,310 square foot educational facility.	In construction.
Whole Foods and the Park *Civic Center Way and Cross Creek Road*	City of Malibu	Development of two vacant parcels to include a 38,425-square foot community shopping center in the Civic Center area of Malibu.	Environmental studies complete. Development on-hold.

Unincorporated Ventura County. Proposed project Locations No. 18 and 19 exist within an unincorporated area of Ventura County just west of the Los Angeles County/Ventura County line. Similar to the City of Malibu, this portion of unincorporated Ventura County maintains a coastal, semi-rural characteristic, but with more limited development that is characterized by land zoned primarily as agricultural, with occasional existing residential zoned uses along the coast. The Ventura County General Plan (1988) is currently being updated, to more accurately reflect the goals, policies, and programs the County will implement to manage future growth and land uses. The coastal area of unincorporated Ventura County where proposed project Locations No. 18 and 19 exist are managed

through the Ventura County Local Coastal Program (LCP) as an extension of the California Coastal Act. The Ventura LCP consists of the Ventura County Coastal Area Plan and the Coastal Zoning Ordinance (CZO) that aim to ensure that land use and zoning meet the requirements of, and implement the provisions and policies of the California Coastal Act at the local level. Like Malibu, the policies and regulations of the LCP supersede any policy or regulation of the Ventura County General Plan, though the County is granted the authority to review and approval Coastal Development Permits (CDPs).

Development in the immediate area of proposed project Locations No. 18 and 19 is fairly limited characterized by land that is zoned as "open space," with "existing community" land uses interspersed within. SR-1/PCH through this area provides primary access to Malibu beaches on the east, and Leo Carillo State Park/Beach, Point Mugu, and Oxnard on the west before connecting to U.S. Route 101. The Following figure as excerpted from the Ventura County General Plan illustrates the current land use planning designations and current development patterns within the vicinity of proposed project Locations No. 18 and 19.

Figure 2.2.1-g Land Use for Unincorporated Ventura County in the Vicinity of Proposed Project Locations 18/19



Consistency with State, Regional, and Local Plans and Programs

Federal Transportation Improvement Program (FTIP) and the 2016 Southern California Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). The proposed project is listed in the FTIP (FTIP ID: LALS02) as it is eligible for Federal funding, and is included in the current 2016 SCAG RTP/SCS, though the proposed undertaking is not "capacity increasing" by

nature, and not required to conform to or achieve the plans laid out in such. The proposed project does not have the potential to affect existing local or regional traffic conditions, and simply aims to repair, rehabilitate, and enhance existing drainage facilities to restore full functionality, prevent future deterioration, and enhance local habitat through context-sensitive solutions.

Los Angeles County General Plan (2014) and Ventura County General Plan (2014). The Los Angeles and Ventura County General Plans, mandated by State law, are guides for long-term, physical development and conservation through a framework of goals, policies, and implementation programs. They also provide the policy framework for where the unincorporated areas will grow, and establish the goals, policies, and programs to foster healthy, livable, and sustainable communities. The proposed project does not have the potential to affect existing growth patterns on a local or county-wide level, and simply aims to repair, rehabilitate, and enhance existing drainage facilities to restore full functionality, prevent future deterioration, and enhance local habitat through context-sensitive solutions.

City of Los Angeles General Plan (1995) / Brentwood – Pacific Palisades Community Plan (2006-2014). The City of Los Angeles General Plan is a strategy for long-term growth which sets a citywide context to guide the update of the community plan and citywide elements. The General Plan responds to State and Federal mandates to plan for the future using population forecasts provided by the Southern California Associate of Governments (SCAG), though it does not mandate or encourage growth. California State law (Government Code Section 65300) requires that each city prepare and adopt a comprehensive, long-term general plan that contain seven elements, including land use, circulation, housing, conservation, open space, noise, and safety. In fulfilment of the State's requirements, the General Plan contains citywide elements for all the aforementioned topics except Land Use, for which Community Plans establish policy and standards for each of the city's 35 geographic areas.

The Brentwood-Pacific Palisades Community Plan is the official guide to the future development in this geographic area and is intended to promote an arrangement of land uses, streets, and services which encourage and contribute to the economic, social, and physical health, safety, welfare, and convenience of the people who live and work in the community. The Community Plan ensures that sufficient land is designated which provides for the housing, commercial, employment, educational, cultural, social, and aesthetic needs of its residents. The proposed project does not have the potential to affect existing growth patterns within this context, and simply aims to repair, rehabilitate, and enhance existing drainage facilities to restore full functionality and prevent future deterioration. Only one proposed project location (Location No. 1 at post mile 37.67) exists within this geographic location, with a limited scope of work that includes the removal of debris from an existing corrugated steel drainage pipe, and replacement of cured-in-place pipe lining – this scope of work will have no effect on land use or development plans whatsoever.

Malibu General Plan (1995). The Malibu General Plan serves as the major tool for directing growth while maintaining an attractive, viable, and safe environment, and outlines a vision of what the city should be, and also establishes policies to achieve the objectives. It provides an analysis of existing conditions in the city, including physical, social, cultural and environmental resources and opportunities. It looks at trends, issues, and concerns that effect the region and provides policies to guide development and change by identifying common goals, objectives and programs. Like the City of Los Angeles General Plan, the Malibu General Plan was developed to form and contain seven state-mandated elements: Land Use Element, Conservation Element, Open Space and Recreation Element, Circulation and Infrastructure Element, Safety and Health Element, Noise Element, and a Housing Element. All of these elements,

taken together, establish a comprehensive plan, setting forth a consistent guide to future development in the city. In addition, the General Plan relates to several requirements of the California Coastal Act in which the Malibu Local Coastal Program was developed.

The proposed project does not have the potential to affect existing growth patterns on a local level, and simply aims to repair, rehabilitate, and enhance existing drainage facilities to restore full functionality and prevent future deterioration, but its goals in enhancing local habitat through context-sensitive solutions, particularly at Solstice Canyon Creek, assist in fulfilling goals as outlined in the Conservation Element as laid out in the Malibu General Plan.

The Conservation Element serves as a guide for the conservation, protection, restoration, and management, development, and appropriate and responsible utilization of the city's existing natural resources. Solstice Canyon, in particular, is a relatively undisturbed watershed with a riparian woodland that support white alder (*Alnus rhombifolia*), coast live oak, western sycamore, and California bay (*Umbellularia californica*). A large native wildlife population is present in this watershed due to both the lack of disturbance and the well-developed vegetation. The presence of white alder throughout the entire watershed indicates a perennial supply of water, but while the riparian woodland extends downstream, there is no natural stream habitat south of Pacific Coast Highway (project study area), but the proposed improvements associated with this project would aid in the recovery of such.

City of Malibu Local Coastal Program (2002). In October 1972, the United State Congress passed Title 16 U.S.C. 1451-1464, which established a federal coastal zone management policy and created a federal coastal zone. By that legislation, the Congress declared a national interest in the effective management, beneficial use, protection and development of the coastal zone in order to balance the nation's natural, environmental, and aesthetic resource needs with commercial-economic growth. The California Coastal Zone Conservation Act of 1972 (Proposition 20) was a temporary measure passed by the voters of the state as a ballot initiative. It set up temporary regional Coastal Commissions with permit authority and a directive to prepare a comprehensive coastal plan. The California Coastal Act of 1976 is the permanent enactive law approved by the State legislature. The Coast Act established a different set of policies, a different boundary line, and different permitting procedures than Proposition 20. Further, it provided for the transfer of permitting authority, with certain limitations reserved for the State, to local governments like the City of Malibu through adoption and certification of Local Coastal Programs (LCPs) by the Coastal Commissions.

Certified by the California Coastal Commission in 2002, the Malibu LCP consists of the city's land use plans, zoning ordinances, zoning district maps, and within sensitive coastal resource areas, other implementing actions, which, when taken together, meet the requirements of, and implements the provisions and policies of the Coastal Act at the local level. The Land Use Plan component of the Malibu LCP indicates and drive the kind, location, and intensity of land uses, the applicable resource protection and development policies, and where necessary, a listing of implementing actions. The proposed project does not have the potential to affect land use within this context as it simply aims to repair, rehabilitate, and enhance existing drainage facilities to restore full functionality and prevent future deterioration, but the proposed improvements do fulfil objectives of the Coastal Act in the preservation, protection, and enhancement of coastal resources, including land and marine habitats, and water quality. In particular, the proposed improvements at Solstice Canyon Creek are anticipated to restore, protect, and enhance an environmentally sensitive habitat area in order to maintain biological productivity and general quality of coastal waters.

Ventura County Local Coastal Program (2017). Similar to the City of Malibu Local Coastal Program, the Ventura County Local Coastal Program (LCP) was initiated in response to the 1976 mandate by the California Legislature for management, conservation, and development of coastal resources through this comprehensive planning and regulatory program. The Ventura LCP consists of the Ventura County Coastal Area Plan and the Coastal Zoning Ordinance (CZO) with the primary goal of ensuring that local government's land use plan, zoning ordinances, zoning maps, and implemented actions meet the requirements of, and implement the provisions and policies of the Coastal Act at the local level.

In addition to being an element of Ventura County's LCP, the Coastal Area Plan is also an Area Plan for the unincorporated coastal portions of Ventura County, and particularly where proposed project Locations No. 18 and 19 are located. The Coastal Area Plan addresses topics such as shoreline access and public trails; development in scenic areas, coastal hazards, and coastal bluffs; environmentally sensitive habitat areas; cultural resources; transportation; public services; and more. The LCP specifically applies to development undertaken in the unincorporated portions of the Coastal Zone of Ventura County. The proposed undertaking will be completely consistent with the goals set forth in the Ventura County LCP, and is subject to approval by Ventura County prior to commencement of construction.

Solstice Canyon Creek Fish Passage Restoration – California Coastal Conservancy (2005). In 2005, the California Coastal Conservancy authorized the disbursement of funds to the National Park Service (NPS) to initiate a plan to remove fish passage barriers and restore habitat conditions to facilitate passage for Southern steelhead trout in the Solstice Creek watershed. The proposed actions would support the removal of human-made fish passage barriers,and restore stream habitat to both facilitate steelhead restoration and serve as a location for environmentally sensitive educational outreach and public use. The plan and proposal involved the removal of three check dams and four Arizona crossings (a low-water crossing that provides a bridge when water flow is low) to ensure a significant length of streambed is available for spawning of southern steelhead trout.

The aforementioned proposal was designed to complement two other projects in the Solstice Creek watershed funded by other sources – the modification of the Corral Canyon Road Bridge and the modification of the culvert at Pacific Coast Highway (SR-1/PCH), both downstream of the proposed project area. In 2008, the City of Malibu, in conjunction with the California Department of Fish and Wildlife (CDFW), completed the removal of barriers preventing fish passage which included the demolition, removal, and replacement of the old concrete bridge located on Corral Canyon Road, and just north of the Caltrans facility at SR-1/PCH. Caltrans modification of the culvert at SR-1/PCH as proposed in this project, in combination with the aforementioned projects by the City of Malibu, CDFW, NPS and the California Coastal Conservancy would provide the southern steelhead trout with a continuous, unobstructed fish passage route to the rich upstream spawning areas of Solstice Canyon.

2.2.2 COASTAL ZONE

Regulatory Setting

This project has the potential to affect resources protected by the Coastal Zone Management Act (CZMA) of 1972. The CZMA is the primary federal law enacted to preserve and protect coastal resources. The CZMA sets up a program under which coastal states are encouraged to develop coastal management programs. States with an approved coastal management plan are able to review federal permits and activities to determine if they are consistent with the state's management plan.

California has developed a coastal zone management plan and has enacted its own law, the California Coastal Act of 1976, to protect the coastline. The policies established by the California Coastal Act are similar to those for the CZMA: They include the protection and expansion of public access and recreation; the protection, enhancement, and restoration of environmentally sensitive areas; the protection of agricultural lands; the protection of scenic beauty; and the protection of property and life from coastal hazards. The California Coastal Commission is responsible for implementation and oversight under the California Coastal Act.

Just as the federal CZMA delegates power to coastal states to develop their own coastal management plans, the California Coastal Act delegates power to local governments to enact their own local coastal programs (LCPs). This project is subject to the City of Malibu's LCP and the Ventura County LCP. LCPs contain the ground rules for development and protection of coastal resources in their jurisdiction consistent with the California Coastal Act goals. A Federal Consistency Certification will be needed as well. The Federal Consistency Certification process will be initiated prior to FED and will be completed to the maximum extent possible during the NEPA process.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

All proposed project locations fall within the Coastal Zone Boundary established in the Coastal Act, and within the jurisdiction of the California Coastal Commission. As previously mentioned, the transfer of permitting authority was transferred to the City of Malibu in the certification of the Malibu Local Coastal Program (Malibu LCP) in 2002, which consists of the city's land use plans, zoning district maps, and within sensitive coastal resource areas, other implementing actions, which, when taken together, meet the requirements of, and implements the provisions and policies of the Coastal Act at the local level. Enacted in 1983, the Ventura County LCP consists of the Coastal Area Plan (CAP), the Coastal Zoning Ordinance (CZO), and two Categorical Exclusion Orders – all of which are subject to the Coastal Act (PRC § 30000et seq.) and corresponding Coastal Regulations (14 Cal. Code of Regs. § 13000 et seq.).

Significant coastal resources vary throughout the project study area and include environmentally sensitive habitat areas (coastal sage scrub and/or chaparral, riparian areas and wetlands), near shore shallow-water fish habitat, areas utilized by sea lions, Pismo Clam habitat, kelp beds, and various streams that flow from the Santa Monica Mountains to the Pacific Ocean.

Environmental Consequences

In general, the goals of the Coastal Act, the Malibu LCP, and the Ventura County LCP are to protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources. This assures an orderly, balanced utilization and conservation of coastal zone resources, while accounting for the social and economic needs of the community. The Coastal Act also aims to maximize public access along the coast and maximize public recreational opportunities in the coast zone consistent with sound resources conservation principles and constitutionally protected rights of private property owners. The following tables summarize anticipated impacts to coastal resources, if any, in consideration of the proposed project improvements, and the relevant technical studies initiated to determine such. The tables also demonstrate the proposed project's consistency with policies set forth in both the Malibu LCP and the Ventura LCP as derived from the Coastal Act of 1976.

Table 2.2.2-a Proposed Project Consistency with Malibu Local Coastal Program (Malibu LCP), Malibu Land Use Plan (Malibu LUP)

Policy Chapter in the Malibu LUP	Policy Subject	Discussion
Chapter 2	**Public Access and Recreation**	**Temporary, Construction-Related Lane Closures.** Temporary, construction-related effects to public access of the coast are anticipated, particularly as they relate to lane closures during construction at drainage locations, and during the construction of the new bridge structure at project Location No. 10. Caltrans continues to coordinate with local jurisdictions, and a Transportation Management Plan (TMP) will be implemented accordingly to provide detailed access and detour strategies that would minimize any effects related to such. **Beach Access.** None of the improvements associated with the proposed project include any permanent impacts to public access to the coast, though beach access will be required for construction vehicles and equipment at Will Rogers State Beach, Dan Blocker Beach, and Leo Carillo State Beach. Caltrans shall maintain access to these facilities during the duration of construction and continues to coordinate with respective jurisdictional agencies to minimize any effects during construction.
Chapter 3	**Marine and Land Resources**	**Environmentally Sensitive Habitats**. Any potential effects to environmentally sensitive habitat areas and significant coastal resources are only anticipated at Project Location No. 10, where it is proposed that the existing bridge/culvert be replaced with a new bridge structure with an underlying natural slope. This riparian corridor landward of the proposed new bridge structure matches the description of the California Sycamore series as described by the Sawyer and Keeler-Wolf vegetation classification system. Solstice Canyon Creek terminates onto a coastal beach habitat leading to the Pacific Ocean. During times of high flows, a large portion of the sand bar is breached, exposing more of the downstream channel. Coastal regional migratory birds often use riparian habitats for resting and foraging. It is estimated that approximately 3300 square feet (0.08 acres) of Alder/Sycamore Riparian habitat will be impacted but offset by a proposed replanting of 0.08 acres on-site, and 0.08 acres off-site. At the same project location, it is estimated that 50,200 square feet (1.15 acres) of Coastal Scrub will be impacted during construction of the new bridge structure but offset by a proposed replanting of 1.15 acres on-site (hydroseeding with 2-year watering). Determinations and appropriate measures will be reviewed by the City of Malibu during the Local Coastal Development permit application process. **Water Quality Impacts Related to Disturbed Soil Area (DSA) and Net Additional Impervious Area.** It is anticipated that the proposed project operations would slightly increase runoff volume, but it is not anticipated to affect downstream flow, discharge to lined channels, potential sediment loading, or cause other hydraulic changes to the storm drain system affecting downstream channel stability as a result of increases in Disturbed Soil Areas (DSAs) and Net Additional Impervious Areas (AIA). **Water Quality Impacts Related to Total Maximum Daily Loads (TMDLs).** The proposed project lies within the Santa Monica Bay, Malibu Creek, and Ventura Coastal Streams watersheds, and storm water runoff in the project study area discharges through the storm drain systems and eventually out into a number of receiving 303(d) listed water bodies. The 303(d) list is a list of impaired and threatened waters (stream/river segments, lakes) that the Clean Water Act (CWA) requires prioritization and development of TMDLs based on the severity of pollution and the sensitivity of the uses to be made of the waters. Regional water quality control board special requirements/concerns, including TMDLs and/or effluent limits as they pertain to the proposed project will occur in the next design phase. Caltrans will comply with the pertinent TMDL standards, and project engineers shall consider treatment controls for the proposed project and consult with the Caltrans NPDES Storm Water Coordinator to be in compliance.

Table 2.2.2-a (continued) Proposed Project Consistency with Malibu Local Coastal Program (Malibu LCP), Malibu Land Use Plan (Malibu LUP)

Policy Chapter in the Malibu LUP	Policy Subject	Discussion
Chapter 4	**Hazards and Shoreline/Bluff Development**	**Earthquakes.** The project study area exists within a seismically active region of Southern California, and close to a number of faults that are considered to be active or potentially active, with a shear wave velocity (VS30) of 883 feet/second (270 meters/second). Location No. 10 is located 0.05 miles north of the Malibu Coast on a strike-slip fault, for which the magnitude of the maximum credible earthquake (MCE) is 6.6. The design median peak ground acceleration (PGA) at Location No. 10 is approximately 0.69g. Other nearby faults, including the Anacapa-Dume Alt 1 fault and the Santa Monica fault would be expected to have a lesser impact on the proposed bridge structure. While seismicity/earthquakes pose a minimal hazard threat to project locations where improvements are limited to existing drainage facilities, the proposed new bridge structure at project Location No. 10 will be designed to minimize impacts regarding such. **Tsunamis.** Coastal communities in Southern California, including the coastal areas within the City of Malibu, are vulnerable to tsunamis. Tsunamis may be generated immediately offshore of Malibu by surface ground rupture of faulting or by the occurrence of submarine landslides. Run-up heights along the City of Malibu shoreline are estimated between five and seven feet for the 100-year zone, and between eight and twelve feet for the 500-year zone. While tsunamis pose a minimal hazard threat to project locations where improvements are limited to existing drainage facilities, the proposed new bridge structure at project Location No. 10 will be designed to minimize impacts regarding such. **Liquefaction.** Impacts related to liquefaction are not anticipated to be significant at project locations where improvements are limited to existing drainage facilities. According to the map of the Earthquake Fault Zones and Seismic Hazard Zones of Malibu Beach 7.5 Minute Quadrangles released on August 16, 2007, project Location No. 10 is within an area delineated as a liquefaction zone, but based on the SPT N values and groundwater table levels from previous logs of test borings, the on-site soils have a minimal potential to be liquefiable during a seismic event.

Table 2.2.2-b Proposed Project Consistency with the Ventura County Local Program (Ventura County LCP), Ventura County Coastal Zoning Ordinance (Ventura CZO)

Section of the Ventura CZO	Policy Subject	Discussion
8178-2.4c	**Creek Corridors**	Any potential effects to relevant and significant coastal resources are only anticipated at Project Location No. 10, where it is proposed that the existing bridge/culvert be replaced with a new bridge structure with an underlying natural slope. This riparian corridor landward of the proposed new bridge structure matches the description of the California Sycamore series as described by the Sawyer and Keeler-Wolf vegetation classification system. Solstice Canyon Creek terminates onto a coastal beach habitat leading to the Pacific Ocean. During times of high flows, a large portion of the sand bar is breached, exposing more of the downstream channel. Coastal regional migratory birds often use riparian habitats for resting and foraging.
8178-3	**Archaeological/ Historic Resources**	Any potential effects to archaeological resources are limited to the project study area within the vicinity of proposed project Locations No. 9 and 10. The Area of Potential Effects (APE) in this area encompasses the boundaries of archaeological site CA-LAN-210, though background research and examination of previous technical reports and maps for the area show that the totality of the APE has been previously disturbed by road construction (including associated culverts and drainage systems) and other development activities. While the potential is low for encountering intact archaeological deposits during construction and excavation activities, archaeological and Native American monitoring will be implemented to ensure any effect would be minimal.
8178-4	**Mitigation of Potential Hazards**	**Earthquakes.** The project study area exists within a seismically active region of Southern California, and close to a number of faults that are considered to be active or potentially active, with a shear wave velocity (VS30) of 883 feet/second (270 meters/second). Location No. 10 is located 0.05 miles north of the Malibu Coast on a strike-slip fault, for which the magnitude of the maximum credible earthquake (MCE) is 6.6. The design median peak ground acceleration (PGA) at Location No. 10 is approximately 0.69g. Other nearby faults, including the Anacapa-Dume Alt 1 fault and the Santa Monica fault would be expected to have a lesser impact on the proposed bridge structure. While seismicity/earthquakes pose a minimal hazard threat to project locations where improvements are limited to existing drainage facilities, the proposed new bridge structure at project Location No. 10 will be designed to minimize impacts regarding such. **Tsunamis.** Coastal communities in Southern California, including the coastal areas within the City of Malibu, are vulnerable to tsunamis. Tsunamis may be generated immediately offshore of Malibu by surface ground rupture of faulting or by the occurrence of submarine landslides. Run-up heights along the City of Malibu shoreline are estimated between five and seven feet for the 100-year zone, and between eight and twelve feet for the 500-year zone. While tsunamis pose a minimal hazard threat to project locations where improvements are limited to existing drainage facilities, the proposed new bridge structure at project Location No. 10 will be designed to minimize impacts regarding such. **Liquefaction.** Impacts related to liquefaction are not anticipated to be significant at project locations where improvements are limited to existing drainage facilities. According to the map of the Earthquake Fault Zones and Seismic Hazard Zones of Malibu Beach 7.5 Minute Quadrangles released on August 16, 2007, project Location No. 10 is within an area delineated as a liquefaction zone, but based on the SPT N values and groundwater table levels from previous logs of test borings, the on-site soils have a minimal potential to be liquefiable during a seismic event.
8178-6	**Beach Access**	**Beach Access.** None of the improvements associated with the proposed project include any permanent impacts to public access to the coast, though beach access will be required for construction vehicles and equipment at Will Rogers State Beach, Dan Blocker Beach, and Leo Carillo State Beach. Caltrans shall maintain access to these facilities during the duration of construction, and continues to coordinate with respective jurisdictional agencies to minimize any effects during construction.
8178-7	**Tree Protection Regulations**	Any potential effects to trees are only anticipated at Project Location No. 10, where it is proposed that the existing bridge/culvert be replaced with a new bridge structure with an underlying natural slope. This riparian corridor landward of the proposed new bridge structure matches the description of the California Sycamore series as described by the Sawyer and Keeler-Wolf vegetation classification system. It is estimated that approximately 3300 square feet (0.08 acres) of Alder/Sycamore Riparian habitat will be impacted, but offset by a proposed replanting of 0.08 acres on-site, and 0.08 acres off-site.

2.2.3 PARKS AND RECREATIONAL FACILITIES

Within project limits, Pacific Palisades and Malibu are home to many parks and open space areas that are available for public enjoyment. Depending on location along SR-1/PCH, these facilities are owned, managed and operated by the National Park Service, State of California Department of Parks and Recreation, County of Los Angeles Department of Beaches and Harbors, Ventura County Local Coastal Program, City of Los Angeles Department of Recreation and Parks, or the City of Malibu. Only parks and recreational facilities within 0.5 miles of the project study area were analyzed for any potential effects as a result of the proposed project improvements as detailed in the following table:

Table 2.2.3-a Parks and Recreational Facilities within the Project Study Area

Park/Recreational Facility	Post Mile	Jurisdiction
Potrero Canyon Park	37.50	City of Los Angeles Department of Recreation and Parks
Temescal Canyon Park	38.02	City of Los Angeles Department of Recreation and Parks
Will Rogers State Beach	38.45	State of California Department of Parks and Recreation
Topanga State Park	40.70	State of California Department of Parks and Recreation
Las Tunas Beach	41.85	Los Angeles County Department of Beaches and Harbors
Las Flores Creek Park	44.12	City of Malibu Parks and Recreation
Malibu Surfrider Beach	46.64	Los Angeles County Department of Beaches and Harbors
Malibu Lagoon State Beach	46.98	State of California Department of Parks and Recreation
Malibu Legacy Park	47.26	City of Malibu Parks and Recreation
Malibu Bluffs Park	48.20	City of Malibu Parks and Recreation
Dan Blocker Beach	50.48	Los Angeles County Department of Beaches and Harbors
Solstice Canyon Park	50.81	National Park Service (NPS)
Point Dume State Beach	54.41	State of California Department of Parks and Recreation
Zuma Beach	55.39	Los Angeles County Department of Beaches and Harbors
Robert H. Meyer Memorial State Beach	58.88	State of California Department of Parks and Recreation
Nicholas Canyon Beach	61.23	Los Angeles County Department of Beaches and Harbors
Leo Carillo State Park	62.35	State of California Department of Parks and Recreation

California Public Park Preservation Act of 1971. *Public Resources Code* Section 5400-5409, as codified in the Public Park preservation Act of 1971, states that "No city, city and county, county, public district, or agency of the state, including any division department or agency of the state government, or public utility, shall acquire any real property, which property is in use as a public park at the time of such acquisition, for the purposes of utilizing such property for any non-park purpose, unless the acquiring entity pays or transfers to the legislative body of the entity operating the park sufficient compensation or land, or both."

No permanent full or partial acquisition, or displacement of the listed community/public park facilities would be required with either Alternative 1 (No-Build Alternative) or Alternative 2 [Rehabilitate Drainage at 19 Locations, including Replacement of Bridge/Culvert with New Bridge Structure with and Underlying Natural Slope creek bottom at Solstice Canyon Creek (Location No. 10)]. Therefore, there would be no effect to the listed community facilities within the context of the California Public Park Preservation Action of 1971.

Section 4(f) / Code of Federal Regulations, Title 23, Part 774 (23 CFR 774). Since the mid-1960s, federal transportation policy has reflected an effort to preserve publicly owned parks and recreation areas, waterfowl and wildlife refuges, and historic sites considered to have national, state, or local significance.

The Department of Transportation Act of 1996 included a special provision to carry out this effort, which was 23 CFR 774, or Section 4(f). Section 4(f) stipulated that the Federal Highway Administration (FHWA) and other U.S. Department of Transportation agencies cannot approve the use of land from a significant publicly owned park, recreation area, wildlife or waterfowl refuge, or any significant historic site unless there is no feasible and prudent alternative to the use of land; and the action includes all possible planning to minimize harm to the property resulting from use.

Caltrans considered the proposed project alternatives within the context of Section 4(f), and because it was found that there is no potential for effects on waterfowl and wildlife refuges, analyses were focused on 1) publicly owned parks and recreation areas within the project study area, and 2) historic sites considered to have national, state, or local significance. With Alternative 1 (No-Build Alternative), the proposed project would not be constructed, there would be no alternations or improvements to the existing drainage systems, and no replacement of the existing bridge/culvert with an underlying natural slope creek bottom. Consequently, there would be no potential effect on Section 4(f) resources/facilities in the project study area.

While all of the previously listed parks and recreational facilities within the project study area qualify as protected Section 4(f) properties, Alternative 2 [Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope creek bottom (Location No. 10)], as currently proposed, does not have to potential to affect every property. Caltrans further screened all Section 4(f) protected properties in the project study area and found that the proposed undertaking would only have the potential to affect four (4) publicly owned parks and recreation areas in the project study area. Section 4(f) protections also extend to historic sites within the project study area and one (1) property was identified where the proposed undertaking had the potential to affect the resource. The following table summarizes the results of this screening, and a more detailed analysis of Section 4(f) resources in the project study area can be referenced in Appendix A of this environmental document entitled, “Resources Evaluated Relevant to the Requirements of Section 4(f).”

Table 2.2.3-b Results of Screening of Section 4(f) Properties and Proposed Use Determinations

Section 4(f) Protected Resource/Facility	Post Mile	Jurisdiction	Project Locations within Vicinity of Resource/Facility	Scope of Work	Proposed Section 4(f) Use Determination	Remarks
Publicly Owned Parks and Recreation Areas						
Will Rogers State Beach	38.45	State of California Department of Parks and Recreation	Location 1 | PM 37.67	Remove debris from corrugated steel drainage pipe, replace cured-in place pipe lining	Temporary occupancy (Exception)	No permanent acquisition of lands required. Beach access required for temporary access road. Duration of access less than duration of construction of full project.
			Location 2 | PM 39.08	Replace existing pipe with 24" RCP	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
			Location 3 | PM 40.16	Replace 36" CMP	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
			Location 4 | PM 40.18	Install culvert barrel lining (CIP) in upstream section of pipe, replace in-kind 24" RCP middle section of downstream pipe using Cut-and-Cover method, install culvert barrel lining downstream (CIP) section of pipe	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway and partially on beach to replace drainage pipe.
			Location 5 | PM 40.23	Remove debris from corrugated steel drainage pipe, replace cured-in place pipe lining	Temporary occupancy (Exception)	No permanent acquisition of lands required.
			Location 6 | PM 40.24	Replace 36" RCP and 18" CMP sections	Temporary occupancy (Exception)	No permanent acquisition of lands required.
Dan Blocker Beach	50.48	Los Angeles County Department of Beaches and Harbors	Location 7 | PM 50.05	Replace 18" RCP	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
			Location 8 | PM 50.08	Replace 24" CMP	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
			Location 9 | PM 50.28	Install culvert barrel lining (CIP), repair joint seals at headwall and pipe, regrade channel and remove debris and vegetation at outlet	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
			Location 10 | PM 50.39	Replace bridge/culvert with new bridge with underlying natural slope creek bottom	Temporary occupancy (Exception)	No permanent acquisition of lands required. Excavation for new bridge structure within creek and existing easements only.

Table 2.2.3-b (continued) Results of Screening of Section 4(f) Properties and Proposed Use Determinations

Section 4(f) Protected Resource/Facility	Post Mile	Jurisdiction	Project Locations within Vicinity of Resource/Facility	Scope of Work	Proposed Section 4(f) Use Determination	Remarks
Nicholas Canyon Beach	61.23	Los Angeles County Department of Beaches and Harbors	Location 13 | PM 61.29	Replace 24" RCP	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe. Beach access required for temporary access road. Duration of access less than duration of construction of full project.
			Location 14 | PM 61.35	Replace 24" RCP	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe. Beach access required for temporary access road. Duration of access less than duration of construction of full project.
Leo Carillo State Park and Beach	62.35	State of California Department of Parks and Recreation	Location 15 | PM 61.68	Replace 24" RCP	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
			Location 16 | PM 62.51	Replace 24" RCP on upstream section, joint seal manhole	Temporary occupancy (Exception)	No permanent acquisition of lands required.
			Location 17 | PM 62.55	Install culvert barrel lining (CIP), remove debris and clear manhole, and replace 18" CMP on downstream section	Temporary occupancy (Exception)	No permanent acquisition of lands required.
			Location 18 | PM 0.37	Install culvert barrel lining (CIP), replace lid/grate for upstream drop inlet	Temporary occupancy (Exception)	No permanent acquisition of lands required.
			Location 19 | PM 0.92	Install culvert barrel lining (CIP)	Temporary occupancy (Exception)	No permanent acquisition of lands required.
Historic Sites Considered to Have National, State, or Local Significance						
Archaeological Site CA-LAN-210	50.48	No public ownership or ties to any jurisdictional agency	Location 9 | PM 50.28	Install culvert barrel lining (CIP), repair joint seals at headwall and pipe, regrade channel and remove debris and vegetation at outlet	No Use	No permanent acquisition of lands required. Minor excavation limited to regrading of existing channel and vegetation removal at outlet of drainage pipe.
			Location 10 | PM 50.39	Replace bridge/culvert with new bridge with underlying natural slope creek bottom	No Use	No permanent acquisition of lands required. Intact cultural deposits likely to occur at depths of 23 and 33 feet. Maximum excavation for construction of bridge structure is 15 feet – potential for effects as a result of exaction is low.

CMP = Corrugated Metal Pipe CSP = Corrugated Steel Pipe RCP = Reinforced Concrete Pipe CIP = Cured-In-Place pipe lining
*NOTE: Proposed project Locations No. 11/12 do not have the potential to affect Section 4(f) resources/properties

2.2.4 COMMUNITY IMPACTS

Relocations and Real Property Acquisitions

Regulatory Setting

The Department's Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), and Title 49 Code of Federal Regulations (CFR) Part 24. The purpose of the RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

All relocation services and benefits are administered without regard to race, color, national origin, persons with disabilities, religion, age, or sex. Please see the appendices of this document for a copy of the Department's Title VI Policy Statement.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, none of the proposed alternatives require displacement or relocation of any persons or businesses, but the potential for real property acquisition exists at project Location No. 10 at Solstice Canyon Creek (replace bridge/culvert with new bridge with an underlying natural slope creek bottom). State Route 1 (Pacific Coast Highway) traverses east-west through the project study area, and the nature of the potentially affected property (AIN No. 4459-008-001) on the northern side of the highway is predominantly commercial/industrial and totals approximately 4,975 square feet in size. Currently, Solstice Canyon Creek occupies the western side of the parcel, with existing structures occupying the eastern and northern portions. The parcel as it exists now contains a restaurant with gift shop and one single family residence on the east, and a warehouse structure on the north. The proposed acquisition is required for activities related to the removal of the existing bridge structure and culvert within Solstice Canyon Creek, and to construct the new wider bridge structure with an underlying natural slope creek bottom. Permanent acquisition is limited to the area surrounding the inlet on the north side of the proposed bridge structure at project Location No. 10 (Solstice Canyon Creek). Additionally, a temporary access road will be required from the eastern side of Corral Canyon Road to access the creek. The following figure illustrates the proposed permanent acquisition and temporary access required to construct the new bridge structure, and the general nature of the parcel within the project study area.

Figure 2.2.4-a Proposed Acquisition Associated with Project Location No. 10

Environmental Consequences

Alternative 1 (No-Build Alternative). With the selection of Alternative 1 (No-Build Alternative), there would be no potential to affect any properties or parcels surrounding the interchange in terms of acquisition if the proposed project were not built; therefore, selection of Alternative 1 (No-Build Alternative) would present no potential impacts regarding relocation or real property acquisition.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). As previously mentioned, The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, none of the proposed alternatives require displacement or relocation of any persons or businesses, but the proposed project does have the potential to affect one property in terms of real property acquisition at Location No. 10 as detailed in the previous figure. The parcel (AIN No. 4459-008-001) is currently occupied by the Calimigos Beach Club (26023 Pacific Coast Highway), which is satellite facility of the Calimigos Guest Ranch approximately 9.5 miles north west of the parcel on Latigo Canyon Road. Selection of proposed Alternative 2 does not have the potential to cause disproportionately high and adverse effects on any minority or low-income populations in accordance with the provisions of Executive Order 12898, and no environmental justice analysis is required.

Avoidance, Minimization, and/or Mitigation Measures

Because none of the proposed alternatives require displacement or relocation of any persons or businesses, no avoidance, minimization, and/or mitigation measures are required, but because selection of Alternative 2 would require the partial acquisition of the aforementioned property in the project study area, project funds shall be adequately budgeted to cover acquisition expenses associated with the selection of the Alternative 2.

2.2.5 UTILITIES/EMERGENCY SERVICES

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

The following information regarding utilities/emergency services were obtained from Caltrans Right-of-Way Estimates and Data Reports, and general research performed by the Caltrans Division of Environmental Planning.

Public and Private Utilities

Electricity. Southern California Edison (SCE) provides electricity to the City of Malibu. SCE delivers power to more than 14 million people with a service area of approximately 50,000 square miles that covers central, coastal, and Southern California. Electricity in the project study area is provided by the Latigo, Rindge, Reclaim, and Crater substations.

Natural Gas. The Southern California Gas Company (SoCalGas) provides natural gas to the City of Malibu. SoCalGas is the nation's largest natural gas distribution utility, providing energy to 20.9 million consumers through 5.8 million meters in more than 500 communities. The company's service territory encompasses approximately 20,000 square miles of diverse terrain throughout central and Southern California, from Visalia to the Mexican border.

Wasterwater. There is no municipal sewer in the City of Malibu or the neighboring unincorporated portions of the county because most wastewater is treated and disposed of on-site. The City of Malibu Wastewater Management Program administers permitting, plan review, and oversight programs for On-site Wastewater Discharge Systems (OWDSs). In 2016, the City of Malibu began constructing the first phase of the Civic Center Wastewater Treatment Facility, which is a response to regulatory actions taken by the Los Angeles Regional Water Quality Control Board (LARWQCB) and the State Water Resources Control Board (SWRCB) to prohibit discharges from septic systems in the Civic Center area, and to ban new septic systems based on a phased schedule.

Water Supply. Water is conveyed (or retailed) to the City of Malibu by Los Angeles County Waterworks District No. 29 (District 29), with wholesale supplies purchased from West Basin Municipal Water District (West Basin). West Basin, in turn, imports its supplies predominantly from the Metropolitan Water District of Southern California (MWD), though has more recently increased development of local supplies to address concerns about future supply reliability. MWD, in turn, obtains its water from the State Water Project and the Colorado River.

District 29 currently supplies water to the City of Malibu, and unincorporated portions of the County, including Topanga Canyon and portions of Marina Del Rey. The City's water service area comprises a narrow strip along the coastline, bounded on the north by the Santa Monica Mountains, on the east by Topanga Canyon, on the west by Ventura County, and on the south by the Pacific Ocean. District 29 occupies an area of approximately 47 square miles and has served the Malibu area since 1967. District 29 currently serves an estimated population of 31,229 through approximately 7,790 active meters.

Telephone and Cable Services. Frontier Communications (formerly Verizon FiOS) and Spectrum (formerly Charter Communications) are the major telephone and cable service providers in the City of Malibu, with cable and fiber optic infrastructure throughout the project study area.

Emergency Services

Fire Protection Services. The County of Los Angeles Fire Department serves the City and the unincorporated area surrounding Malibu. Four local fire stations (Nos. 70, 71, 88, and 99) serve Malibu and the surrounding area. Combined, these stations have four staff engine companies, two paramedic rescue squads, one battalion chief, and a swift water rescue team that is staffed during inclement weather.

Police Protection Services. Police protection services in the project study area are contracted with the Los Angeles County Sheriff's Department established in March 1991, when the City was incorporated. The City's enforcement service is provided by the Malibu/Lost Hills Sheriff's Station located in the City of Agoura.

Medical Institutions. There are no emergency rooms in the project study area, and the closest medical facilities are in the Civic Center area – UCLA Health (family medicine, internal medicine, and pediatrics), and Malibu Urgent Care for community urgent care needs.

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing facilities, posing no changes to the existing environment, and no disturbance to utilities and/or emergency services; therefore, it would present no potential for effects to such.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure at project Location No. 10. Temporary, construction-related effects to utilities and emergency services are anticipated, and are summarized as follows:

> **Temporary Utility Relocation at Project Location No. 10.** Temporary relocation of local gas (SoCalGas), water (Los Angeles County Water Works, Malibu Water, Yerba Buena Water), and telephone/cable services (Frontier/Verizon) will be required for the duration of construction of the new bridge structure at project Location No. 10. Construction of a temporary utility bridge will be necessary to carry these utilities while construction is ongoing, and an agreement with utility owners will be necessary for the temporary relocation and permanent location of utility services.
>
> **Temporary, Construction-Related Effects on Local Accessibility and Use by Emergency Service Vehicles**. Temporary, construction-related effects related to lane closures are anticipated during construction at drainage locations, and during the construction of the new bridge structure at project Location No. 10. Caltrans continues to coordinate with local jurisdictions, and a Transportation Management Plan (TMP) will be implemented accordingly to provide detailed access and detour strategies that would minimize any effects related to such.

Avoidance, Minimization, and/or Mitigation Measures

UTL-01 | Early and Continuing Coordination with Utility Providers. Early communication and planning with affected utility providers before and during construction will ensure that all affected infrastructure will be relocated with consideration, and to minimize any disruption of services and any effects as much as possible.

TMP-01 | Transportation Management Plan (TMP). A Transportation Management Plan (TMP) shall be implemented to provide detailed access and detour strategies that would minimize any effects on response times for fire, police, and emergency services. Caltrans shall maintain close coordination with local agencies and jurisdictions, including fire protection services, police, schools, and park agencies via a public outreach campaign during the construction phase of the proposed project.

TMP-02 | Early and Continuing TMP Coordination with the City of Malibu. Caltrans shall initiate early coordination with the City of Malibu to achieve consensus and obtain concurrence on traffic management strategies during construction, and to ensure public access and availability of emergency and public services during the construction period.

2.2.6 CULTURAL RESOURCES

Regulatory Setting

The term "cultural resources," as used in this document, refers to the "built environment" (e.g., structures, bridges, railroads, water conveyance systems, etc.), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of significance. Under federal and state laws, cultural resources that meet certain criteria of significance are referred to by various terms including "historic properties," "historic sites," "historical resources," and "tribal cultural resources." Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places (NRHP). Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by the ACHP (36 Code of Federal Regulations [CFR] 800). On January 1, 2014, the First Amended Section 106 Programmatic Agreement (PA) among the Federal Highway Administration (FHWA), the ACHP, the California State Historic Preservation Officer (SHPO), and the Department went into effect for Department projects, both state and local, with FHWA involvement. The PA implements the ACHP's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA's responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327).

The Archaeological Resources Protection Act (ARPA) applies when a project may involve archaeological resources located on federal or tribal land. The ARPA requires that a permit be obtained before excavation of an archaeological resource on such land can take place.

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties (in Section 4(f) terminology—historic sites). See Appendix A for specific information about Section 4(f).

The California Environmental Quality Act (CEQA) requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as "unique" archaeological resources. California Public Resources Code (PRC) Section 5024.1 established the California Register of Historical Resources (CRHR) and outlined the necessary criteria for a cultural resource to be considered eligible for listing in the CRHR and, therefore, a historical resource. Historical resources are defined in PRC Section 5020.1(j). In 2014, Assembly Bill 52 (AB 52) added the term "tribal cultural resources" to CEQA, and AB 52 is commonly referenced instead of CEQA when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in PRC Section 21074(a), a tribal cultural resource is a CRHR or local register eligible site, feature, place, cultural landscape, or object which has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in PRC Section 21083.2.

PRC Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the NRHP listing criteria. It further requires the Department to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer (SHPO) before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the NRHP or are registered or eligible for registration as California Historical Landmarks. Procedures for compliance with PRC Section 5024 are outlined in a Memorandum of Understanding (MOU) between the Department and SHPO, effective January 1, 2015. For most Federal-aid projects on the State Highway System, compliance with the Section 106 PA will satisfy the requirements of PRC Section 5024.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

The ensuing discussion has been excerpted from the Archaeological Survey Report (ASR), Finding of Effect (FOE), and Historic Properties Survey Report (HPSR) as prepared for the proposed project by the Caltrans Division of Environmental Planning, Cultural/Archaeological Resources Branch, August 2018.

Study Methods

A records search was conducted at the South Central Coastal Information Center (SCCIC) situated at California State University, Fullerton, California, on May 2, 2018, for the 19 project locations comprising the project study area, or Area of Potential Effects (APE), and encompassing a 0.25 mile radius around each of the proposed locations. A records search of the Caltrans Cultural Resources Database (CCRD) was also conducted. Additional sources consulted as part of the records search included:

- National Register of Historic Places (NRHP)
- National Historic Landmark (NHL)
- California Register of Historical Resources (CRHR)
- California Historical Landmarks (CHL)
- Department of Parks and Recreation (DPR) Series 523 Forms
- Caltrans Historic Bridge Inventory List
- Historic United States Geological Survey (USGS) Topographic Quadrangle Maps
- Regional historic maps of Los Angeles County
- Caltrans Historical Architectural Survey Report for Big Sycamore Maintenance Station and Las Flores Maintenance Station (Sheid 1993)
- General Land Office (GLO) Land Patents
- General Land Office (GLO) Historic Survey Plats

The records search resulted in a total of 44 previously conducted cultural resource studies within the 0.25-mile records search radius of the APE. Nine (9) previously recorded resources were identified within a 0.25-mile records search radius for the discontiguous APE. Of the nine (9) previously recorded resources, only one (1) archaeological site falls within the proposed APE, Site P-19-000210/CA-LAN-210, at project Locations No. 9 and 10.

Site P-19-000210/CA-LAN-210 was described as a prehistoric habitation site with associated burials. Previous archaeological investigations of the portion of the site within the current study area indicate that the deposits in this area are sparse and consist of redeposited materials; however, intact deposits may occur at depths between 23 and 33 feet under State Route 1. The NAHC's Sacred Lands File search did not identify any cultural sites, nonetheless consultation with Native American representatives confirmed the sensitivity of the area and the presence of the site at Solstice Creek.

Native American Consultation. On February 1, 2018, a Sacred Lands File and Native American Contacts List Request form and a map depicting the project location was sent to the Native American heritage Commission (NAHC). The Sacred Lands File and Native American Contacts List Request form requested that the NAHC search their Sacred Lands Database and provide a list of potentially interested Native American representatives for the project area. The NAHC responded in writing on February 2, 2018. The NAHC stated that their Sacred Lands File search did not show Native American cultural resources within the project locations. The NAHC provided a list of 16 Native American representatives to contact for further information. Letters describing the project locations and project area maps were sent to the 16 Native American individuals on February 9, 2018. Project status letters were mailed to the Native American representatives on July 09, 2018 to provide a project update and the results of the current study. Native American consultation for the proposed project is ongoing.

Archaeological Surveys. Caltrans archaeologists conducted an archaeological survey of the project area on August 7, 2017 and on March 19, 2018. The scope of survey efforts was focused primarily in the areas that have the potential to be impacted by construction activities, the proposed easements, and staging and storage locations. Areas along the coast that were too steep to walk over were not surveyed. No archaeological resources were identified within the APE during the survey efforts.

Area of Potential Effects (APE). The APE for the proposed project was established to ensure identification of significant historical, architectural, and archaeological resources regarding listing or eligibility for inclusion not just in the National Register of Historic Places, but also the California Register of Historic Resources, and whether the proposed undertaking would have the potential for direct or indirect effects on any resources of concern.

In accordance with Section 106 Programmatic Agreement Stipulation VIII.A, the Area of Potential Effects (APE) for the proposed project was established, totaling approximately 5 acres and spanning nineteen (19) discontiguous areas that include the locations of proposed culvert work, bridge replacement, temporary construction easements, staging areas, and areas where temporary construction signs would be placed. The APE also encompasses the known boundaries of archaeological site CA-LAN-210. The majority of the proposed project ground disturbance will occur within the previously disturbed footprint of existing culverts and drainages. However, the replacement of the existing bridge at Solstice Creek will require excavation depths of a maximum of 15 feet, which may include undisturbed soils.

General Setting

Physical Environment. The Project is located on a marine cut terrace directly above the Pacific coastline, just below the southern slope of the Santa Monica Mountains, within the Transverse Ranges Geologic/Geomorphic Province of California (Figure 5). The proposed project APE is located along the coastline of the Pacific Ocean, with a maximum elevation of 1000 feet in certain locations and minimum of approximately 800 feet. Ground surface elevation at the proposed project locations is around 200 feet or less above Mean Sea Level (MSL). All project locations have been disturbed by modern earthmoving for construction of the Pacific Coast Highway as well as the placement of the existing culverts, drainages, and the existing Solstice Canyon Creek bridge. Some areas immediately outside of the present Caltrans right-of-way have also been extensively disturbed, primarily by housing and business development. Soils within the APE are poorly developed and are composed of fill and other imported materials. Soils outside the proposed project APE include both very sandy deposits, which are indicative of the shoreline, and more organic and developed soils that are indicative of the nearby Santa Monica Mountains. Coastal Sage Scrub is the native and typical vegetation within the APE, but the environment has been altered by non-native plantings and dry grasses (for soil stabilization) along the northern portion of State Route 1/Pacific Coast Highway, especially where there are no buildings.

In terms of geomorphology, the project consists of a mixture of beach sand (Qs), alluvium (Qa), gravel, clay of flatlands, volcanic diabase/ basalt (db), and clay, shale, and sandstone of the Lower Topanga formation (Ttlc) (Dibblee 2010: Figure 5). These types of alluvial soils offer low potential for encountering buried archaeological deposits in the first several feet of soil. This is due to the episodic nature of alluvial sedimentation as rapid burial of artifacts is highly probable, especially where steep slopes are adjacent to shoreline. However, possible superficial deposits may have already been eroded onto the beach or ocean.

The most extensive ground disturbance is anticipated to occur at project Location No. 10 at Solstice Canyon Creek and within the project APE – a previously recorded archaeological site exists at this location, which warrants further discussion. Solstice Creek is a perennial water source that sustains a variety of plant and animal life. Currently the creek supports a number of tree species such as the Western Sycamore (*Platanus racemosa*), Fremont cottonwood (*Populous fremontii*), and Coastal Live Oak (*Quercus agrifolia*). Understory species also occur within this community, and they include wild berry (*Rubus sp*.) and exotic forbs and grasses. Prehistorically, the creek was likely more verdant, containing many more trees and plants such as California Laurel (*Umbellararia californica*), Pacific Mandrone (*Arbutus meniesii*), rushes (*Juncus sp*.), bulrushes (*Scirpus sp*.), sedges (*Cyperu sp*.), and cattails (*Typha sp*.). Wildlife may have been more plentiful, providing Native American inhabitants' ample food year around. Maritime resources such as shellfish, fish, and sea mammals were also likely important to Native American residents.

Geologically, Solstice Canyon Creek originates from a narrow canyon which has its reaches in the Castro Peak area, with a watershed of approximately five square miles. The canyon is steep on the coastal side and is susceptible to erosion during rainy season. Large debris flows are not uncommon during severe storms. Within the Solstice Canyon Creek project location (near the mouth of Solstice Canyon) the landforms are characterized by small stream terraces and adjacent steep canyon walls. Terraces are underlain by bedrock comprising early Miocene to Middle Miocene andesitic breccia of the Zuma Volcanics and are without exception, modified by past and recent grading activities. Grading activity of soils is evident throughout the project location. Original soils were likely alluvial, containing cobbles,

gravel, and pebbles. Some of these soils are evident in isolated locations and have been shown to have been mixed by intensive grading operations. Also evident is the relatively recent (1947) channelization of the creek within the project area. It is likely that the first 200 feet of the creek north of the box culvert was dug out by Caltrans to accommodate the existing box culvert built in 1947. This excavation was extensive in scope and reached depths exceeding 15 feet from the original ground surface. Additional disturbance to the area was likely derived from the construction of the box culvert and Pacific Coast Highway.

The majority of the APE has been disturbed by previous highway and road construction as well as construction of features such as culverts and ditches/drainages. These areas are unlikely to preserve intact buried archaeological deposits since previous earthmoving construction was extensive. Areas adjacent to the APE and outside of the State right of way have also been extensively modified by non-roadway construction activities and are also unlikely to preserve intact buried archaeological deposits.

Ethnography. The APE is situated within the traditional territory of the Chumash Indians, who occupied the California mainland region from along the San Luis Obispo to Malibu Canyon coastline and inland toward the San Joaquin Valley, as well as the islands in the Santa Barbara Channel area. Specifically, the APE is located on the Malibu Coastline, which was occupied by the Ventureño Chumash at the time of contact. The earliest, yet fragmentary, written accounts of the Chumash come from the diaries of Spanish explorers: notably Juan Rodríguez Cabrillo's 1542 expedition in which he encountered numerous Chumash settlements in the coastal mainland and Channel Islands and Gaspar de Portolá's 1769 expedition to Monterey Bay that passed through the Chumash coastal territory.

Altogether, early historic accounts and subsequent ethnographic and archaeological studies indicate that at the time of contact, the Chumash territory boasted a high indigenous population occupying what appear to have been year-round and/or seasonal village sites consisting of multiple residential units united under a leader. Groups of villages crosscutting variable ecological zones could also be united under a single leader, with intermarriages and resulting kinship ties serving as a uniting force. Research suggests that marriages tended to occur across ecological boundaries so as to ensure greater access to non-local goods.

The Chumash subsistence system was generally focused on marine and terrestrial resources, but there was less emphasis on ocean resources in the subsistence economy of more inland groups. There is definitive evidence for craft specialization among the Chumash—particularly in the production of shell beads, microblade technology, and the plank canoe (tomol), which indicates a degree of social stratification that is relatively rare among hunter-gatherer-fisher populations. The Chumash also participated in a regional exchange system that involved indigenous groups throughout southern California, and perhaps beyond. Evidence of Chumash trade goods is generally in the form of shell beads or ornaments recovered from archaeological sites throughout this region.

Little is known regarding Chumash ceremonial life. Observations by early explorers indicate that Chumash villages did contain large sweathouses or ceremonial chambers that undoubtedly were associated with some form of sacred ritual(s). Chumash mortuary practices included mourning ceremonies and inhumation in dedicated cemeteries. Interestingly, mourning ceremonies were practiced by much of southern California's indigenous populations, but cremation of the dead rather than inhumation was the common practice among most groups in the region.

Identification of Historic Properties

Background research and examination of previous technical reports and maps for the area show that the totality of the APE has been previously disturbed by road construction (including associated culverts and drainage systems) and other development activities. Much of the proposed project work will occur within the previously disturbed footprint of existing culverts and drainages. However, the proposed work at Solstice Creek is much more extensive and will reach depths of approximately 15 feet.

Archaeological Site CA-LAN-210 at Project Locations No. 9 and 10. The APE encompasses the known boundaries of archaeological site CA-LAN-210, where the replacement of the existing bridge at Solstice Canyon Creek will require excavation depths to a maximum of 15 feet. The site is assumed eligible for inclusion in the NRHP and CRHR under Criterion D/4 for the purposes of this project and has been identified as a Native American habitation site with associated burials. Previous archaeological investigations of the portion of the site within the current APE indicate that the cultural deposits in this area are sparse and consist of redeposited materials; however, intact deposits are suspected at depths between 23 and 33 feet under State Route 1.

The entire study area at Solstice Canyon Creek has experienced some form of alteration for the last 80-90 years, including redirection of the creek itself and construction of SR-1 and the existing/associated culvert/bridge structure, as well as the nearby buildings and parking lot. Intact cultural deposits, if any, at Solstice Canyon Creek and within the APE are likely to occur at depths between 23 and 33 feet. Thus, the potential is low for encountering intact deposits as a result of the proposed project (maximum estimated excavation depth of 15 feet). Regardless, archaeological monitoring of project construction at Solstice Creek will be carried out because of the archaeological sensitivity of the immediate surrounding area.

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing facilities, posing no changes to the existing environment, and no disturbance to soils; therefore, it would present no potential for effects to cultural and/or archaeological resources of historical significance.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). Background research and examination of previous technical reports and maps for the area show that the totality of the APE has been previously disturbed by road construction (including associated culverts and drainage systems) and other development activities. Much of the proposed project work will occur within the previously disturbed footprint of existing culverts and drainages, though the potential to affect to cultural/archaeological resources exists at project Location No. 10 at Solstice Creek, as the general scope of work and the associated excavation is much more extensive, will depths to approximately 15 feet.

Proposed Finding of No Adverse Effect without Standard Conditions (FNAE-No SC) for Archaeological Site CA-LAN-210 and the Project as a Whole. A potential for encountering intact deposits exists at project Locations No. 9 and 10, particularly as it pertains to excavation associated with construction of the new bridge structure at Solstice Canyon Creek, though the potential is low in consideration of an estimated maximum excavation depth of 15 feet – intact deposits are suspected at depths between 23 and 33 feet. Pursuant to Stipulation VIII.C.4 of the Section 106 PA and as applicable Stipulation VIII.C.4 of the PRC 5024 MOU, Caltrans has assumed eligibility of archaeological site CA-LAN-210, under Criterion D for the site's data potential for the purposes of this project only. For the project as a whole, Caltrans, in applying the Criteria of Adverse Effect, proposes that a Finding of No Adverse Effect without Standard Conditions (FNAE-No SC) is appropriate and is currently seeking the State Historic Preservation Officer's (SHPO's) concurrence in the finding, pursuant to 36 CFR 880.5(c) and Section 106 PA Stipulation X.B.2.

Discovery of Cultural Materials. If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

Discovery of Human Remains. If human remains are discovered, California Health and Safety Code (H&SC) Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), who, pursuant to PRC Section 5097.98, will then notify the Most Likely Descendent (MLD). At the time of discovery, the person who finds the remains will contact Sarah Mattiusi-Gutierrez, PQS Co-Principal Investigator Prehistoric Archaeology at Caltrans District 7 Division of Environmental Planning, so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

Native American Consultation. Caltrans contacted the Native American Heritage Commission (NAHC) to request a search of the Sacred Lands file on February 1, 2018. The NAHC responded in writing on February 2, 2018, stating that their Sacred Lands File search did not show Native American cultural resources within the project locations. The NAHC provided a list of 16 Native American contacts throughout Los Angeles and Ventura Counties, nevertheless – letters describing the project locations were sent to those individuals on February 9, 2018.

- The Barbareño/Ventureño Band of Mission Indians responded on February 14, 2018, informing Caltrans of further required consultation on their part, and requesting a meeting with Caltrans to further discuss the proposed project. Additional project status letters were mailed to all appropriate Native American representatives on July 09, 2018, providing a project update and the results of the current study. On July 25, 2018, the Barbareño/Ventureño Band of Mission Indians requested a map depicting all the locations listed.
- On July 26, 2018 the Coastal Band of the Chumash Nation informed Caltrans via email about the desire to initiate consultation with regards to the project and all adverse impacts to potential cultural resources located within the proposed project limits. On August 2, 2018 Caltrans received a phone call from the Coastal Band of the Chumash

Nation (CBCN), requesting that the CBCN tribe be included in the Native American Consultation efforts. Additionally, the CBCN stated that if it is determined that monitoring is needed during construction, they request to be present.

- Caltrans received phone calls from the Fernandeno Tataviam Band of Mission Indians and the Gabrielino Tongva Indians of California Tribal Council on July 17, 2018 requesting inclusion in the Native American consultation efforts and requested regular updates on the project. The Gabrielino Tongva Indians of California Tribal Council specifically informed Caltrans that areas of the proposed project are within sacred family lands, and that the project locations are highly sensitive for cultural resources and, thus, the tribes would like to be involved in any monitoring activities during the construction phase.

Status of Consultation with the State Historic Preservation Office (SHPO). Caltrans Native American consultation for the proposed project is on-going. Caltrans, in applying the Criteria of Adverse Effect, proposes that a Finding of No Adverse Effect without Standard Conditions (FNAE-No SC) is appropriate and is currently seeking the State Historic Preservation Officer's (SHPO's) concurrence in the finding, pursuant to 36 CFR 880.5(c) and Section 106 PA Stipulation X.B.2. The results of consultation with SHPO will be updated and finalized in the publication of the Final Initial Study/Environmental Assessment (IS/EA) for this proposed project upon completion of public circulation and closure of the public comment period.

Section 4(f) Protected Historic Resources in the Project Study Area. In addition to publicly owned parks and recreation areas, Section 4(f) protections also extend to historic sites, sometimes referred to as cultural resources. In order to qualify for protection under Section 4(f), a historic site must meet the following criteria:

- It must be of national, state or local significance.
- It must be on or eligible for listing on the National Register of Historic Places (NRHP).

Unlike the other Section 4(f) property categories—parks, recreation areas, and refuges—historic sites do not require public ownership in order to qualify for protection under Section 4(f). Additionally, Section 4(f) applies to cultural resources such as archeological sites that are on or eligible for listing on the NRHP, including those discovered during construction, except when the resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place. Judgments about a site's importance and preservation value are made by Caltrans after consultation with the State Historic Preservation Officer (SHPO), Federally recognized Indian Tribe as appropriate, and the Advisory Council on Historic Preservation (ACHP) if participating in the project.

While Caltrans has assumed that Archaeological Site CA-LAN-210 is eligible for inclusion in the NHRP and the CRHR, it is solely for planning purposes associated with the proposed undertaking and not because the site's primary value warrants preservation in place. Therefore, excavation associated with the scope of work at proposed project Locations No. 9 and 10 does not constitute a "use" within the context of Section 4(f), which is supported by archaeological studies that show a low potential to encounter intact cultural deposits during excavation in consideration of maximum vertical excavation depths.

In compliance with AB52, Caltrans contacted the Native American Heritage Commission (NAHC) to request a search of the Sacred Lands file on February 1, 2018. The NAHC responded in writing on February 2, 2018. The NAHC stated that their Sacred Lands File search did not show Native American cultural resources within the project locations. The NAHC provided a list of 16 Native American contacts throughout Los Angeles and Ventura Counties, and letters describing the project locations were sent to the individuals on February 9, 2018. Customarily, Caltrans, in applying the Criteria of Adverse Effect, proposes that a Finding of No Adverse Effect (FNAE) without Standard Conditions is appropriate and is seeking concurrence from the State Historic Preservation Officer (SHPO) as the official with jurisdiction over Archaeological Site CA-LAN-210. Caltrans' "no use" determination under Section 4(f) is considered finalized and approved with SHPO concurrence on the FNAE. SHPO consultation was initiated on September 7, 2018 and concurrence with the FNAE is currently pending. Reference Appendix A of this environmental document entitled, "Resources Evaluated Relative to the Requirements of Section 4(f)" for additional details.

Avoidance, Minimization, and/or Mitigation Measures

ARC-01 | Archaeological and Native American Monitoring During Construction Excavation Activities. Through background research and Native American consultation, the portion of the APE located at project Locations No. 9 and 10 has been identified as potentially sensitive for subsurface archaeological deposits, but only if project construction reaches depths below 20 feet (intact deposits are expected below 25 feet). While the potential is low for encountering intact deposits during excavation activities at both project locations, archaeological and Native American monitoring is recommended within the boundaries of archaeological site CA-LAN-210. These activities will be governed by an Environmentally Sensitive Area (ESA) Action Plan with responsibilities outlined as follows:

Table 2.2.6-a ESA Action Plan

Project Phase	Responsible Parties *denotes primary responsibility	Task
Pre-Construction	Caltrans Archaeologist* Caltrans Environmental Planner Caltrans Design Engineer*	The Caltrans Archaeologist will review for approval the PS&E Package at the 35%, 65%, and 95% and 100% stages to ensure that the ESA Action Plan requirements for the project are clearly described and illustrated in the PS&E Package.
	Caltrans Archaeologist* Caltrans Environmental Planner	The Caltrans Archaeologist, and Environmental Planner will ensure the ESA Action Plan and the conditions it proposes are in the Environmental Commitments Record (ECR).
	Caltrans Resident Engineer Caltrans Archaeologist	Caltrans will ensure the Archaeological Monitor and Native American Monitor are provided with the PRDMP
	Caltrans Resident Engineer Caltrans Archaeologist* Lead Archaeological Monitor Archaeological Monitor Native American Monitor Construction Firm Foreman Construction Crew	The responsible parties listed to the left will attend a preconstruction and field review of the project one week prior to construction. The preconstruction meeting with the responsible parties listed to the left, will consist of providing information related to cultural resources including, but not limited to: the location and extent of ESAs, cultural resources monitoring roles, responsibilities, and authority; restricted areas and approved vehicle corridors; the types of sites and artifacts that may be encountered; penalties for unauthorized collection of artifacts; and the need to temporarily halt construction at the location of any unanticipated discovery until it is adequately documented and treated. A field review will visit the locations of ESA and cultural resources within the project area. Any ESA fencing/signage required will be installed at this time.
During Construction	Native American Monitor* Caltrans Archaeologist Caltrans Resident Engineer	Archaeological and Native American monitoring will be imposed for ground-disturbing activities, including but not limited to mechanical boring, grubbing, scrapping, and excavating below artificial fill comprising the roadbed, any sidewalk base, and the existing culvert. See PRDMP for monitoring and post-review discovery procedures.
	Caltrans Resident Engineer Caltrans Archaeologist Archaeological Monitor	Should the ESA for CA-LAN-210 be breached, the lead archaeological monitor will immediately halt all work within the ESA, and notify both the Caltrans Archaeologist and the Caltrans Resident Engineer. Caltrans Resident Engineer and Caltrans Archaeologist will assess any damage to the site as a result of the ESA violation.
Post-Construction	Native American Monitor Caltrans Archaeologist Caltrans Resident Engineer Consulting Archaeological Firm	The Consulting Archaeological Firm will ensure that all archaeological collections, final reports, field notes, photographs, and other standard documentation collected during the Project, if any, is permanently curated at a facility that meets the California Office of Historic Preservation's Guidelines for the Curation of Archaeological Collections. The Consulting Archaeological Firm shall be required to secure a written agreement with a recognized museum repository regarding the final disposition and permanent storage and maintenance of any unique archaeological resources recovered as a result of the archaeological monitoring, as well as provenance data that might result from the specified monitoring program, and any evaluation and data recovery archaeological investigations conducted. A final Monitoring Report detailing the results of the monitoring program will be completed by the Consulting Archaeological Firm, and submitted to Caltrans Archaeologist for review and approval.
	Caltrans Archaeologist*	Following the completion of the project and receiving confirmation that all conditions proposed in the ESA Action Plan were successfully followed, the Caltrans Archaeologist will update this log and note its successful completion.

CUL-01 | Discovery of Cultural Materials. If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

CUL-02 | Discovery of Human Remains. If human remains are discovered, California Health and Safety Code (H&SC) Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), who, pursuant to PRC Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact Sarah Mattiusi-Gutierrez, PQS Co-Principal Investigator Prehistoric Archaeology at Caltrans District 7 Division of Environmental Planning, so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

2.3 PHYSICAL ENVIONRMENT

2.3.1 HYDROLOGY AND FLOODPLAIN

Regulatory Setting

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration (FHWA) requirements for compliance are outlined in 23 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.
- Impacts on natural and beneficial floodplain values.
- Support of incompatible floodplain development.
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year." An encroachment is defined as "an action within the limits of the base floodplain."

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

Of the 19 locations proposed for drainage restoration, 18 locations do not require hydraulic analyses as the scope of work simply involves replacement-in-kind of drainage pipes, and/or replacement of lining of existing drainage structures. The nature of this work does not qualify as a significant encroachment on a base floodplain as all work will occur within the footprint of existing facilities. The design improvements proposed with the culvert modification at Location No. 10 (Solstice Canyon Creek) does, however, qualify for hydraulic analyses, and the ensuing discussion is based on a review of the Preliminary Hydraulic Evaluation for the Bridge Replacement Project on the Solstice Canyon Creek Culvert (Bridge Number 53-0030) [January 2018), and the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the project area on SR-1/PCH at Solstice Canyon Creek (February 2018).

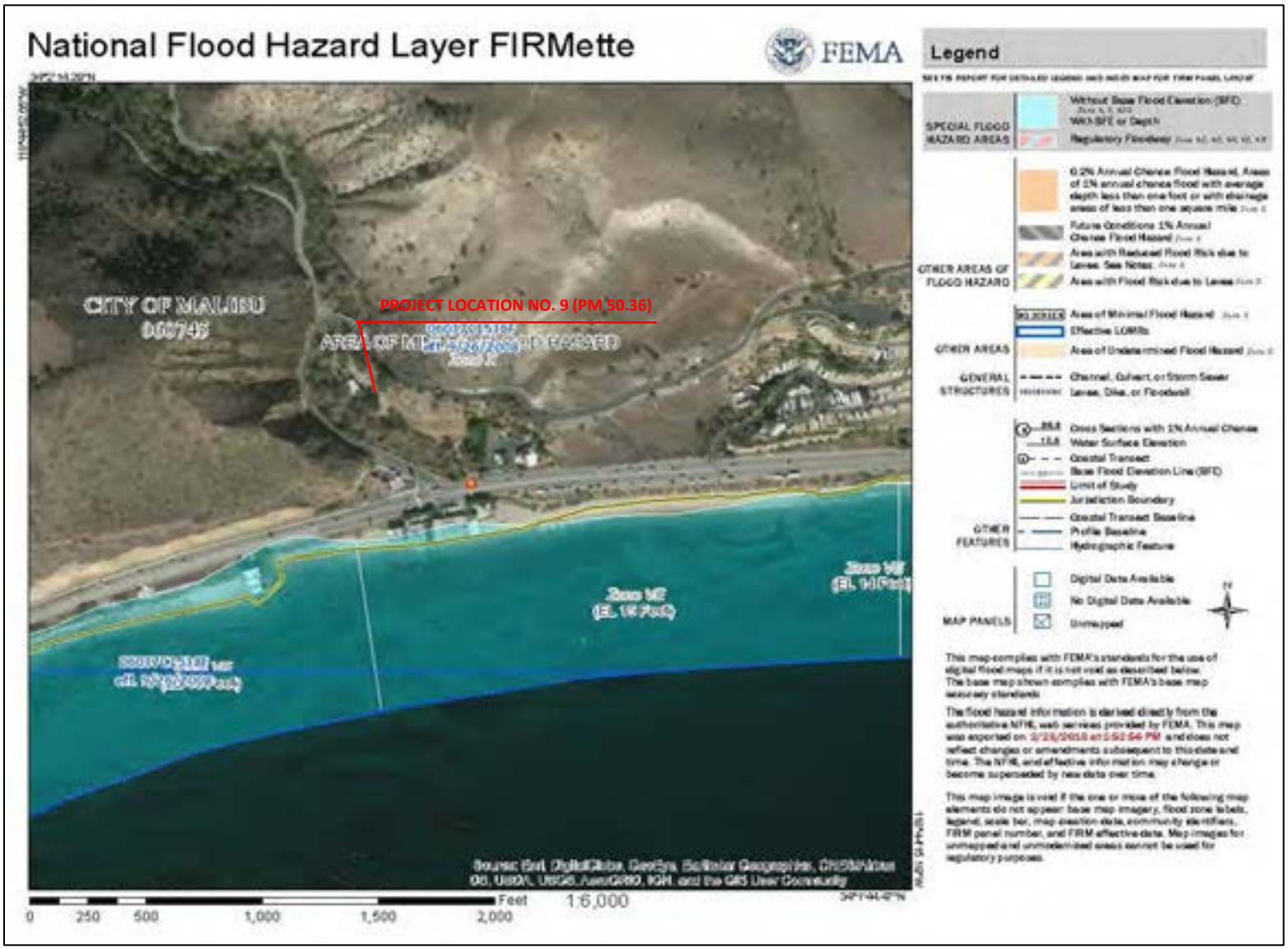
Historically, the segment of SR-1/PCH from Pacific Palisades through Malibu, and to the Los Angeles/Ventura county line is, and continues to be susceptible to major storms and unpredictable

seasonal rainfall. In general, Malibu and the project study area have a warm-summer Mediterranean climate, which is strongly influenced by the Pacific Ocean. In general, Mediterranean climates are characterized by dry summers where subtropical high-pressures dominate and mild, rainy winters where the bulk of annual precipitation is incurred. While winter rainfall in the project study area can be scant, the region is subject to periods of intense and sustained precipitation that often results in flooding. Localized flooding tends to occur along the coast, in lagoons, and in creeks during peak storm events, which can become hazardous in areas where human activity has encroached onto floodplains, where the landscape has been modified with a customary increase in the amount of impervious surfaces, and/or where structures are built in areas that are meant to convey excess water during these events.

Hydrology at Location No. 10 (SR-1/PCH/Solstice Canyon Creek). Location No. 10 at post mile 50.36 is located downstream of the Solstice Canyon Creek watershed, which drains a land area of approximately 4.7 square miles (mi^2). Solstice Canyon Creek is a small, perennial, spring-fed creek that drains directly into the Pacific Ocean approximately 2.3 miles east of the City of Malibu. The creek begins in its headwaters as a small spring at an approximate elevation of 2,100 feet, and the watershed lies completely within the Santa Monica Mountains National Recreation Area – a part of the larger coastal mountain range of the Transverse Ranges. Solstice Canyon Creek flows in a southeasterly direction; flowing approximately 5 miles before reaching the Pacific Ocean at Dan Blocker State Beach. The watershed has a mean basin elevation of 1,331 feet with a maximum basin elevation of 2,785 feet. Solstice Canyon Creek is a high gradient mountain stream that has an averaged slope of approximately 3% at the project location, and is a rural watershed covered by roughly 31% forest, and contains very little development, with the exception of a small cluster of housing (approximately 10% of the watershed) on its lower, easterly side.

Designated Flood Zones. FEMA Flood hazard areas identified on the FIRM are identified as a Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, labeled Zone B or Zone X (shaded) are also shown on the FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded). The bridge replacement and culvert modification proposed at Location No. 10 is not located within a 100-year base floodplain, and exists within a FEMA Zone X (unshaded) area, which is considered to be of minimal flood hazard as illustrated in the following figure:

Figure 2.3.1-a Project Location No. 10 within FEMA Designated Zone X (unshaded) area of FIRM



Effects of Sea Level Rise (SLR) and Ocean Storm Flooding Conditions. In 2008, California Governor's Executive Order S-13-08 was issued to direct State agencies' planning of construction projects in areas vulnerable to Sea Level Rise (SLR) to address the potential impacts of such by considering a range of SLR scenarios for the years 2050 and 2100. Changes in climate have caused the global mean sea level to rise, primarily due to the rising of global temperatures causing ocean water to expand and land ice to melt. When Caltrans implements projects on the State Highway System in areas that are vulnerable to SLR, the aforementioned SLR scenarios are integrated into the assessment of existing conditions and modeling within the context of proposed improvements.

The proposed improvements at Location No. 10 (bridge replacement and culvert modification) at Solstice Canyon Creek are in close proximity to the coast of the Pacific Ocean, and the potential impacts of SLR must be taken into account. Using the guidance of SLR projects from the National Research Council's 2012 report entitled, "*Sea Level Rise for the Coasts of California, Oregon, and Washington: Past Present, and Future*" as adopted by the California Coastal Commission, the preliminary hydraulic analyses for this project location accounted for the varying degree of SLR projections (depth above existing ocean sea levels) for the Pacific Ocean near Los Angeles, California for the projected year of 2100, and further scrutinized for Low (B1), Medium (A1B), and High (A1FI) scenarios in projected Greenhouse Gas Emissions (GHG). The Low (B1) GHG scenario illustrates the possible emissions implications of a scenario in which the world chooses consistently and effectively a development path that favors efficiency of resource use and "dematerialization" of economic activity. The Medium (A1B) GHG scenario assumes "balanced" progress actions across all resources and technologies from energy supply to end use, as well as "balanced" land use changes. The High (A1FI) GHG scenario assumes a more "fossil intensive" development path and customary emissions implications.

Table 2.3.1-a Sea Level Rise (SLR) Projections for Los Angeles, California Relative to the Year 2100

Projected Year	GHG Scenario	Sea Level Rise Projection (feet)
2100	Low (B1)	1.5
	Medium (A1B)	3.1
	High (A1FI)	5.5

In addition to the effects of SLR with the proposed improvements at Location No. 10, the effects of coastal flooding from the Pacific Ocean for various ocean storm frequencies were analyzed and utilized in the hydraulic model as downstream boundary conditions. Total Water Elevation is a coastal engineering term that defines the elevation of the combined effects of astronomical tides, El Niño, storm surge, and wave effect. Primary wave effect types include "static and dynamic setup," and "wave run-up." Total Water Elevations were developed by FEMA and are based on the most recent FEMA Flood Insurance Study for Los Angeles County. To determine the full effect of coastal flooding hazards at project Location No. 10 at Solstice Canyon Creek, the Total Water Elevations in the following table plus the riverine effects of the creek were analyzed together at the appropriate flood recurrence intervals.

Table 2.3.1-b Total Water Levels for Various Storm Frequencies from the Pacific Ocean near the Project Site

Ocean Storm Frequency	Total Water Elevation[(1)] (feet)
2-year	15.2
10-year	17.3
50-year	19.2
100-year	20.2

[1] Total Water Elevations as developed by FEMA, and based on most recent Flood Insurance Study for Los Angeles County, using vertical datum derived from the North American Vertical Datum of 1988 (NAVD-88)

In combining Total Water Elevation and projected SLR, determinations were made regarding coastal hazard potential for both the existing condition and projections with varying degrees of SLR. Ocean floodwater elevations are used as downstream boundary conditions within hydraulic models, and the results of this analysis are detailed in the following table.

Table 2.3.1-c Total Water Elevation plus SLR Conditions at the Mouth of Solstice Canyon Creek

Flood Frequency	Current Ocean Conditions (feet)	Plus Low SLR Projections (feet)	Plus Medium SLR Projections (feet)	Plus High SLR Projections (feet)
2-year	15.2	16.7	18.3	20.7
10-year	17.3	18.8	20.4	22.8
50-year	19.2	20.7	22.3	24.7
100-year	20.2	21.7	23.3	25.7

Hydraulic Modeling and Presentation through Distinct Flooding Condition Scenarios. Hydraulic analyses for both existing conditions and proposed conditions (with proposed improvements at Location No. 10) are presented through five distinct flooding scenarios, or conditions, as follows:

1) *Normal Depth Flow Conditions* – this hydraulic analysis assumes there are no influences from the Pacific Ocean. At this flooding condition, the upland riverine flooding is allowed to flow downstream unimpeded by ocean effects. Normal depth is used as the downstream boundary condition in hydraulic modeling.
2) *Ocean Flow Conditions* – this hydraulic analysis uses the Total Water Elevations due to ocean storm events from the Pacific Ocean as downstream boundary conditions in hydraulic modeling.
3) *Low SLR Conditions* – this hydraulic analysis uses the combined effects of ocean flow conditions and the low-projected SLR conditions (+1.5 feet) as the downstream boundary conditions in hydraulic modeling.
4) *Medium SLR Conditions* – this hydraulic analysis uses the combined effects of ocean flow conditions and the medium-projected SLR conditions (+3.1 feet) as the downstream boundary conditions in hydraulic modeling.
5) *High SLR Conditions* – this hydraulic analysis uses the combined effects of ocean flow conditions and the high-projected SLR conditions (+5.5 feet) as the downstream boundary conditions in hydraulic modeling.

Existing Conditions at the Solstice Canyon Creek Culvert (Location No. 10). Analysis of existing hydraulic conditions provides a baseline comparison to the proposed conditions analyses and is expressed though a modeled measurement of water surface elevation and average channel velocities. The results are further defined by flow conditions (Normal Depth and Ocean Flow Conditions, and Low/Medium/High SLR Conditions) and flood frequency at the project location. The following tables detail preliminary water elevations and average channel velocities at the Solstice Canyon Creek culvert (Location No. 10).

Table 2.3.1-d Preliminary Water Surface Elevations at Solstice Canyon Creek (Location No. 10) in the Existing Condition

	Water Surface Elevations (feet)				
Flood Frequency	**Normal Depth Flow Conditions**	**Ocean Flow Conditions**	**With Low SLR Conditions**	**With Medium SLR Conditions**	**With High SLR Conditions**
Upstream Edge of Bridge Deck (River Station 309.552)					
2-year	14.21	14.21	16.60	18.24	20.66
10-year	20.57	20.57	16.61	20.66	23.00
50-year	26.33	26.33	26.33	24.46	26.45
100-year	29.11	29.11	29.11	29.11	28.90
Downstream Edge of Bridge Deck (River Station 134.243)					
2-year	13.22	15.17	16.63	18.24	20.65
10-year	13.62	16.76	18.42	20.13	22.63
50-year	16.12	16.12	16.12	21.51	24.23
100-year	17.24	17.24	17.24	22.23	25.06

Table 2.3.1-e Preliminary Average Channel Velocities at Solstice Canyon Creek (Location No. 10) in the Existing Condition

	Average Channel Velocities (feet/second)				
Flood Frequency	**Normal Depth Flow Conditions**	**Ocean Flow Conditions**	**With Low SLR Conditions**	**With Medium SLR Conditions**	**With High SLR Conditions**
Upstream Edge of Bridge Deck (River Station 309.552)					
2-year	14.24	14.24	3.24	2.10	1.38
10-year	7.87	7.87	18.20	7.76	5.79
50-year	9.14	9.14	9.14	10.77	9.04
100-year	9.35	9.35	9.35	9.35	9.50
Downstream Edge of Bridge Deck (River Station 134.243)					
2-year	3.48	1.94	1.45	1.14	0.85
10-year	16.93	8.03	6.28	5.12	3.88
50-year	19.45	19.45	19.45	9.47	7.19
100-year	20.39	20.39	20.39	11.10	8.49

Preliminary analyses show that for the 50 and 100-year flood events, the effects of SLR only begin to affect water surface elevations at the downstream edge in modeling for Medium SLR conditions. In Normal Depth Flow, Ocean Flow, and Low SLR conditions, the 50 and 100-year riverine flood events dominate the local hydraulics, where larger upland riverine flood events push against the rise of sea levels and impede coastal flooding upstream of the existing culvert. In contrast, the opposite effect dominates local hydraulics during low riverine flood events or ordinary stream flows where an increase in sea levels push upstream and beyond the existing culvert. At all flooding conditions, water surface

elevations never inundate the local roadway of SR-1/PCH at Solstice Canyon Creek, and all floodwaters stay within the banks of the creek, with flood events occurring only at the beach, downstream of the existing culvert.

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing drainage systems, and no replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope creek bottom. Consequently, there would be no disturbance of soils or increase in impervious areas, and selection of Alternative 1 (No-Build Alternative) would not present any potential impacts in terms of hydrology and/or floodplain encroachment.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). As previously mentioned, only one of the eighteen (19) locations proposed for drainage restoration qualifies for more extensive hydraulic analyses – Location No. 10 at SR-1/PCH/Solstice Canyon Creek. As a result, the ensuing section details only the environmental consequences of the proposed improvements associated with the bridge replacement and culvert modification at Location No. 9 at SR-1/PCH/Solstice Canyon Creek. There is no further discussion of the additional 17 locations as the scope of work simply involves replacement-in-kind of drainage pipes, and/or replacement of lining of existing drainage structures which do not require extended analyses.

Hydraulic analyses for proposed project Location No. 10 at SR-1/PCH/Solstice Canyon Creek were calculated using the one-dimensional river analysis hydraulic modeling software HEC-RAS (v. 5.0.3) developed by the U.S. Army Corps of Engineers (USACE); HY-8 Culvert Analysis Program (v. 8.7.50) developed by the Federal Highways Administration (FHWA); topographical land surveys collected by the Caltrans District 7 Office of Surveys; and the latest FEMA Flood Insurance Study and FIRM for Los Angeles County (dated January 6, 2016). The existing hydraulic and scour information in these analyses are preliminary and subject to change pending further detailed analysis to be completed as part of the Final Hydraulic Report in the next project phase.

Environmental Consequences as a Result of Proposed Improvements at Location No. 10 (SR-1/PCH/Solstice Canyon Creek). In general, the proposed replacement of the bridge at SR-1/PCH/Solstice Canyon Creek with a lengthened span structure will provide an increase in conveyance to the waterway with increased river flow underneath the structure that would push against coastal flooding effects and thus dampen its influence on upstream flooding. While modeling and analyses show a general increase in water surface elevation relative to the existing condition, the increases are not anticipated to inundate the roadway or significantly affect the proposed structure from properly conveying flows outside of the floodway and onto the beach environment and are thus considered insignificant. Nevertheless, the following tables detail water surface elevation as modeled and analyzed relative to the existing condition at both the upstream and downstream edges of the proposed bridge deck and present the results through the four flood frequency scenarios and five distinct flooding conditions.

Table 2.3.1-f Preliminary Water Surface Elevations at Solstice Canyon Creek (Location No. 10) in the Proposed Condition

Flood Frequency	Available Freeboard[(1)] (feet)	Water Surface Elevations (feet)				
		Normal Depth Flow Conditions	Ocean Flow Conditions	With Low SLR Conditions	With Medium SLR Conditions	With High SLR Conditions
Upstream Edge of Bridge Deck (River Station 309.552)						
2-year	11.7	16.29	16.32	16.78	18.28	20.67
10-year	9.6	21.13	18.96	19.40	20.61	22.84
50-year	7.5	24.53	24.53	22.10	22.83	24.86
100-year	6.5	25.95	25.95	23.50	24.05	25.94
Downstream Edge of Bridge Deck (River Station 134.243)						
2-year	9.9	13.32	15.18	16.64	18.24	20.66
10-year	7.9	14.89	16.95	18.53	20.21	22.68
50-year	6.2	16.28	18.02	19.94	21.81	24.41
100-year	5.3	17.18	17.18	20.72	22.67	25.33

Notes: [(1)] The available freeboard was calculated from the estimated soffit elevations for the upstream and downstream edges of bridge deck of 32.4 feet and 30.6 feet, respectively, and the calculated highest water surface elevation.

Utilizing estimated soffit elevations of 32.4-feet and 30.6-feet for the upstream and downstream edge of the bridge deck respectively, modeling results in the preceding table show that there is ample freeboard available for the proposed bridge structure under all flood conditions. The available freeboard is calculated utilizing the estimated soffit elevations and the highest calculated water surface elevations for each flooding scenario.

Table 2.3.1-g Preliminary Average Channel Velocities at Solstice Canyon Creek (Location No. 10) in the Proposed Condition

Flood Frequency	Average Channel Velocities (feet/second)				
	Normal Depth Flow Conditions	Ocean Flow Conditions	With Low SLR Conditions	With Medium SLR Conditions	With High SLR Conditions
Upstream Edge of Bridge Deck (River Station 309.552)					
2-year	4.92	4.82	3.67	2.05	1.20
10-year	6.24	9.64	8.67	6.83	4.88
50-year	8.65	8.65	11.66	10.55	8.36
100-year	9.52	9.52	12.32	11.56	9.53
Downstream Edge of Bridge Deck (River Station 134.243)					
2-year	2.84	1.63	1.22	0.95	0.69
10-year	9.85	6.52	5.18	4.14	3.05
50-year	15.86	12.02	9.29	7.31	5.47
100-year	17.25	17.25	10.62	8.37	6.33

With the proposed bridge replacement, an analysis of average channel velocities show an overall trend in the decrease of velocities as ocean flooding and projected SLR increase. Modeling shows an increase in all flooding conditions only in the 100-year flood condition, on the upstream side of the bridge.

Hydraulic Analysis for Fish Passage at Solstice Canyon Creek. The proposed design of a single-span bridge structure spanning 30-feet is sufficient to meet analysis requirements set forth by the California Department of Fish and Wildlife (CDFW) culvert/bridge criteria for the design method – *Stream*

Simulation Option. According to the CDFW, the Stream Simulation Option is a design process that is intended to mimic the natural stream processes within a culvert/bridge. Determination of the high and low fish passage design flows, water velocity, and water depth is not required for this option since the stream hydraulic characteristics within the bridge are designed to mimic the stream conditions upstream and downstream of the bridge crossing. CDFW design requirements for the Stream Simulation Option are: 1) expand the bridge crossing to be as wide, or wider than, the bankfull channel, and 2) grade/slope the channel bed inside the bridge at a gradient similar to that of the adjacent stream reach.

With the design of the proposed bridge, Caltrans has met the design requirements for the Stream Simulation Option. The proposed 30-foot bridge opening is as wide as the bankfull channel. Modeling and analyses show that all flood flows will be contained within the natural upstream creek channel, and flows through the proposed bridge structure are not anticipated to raise the floodwater elevations above the bankfull channel elevation. Finally, the channel bed slope will be regraded to match the upstream and downstream natural slope after removal of the existing culvert and its concrete apron.

Avoidance, Minimization, and/or Mitigation Measures

While modeling and analyses show a general increase in water surface elevation relative to the existing condition, the increases are not anticipated to inundate the roadway or significantly affect the proposed structure from properly conveying flows outside of the floodway and onto the beach environment. Overall, the effects on the existing environment are considered insignificant, and as a result, no avoidance, minimization, and/or mitigation measures are proposed.

2.3.2 WATER QUALITY AND STORM WATER RUNOFF

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source[1] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards

[1] A point source is any discrete conveyance such as a pipe or a man-made ditch.

(RWQCBs) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's (U.S. EPA) Section 404 (b)(1) Guidelines (40 Code of Federal Regulations [CFR] Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent[2] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined, and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

[2] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect those uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollutant Discharge Elimination System (NPDES) Program

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." The SWRCB has identified the Department as an owner/operator of an MS4 under federal regulations. The Department's MS4 permit covers all Department rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.
The Department's MS4 Permit, Order No. 2012-0011-DWQ (adopted on September 19, 2012 and effective on July 1, 2013), as amended by Order No. 2014-0077-DWQ (effective July 1, 2014) and Order No. 2015-0036-EXEC (effective April 7, 2015) has three basic requirements:

1. The Department must comply with the requirements of the Construction General Permit (see below);
2. The Department must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and

3. The Department storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs), to the maximum extent practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within the Department for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit, Order No. 2009-2009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective on July 17, 2012). The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop Storm Water Pollution Prevention Plans (SWPPPs); to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with the Department's SWMP and Standard Specifications, a Water Pollution Control Program (WPCP) is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

The ensuing discussion regarding water quality and storm water runoff has been excerpted from multiple sources, including the Preliminary Storm Water Data Report as prepared by the Caltrans Office of Design (2018), the Ventura River Watershed Management Plan as prepared by the Ventura River Watershed Council (2015), and independent research performed by the Caltrans Division of Environmental Planning.

The project study area for the proposed project lies within the Santa Monica Bay, Malibu Creek, and Ventura Coastal Streams watersheds. The Santa Monica Bay Watershed covers approximately 43 square miles and extends along the crest of the Santa Monica Mountains from the Ventura-Los Angeles County Line on the west, to the Ballona Creek Watershed on the east. This watershed contains 27 subwatersheds that are separated into seven jurisdictions, with much of the terrain in the northern portion characterized by rugged, open space, containing many canyons that carry runoff directly to the Santa Monica Bay. Topanga and Malibu Creeks are the two largest watercourses in the area, fed both by tributary creeks and by channelized storm drains in and near developed areas.

The Malibu Creek watershed covers approximately 109 square miles at the northwestern end of Los Angeles County and the southern end of Ventura County. Nearly 80 percent of the watershed is open space with a suburban corridor along State Route 101. The watershed poses unique challenges due to the topography of the land, with steep ravines and densely vegetated riparian corridors. The Malibu Creek watershed has a variety of different receiving waters, including creeks, lakes, and a lagoon, with some of the lakes resulting from construction of dams in the watershed. Additionally, a geologic

formation known as the Monterey/Modelo formation – an extensive Miocene oil-rich geological sedimentary formation in Malibu Creek's northern headwaters – presents significant natural sources of water quality impairments.

The Ventura River Watershed is located in western Ventura County and covers approximately 226 square miles, with the Ventura River running through its center, draining numerous tributaries along a 33.5-mile run from its headwaters in the Transverse Ranges to the Pacific Ocean. The main stem of the Ventura River originates at the junction of Matilija Creek and North Fork Matilija Creek, 16.2 miles from the Pacific Ocean. The Ventura River is fed by five significant tributaries that form "subwatersheds" nested within the larger Ventura River watershed. These tributaries, and subwatersheds, include Matilija Creek, North Fork Matilija Creek, San Antonio Creek, Cañada Larga Creek, and Coyote Creek. Ridges form the rims of these watersheds, and the main stem of the Ventura River forms a sixth watershed. Two small coastal watersheds – the Ventura Coastal Streams Watershed and the Buenaventura watershed – flank the Ventura River Watershed's lower section and are dependent on its water. The westernmost limits of the project study are within the Ventura Coastal Streams Watershed, and have a natural and undeveloped character, in general. Most primary streams and drainages are unchannelized, and agriculture is the dominant land use within the watershed. Despite relatively good water quality, all of the watershed's major water bodies are on the Clean Water Act Section 303(d) list of impaired water bodies – these are water bodies where states are required to identify pollutants causing impairment, and assign a priority for development of Total Maximum Daily Loads (TMDL) based on the severity of pollution and the sensitivity of the uses to be made of the waters, among other factors.

Environmental Consequences

Disturbed Soil Area (DSA) and Net Additional Impervious Area. Disturbed soil areas (DSAs) include all proposed project construction activity that disturbs native soil and fill within project limits. This does not include routine or preventative maintenance activities to maintain existing highways (facilities), structures, and existing functions. Asphalt concrete, Portland cement concrete, aggregate base, should backing, bridge decks, sidewalks, buildings, road side ditches, gutters, dikes, and culverts are all part of existing highway facilities, and are not considered in the calculation of DSA.

Proposed project construction can involve grading and soil compaction, an increase in impervious surfaces (roadways, roofs, sidewalks, parking lots, etc.), or a reduction of vegetative cover, all of which reduce infiltration and increase the amount of rainfall that ends up as runoff. When precipitation soaks into the ground, or infiltrates, some of it moves very slowly toward stream channels as groundwater and is gradually released over days, weeks, or months. Increasing the tributary area by paving undeveloped areas and draining into the existing storm drain system would increase impervious areas, thus collecting more surface runoff, which in general, tends to move more rapidly into channels than infiltration. Therefore, increasing the amount of impervious area in a watershed increases the total amount of water that a receiving channel must convey, and also increases the peak flow rate.

It is anticipated that the proposed project operations would slightly increase runoff volume, but it is not anticipated to affect downstream flow, discharge to lined channels, potential sediment loading, or cause other hydraulic changes to the storm drain system affecting downstream channel stability as a result of

increases in Disturbed Soil Areas (DSAs) and Net Additional Impervious Areas (AIA). The following table summarizes estimated DSA and Net Additional Impervious Area by project alternative.

Table 2.3.2-a Estimated Project Disturbed Soil Area (DSA) and Net Additional Impervious Area

Project Alternative	Total Disturbed Soil Area (DSA) in acres	Net Additional Impervious Area in acres
Alternative 1 (No-Build Alternative)	0	0
Alternative 2	1.5	0

Total Maximum Daily Loads (TMDL). As previously stated, the proposed project lies within the Santa Monica Bay, Malibu Creek, and Ventura Coastal Streams Watersheds, and storm water runoff in the project study area discharges through the storm drain systems and eventually out into a number of receiving 303(d) listed water bodies. The 303(d) list is a list of impaired and threatened waters (stream/river segments, lakes) that the Clean Water Act (CWA) requires prioritization and development of TMDLs based on the severity of pollution and the sensitivity of the uses to be made of the waters. The 303(d) listed water bodies within the project study area are as follows:

Will Rogers Beach	Malibu Creek	Zuma Beach (Westward Beach)
Santa Monica Bay Offshore/Nearshore	Malibu Lagoon Beach (Surfrider)	Trancas Beach (Broad Beach)
Castlerock Beach	Malibu Beach	Sea Level Beach
Topanga Beach	Amarillo Beach	Robert H. Meyer Memorial Beach
Las Tunas Beach	Puerco Beach	Nicholas Canyon Beach
Big Rock Beach	Dan Blocker Memorial (Coral) Beach	Leo Carillo Beach (South of County Line)
Las Flores Beach	Solstice Canyon Creek	Staircase Beach (North of County Line)
La Costa Beach	Escondido Beach	County Line Beach
Carbon Beach	Paradise Cove Beach	
Malibu Lagoon	Point Dume Beach	

A TMDL or Total Maximum Daily Load is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. Water quality standards are set by the California Regional Water Quality Control Board, who identifies the uses for each waterbody, for example, drinking water supply, contact recreation (swimming), and aquatic life support (fishing), and the scientific data to support that use. A TMDL is the sum of allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes the State has designated. The calculation must also account for seasonal variation in water quality. The Clean Water Act (CWA), Section 303, establishes the water quality standards and TMDL programs.

Established TMDLs for Santa Monica Bay

Dry Weather Bacteria TMDL for the Santa Monica Bay Beaches and Wet Weather Bacteria TMDL for the Santa Monica Bay Beaches. The Dry Weather Bacteria TMDL for the Santa Monica Bay Beaches focuses on storm drain flows during summer and winter dry weathers. Caltrans is in compliance with the TMDL. The Wet Weather Bacteria TMDL for the Santa Monica

Bay Beaches outlines 7 Jurisdiction Groups in the Santa Monica Bay coastal watersheds and assigns a Primary Responsible Jurisdiction and the Additional Responsible Jurisdictions and Agencies to each Jurisdiction Group. Caltrans participates in the Jurisdiction Groups as an Additional Responsible Agency and is working cooperatively with other Responsible Agencies toward compliance of the TMDL.

Santa Monica Bay Nearshore and Offshore Debris TMDL. The Santa Monica Bay Nearshore and Offshore Debris TMDL became effective on March 20, 2012. The TMDL requires the Responsible Agencies in the Santa Monica Bay, Ballona Creek and Malibu Creek Watersheds, including Caltrans, to reduce amount of trash and plastic pellets in the storm water discharges to "zero" in eight (8) years. Responsible Agencies may implement a Minimum Frequency of Assessment and Collection (MFAC) Program in or adjacent to the waterbody or place full capture devices at the drainage outfalls.

Santa Monica Bay Total Maximum Daily Load for DDT and PCBs. The Santa Monica Bay Total Maximum Daily Load for DDT and PCBs was adopted by the United States Environmental Protection Agency (USEPA) on March 26, 2012. The TMDL assigns waste load allocations for DDT and PCB to the Responsible Agencies in the Santa Monica Bay, Ballona Creek and Malibu Creek Watersheds, including Caltrans. Caltrans will be working with other Responsible Agencies to jointly comply with the TMDL.

Established TMDLs for Malibu

Malibu Creek Watershed Bacteria TMDL. The Malibu Creek Watershed Bacteria TMDL became effective on January 24, 2006. Caltrans is working cooperatively with a group of Responsible Agencies to jointly comply with the TMDL.

Malibu Creek Watershed Trash TMDL. The Malibu Creek Trash TMDL became effective on July 7 2009. The TMDL requires the Responsible Agencies, including Caltrans to reduce amount of trash deposited in the waterbody and in the storm water discharges to "zero" in eight (8) years. Responsible Agencies may implement a Minimum Frequency of Assessment and Collection Program in or adjacent to the waterbody or place full capture devices at the drainage outfalls.

Malibu Creek Watershed Nutrients TMDL. EPA established and approved Total Maximum Daily Loads (TMDLs) for Malibu Creek Watershed (Malibu Lagoon, Malibu Creek and its tributaries and four urban lakes) for nutrients (such as nitrogen and phosphorus) on March 21, 2003 under a consent decree deadline. The TMDLs have numeric targets for dissolved oxygen (DO), ammonia toxicity, algae/chlorophyll a, and nitrogen and phosphorus. Separate loading capacities for nitrogen and phosphorus are established for summer and winter, respectively. The TMDLs include recommendations for implementation, monitoring, and special studies. Caltrans is working cooperatively with other responsible agencies in the watershed to jointly comply with the TMDL.

Malibu Creek and Lagoon Sedimentation and Nutrients TMDL. Total Maximum Daily Loads (TMDLs) for Malibu Creek and Lagoon for sedimentation and nutrients to address benthic community impairments became effective on May 16, 2017. The water quality objectives apply

to the support and protection of aquatic life in the Malibu Creek Watershed. The TMDLs set numeric targets for Malibu Creek and its major tributaries for SC-IBI, CSCI, benthic algal coverage, chlorophyll a, dissolved oxygen, natural sedimentation rate, and nutrient concentration, and set targets for Malibu Lagoon for benthic community diversity, dissolved oxygen, and nutrient concentrations. Wasteload allocations and load allocations are established for summer and winter, respectively, for sedimentation, and for total nitrogen (TN) and total phosphorus (TP) in Malibu Creek and main tributaries. An adaptive management approach to implementation is recommended. Caltrans is working cooperatively with other responsible agencies in the watershed to jointly comply with the TMDL.

Santa Monica Bay Nearshore and Offshore Debris TMDL. The Santa Monica Bay Nearshore and Offshore Debris TMDL became effective on March 20, 2012. The TMDL requires the Responsible Agencies in the Santa Monica Bay, Ballona Creek and Malibu Creek Watersheds, including Caltrans, to reduce amount of trash and plastic pellets in the storm water discharges to "zero" in eight (8) years. Responsible Agencies may implement a Minimum Frequency of Assessment and Collection (MFAC) Program in or adjacent to the waterbody or place full capture devices at the drainage outfalls.

Santa Monica Bay Total Maximum Daily Load for DDT and PCBs. The Santa Monica Bay Total Maximum Daily Load for DDT and PCBs was adopted by the United States Environmental Protection Agency (USEPA) on March 26, 2012. The TMDL assigns waste load allocations for DDT and PCB to the Responsible Agencies in the Santa Monica Bay, Ballona Creek and Malibu Creek Watersheds, including Caltrans. Caltrans will be working with other Responsible Agencies to jointly comply with the TMDL

Established TMDLs for Miscellaneous Ventura Coastal Watersheds – Oxnard Subwatershed

There are 4 coastal subwatersheds grouped under the Miscellaneous Ventura Coastal Watersheds, Pitas Point, Buenaventura, Oxnard and Ventura Coastal Streams Subwatersheds. These subwatersheds are physically independent from one and other (see pdf maps). Oxnard is the only subwatershed that currently has an established TMDL - the Total Maximum Daily Loads for Santa Clara River Estuary/Surfers' Knoll, McGrath State Beach, and Mandalay Beach Coliform and Beach Closures.

The Total Maximum Daily Loads for Santa Clara River Estuary/Surfers' Knoll, McGrath State Beach and Mandalay Beach Coliform and Beach Closures. Caltrans is not a responsible party in the TMDL.

Regional water quality control board special requirements/concerns, including TMDLs and/or effluent limits as they pertain to the proposed project will occur in the next design phase. Caltrans will comply with the pertinent TMDL standards, and project engineers shall consider treatment controls for the proposed project and consult with the Caltrans NPDES Storm Water Coordinator to be in compliance.

Avoidance, Minimization, and/or Mitigation Measures

WDP-01/GDP-01 | Measures Relating to Section 404 of the Clean Water Act (CWA). Improvements associated with the proposed project and Location No. 10 (Replace bridge/culvert with new bridge with an underlying natural slope creek bottom at Solstice Canyon Creek) are subject to Section 404 of the Clean Water Act (CWA), which was established to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. The basic premise of the program is that no discharge of dredged or fill material may be permitted if: (1) a practicable alternative exists that is less damaging to the aquatic environment or (2) the nation's waters would be significantly degraded. A Section 404 Nationwide Permit Program (NWP) No. 14 (Linear Transportation Project), and NWP No. 33 (Temporary Construction, Access, and Dewatering), will need to be obtained from the United States Army Corps of Engineers (ACOE) in compliance with the CWA for proposed activities in "Waters of the United States." During construction of the proposed project, the following measures will be implemented as they relate to Section 404 of the CWA:

- **WDP-01.** A Water Diversion Plan shall be developed and implemented in consultation with the National Oceanic and Atmospheric Administration (NOAA), California Department of Fish and Wildlife (CDFW), United States Fish and Wildlife Service (USFWS) and the Regional Water Quality Control Board (RWQCB) to divert water through the project site to reduce turbidity and prevent sediments from entering the lagoon downstream of the project site.
- **GDP-01.** A Stream Restoration Plan will be developed by Caltrans in conjunction with a qualified hydraulics engineer to ensure that the morphology of the stream ill not be affected in such a way as to prevent fish migration and passage through the project area.

WPC-01 | Water Pollution Control Program (WPCP) and Temporary Construction BMPs. Generally, construction projects with a Disturbed Soil Area (DSA) of less than one (1) acre do not require a Storm Water Pollution Prevention Plan (SWPPP), and a Water Pollution Control Program (WPCP) prepared prior to commencement of soil-disturbing activities is suitable for compliance. While the Disturbed Soil Area (DSA) for all nineteen (19) proposed project locations is estimated at 1.5 acres, the total is non-contiguous throughout all project locations and thus qualifies for the preparation of a WPCP, rather than a more extensive SWPPP. A WPCP shall be implemented to improve construction site water quality practices, and control the impacts of storm water pollution through Best Management Practices (BMPs).

Construction work for the full project is estimated to cover approximately 3 years. The temporary construction BMP categories suitable for controlling potential pollutants to be considered for the proposed project will be refined during the next design phase, and shall include:

- Soil stabilization measures
- Sediment control measures
- Tracking control
- Wind erosion control
- Non-storm Water Management
- Waste management and Materials Pollution Control

2.3.3 GEOLOGY/SOILS/SEISMIC/TOPOGRAPHY

Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under the California Environmental Quality Act (CEQA).

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Structures are designed using the Department's Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see the Department's Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

The ensuing discussion regarding geology/soils/seismicity/topography has been excerpted from multiple sources, including the Geologic and Geotechnical Memorandum (Caltrans Office of Geotechnical Design, 2005), the Preliminary Geotechnical Report (Caltrans Office of Geotechnical Design South – Mets and Geotechnical Services , 2017), and the District Preliminary Geotechnical Report (Caltrans Division of Design – Office of Geotechnical Services, Geotechnical Design South, June 2018)

Regional Geology. The proposed project site is located within the southern slopes of the Santa Monica Mountains – part of the southern-most portion of the western Transverse Ranges geomorphic province of Southern California. The western Transverse Ranges are characterized as a belt of east/west-trending folds (anticlines and synclines) with associated thrusts that formed in response to northeast crustal shortening. The province has undergone intense deformation with many reversed faults and folds a result of north-south compressive forces produced by the convergence of the Pacific and North American Plates. The province extends about 320 miles (520 kilometers) from Point Arguello and San Miguel Island on the west to the mountains of Joshua Tree National Monument on the east where the provide merges with the Mojave and Colorado Plateau. From northwestern Ventura County east to Cajon Pass, the San Andreas fault system forms the northern boundary of the province, which is subdivided into multiple individual ranges and intervening valleys that are generally bounded by reverse faults and/or thrust faults. The Transverse Ranges, in general, incorporate a greater spectrum of rock types and structure than any other province in the state of California.

The stratigraphic nomenclature of the Santa Monica Mountains, and the Malibu Coast Fault in particular, represent the boundary between two different geologic terranes. On the north side of the fault, a basement of Santa Monica Slate and granodiorite is overlain by Upper Cretaceous through upper Miocene deposits, and on the south, a basement of Catalina Schist is overlain by Miocene and younger deposits. The proposed project site is located south of the Malibu Coast Fault with the sequence of bedrock units consisting of lower-to-middle- Miocene Trancas Formation and Zuma Volcanics and the middle-to-upper Miocene Monterey Formation. The Trancas Formation is exposed in fault sections in the southwest and south-central part of the map area and is composed of marine sandstone, mudstone, silty shale and claystone. The Zuma Volcanics crops out in the southwest corner of the area and consists primarily of mudflow breccia. The Monterey Formation intertongues with and overlies the Trancas Formation and the Zuma Volcanics. The Monterey Formation is composed of marine clay shale, laminate to platy siltstone, and interbedded altered vitric tuffs and fine-to-medium grained sandstone. The relationship between the Zuma Volcanics, Trancas, and Monterey Formation units are very difficult to interpret since the site is located within the Malibu Coast Fault deformation zone and the units are very tightly folded, fractured, and faulted.

Upper Pleistocene marine and nonmarine coastal terrace deposits in the southern part of the Malibu Quadrangle unconformably overlie the Monterey Formation and older bedrock units. Along the flanks and the canyons and valleys are scattered remnants of upper Pleistocene stream-terrace deposits. Quarternary surficial deposits in the Malibu Beach Quadrangle consist of upper Pleistocene to Holocene undifferentiated surficial deposits, fan deposits, landslide deposits, dunes, beach deposits, colluvium, undifferentiated alluvial deposits, alluvial floodplain deposits, alluvium in active channels, and artificial fill.

Geology and Soils at Proposed Project Location No. 10 (Bridge Replacement/Culvert Removal at Solstice Canyon Creek). The Caltrans Office of Geotechnical Design, South completed a subsurface investigation at proposed Location No. 10 to obtain information on the physical properties of soil and rock around the site in order to design earthworks and foundations for the proposed bridge structure and culvert removal. The subsurface investigation entailed a drilling of five exploratory mud rotary sample borings that were advanced using a self-casing wireline drilling method. The following materials were encountered during the subsurface investigation – interpreted as artificial fill, marine deposits, alluvial deposits, and bedrock.

> **Artificial Fill Material.** Artificial fill material was found to overlay most of the natural site. The fill material generally consisted of medium-to-loose density silty gravel with sand, clayey gravel with sand, cobbles, rootlets, and concrete debris. Cobble encountered during the drilling ranged in size from 0.1 meters (0.3 feet) to 0.2 meters (0.6 feet) and are hard, moderately weathered, and sub-rounded. Concrete rubble was encountered from an elevation of 9.7 meters (31.8 feet) to 9.2 meters (30.2 feet). Multiple pieces of concrete debris were observed lying in the creek near the inlet of the existing culvert and near the southeast wing wall located at the outlet of the existing culvert. Semi-square shaped concrete debris ranged in size from 0.6 meters X 1.2 m (2.0 feet X 4.0 feet) to 1.2 meters X 1.5 meters (4.0 feet X 5.0 feet) with a thickness of approximately 0.3 meters X 0.5 meters (1.0 feet X 1.6 feet). Multiple cobbles and boulders were visible within the slopes of the wash (from the slopes to the bottom of the wash). They were also observed scattered in the bottom of the wash. The boulders were hard, moderately weathered, sub-rounded to round, and ranged from approximately 0.3 meters to

1.0 meters (0.9 feet to 3.3 feet) in size. The fill material extended to a minimum elevation of approximately 5.7 meters (18.7 feet) in all borings, with the exception of one, where the fill material extended to a minimum elevation of 7.2 meters (23.6 feet).

Marine Deposits. Marine deposits were found throughout the site and consisted of loose, organic, rich, black, fine grained silty sand with an abundance of shell fragments. The marine deposits were found to be generally consistent in thickness in all of the borings, except one. Across the site, the general thickness of this layer was approximately 1.0 meters (3.3 feet) and in one boring, the thickness of this layer was approximately 2.3 meters (7.5 feet). The marine deposits extended to a minimum elevation of 4.9 meters (16.1 feet).

Alluvial Deposits. Alluvial deposits were encountered across the site and consisted primarily of medium-to-very dense silty sand/gravel, silty gravel/sand, clayey gravel/sand, and sandy lean clay/gravel. Also incorporated with the alluvial/fan deposits were cobbles and boulders. Cobbles encountered during the drilling ranged in size from 0.1 meters (0.3 feet) to 0.3 meters (1.0 feet) and were hard, moderately weathered, sub-angular to sub-rounded, and consisted primarily of andesite and sandstone. Boulders encountered during drilling ranged in size from approximately 0.3 meters (1.0 feet) to 0.5 meters (1.5 feet), were hard, moderately to lightly weathered, sub-angular to sub-rounded, and consisted primarily of andesite. The alluvial deposits extended to a minimum elevation of 0.3 meters (0.9 feet).

Bedrock. The bedrock encountered during drilling consisted of volcanic rock, andesitic breccia, sedimentary rock, and shale/siltstone. The andesitic breccia was encountered in all borings, with the exception of one, encountered at a minimum elevation of 0.4 meters (1.3 feet). The andesitic breccia was interpreted as belonging to the Zuma Volcanics that includes basaltic and andesitic flows, breccias, pillow lavas, mudflow breccias, and local interlayers of siltstone and mudstone. The shale/siltstone was encountered in two borings, encountered at a minimum elevation of -12.2 meters (-40.0 feet) – the maximum depth explored during the subsurface investigation. The shale/siltstone was interpreted as belonging to either the Trancas or Monterey Formation. The relationship between the Zuma Volcanics, Trancas and Monterey Formation units at the site is very difficult to interpret since the site is located within the Malibu Coast Fault deformation zone and the stratigraphic units are very tightly folded, fractured, and faulted.

Groundwater. Following the completion of the subsurface investigation, groundwater was measured, and it was found that the approximate groundwater elevation was measure at 3.3 meters (10.8 feet). Seasonal fluctuations of the site groundwater conditions are expected to occur with changes in annual precipitation and may also be influenced by tidal changes. However, historical records indicate that groundwater may fluctuate between a depth of 1.5 meters (5.0 feet) and 3.0 meters (10.0 feet) below the existing ground surface.

Tsunamis. A tsunami is a series of waves of extremely long wavelength and long period generated in a body of water by an impulsive disturbance that displaces the water. Tsunamis are primarily associated with earthquakes in oceanic and coastal regions. Landslides, volcanic eruptions, nuclear explosions, and even impacts of objects from outer space (such as meteorites, asteroids, and comets) can also generate tsunamis. Large earthquakes off the coast of South and Central America, Alaska, and Japan generate most major Pacific Ocean tsunamis.

The only tsunami to cause appreciable damage and loss of life along the California coastline occurred on March 27, 1967, as a result of the Great Alaska Earthquake. Coastal communities in Southern California, including the coastal areas within the City of Malibu, are vulnerable to tsunamis. Tsunamis may be generated immediately offshore of Malibu by surface ground rupture of faulting or by the occurrence of submarine landslides. Run-up heights along the City of Malibu shoreline are estimated between five and seven feet for the 100-year zone, and between eight and twelve feet for the 500-year zone.

Corrosion. The Caltrans Office of Testing and Technology Services, Corrosive Technology Branch tested composite samples for corrosive potential. A site is considered to be corrosive if one or more of the following conditions exist for the representative soil and/or water samples taken at the site: chloride concentration at 550 parts-per-million (ppm) or greater, sulfate concertation at 2000 ppm or greater, or a potential of hydrogen (pH) at 5.5 or less. The results of the laboratory test determined that the composite samples were considered to be corrosive. The controlling corrosive parameters for the site consist of 568 ppm or chloride and 5073 ppm sulfate, and remedial measures to protect against a corrosive environmental at all foundation locations will be implemented in design of the proposed bridge structure.

Seismicity. The existing culvert is located within a seismically active region of Southern California, and close to a number of faults that are considered to be active or potentially active, with a shear wave velocity (V_{S30}) of 883 feet/second (270 meters/second). Location No. 10 is located 0.05 miles north of the Malibu Coast on a strike-slip fault, for which the magnitude of the maximum credible earthquake (MCE) is 6.6. The design median peak ground acceleration (PGA) at Location No. 10 is approximately 0.69g. Other nearby faults, including the Anacapa-Dume Alt 1 fault and the Santa Monica fault would be expected to have a lesser impact on the proposed bridge structure.

Liquefaction. According to the map of the Earthquake Fault Zones and Seismic Hazard Zones of Malibu Beach 7.5 Minute Quadrangles released on August 16, 2007, Location No. 10 is within an area delineated as a liquefaction zone, but based on the SPT N values and groundwater table levels from previous logs of test borings, the on-site soils have a minimal potential to be liquefiable during a seismic event.

Environmental Consequences

Alternative 1 (No Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing drainage system, and no replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope creek bottom. Consequently, selection of this alternative would present no potential impacts on geologic resources.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). Based on subsurface exploration information, the proposed bridge at Location No. 10 can be supported by spread footing, with bearing capacity of the spread footing to be determined once structural design requirements are refined. Groundwater elevation was measured at an elevation of

10.8 feet during subsurface exploration. The proposed footing bottom elevations vary from 3-to-5 feet, which is below measured groundwater elevation.

It is recommended that remedial measures should be taken to minimize the effect of groundwater and soil excavation during construction. Shoring and a dewatering system may be required during footing construction and the stability of these excavations is dependent on the total time the excavation is exposed, groundwater conditions, granular nature of the soil, and contractor operations. The soils encountered in the borings are mostly granular, including sand, silt, gravel, cobbles, and boulders, and are susceptible to raveling.

Avoidance, Minimization, and/or Mitigation Measures

GW-01 | Minimization of the Effects of Groundwater and Soil Excavation during Construction. It is recommended that remedial measures should be taken to minimize the effect of groundwater and soil excavation during construction. Shoring and a dewatering system may be required during footing construction and the stability of these excavations is dependent on the total time the excavation is exposed, groundwater conditions, granular nature of the soil, and contractor operations. The soils encountered in the borings are mostly granular, including sand, silt, gravel, cobbles, and boulders, and are susceptible to raveling.

GT-01 | Additional Geologic Testing. Further engineering analyses are required to provide the appropriate recommendations to ensure the design of the proposed bridge structure, foundation, paving, and grading associated with the proposed project is geologically sound. The result of these efforts shall be presented in the final Foundation Report (FR) and will include the following:

- Evaluation of soil strength, moisture, classification, particle size distribution, consolidation, collapse potential, compaction, and corrosion potential utilizing previous boring data and laboratory test results at Solstice Canyon Creek bridge
- Further analyses of site geology and subsurface conditions based on previous subsurface exploration at Solstice Canyon Creek bridge
- Seismic studies to include further evaluation of liquefaction potential and seismically induced settlement
- Evaluation of all geotechnical data and production of a final report that summarizes all data and the resulting design recommendations

2.3.4 HAZARDOUS WASTE/MATERIALS

Regulatory Setting

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, and the Resource Conservation and Recovery Act (RCRA) of 1976. The purpose of CERCLA, often referred to as "Superfund," is to identify and cleanup abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order (EO) 12088, Federal Compliance with Pollution Control Standards, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and cleanup of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

The ensuing discussion has been excerpted from the Initial Site Assessment for the proposed project as prepared by the Caltrans Office of Environmental Engineering (November 2016, revised December 2017 and May 2018), and supported by independent research performed by the Caltrans Division of Environmental Planning.

State Route 1 (SR-1), or Pacific Coast Highway (SR-1/PCH) is a four-lane state highway that traverses in an east-to-west direction along the coastline of the Pacific Ocean, and is a major artery providing access to the many canyons of the Santa Monica Mountains and several major beaches. The facilities exist within an area that is primarily residential with occasional neighborhood service facilities located on or adjacent to SR-1/PCH, and while it continues to maintain a coastal, semi-rural characteristic, development continues to expand into the canyons and hillside, though it is severely limited by land that is not suitable for development because of steep terrain, unstable geological conditions, fire hazards, and sensitive environmental resources.

During the initiation phase of the proposed project, a general screening was performed to determine the potential to encounter hazardous waste, hazardous materials, and contamination, and assess the need for subsequent studies. This screening generally consists of project evaluation, a departmental record review, regulatory agency records review, and a general field visit. Because the proposed project requires minor acquisition of right of way (particularly at Location No. 10 at Solstice Canyon Creek), and includes structure demolition, modification, and excavation, it was deemed that a more in-depth Initial Site Assessment (ISA) was necessary to more accurately identify the potential to encounter known hazardous waste, hazardous materials, and/or contamination in the project study area.

Project Locations No. 1-9 and Locations No. 11-19. For proposed project locations where culvert barrel linings will be replaced, it is anticipated that soil disturbance will be minor during construction and the generation of surplus soils will not occur. For proposed project locations where full and/or partial culvert system replacement using a cut-and-cover method is required, the asphalt concrete (AC) will be saw cut, and the soil beneath the AC will be excavated, stockpiled, and backfilled after the work is complete. For proposed project locations where culvert system replacement requires a jack-and-bore method, holes will be drilled underground and horizontally between the inlet and outlet, and replacement pipe will be sent and received without disturbing the surface between the pits at either end. No groundwater is expected to be encountered at any of the proposed project locations, with the exception of Location No. 10 at Solstice Canyon Creek, where a dewatering method will be required to control groundwater by pumping, to locally lower groundwater levels in the vicinity of the excavation. Based upon the analysis in the ISA, it was determined that there is low potential of hazardous waste contamination associated with the scope of work for these proposed project locations.

Project Location No. 10 at Solstice Canyon Creek. The proposed replacement of the existing bridge structure and culvert, and construction of a new bridge with an underlying natural slope creek bottom will require major soil excavation, which will require a water control method called dewatering. Dewatering is the process of dealing with groundwater to allow excavation for construction to be carried out in workable dry conditions. Encounter with groundwater is anticipated during construction as project work extends to an elevation below existing groundwater levels. The dewatering method to be applied to this location will require pumping of groundwater, to locally lower groundwater levels within the vicinity of the excavation. When groundwater is pumped at a high enough pump rate, radial flow is induced with a reduction in hydraulic "head" or "drawdown," thus, generating a cone of depression. The "drawdown" results in groundwater flowing in the down-gradient direction to the well. A previous site investigation (November 2006) indicated that the depth of groundwater at this location is estimated at 18.54 feet above mean sea level.

The ISA performed for the proposed project, and particularly at this project location, indicated potential concerns regarding groundwater pollution in consideration of its proximity to a gas station adjacent, and just west of the site (Union 76 Gas Station at 26101 Pacific Coast Highway, APN No. 4459-005-011). Utilizing the Geotracker database as maintained by the California State Water Resources Control Board (SWRCB), it was determined that several Leaking Underground Storage Tanks (LUST) clean-up sites exist adjacent to this property with the potential for residual contamination in soil and groundwater from past releases. The Regional Water Quality Control Board (RWQCB) has since closed these site cases under the "low threat closure policy," which allows residual contamination to remain in groundwater without further action required.

Laboratory results indicate that other contaminants (such as cadmium, chromium, copper, lead, zinc, et. Al) in the groundwater exceed the National Pollutant Discharge Elimination System (NPDES) discharge limits. Additionally, six groundwater samples from a supplemental site investigation report (January 2008) indicated a potential for contamination from heavy metals in groundwater at this site due to suspended and settled solids. Because the groundwater and surface water quality sampling were conducted more than 10 years ago, updated sampling will be required in the next project phase. Based upon the aforementioned findings, groundwater at this site is not expected to meet the NPDES permit discharge limitations and all groundwater will require treatment before discharge to comply with Regional Water Quality Control Board (RWQCB) regulations.

Aerially Deposited Lead (ADL). Soils within the project vicinity, particularly in areas that are unpaved, have the potential for ADL contamination, related to previous and historical use of leaded gasoline additives. Particulate emissions in engine exhaust contained lead from leaded gasoline, which was deposited in unpaved areas adjacent to most roadways and potentially from runoff to roadway embankments and adjacent right-of-way. However, the potential for occurrence of ADL contamination at hazardous levels in the project study area is low because most proposed work and soil disturbance is anticipated to occur at culvert inlets and outlets that are 30-to-60 feet from the roadway. A previous ADL Site Investigation (SI) completed in 2013 indicated that concentrations of total lead and soluble lead in soil samples were less than the regulatory threshold concentrations to be considered hazardous waste. In general, soils within the project study area are most likely non-hazardous, and sediment inside drainage systems are likely derived from the same soils and considered to have a low potential to be considered hazardous.

Asbestos Containing Materials (ACM). Structural demolition work relating to the replacement of the bridge/culvert at Project Location No. 10 at Solstice Canyon Creek has the potential to generate Asbestos Containing Materials (ACMs) as the structure was built in the 1960s. ACM may be present in construction materials used in drainage piping, joint seals, and railing shim plates. Bridges are considered regulated structures by the U.S. Environmental Protection Agency (USEPA) and local air quality management district, which states that demolition and renovation activities relating to such structures require an asbestos survey, which will be performed during the next project phase. The survey will more accurately evaluate the potential of ACMs in the existing bridge/culvert structure to be replaced during construction.

Potential Occurrence of Contamination in Parcels Associated with the Proposed Project. The Caltrans Office of Environmental Engineering performed a preliminary environmental database search of the properties that require acquisition associated with the proposed undertaking. It was found that no hazardous waste sites exist in relation to all proposed project locations, with the exception of Location No. 10 as detailed previously. A more in-depth evaluation and assessment of risks associated with such will be included in an additional Site Assessment and Site Investigation in the next project phase.

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing facilities, posing no changes to the existing environment, and no disturbance to soils; therefore, it would present no potential for exposure to hazardous waste and/or materials.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). As previously stated, it was determined that there is low potential of hazardous waste contamination associated with the scope of work for proposed Project Locations No. 1-9 and Project Locations No. 11-19. Soil excavation and earth-moving activities associated with proposed Project Location No. 10 present concerns regarding worker exposure to residual contamination in soil and groundwater due to Leaking Underground Storage Tanks (LUST). The contaminants include petroleum hydrocarbons, and heavy metals such as cadmium, chromium, copper, lead, zine, et. Al in groundwater. Based upon these findings, groundwater at this site is not expected to meet the NPDES permit discharge limitations and all groundwater will require treatment before discharge to comply with Regional Water Quality Control Board (RWQCB) regulations.

Structural demolition work relating to the replacement of the bridge/culvert at Project Location No. 10 at Solstice Canyon Creek has the potential to generate Asbestos Containing Materials (ACMs) as the structure was built in the 1960s. An asbestos survey, will be performed during the next project phase to more accurately evaluate the potential of ACMs in the existing bridge/culvert structure to be replaced during construction.

Because the ISA identified potentially contaminated sites or properties at proposed Project Location No. 10, further investigation and evaluation is required to more adequately determine contamination, and the risks associated with remediation. An additional Site Investigation is recommended to assess the nature and extent of remaining soil impacts on the parcels with constituents of concern including

Aerially Deposited Lead (ADL), and sampling of soils to evaluate any residual Total Petroleum Hydrocarbons (TPH) or the presence of fuel-related constituents, given the proximity to former Underground Storage Tanks (USTs). The investigation will also screen for contaminant levels relating to cadmium, chromium, copper, lead, zinc, et. Al, and contaminant levels relating to heavy metals in groundwater at this site due to suspended and settled solids. The results of this investigation will be used to prepare a remediation plan to manage, handle, and dispose of impacted soils during construction and post-construction, should long-term monitoring or remedial actions be required.

Aerially deposited lead (ADL) from the historical use of leaded gasoline, exists along roadways throughout California. If encountered, soil with elevated concentrations of lead as a result of ADL on the state highway system right of way within the limits of the project will be managed under the July 1, 2016, ADL Agreement between Caltrans and the California Department of Toxic Substances Control. This ADL Agreement allows such soils to be safely reused within the project limits as long as all requirements of the ADL Agreement are met.

Avoidance, Minimization, and/or Mitigation Measures

ADL-01 | Aerially Deposited Lead (ADL). During construction, excess ADL soils will require special handling and waste management, especially when disturbed during earth-moving activities. A project-specific ADL site investigation will be performed to evaluate excess soils with ADL contamination and determine whether they are classified as Federal waste, which will require off-site disposal at a permitted Class I California hazardous waste (RCRA) disposal facility. Collectively, the site investigation data will assist in the preparation of the necessary Lead Compliance Plan as required under California Code of Regulations (8CCR), Title 8, Section 1532.1, “Lead,” and Cal-OSHA Construction Safety Order.

ACM-01 | Asbestos Containing Materials (ACM). Surveying and sampling will be required to determine procedures for the proper removal, handling and disposal of ACM during construction. Upon completion and analyses of surveys and sampling, an Asbestos Compliance Plan (ACP) shall be completed and signed by a Certified Asbestos Consultant (CAC), which outlines potential risks and appropriate monitoring plans, as well as safety measures to reduce the risk of worker exposure to contamination. Additionally, the production of a Dust Control Plan (DCP) is required by the South Coast Air Quality Management District (SCAQMD) under Rule 403 for large operations of 50 or more acres of disturbed surface area, or any earth moving operation with daily earth moving volumes of 3,850 cubic meters (5,000 cubic yards). Similarly, the Ventura County Air Pollution Control District (VCAPCD) invokes Rule 55 as it relates to production of a DCP for fugitive dust emissions. The DCP will outline procedures to prevent dust emissions during excavation, stockpiling, transportation, or placement of materials containing ACM.

SIR-01 | Remediation of Parcels Associated with the Proposed Project. Site investigation work is required to include sampling and evaluation of any residual concentrations of contamination that may be present at Project Location No. 10, and all proposed parcels requiring acquisition. The results of the additional site investigations will be used to prepare the appropriate remediation cost estimates to manage, handle, and dispose of any impacted soils during construction and following construction, should long-term monitoring or remedial actions be required.

2.4 BIOLOGICAL ENVIRONMENT

2.4.1 NATURAL COMMUNITIES

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. There are three (3) Natural Habitat Communities within the project Biological Study Area, these are Coastal bluff scrub, Alder/Sycamore Riparian, and Sandy Beach. This section also includes information on wildlife corridors, fish passage, and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value. Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in the Threatened and Endangered Species section. Wetlands and other waters are also discussed below. Discussion of fish passage is included under the Threatened and Endangered Species section as a component of Federal consultation.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

A series of field investigations were performed to survey the existing biological environment and how the proposed project alternatives and undertaking would affect such. The findings of these investigations were incorporated in the Natural Environment Study (NES) for the State Route 1 (Pacific Coast Highway) Drainage Restoration Project and Bridge Replacement at Solstice Canyon Creek, published July 2018, by the Caltrans Division of Environmental Planning, Biology Unit – District 7. The NES is based on the aforementioned field investigations, reviews of relevant literature on the biological resources of the project study area and the surrounding vicinity (including biological databases), and a search for any applicable regional Habitat Conservation Plan (HCP) or Multiple Species Conservation Plan (MSCP).

The Biological Study Area (BSA) encompasses a portion of the City of Los Angeles (Pacific Palisades) on its western end, most of the City of Malibu (LA-1 post miles 37.67 to 62.86) and extends just west of the Ventura County border (VEN-1 post miles 0.00 to 0.92). The proposed scope of work includes a total of nineteen (19) project locations – eighteen (18) of which are small culvert project sites and one (1) bridge/culvert location. In general, little-to-no vegetation exists within the immediate project impact area at the eighteen (18) small culvert project sites, and any vegetation is primarily non-native and ruderal, especially in areas adjacent to the SR-1/PCH roadway. However, five (5) of the small culvert project locations (project Locations No. 13-17, PM 61.29 to 62.55) have substantial native vegetation that is summarized as follows.

- **Proposed Project Locations No. 13-15.** Vegetation within the basins of project Locations No. 13, 14, and 15 can be classified as a mix of Coastal Scrub, Chaparral, and non-native shrub and herbaceous species, with substantial non-native tree species present at the outlet of the existing drainage as project Location No. 13. At project Locations No. 13 and 14, the culvert inlets occur within medium-to-heavily vegetated drainage basins, while the outlets extend approximately 175 feet from the edge of the roadway onto a heavily vegetated steep roadway fill slope. Proposed project Location No. 15 outlets into a deep erosional canyon which has caused segments of the existing pipe to fail, leaving it hanging over the void. Access to these locations on the beach side of the roadway will be along Sandy Beach habitat.
- **Proposed Project Locations No. 16/17.** Proposed Project Locations No. 16 and 17 exist within a vegetated strip between SR-1/PCH and Beach Access Road, to Leo Carillo State Park. The vegetation/natural community at these locations can be classified as a mix of heavily disturbed Coastal Scrub, Chaparral shrub, and herbaceous species with ruderal non-natives interspersed within.

Certified by the California Coastal Commission (CCC) in 2003, the City of Malibu Local Coastal Program (LCP) identifies Environmentally Sensitive Habitat Areas (ESHA) in which plant or animal life, or their habitats, are either rare or especially valuable because of their special nature or role in the ecosystem, and which could be easily disturbed or degraded by human activity and development. ESHAs are further defined as "major riparian corridors; oak woodlands (including those in proximity to existing highways and/or residential development); coastal wetlands and estuaries; offshore rocks and rocky shoreline areas; marine resources; kelp beds; undeveloped sandy beaches; coastal bluffs, and coastal sand dunes between Arroyo Sequit and Paradise Cove." Proposed project Locations No. 13-15 are located within a designated ESHA, which warrants protection against significant disruption of habitat values, with only particular resource dependent uses permitted within.

Solstice Canyon Creek (Project Location No. 10). Solstice Canyon Creek – at proposed project Location No. 10 where Caltrans proposes fish passage restoration at SR-1/PCH – drains approximately 4.4 square miles of steep terrain in the Santa Monica Mountains, and flows through Solstice Canyon to the Pacific Ocean at Dan Blocker County Beach. The perennial creek is spring-fed with a relatively constant low-flow, in-channel volume during typical summer low-flow conditions, with seeps and springs in the canyon that are associated with the Malibu Coast Fault (Klein R. et al., 2002). Solstice Canyon Creek is adjacent and connected to a National Recreation Area and it provides a link between the coastal strand and upstream habitats. Solstice Canyon Creek terminates onto a coastal beach habitat that leads to the Pacific Ocean, and during times of high flows, a large portion of the sand bar is breached, exposing more of the downstream channel.

Solstice Canyon has diverse natural resources with plant communities such as chaparral, coastal sage scrub, and southern sycamore alder riparian woodland. The riparian corridor landward of the highway matches the description of the California Sycamore series as described in the Sawyer and Keeler-Wolf vegetation classification system. Southern Sycamore Alder Riparian Woodland is a tall, open, broad-leafed, winter-deciduous woodland dominated by California sycamore and, often, White Alder (*Almus rhombifolia*). These stands seldom form closed canopy forests and are known to occur in very rocky streambeds subject to seasonal, high-intensity flooding. Alder increases in abundance on more perennial streams, while sycamore favors more intermittent hydrographs. Distribution is common in the Transverse and Peninsular ranges from Point Conception south into Baja California Norte.

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing facilities, posing no changes to the existing environment. Therefore, it would present no potential for adverse effects on habitat and/or wildlife connectivity.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). A functional network of connected habitats is essential to the continued existence of California's diverse species and natural communities in the face of both human land use and climate change and is key to the conservation of fish and wildlife. Due to the project being located directly along the coast, the potential for adverse effects on habitat connectivity is extremely low. The proposed project will not decrease or otherwise impede wildlife connectivity in the area.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are proposed as the potential for adverse effects on habitat and wildlife connectivity is extremely low.

2.4.2 WETLANDS AND OTHER WATERS

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. The lateral limits of jurisdiction over non-tidal water bodies extend to the ordinary high-water mark (OHWM), in the absence of adjacent wetlands. When adjacent wetlands are present, CWA jurisdiction extends beyond the OHWM to the limits of the adjacent wetlands. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (40 Code of Federal Regulations [CFR] 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a "least environmentally damaging practicable alternative" (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency, such as FHWA and/or the Department, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCBs) and the California Department of Fish and Wildlife (CDFW). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see the Water Quality section for more details.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

A series of field investigations were performed to survey the existing biological environment and how the proposed project alternatives and undertaking would affect such. The findings of these investigations were incorporated in the Natural Environment Study (NES) for the State Route 1 (Pacific Coast Highway) Drainage Restoration Project and Bridge Replacement at Solstice Canyon Creek, published July 2018, by the Caltrans Division of Environmental Planning, Biology Unit – District 7. The ensuing discussion regarding Wetlands has been excerpted from this report. Wetlands are areas frequently inundated or saturated by surface water or groundwater sufficient to support vegetation adapted for life in saturated soil conditions (ACOE 1987). Riparian areas are the areas adjacent to streams and rivers, and have a distinct vegetative community associated with the higher groundwater level adjacent to the drainages.

Streams and other waters with a defined bed and bank are subject to the jurisdiction of the California Department of Fish and Wildlife (CDFW), in accordance with Fish and Game Code Sections 1600-1607. The CDFW regulates activities that would alter the flow, bed, channel or bank of streams, lakes and other drainages by requiring a Streambed Alteration Agreement (SAA). In riparian areas, CDFW jurisdictional limits are usually delineated by the top of the stream or lake banks, or the outer edge of riparian vegetation; whichever is wider.

Waters of the U.S. include all navigable waters and their tributaries, all interstate waters and their tributaries, all wetlands adjacent to these waters, and all impoundments of these waters. These waters are regulated by U.S. Army Corps of Engineers (USACE) and the Regional Water Quality Control Board (RWQCB) pursuant to Sections 404 and 401 of the Clean Water Act, respectively. Wholly upland waters, such as intermittent tributaries with no flow and no riparian vegetation (i.e. no hydrological or biological connectivity to Waters of the U.S.), are not regulated by the USACE and the RWQCB pursuant to Sections 404 and 401 of the Clean Water Act, respectively.

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing facilities, posing no changes to the existing environment. Therefore, it would present no potential for adverse effects on wetlands and other waters.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). Proposed project Locations No. 10 (Solstice Canyon Creek) and No. 13 will be subject to CDFW, USACE, and Water Board jurisdiction and permitting, upon completion and finalization of this CEQA/NEPA document. In addition, sites 14 and 15 will be subject to CDFW jurisdiction and permitting.

Any beach access that is within the Mean High Tide Line (MHTL) will require permitting from the Regional Water Quality Control Board and U.S. Army Corps of Engineers as well, this includes proposed project Locations No. 3, 4, 5, 6, 10, 13, 14, and 15.

Regardless, as is standard practice, Caltrans shall consult with the regulatory agencies regarding all locations and aspects of this project and ensure that all necessary permitting is obtained prior to the commencement of construction.

At Solstice Canyon Creek, approximately 12,600 sq. ft. (0.29 Acres) of Waters of the U.S. will be temporarily impacted by this project. Approximately 3,300 sq. ft. of riparian woodland habitat will be temporarily impacted by the project.

Executive Order 11990 - Wetlands Only Practicable Alternative Finding. Per the requirements under Executive Order 11990, alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included.

Of the 19 project locations, only the Solstice Creek location is classified as riverine wetland/riparian habitat.
The National Marine Fisheries Service (NMFS) mandated the Solstice Canyon Creek fish passage restoration location via an Administrative Settlement signed in 1999. Caltrans has considered various alternatives at Solstice Canyon Creek over the years and in coordination with NMFS, it was determined that the natural bottom creek beneath the new bridge will widen and restore the creek to its natural condition, and create the potential for a net positive/increase to wetlands.

Therefore, Caltrans has determined that: (a) that there is no practicable alternative to the construction of this project and (b) the proposed project includes all practicable measures to minimize harm.

Avoidance, Minimization, and/or Mitigation Measures

BIO-01 | Biological Monitoring. A biological monitor will be on-site at all times while work is occurring within or adjacent to a beach or tidal environment. This includes on-site monitoring during construction at proposed project Location No. 10 at Solstice Canyon Creek.

2.4.3 PLANT SPECIES

Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) have regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act

(FESA) and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species section in this document for detailed information about these species.

This section of the document discusses all other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at California Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act (CEQA), found at California Public Resources Code, Sections 21000-21177.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

A series of field investigations were performed to survey the existing biological environment and how the proposed project alternatives and undertaking would affect such. The findings of these investigations were incorporated in the Natural Environment Study (NES) for the State Route 1 (Pacific Coast Highway) Drainage Restoration Project and Bridge Replacement at Solstice Canyon Creek, published July 2018, by the Caltrans Division of Environmental Planning, Biology Unit – District 7. The ensuing discussion has been excerpted from this report.

Flora through this stretch of highway consists of disturbed roadside landscaped and ruderal vegetation intermixed with some common native coastal bluff scrub species. Sites 10 and 13-17 have the most substantial amount of native vegetation within the project impact area. All other sites are primarily either unvegetated or made up of ruderal/non-native vegetation with just a handful of native species mixed in. Generally speaking, the species include pampas grass (*Cortaderia selloana*), fountain grass (*Pennisetum setaceum*), laurel sumac (Malosma laurina), Russian thistle (*Salsola tragus*), cliff aster (*Malacothrix saxatilis*), common ice plant (*Mesembryanthemum crystallinum*), tree tobacco (*Nicotiana glauca*), castor bean (*Ricinus communis*), canyon sunflower (*Venegasia carpesioides*), white sweet clover (*Melilotus albus*), and Australian saltbush (*Atriplex semibaccata*). The Natural Community for these sites would be classified as ruderal vegetation with some native coastal scrub species mixed in.

Proposed Project Location No. 10 at Solstice Canyon Creek. On the south side area of the bridge along the roadway, several ornamental and native plants were observed. Native plants include California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), California encelia (*Encelia californica*), laurel sumac (*Rhus laurina*), and buckwheat (*Eriogonum sp*.). Non-native, invasive/non-native species observed include iceplant (*Carpobrotus edulis*), myoporum (*Myoporum laetum*), fountain

grass (*Pennisetum setaceum*), *Euphorbia terracina* and castor bean (*Ricinus communis*). The Natural Community here can be classified as ruderal/disturbed.

On the north side area of the bridge, dominant native species observed include western sycamore (*Platanus racemosa*) and white alder (*Alnus rhombifolia*). Grasses (*Bromus sp*.), sea rocket (*Cakile maritima*), scarlet monkeyflower (*Mimulus cardinalis*), bermuda buttercup (*Oxalis pes-caprae*), red valverian (*Plictritus ciliosa*), watercress (*Rorippa nasturtium*), and poison oak (*Toxicodendron diversilobum*) were observed along the streambed. The Natural Community here can be classified as Alder/Sycamore Riparian.

Proposed Project Location No. 13. Vegetation within the inlet basin is classified as Coastal sage/bluff scrub and is primarily made up of coyote bush (*Baccharis pilularis*), California sagebrush (*Artemisia californica*) with some mulefat (*Baccharis salicifolia*), tree tobacco (*Nicotiana glauca*) and black mustard (*Brassica nigra*) mixed in. Other species observed include: cliff aster (*Malacothrix saxatilis*), laurel sumac (*Malosma laurina*), ashyleafed buckwheat (*Eriogonum cinereum*), California encelia (*Encelia californica*), toyon (*Heteromeles arbutifolia*), chaparral yucca (*Yucca whipplei*), telegraph weed (*Heterotheca grandiflora*), Russian thistle (*Salsola tragus*), tree tobacco (*Nicotiana glauca*), horehound (*Marrubium vulgare*), and fountain grass (Pennisetum setaceum). Chalk Dudleya (*Dudleya pulverulenta*) plants were observed on the side of the basin slope, outside of the proposed work area/access area. The Natural Community here can be classified as coastal scrub.

At the outlet, the immediate project area is primarily made up of non-native Mousehole tree (*Myoporum laetum*) along the toe of the slope near the beach, and two 50-60' tall Mexican fan palms (*Washingtonia robusta*). The area immediately around the culvert outlet has a small grove of non-native Eucalyptus trees (*Eucalyptus sp*.), that may be affected by the project as well. Other vegetation in the area includes: coyote bush (*Baccharis pilularis*), tree tobacco (*Nicotiana glauca*), coreopsis (*Coreopsis gigantea*), California sagebrush (*Artemisia californica*), Mexican elderberry (*Sambucus mexicana*), laurel sumac (*Malosma laurina*), and Canyon sunflower (*Venegasia carpesioides*). The Natural Community here can be classified as ruderal vegetation with some native coastal scrub species mixed in.

Proposed Project Location No. 14. Vegetation at the inlet and surrounding the standpipe includes coyote bush (*Baccharis pilularis*), California brickelbush (*Brickellia Californica*), western vervain (*Verbena lasiostachys*), mulefat (*Baccharis salicifolia*), lemonade berry (*Rhus integrifolia*), morning glory (*Calystegia occidentalis ssp. occidentalis*), cliff aster (*Malacothrix saxatilis*), telegraph weed (*Heterotheca grandiflora*), ashyleafed buckwheat (*Eriogonum cinereum*), California sagebrush (*Artemsia californica*), California encelia (*Encelia californica*), purple sage (*Salvia leucophylla*), bladder pod (*Isomeris arborea*), everlasting (*Gnaphalium californicum*), sweet fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), yellow star-thistle (*Centaurea solstitialis*), red brome (*Bromus madritensis L. ssp. rubens*), jimson weed (*Datura stramonium*). The Natural Community here can be classified as coastal sage/bluff scrub.

At the outlet, the immediate impact area is primarily made up of non-native *Myoporum laetum*, *Arundo donax*, and coastal goldenbush (*Isocoma menziesii*). Other species include coastal sage scrub species such as California sagebrush (*Artemsia californica*), Ashyleafed buckwheat (*Eriogonum cinereum*) and laurel sumac (*Malosma laurina*). The Natural Community here can be classified as heavily disturbed coastal bluff scrub.

Proposed Project Locations No. 15/16. The inlet is located within the paved surface of the roadway. At the outlet, the immediate impact area is primarily vertical unvegetated erosional canyon slopes on the downstream side and the inlet is within the immediate shoulder of the roadway. However, the vegetated areas adjacent to the vertical slope will be impacted by the reconstruction of the eroded slope. This area is vegetated with native coastal sage scrub species such as ashyleaf buckwheat (*Eriogonum cinereum*), California sagebrush (*Artemsia californica*), deer weed (*Lotus scoparius*), coyote bush (*Baccharis pilularis*), canyon sunflower (*Venegasia carpesioides*), laurel sumac (*Malosma laurina*), giant coreopsis (*Coreopsis gigantean)*, and sugarbush (*Rhus ovata*). The Natural Community here can be classified as coastal sage/bluff scrub.

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing facilities, posing no changes to the existing environment. Therefore, it would present no potential for adverse effects on plant species.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). At proposed project Location No. 10, it is anticipated that 3,300 square feet of Alder/Sycamore Riparian Woodland habitat will be affected. Several native trees that may need to be removed and/or trimmed as part of the project, include: two (2) mature western sycamores (*Platanus racemosa*) with diameter-at-breast-height (DBH) of approximately 18-20 inches, two willows (*Salix lasiolepis*.) one cottonwood (*Populus fremontii*) (DBH approx. 15 inches) in an ornamental setting and one juvenile coast live oak (*Quercus agrifolia*). Other non-native trees in an ornamental setting along the roadway edge may be removed as well – these include two Japanese black bark pines (*Pinus thunbergii*) and one *Eucalyptus sp*.

At proposed project Location No. 13, it is estimated that 20,400 square feet of coastal scrub habitat will require removal. At the outlet, two (2) 50'-60' tall, non-native Mexican fan palms (*Washingtonia robusta*) will be removed as well as several non-native *Myoporum laetum*. The area immediately around the culvert outlet has a small grove of non-native Eucalyptus trees (*Eucalyptus sp*.) of which one or two may need to be trimmed or removed as well.

At proposed project Location No 14 and 15 it is estimated that 10,300 square feet and 14,500 square feet of coastal scrub habitat will require removal, respectively. At proposed project Locations No. 16 and 17, it is estimated that 5,000 square feet of disturbed coastal sage/bluff scrub habitat will require removal. The total estimated habitat impacts and proposed replanting ratios are quantified in the following table.

Table 2.4.3-a Estimated Habitat Impacts and Replanting Ratios – Plant Species

Habitat Type	Amount of habitat anticipated to be impacted	Proposed Replanting Ratio
Alder/Sycamore Riparian (Solstice Canyon Creek)	Approx. 3,300 sq. ft. (0.08 Acres) [temporary]	On-site: 3,300 sq. ft. (0.08 Acres)
Coastal scrub	Approx. 50,200 sq. ft. (1.15 Acres) [temporary]	On-site: 50, 094 sq. ft. (1.15 Acres)

Avoidance, Minimization, and/or Mitigation Measures

BIO-02 | Delineation of Environmentally Sensitive Areas (ESAs). Project work limits shall be delineated by ESA fencing at each proposed project location prior to the initiation of any construction activities.

2.4.4 ANIMAL SPECIES

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service), and the California Department of Fish and Wildlife (CDFW) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in the Threatened and Endangered Species Section later in this chapter. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries Service candidate species.

Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the California Fish and Game Code
- Sections 4150 and 4152 of the California Fish and Game Code

The Marine Mammal Protection Act (MMPA) establishes a federal responsibility to conserve marine mammals. The MMPA is the main regulatory vehicle that protects marine mammal species and their habitats in an effort to maintain sustainable populations. In doing so, the statute outlines prohibitions, required permits, criminal and civil penalties, and international aspects in addressing marine mammals. The act requires consultation on any action that may adversely affect marine mammals and provides a mechanism for an "incidental" take of species not listed under the federal Endangered Species Act.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

A series of field investigations were performed to survey the existing biological environment and how the proposed project alternatives and undertaking would affect such. The findings of these investigations were incorporated in the Natural Environment Study (NES) for the State Route 1 (Pacific Coast Highway) Drainage Restoration Project and Bridge Replacement at Solstice Canyon Creek, published July 2018, by the Caltrans Division of Environmental Planning, Biology Unit – District 7. The ensuing discussion has been excerpted from this report.

Common fauna, or animal species, expected to inhabit the general area include raccoon (*Procyon lotor*), coyote (*Canis lantrans*), mule deer (*Odocoileus hemionus*), Audubon's cottontail (*Sylvilagus audobonii*), woodrat (*Neotoma sp*.), ringtail (*Bassariscus astutus*), deer mouse (*Peromyscus maniculatus*), California mouse (*Peromyscus californicus*), western harvest mouse (*Reithrodontomys megalotis*) and possibly California pocket mouse (*Chaetodipus californicus*), bobcat (*Lynz rufus*), and opossum (*Didelphis virginiana*).

Many different bat species may forage for insects within the project study area. At proposed project Location No. 10, acoustic surveys were conducted for bat species in August 2017, and it was found that foraging of the Hoary bat (Lasiurus cinereus) and little brown bat (Myotis lucifugus) were detected in the vicinity of the proposed project site. The existing arch culvert at this location does not provide suitable roost characteristics for bats due to the lack of crevices and culvert size. Therefore, it is anticipated that the culvert is not suitable for roosting. In addition, evidence of bat signs (guano, urine stains) were not detected during surveys.

Coastal region migratory birds often use riparian habitats as resting and foraging area. Therefore, although some species may breed in the project vicinity, most bird species in the project area are expected to be migrating in the spring and fall. Common bird species previously observed from previous surveys performed by the National Park Service (NPS), Caltrans, and Christopher A. Joseph and Associates, and which are expected in the project area, include Pacific slope flycatcher (*Empidonax difficilis*), Bewick's wren (*Thryomanes bewickii*), house finch (*Carpodacus mexicanus*), California towhee (*Pipilo maculatus*), spotted towhee (*Pipilo maculatus*), California thrasher (*Toxostoma redivivum*), American robin (*Turdus migratorius*), western scrub jay (*Aphelocoma californica*), northern mockingbird (*Mimus polyglottos*), Anna's hummingbird (*Calypte anna*), rufous hummingbird (*Selaphorus rufus*), western kingbird (*Tyrannus verticalis*), rufous crowned sparrow (*Aimophila ruficeps*), bushtit (*Psaltriparus minimus*), red-tailed hawk (*Buteo jamaicensis*), hooded oriole (*Icterus cucullatus*), song sparrow (*Melospiza melodia*), white crowned sparrow (*Zonotrichia leucophrys*), and yellow-rump warbler (*Dendroica coronata*).

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing facilities, posing no changes to the existing environment. Therefore, it would present no potential for adverse effects on animal species.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). Only minimal effects to animal species are anticipated as a result of implementation of the proposed project as many of the proposed project locations have experienced substantial human

activity and disturbance, primarily due to typical beach activities and existing vehicular traffic on SR-1/PCH. Those potential effects are as follows:

- Disturbance of foraging, roosting, and nesting due to construction activities
- Temporary loss of habitat
- Potential relocation of individuals within construction footprints
- Disturbance due to noise, dust, and other construction activities, including dewatering within Solstice Canyon Creek

Avoidance, Minimization, and/or Mitigation Measures

BIO-01 | Biological Monitoring. Biological Monitors shall be on-site at all times during construction at proposed project locations and any work that is adjacent to a beach environment.

BIO-03 | Bat Surveys Prior to Vegetation Removal. No trees will be cut down or trimmed without first being surveyed by a qualified biologist for the presences of bats roosting. Should bats be located within trees that are to be removed or trimmed, Caltrans will coordinate with CDFW to determine how best to minimize impacts to these species.

2.4.5 THREATENED AND ENDANGERED SPECIES

Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration (FHWA) (and the Department, as assigned), are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement or a Letter of Concurrence. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The California Department of Fish and Wildlife (CDFW) is the agency responsible for implementing CESA. Section 2080 of the California Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the California Fish and Game Code as

"hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

A series of field investigations were performed to survey the existing biological environment and how the proposed project alternatives and undertaking would affect such. The findings of these investigations were incorporated in the Natural Environment Study (NES) for the State Route 1 (Pacific Coast Highway) Drainage Restoration Project and Bridge Replacement at Solstice Canyon Creek, published July 2018, by the Caltrans Division of Environmental Planning, Biology Unit – District 7. The ensuing discussion has been excerpted from this report.

Federal Endangered Species Act (FESA) Consultation. All proposed project locations, with the exception of Location No. 10, consist primarily of improvements to existing roadway drainage facilities, and do not pose any potential to effect endangered species. Therefore, FESA consultation is limited to the scope of work as proposed at project Location No. 10 at Solstice Canyon Creek. For the past 18+ years, through various iterations of the proposed fish passage restoration at Solstice Canyon Creek (proposed project Location No. 10), Caltrans has had ongoing technical assistance and coordination with the National Park Service, the California Department of Fish and Wildlife, the U.S. Army Corps of Engineers, the Regional Water Quality Control Board, the National Marine Fisheries Service, the California Coastal Commission, and the City of Malibu.

Federal Fisheries and Essential Fish Habitat (EFH) Consultation. In March 2006, NOAA Fisheries' approved a plan to establish and protect more than 130,000 square miles of marine waters off the coasts of Washington, Oregon and California, as Essential Fish Habitat (EFH) for groundfish. The plan prohibits fishing methods that can cause long-term damage to the ocean floor, such as bottom trawling, within much of this area. Developed by the Pacific Fishery Management Council, the plan is aimed at

replenishing fish stocks. It covers an area from Canada to Mexico, out to 200 nautical miles in some places. (NOAA, 2018).

The project falls under the Construction/maintenance of bank stabilization section of the programmatic consultation between NMFS and Army Corps of Engineers (NFMS, 2005). All work will be limited to beach areas above the current mean high tide line (MHTL/MHW). No special aquatic sites are present within the project footprint and no adverse effects to EFH are expected.

California Endangered Species Act (CESA) Consultation Summary. There are no state agency consultation procedures under CESA. For projects that affect both a state and federal listed species, compliance with the Federal Endangered Species Act (FESA) may satisfy CESA if the California Department of Fish and Wildlife (CDFW) determines that the federal incidental take authorization is "consistent" with CESA under Fish & Game Code § 2080.1. For project that will result in a "take" of a state-only listed species, Caltrans must apply for an incidental take permit under Fish & Game Code § 2080(b). Because no impacts are anticipated to any State-only/CESA Listed Species, no consultation has been initiated.

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing facilities, posing no changes to the existing environment. Therefore, it would present no potential for adverse effects on threatened and/or endangered species.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). Under Section 7 of the Endangered Species Act, Federal agencies, including Caltrans are required to "request the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." In compliance with Section 7, Caltrans has requested an official species list from the United State Fish and Wildlife Service (USFWS) as part of the endangered species review process, which contains information (list of species and critical habitat) to assist in evaluation of potential impacts of the proposed project. The USFWS species list is supplemented by a jurisdictional species list from the National Marine Fisheries Service (NMFS) containing listed marine species and critical habitats. The findings of the evaluation are summarized in the following table.

Table 2.4.5-a FESA Effect Findings for Federal Listed Threatened/Endangered Species in the Project Study Area

Common Name *Scientific Name*	**Status**	**Responsible Agency**	**Effect Finding pursuant to FESA**	**Effect Finding for Critical Habitat (if applicable)**	**Rationale**
Plants					
Agoura Hills dudleya *Dudleya cymosa ssp. Agourensis*	Federal Threatened	USFWS	No Effect	Not Applicable	Rocky volcanic slopes are not present. Elevation is not appropriate for this species.
Braunton's milk-vetch *Astragalus brauntonii*	Federal Endangered	USFWS	No Effect	Not Applicable	Soils present in areas with chaparral and coastal sage scrub (Sites 13-17) do not have appropriate calcium carbonate heavy soils present.
California orcutt grass *Orcuttia californica*	Federal Endangered	USFWS	No Effect	Not Applicable	Vernal pool habitat is not present within the project area.
Coastal dunes milk-vetch *Astragalus tener var. titi*	Federal Endangered	USFWS	No Effect	Not Applicable	Coastal terrace grassland and vernal pools are not present within the project area.
Gambel's watercress *Rorippa gambellii*	Federal Endangered	USFWS	No Effect	Not Applicable	Fresh to brackish marsh habitat is not present within the project area.
Lyon's pentachaeta *Pentachaeta lyonii*	Federal Endangered	USFWS	No Effect	Not Applicable	On volcanic rocky red-clay soils at the interface between chaparral and valley grassland habitats. Appropriate soils and habitat interface is not present within the project area.
Marcescent dudleya *Dudleya cymosa ssp. Marcescens*	Federal Threatened	USFWS	No Effect	Not Applicable	Sheer volcanic rock canyon walls are not present within the project area.
Marsh sandwort *Arenaria paludicola*	Federal Endangered	USFWS	No Effect	Not Applicable	Freshwater marsh habitat is not present within the project area.
Salt marsh bird's-beak *Cordylanthus maritimus ssp. Maritimus*	Federal Endangered	USFWS	No Effect	Not Applicable	Coastal dune/salt marsh habitat is not present within the project area.
Santa Monica Mountains dudleya *Dudleya cymosa ssp. Ovatifolia*	Federal Threatened	USFWS	No Effect	Not Applicable	Shaded deep canyon bottoms with rocky volcanic outcrops or slopes are not present within the project area.
Spreading navarretia *Navarretia fossalis*	Federal Threatened	USFWS	No Effect	Not Applicable	Freshwater marsh and vernal pool habitat is not present within the project area.
Ventura marsh milk-vetch *Stragalus pycnostachyus var. lanosissimus*	Federal Endangered	USFWS	No Effect	Not Applicable	Salt marsh habitat is not present within the project area.
Verity's dudleya *Dudleya verity*	Federal Threatened	USFWS	No Effect	Not Applicable	Coastal sage scrub habitat with north facing rock outcroppings is not present within the project area.
Invertebrates					
Range Black Abalone *Haliotis cracherodii*	Federal Endangered	NMFS	No Effect	Not Applicable	Rocky intertidal and subtidal reefs along the California and Baja California coast. The project is expected to have no effect on intertidal or subtidal habitat.
Range White Abalone *Haliotis sorenseni*	Federal Endangered	NMFS	No Effect	Not Applicable	Pacific Ocean from Point Conception, California, to Punta Abreojos, Baja California, Mexico. They are usually found at depths of 50 to 180 feet on rocky substrates alongside sand channels on the ocean floor. The project is expected to have no effect on off-shore habitat.

Table 2.4.5-a (continued) FESA Effect Findings for Federal Listed Threatened/Endangered Species in the Project Study Area

Common Name *Scientific Name*	Status	Responsible Agency	Effect Finding pursuant to FESA	Effect Finding for Critical Habitat (if applicable)	Rationale
Riverside fairy shrimp *Streptocephalus woottoni*	Federal Endangered	USFWS	No Effect	Not Applicable	Vernal pool habitat is not present within the project area.
Vernal pool fairy shrimp *Branchinecta lynchi*	Federal Threatened	USFWS	No Effect	Not Applicable	Vernal pool habitat is not present within the project area.
Birds					
California least tern *Sterna antillarum browni*	Federal Endangered	USFWS	No Effect	Not Applicable	Sand beach habitat present. This species is only found in large colonies along major estuaries. The nearest known colony is located at Venice Beach. Therefore, the presence of this species is not expected. This species is discussed further in the following section of this document.
Coastal California gnatcatcher *Polioptila californica*	Federal Threatened	USFWS	No Effect	Not Applicable	There is only degraded and fragmented Coastal bluff scrub habitat present within the project area. Therefore, the presence of this species is not expected. This species is discussed further in the following section of this document.
Least Bell's vireo *Vireo bellii pusillus*	Federal Endangered	USFWS	No Effect	Not Applicable	Dense riparian forest habitat is not present within the project area.
Light-footed clapper rail *Rallus longirostris levipes*	Federal Endangered	USFWS	No Effect	Not Applicable	Salt marsh habitat is not present within the project area.
Marbled murrelet *Brachyramphus marmoratus*	Federal Threatened	USFWS	No Effect	Not Applicable	Mature conifer habitat is not present within the project area.
Southwestern willow flycatcher *Empidonax traillii extimus*	Federal Endangered	USFWS	No Effect	Not Applicable	Wide flood plains with dense riparian vegetation are not present within the project area.
Western snowy plover *Charadrius alexandrinus nivosus*	Federal Threatened	USFWS	No Effect	Not Applicable	Coastal beach habitat is present at Solstice Creek. However, the U.S. FWS's 2016 Summer Window Survey, and CDFW's 2017 Winter Window Survey for Snowy Plovers on the U.S. Pacific Coast found no snowy plovers on Dan Blocker State Beach. No impacts to this species are expected.
Amphibians and Reptiles					
California red-legged frog *Rana draytonii*	Federal Threatened	USFWS	May Affect, but is Not Likely to Adversely Affect	Not Applicable	Permanent deep-water breeding habitat is not present within the project area. However, non-breeding habitat is present within the project limits at Solstice Creek. Protocol surveys were undertaken.
East Pacific Green Sea Turtle *Chelonia mydas*	Federal Threatened	NMFS	No Effect	Not Applicable	Rare sitings in off-shore waters along the California coast. The project is expected to have no effect on off-shore habitat.
Leatherback Sea Turtle *Dermochelys coriacea*	Federal Endangered	NMFS	No Effect	Not Applicable	Generally found over the continental slope and more rarely in continental shelf waters. The project is expected to have no effect on off-shore habitat.
North Pacific Loggerhead Sea Turtle *Caretta caretta*	Federal endangered	NMFS	No Effect	Not Applicable	Rarely found in off-shore habitat along southern California. The project is expected to have no effect on off-shore habitat.
Olive Ridley Turtle *Lepidochelys olivacea*	Federal Threatened/ Endangered	NMFS	No Effect	Not Applicable	Rarely found in off-shore habitat along southern California. The project is expected to have no effect on off-shore habitat.

Table 2.4.5-a (continued) FESA Effect Findings for Federal Listed Threatened/Endangered Species in the Project Study Area

Common Name *Scientific Name*	Status	Responsible Agency	Effect Finding pursuant to FESA	Effect Finding for Critical Habitat (if applicable)	Rationale
Mammals					
Blue Whale *Balaenoptera musculus*	Federal Endangered	NMFS	No Effect	Not Applicable	The project is expected to have no effect on off-shore deep water habitat.
Fin Whale *Balaenoptera physalus*	Federal Endangered	NMFS	No Effect	Not Applicable	The project is expected to have no effect on off-shore deep water habitat.
Guadalupe Fur Seal *Arctocephalus townsendi*	Federal Threatened	NMFS	No Effect	Not Applicable	The project is expected to have no effect on coastal rocky habitats immediately adjacent to ocean.
Humpback Whale *Megaptera novaeangliae*	Federal Endangered	NMFS	No Effect	Not Applicable	The project is expected to have no effect on off-shore deep water habitat.
Southern Resident Killer Whale *Orcinus orca*	Federal Endangered	NMFS	No Effect	Not Applicable	The project is expected to have no effect on off-shore deep water habitat.
North Pacific Right Whale *Eubalaena japonica*	Federal Endangered	NMFS	No Effect	Not Applicable	The project is expected to have no effect on off-shore deep water habitat.
Sei Whale *Balaenoptera borealis*	Federal Endangered	NMFS	No Effect	Not Applicable	The project is expected to have no effect on off-shore deep water habitat.
Sperm Whale *Physeter microcephalus*	Federal Endangered	NMFS	No Effect	Not Applicable	The project is expected to have no effect on off-shore deep water habitat.
Fish					
Green Sturgeon *Acipenser medirostris*	Federal Threatened	NMFS	No Effect	Not Applicable	Southern DPS of Green Sturgeon only spawn in the Sacramento River Basin, however they are occasionally found in marine and estuarine waters from Baja California to Alaska. The project is expected to have no effect on this species.
Tidewater goby *Eucyclogobius newberryi*	Federal Endangered	USFWS	No Effect	Not Applicable	Coastal lagoon/salt marsh habitat is not present within the project area.
Southern steelhead trout *Oncorhynchus mykiss*	Federal Endangered	NMFS	No Effect	Not Applicable	Habitat is present at Solstice Creek. However, the species is considered extirpated from Solstice Creek. The proposed fish restoration at Solstice Creek is expected to remediate the existing barrier and allow re-colonization of this species into Solstice Creek. No impacts to this species are expected.

Table 2.4.5-a (continued) FESA Effect Findings for Federal Listed Threatened/Endangered Species in the Project Study Area

Common Name *Scientific Name*	**Status**	**Responsible Agency**	**Effect Finding pursuant to FESA**	**Effect Finding for Critical Habitat (if applicable)**	**Rationale**
Essential Fish Habitat (EFH)					
Groundfish EFH	Not Applicable	NMFS	No Effect	No Effect	Not present within project area.
Coastal Pelagics EFH	Not Applicable	NMFS	No Effect	No Effect	Not present within project area.
Highly Migratory Species EFH	Not Applicable	NMFS	No Effect	No Effect	Not present within project area.

California Endangered Species Act (CESA) Consultation Summary. As previously mentioned, there are no state agency consultation procedures under CESA. For projects that affect both a state and federal listed species, compliance with the Federal Endangered Species Act (FESA) may satisfy CESA if the California Department of Fish and Wildlife (CDFW) determines that the federal incidental take authorization is "consistent" with CESA under Fish & Game Code § 2080.1. For project that will result in a "take" of a state-only listed species, Caltrans must apply for an incidental take permit under Fish & Game Code § 2080(b). No impacts are anticipated to any State-only/CESA Listed Species, and no consultation has been initiated – the following table summarizes analyses performed to make these determinations under CESA, nevertheless.

Table 2.4.5-b CESA Effect Findings for State Listed Threatened/Endangered Species in the Project Study Area

Common Name *Scientific Name*	**Status**	**Responsible Agency**	**Proposed Take Finding pursuant to CESA**	**Rationale**
Plants				
Beach spectaclepod *Dithyrea maritima*	State Threatened	CDFW	The proposed project is not anticipated to result in Take of this Species.	Coastal dunes, sandy coastal scrub habitat is not present. While sandy beach habitat is present, the Solstice creek project area is outside the known historical habitat of this species. The project area is routinely scoured by heavy surf and storm flows each year down to the cobble substrate. As such the species is not expected to be present within the project areas.
Coastal dunes milk-vetch *Astragalus tener var. titi*	State Endangered	CDFW	The proposed project is not anticipated to result in Take of this Species.	Coastal terrace grassland and vernal pools are not present within the project areas.
Lyon's pentachaeta *Pentachaeta lyonia*	State Endangered	CDFW	The proposed project is not anticipated to result in Take of this Species.	On volcanic rocky red-clay soils at the interface between chaparral and valley grassland habitats. Appropriate soils and habitat interface is not present within the project area.
Salt marsh bird's-beak *Cordylanthus maritimus ssp. Maritimus*	State Endangered	CDFW	The proposed project is not anticipated to result in Take of this Species.	Coastal dune/salt marsh habitat is not present within the project areas.
Ventura marsh milk-vetch *Stragalus pycnostachyus var. lanosissimus*	State Endangered	CDFW	The proposed project is not anticipated to result in Take of this Species.	Salt marsh habitat is not present within the project areas.
Birds				
Tricolored blackbird *Agelaius tricolor*	State Candidate Endangered	CDFW	The proposed project is not anticipated to result in Take of this Species.	Marsh and swamp habitat is not present within the project areas.
Swainson's hawk *Buteo swainsoni*	State Threatened	CDFW	The proposed project is not anticipated to result in Take of this Species.	Appropriate foraging habitat is not present in areas adjacent to the project area. Species unlikely to utilize nesting habitat within Solstice Creek riparian corridor without appropriate foraging habitat nearby. Pre-construction surveys for nesting birds will be completed prior to construction to ensure that no active nests are affected by the project.
Least Bell's vireo *Vireo bellii pusillus*	State Endangered	CDFW	The proposed project is not anticipated to result in Take of this Species.	Dense riparian forest habitat is not present within the project areas.
Bank Swallow *Riparia riparia*	State Threatened	CDFW	The proposed project is not anticipated to result in Take of this Species.	Required cliff/bank habitat with fine textured soils is not present within or near the project areas.

Avoidance, Minimization, and/or Mitigation Measures

BIO-04 | Construction Window and Restrictions (Partial). No construction work shall occur at proposed project Locations No. 13 and 14 (PMs 61.29 and 61.35) between the months of January and August. Construction work at these sites shall be restricted to the time period between September 1st and December 31st.

BIO-02 | Delineation of Environmentally Sensitive Areas (ESAs). Project work limits shall be delineated by ESA fencing at each project location prior to initiation of construction activities.

BIO-05 | Fish Exclusionary Measures at Solstice Canyon Creek. Exclusionary nets shall be installed at proposed project Location No. 10 to exclude fish from the project site prior to installation of the proposed water diversion in Solstice Canyon Creek. Any fish found within the project site shall be moved upstream of the project site and released. All exclusionary and removal activities shall be conducted by an ichthyologist as approved by the National Oceanic and Atmospheric Administration (NOAA) and the United States Fish and Wildlife Service (USFWS), who possesses experience in identification and handling of Southern Steelhead trout and Arroyo chub.

BIO-06 | Multi-Agency Project Reporting. Upon completion all monitoring and construction of the proposed project, a Final Project Report will be submitted to the United States Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), California Department of Fish and Wildlife (CDFW). United States Army Corps of Engineers (ACOE), and the Regional Water Quality Control Board (RWQCB).

BIO-07 | Pre-Construction Protocol Surveys for California Gnatcatcher. Caltrans will conduct pre-construction protocol surveys at least one year prior to the initiation of construction activities. The surveys shall follow the appropriate protocols for locating and identifying coastal California gnatcatcher (*Polioptila californica californica*), and shall be performed by a qualified ornithologist, approved by USFWS prior to initiation of work. No construction work shall commence until Caltrans has completed formal consultation with the USFWS.

BIO-08 | Pre-Construction Protocol Surveys for California Red-Legged Frog. Caltrans shall conduct pre-construction protocol surveys for California red-legged frog at seasonal intervals beginning in 2018 and continuing through the start of construction in 2021. The surveys shall be conducted in conjunction with a permitted herpetologist with experience in locating and identifying California red-legged frog (*Rana draytonii*).

BIO-09 | Pre-Construction Surveys for Cooper's Hawk. Caltrans shall conduct pre-construction surveys for Cooper's Hawk (*Accipiter cooperii*) in conjunction with a qualified ornithologist as approved by CDFW. Work shall not commence f any Cooper's hawk are found within 500 feet of the project site and cannot recommence until nesting is complete and the birds have left the area.

BIO-10 | Pre-Construction Surveys for Nesting Birds. Caltrans shall conduct nesting bird surveys prior to any vegetation removal. Nesting surveys must be done within 72 hours of commencement of vegetation removal. If any active nests are found, all work shall halt within 150 feet of the active nest (500 feet for Raptors). Work shall not recommence until the young have fledged and the nest is considered inactive.

BIO-11 | Pre-Construction Surveys for Rare Plants. Caltrans shall conduct pre-construction surveys in conjunction with a qualified botanist with experience in locating and identifying rare plants, prior to initiation of work. If any rare plants are located within the project footprint they will be re-located to a safe location as determined by the botanist and in coordination with the California Department of Fish and Wildlife (CDFW).

BIO-12 | Pre-Construction Surveys for Southern Steelhead Trout and Arroyo Chub. Caltrans shall conduct pre-construction surveys in conjunction with an NOAA/CDFW approved and qualified ichthyologist who possesses experience in locating and identifying Southern Steelhead trout and Arroyo Chub.

BIO-13 | Pre-Construction Surveys for Southwestern Willow Flycatcher and Least Bell's Vireo. Caltrans shall conduct pre-construction surveys in conjunction with a qualified ornithologist [approved by the United States Fish and Wildlife Service (USFWS)] following the appropriate protocols for locating and identifying Southwestern willow flycatcher (*Empidonax traillii extimus*) and Least Bell's vireo (*Vireo bellii pusillus*). Work shall not commence if any Southwestern willow flycatcher or Least Bell's vireo are found within 500 feet of the construction site. Work shall not recommence until nesting is complete and the birds have left the area, and Caltrans has completed formal consultation.

BIO-14 | Pre-Construction Surveys for Two-Striped Garter Snake, California Mountain Kingsnake, and Coastal Whiptail. Caltrans shall conduct pre-construction surveys in conjunction with a qualified herpetologist with experience in locating and identifying Two-striped garter snake (*Thamnophis hammondii*), California mountain kingsnake (*Lampropeltis multifasciata*), and Coastal whiptail (*Aspidoscelis tigris stejnegeri*). If any of these species are identified within project limits, they shall be relocated to a safe location as deemed by the herpetologist, and in coordination with CDFW.

BIO-15 | Pre-Construction Surveys for Western Snowy Plover. Caltrans shall conduct pre-construction surveys in conjunction with a qualified ornithologist approved by the USFWS, following appropriate protocols for locating and identifying Western snowy plover (*Charadrius alexandrinus nivosus*). Work cannot commence if any snowy plover are found within 500 feet of the construction site. Work shall not recommence until nesting is complete and the birds have left the area, and Caltrans has completed formal consultation.

BIO-16 | Presence of Marine Mammals During Construction. All work shall stop/halt if any marine mammals are observed within 500 feet of construction activities, including access roads. Work shall not recommence until the observed marine mammal has left the project area on its own accord.

BIO-17 | Stream Restoration Plan. Caltrans shall develop a Stream Restoration Plan in conjunction with a qualified hydraulics engineer to ensure that the morphology of the stream will not be affected in such a way as to prevent fish migration and passage through the project area.

BIO-18 | Water Diversion Plan at Solstice Canyon Creek. A Water Diversion Plan shall be developed and implemented in consultation with NOAA, CDFW, USFWS, ACOE, and the RWQCB, to divert water through the project site at Solstice Canyon Creek to reduce turbidity and prevent sediments from entering the lagoon during construction and downstream of the project site (Location No. 10).

BIO-19 | Water Quality Best Management Practices (BMPs). All applicable construction BMPs for water quality shall be implemented to minimize effects to downstream areas.

BIO-20 | Sandy Beach Grunion Work Window. No equipment shall access sandy beach habitat during the Grunion spawning season (March 1st – August 31st) except to access the Solstice Canyon Creek bridge site with appropriate night surveys to ensure that Grunion are not spawning in the area.

2.4.6 INVASIVE SPECIES

Regulatory Setting

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

Affected Environment

Under the National Environmental Policy Act (NEPA), the no-build alternative can be used as a baseline for comparing environmental impacts; under the California Environmental Policy Act (CEQA), the baseline for environmental impact analysis is the existing conditions at the time of the Notice of Preparation (NOP) or at the time at which environmental studies commenced. The following discussion is a summary of the existing conditions (or no-build scenario) at the time at which environmental studies commenced for the proposed undertaking.

A series of field investigations were performed to survey the existing biological environment and how the proposed project alternatives and undertaking would affect such. The findings of these investigations were incorporated in the Natural Environment Study (NES) for the State Route 1 (Pacific Coast Highway) Drainage Restoration Project and Bridge Replacement at Solstice Canyon Creek, published July 2018, by the Caltrans Division of Environmental Planning, Biology Unit – District 7. The findings regarding invasive species in the project study area were derived from this report, and it was determined that the project study area is dominated by non-native species, most of which are ornamental cultivars that are regularly planted along public roads for aesthetic reasons and particularly, erosion control.

Environmental Consequences

Alternative 1 (No-Build Alternative). If the proposed project were not built, there would be no alterations or improvements to the existing facilities, posing no changes to the existing environment. Therefore, the spread of invasive species would not be intensified through construction activities.

Alternative 2 (Rehabilitate Drainage at 19 Locations on PCH/SR-1, including Replacement of the Bridge/Culvert at Solstice Canyon Creek with New Bridge Structure and an Underlying Natural Slope Creek Bottom). It is possible that construction activities could cause the disturbance and spread of invasive species in adjacent areas.

Avoidance, Minimization, and/or Mitigation Measures

BIO-21 | Decontamination Protocols for Proposed Project Location No. 10 at Solstice Canyon Creek. All construction equipment/rigs shall be thoroughly washed/scrubbed down with hot water at the construction yard before being transported to the project site to avoid spreading invasive weeds to the project site. Additionally, Caltrans shall implement the California Department of Fish and Wildlife's Aquatic Invasive Species (AIS) Decontamination Protocol as follows.

- If decontamination is not done on site, transport any contaminated equipment in sealed plastic bags and keep separate from clean gear.
- When practical, in flowing water begin work upstream and work downstream. This avoids transporting AIS to non-infested upstream areas.
- For locations known to be infested with AIS, use dedicated equipment/gear that is only used in infested waters. Store this equipment separately.
- Equipment/Gear Decontamination Methods:

Option 1: Dry
Scrub gear with a stiff-bristled brush to remove all organisms. Thoroughly brush small crevices such as boot laces, seams, net corners, etc. Allow equipment to thoroughly dry (i.e., until there is complete absence of moisture), preferably in the sun. Keep dry for a minimum of 48 hours to ensure any organisms are desiccated.
Option 2: Hot Water Soak
Scrub gear with a stiff-bristled brush to remove all organisms. Thoroughly brush small crevices such as boot laces, seams, net corners, etc. Immerse equipment in 140° F or hotter water. If necessary, weigh it down to ensure it remains immersed. Soak in 140° F or hotter water for a minimum of five minutes.
Option 3: Freeze
Scrub gear with a stiff-bristled brush to remove all organisms. Thoroughly brush small crevices such as boot laces, seams, net corners, etc. Place in a freezer 32°F or colder for a minimum of eight hours.

BIO-22 | Executive Order 13112 on Invasive Species. In compliance with the Executive Order on Invasive Species, EO 13112, and guidance from the Federal Highway Administration (FHWA), the landscaping and erosion control included in the proposed project will not use any species on the California Noxious Weed List. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or near construction areas. This includes the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

BIO-23 | Removal and Disposal of Invasive Species. Any invasive species present shall be removed and disposed of offsite at an appropriate disposal location.

2.5 CONSTRUCTION IMPACTS

The proposed project, which includes nineteen (19) locations, would be constructed in phases to reduce any temporary, construction-related impacts to the local community. Detailed construction staging plans for drainage rehabilitation/restoration locations will be completed at the next project planning phase, including detailed analyses regarding the temporary effects of construction on local traffic and the planning of phases to minimize any effect accordingly and where possible. Effects regarding traffic delays are particularly significant at the onset of construction, due to spectator slowing and the need for the average driver to adjust to changes in the roadway. However, within one-to-two weeks after the start of construction, regular commuters tend to become accustomed to driving through the construction zone and the amount of traffic delays caused by construction decreases accordingly. The following measures shall be implemented, nevertheless, to minimize any potential adverse effects on traffic, circulation, and safety during the process of design and construction, and after completion of construction:

CON-01 | Caltrans Complete Street Directive DD-64-R2. A "complete street" is a facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit riders, and motorists appropriate to the function and context of the facility. This directive shall ensure that the proposed project is designed in such a manner that all travelers of all ages and abilities can move safely and efficiently along and across a network of "complete streets."

CON-02 | Transportation Management Plan. A TMP shall be developed to implement practical measures to minimize any traffic delays that may result from lane restrictions or closures in the work zone. TMP strategies shall be planned and designed to improve mobility, as well as increase safety for the traveling public and highway workers. These strategies include, but are not limited to, dissemination of information to motorists and the greater public, traffic incident management, construction management strategies, traffic demand management, and alternate route planning/detouring.

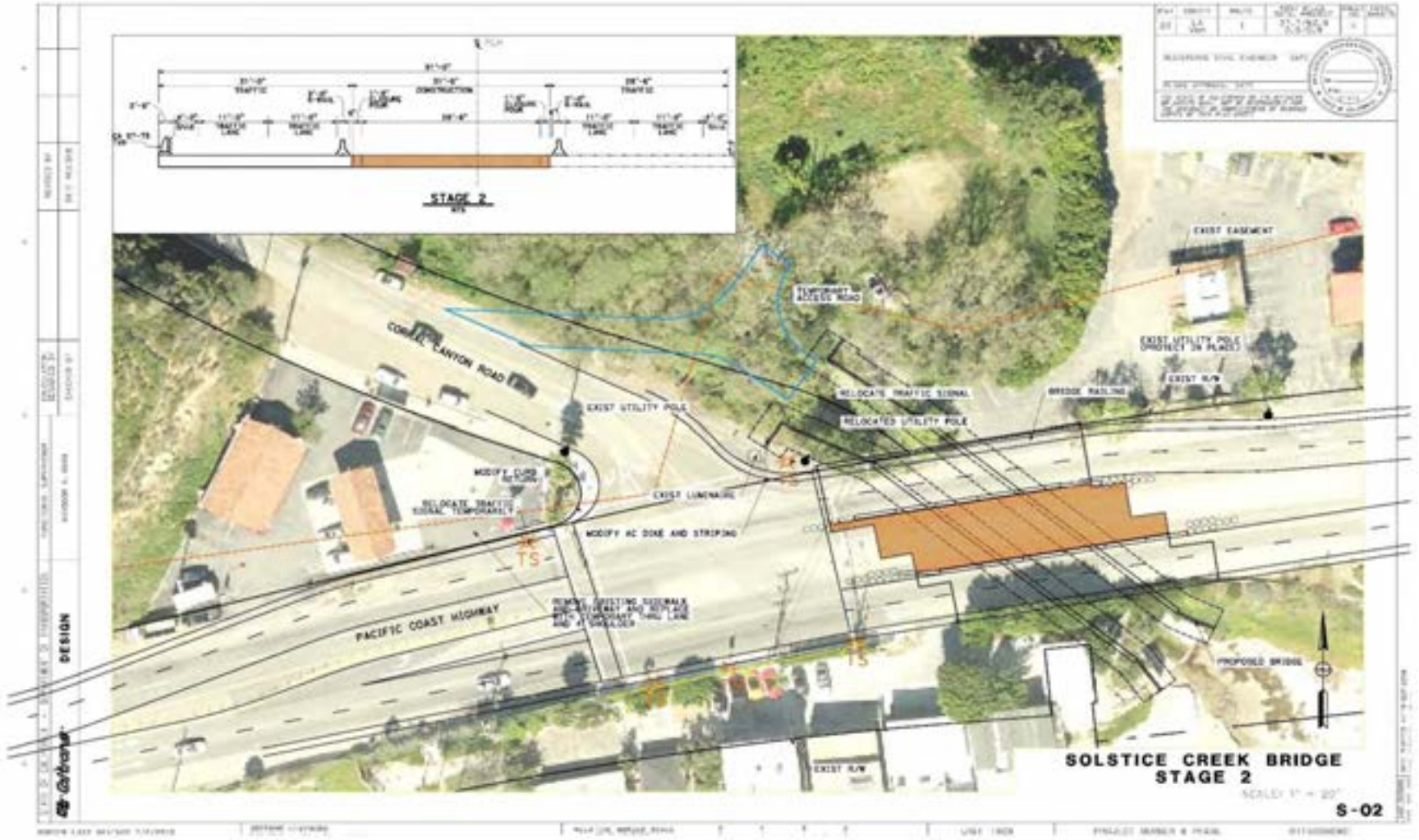
CON-03 | Roadway Closure Planning. Closure plans shall be developed to minimize traffic disruption during peak periods, and to the extent possible, such closures (when required) shall occur during off-peak and/or overnight periods. Customarily, construction staging plans shall complement closure plans to minimize the need for roadway and/or ramp closures. No full closures of SR-1/PCH shall occur during peak periods whatsoever. In advance of any closure periods, appropriate temporary signage (in accordance with Caltrans and City guidelines) shall be used to alert motorists of the closure and direct them to alternate routes.

CON-04 | Temporary Traffic Controls. Temporary traffic controls, signage, barriers, and flagmen shall be deployed as necessary and appropriately for the efficient movement of traffic (in accordance with standard traffic engineering practices) to facilitate construction of the project improvements while maintaining traffic flows and minimizing disruption.

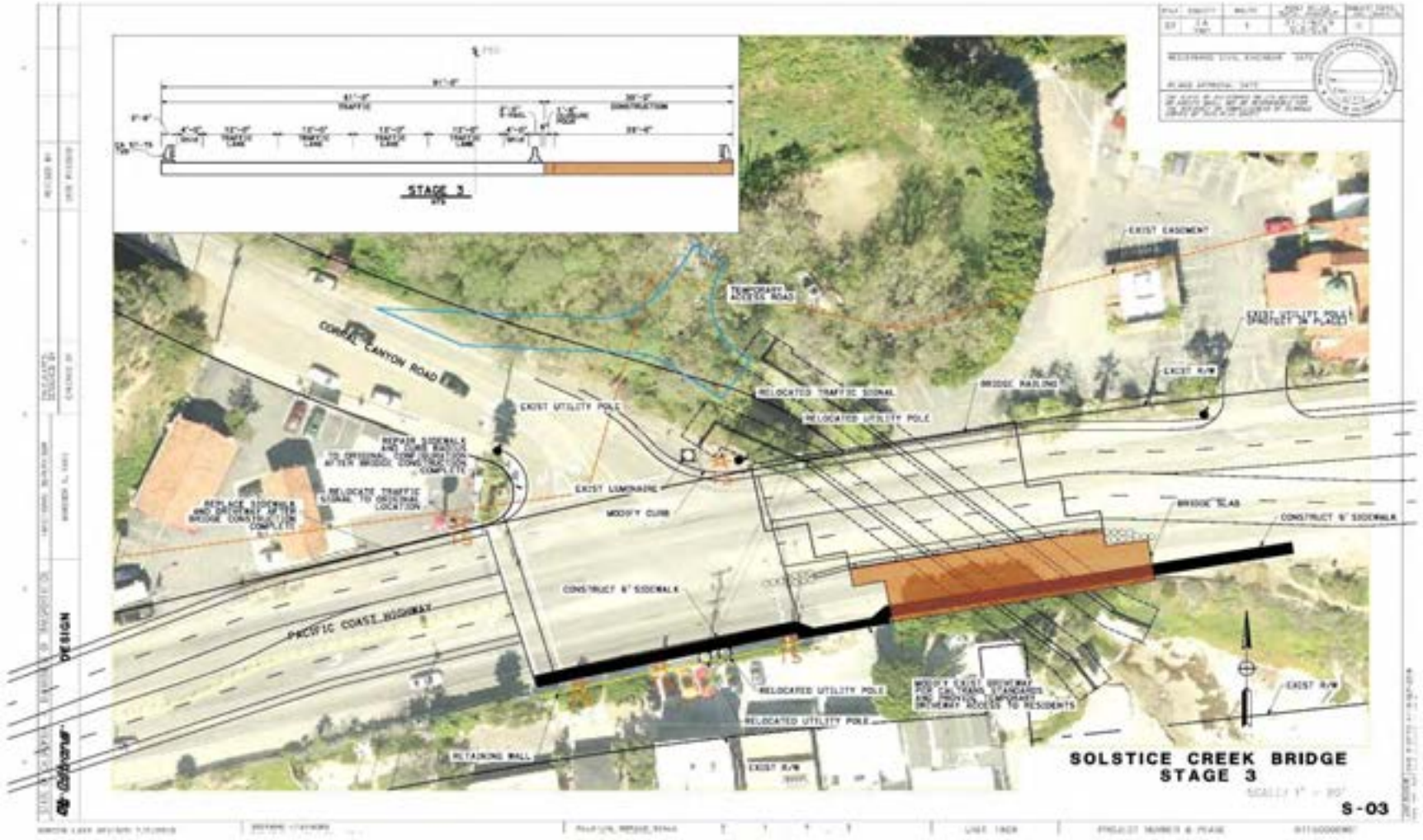
Construction Staging of Bridge Construction at Proposed Project Location No. 10 (Solstice Canyon Creek). The scope of work for the eighteen (18) drainage locations associated with this project is less complex in nature, and as previously mentioned, will be constructed in phases (rather than concurrently) to reduce any temporary, construction-related impacts. Construction of the new bridge structure associated with proposed project Alternative 2 is more complex and will involve a more detailed staging plan on its own to minimize disruption to the local community. In August 2018, Caltrans met with the City of Malibu to advise of the proposed undertaking, and the following construction staging plan for the new bridge structure at proposed project Location No. 10 was developed as a result of this coordination and associated constraints:

Stage 1 | Shift Travel Lanes North with Concurrent Construction on South. As agreed upon during coordination with the City of Malibu, Caltrans shall maintain four (4) operational lanes of traffic during construction at all times (including bike lane facilities). During Stage 1, all lanes would be shifted north while construction of the new bridge structure commences on the south side of the highway. The following preliminary construction staging plan illustrates the lane shift and associated activities during this stage of bridge construction.

Stage 2 | Split Directional Travel Lanes with Concurrent Construction in Central Portion. As agreed upon during coordination with the City of Malibu, Caltrans shall maintain four (4) operational lanes of traffic during construction at all times (including bike lane facilities). During Stage 2, directional travel lanes would be split while construction of the new bridge structure commences in the central portion of the bridge structure. The following preliminary construction staging plan illustrates the lane shift and associated activities during this stage of bridge construction.



Stage 3 | Shift Travel Lanes South with Concurrent Construction on North. As agreed upon during coordination with the City of Malibu, Caltrans shall maintain four (4) operational lanes of traffic during construction at all times (including bike lane facilities). During Stage 1, all lanes would be shifted south while construction of the new bridge structure commences on the north side of the highway. The following preliminary construction staging plan illustrates the lane shift and associated activities during this stage of bridge construction.



Temporary, Construction-Related Effects Related to Noise. While short-term, construction-related noise impacts are anticipated, the following abatement measures will be implemented to minimize any of these temporary impacts:

> **CON-05 | Temporary Noise Barriers.** Effective temporary noise barriers, when they are feasible, shall be used in an attempt to minimize any noise between construction equipment and noise-sensitive receptors.
>
> **CON-06 |Equipment Noise Control.** Noise-generating equipment in operation at each project site shall be fully equipped with effective nose control devices (i.e. mufflers, lagging, and/or motor enclosures). Noise from each piece of construction equipment shall not exceed 86 dBA (L_{max}) at a distance of 15 meters (50 feet). All equipment shall be properly maintained to assure that no additional noise, due to worn or improperly maintained parts, would be generated.
>
> **CON-07 | Noise Control within Vicinity of Residential Units.** Noise generating construction activities within 50 meters (165 feet) of residential units shall be restricted to hours between 7:00AM and 8:00PM, Monday through Friday and 8:00AM and 6:00PM on Saturday. No noise-generative construction activities shall take place on Sundays and holidays.

2.6 CUMULATIVE IMPACTS

Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act (CEQA) Guidelines Section 15130 describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under the National Environmental Policy Act (NEPA) can be found in 40 Code of Federal Regulations (CFR) Section 1508.7.

Identification of Cumulative Impacts by Resource

Cumulative impacts on given resources are defined by a Resource Study Area (RSA). Each resource has a specific RSA, which is delineated to include the project area as well as areas outside of the project where the proposed project's activities, in combination with activities in other projects in the area, could contribute to cumulative impacts on the resource.

Identification and definition of project-specific resources to consider in cumulative impact analyses is based on the degree of impact, ranging from none-to-significant. Resource topics where the proposed project has the potential to cause a potentially significant direct or indirect impact are included in the ensuring discussion. Resource topics where the proposed project has little-to-no potential to cause direct or indirect impacts, and will not contribute to a cumulative impact on the resource are not evaluated. Caltrans performed a series of environmental studies to identify any potential for cumulative effects as a result of the proposed undertaking and identified that the potential solely exists within the resource topic of the Biological Environment. Because it was determined that the potential for cumulative impacts does not exist within the Human Environment or Physical Environment resource topics as presented in this IS/EA, there is no further discussion of such within this context.

Cumulative Impacts in Relation to the Biological Environment

Caltrans defined a RSA and considered the potential for cumulative effects on the biological environment by performing an assessment alongside four (4) past, current, and future Caltrans construction projects on SR-1/PCH and within the vicinity. In particular, the assessment studied any potential cumulative effects on Endangered Steelhead Habitat, Coastal Scrub Habitat, Riparian Habitat, Rocky Intertidal/Endangered Black Abalone Habitat, Kelp Forest/Essential Fish Passage Habitat, and Sand Beach/California Grunion Habitat, which is summarized in the following table.

Table 2.6-a Biological Cumulative Impacts Analysis for Projects within Resource Study Area (RSA)

	Project within Resource Study Area (RSA)	Endangered Steelhead Habitat	Coastal Scrub Habitat	Riparian Habitat	Rocky Intertidal/ Endangered Black Abalone Habitat	Kelp Forest/ Essential Fish Habitat	Sandy Beach/ California Grunion Habitat
1	**SR-1 (PCH) DRAINAGE RESTORATION & BRIDGE REPLACEMENT AT SOLSTICE CANYON CREEK** [EA 07-31350 / E-FIS 0715000090] Construction: Future Date	**Beneficial Effect** Due to Fish Passage Restoration (habitat not currently occupied by Steelhead)	**Temporary Adverse Effect** Will be mitigated to a level of "No Net Loss"	**Temporary Adverse Effect** (0.08 acres of Alder-Sycamore riparian habitat) Will be mitigated to a level of "No Net Loss"	**No Effect** Due to absence of habitat	**No Effect** Due to absence of habitat	**May Effect** Due to temporary access to sandy beaches during construction. However, Caltrans shall not access sandy beaches during spawning season (March through August)
2	**SR-27 Director's Order Emergency Project** [EA 1XC00 / E-FIS 0717000210] Construction/Completion: July 2018	**No Effect** Due to prior Steelhead relocation	**No Effect** Due to absence of habitat	**Adverse Effect** Mitigated through on-site planting	**No Effect** Due to absence of habitat	**No Effect** Due to absence of habitat	**No Effect** Due to absence of habitat
3	**SR-1 (PCH) - Sea Walls Near Sycamore Cove Beach** [EA: 31820/EFIS: 0715000286] Construction: Future Date	**No Effect** Due to absence of habitat	**No Effect** Due to absence of habitat	**No Effect** Due to absence of habitat	**May Effect** Potential exists only if project BMPs (rock catchment devices) fail	**May Effect** Potential exists only if project BMPs (rock catchment devices) fail	**No Effect** With minimization/mitigation measures
4	**SR-1 (PCH) - Sea Wall 07-VEN 1-PM 4.5** [EA: TBD/EFIS: TBD] Construction: Future Date	**No Effect** Due to absence of habitat	**No Effect** Due to absence of habitat	**No Effect** Due to absence of habitat	**May Effect** Potential exists only if project BMPs (rock catchment devices) fail	**May Effect** Potential exists only if project BMPs (rock catchment devices) fail	**No Effect** With minimization/mitigation measures
5	**VEN -1 (PM 4.75/5.25) Emergency Repair-In-Kind of Existing Road and Rock Slope Protection (Director's Order)** [EA: TBD/EFIS: TBD] Construction: Fall 2018	**No Effect** Due to absence of habitat	**No Effect** Due to absence of habitat	**No Effect** Due to absence of habitat	**May Effect** Potential indirect/temporary sedimentation impacts during construction	**May Effect** Potential indirect/temporary sedimentation impacts during construction	**No Effect** This emergency work shall be done outside of the grunion spawning season (March through August)
	DETERMINATION	**No Adverse Cumulative Effect**	**No Adverse Cumulative Effect**	**No Adverse Cumulative Effect**	**No Adverse Cumulative Effect**	**No Adverse Cumulative Effect**	**No Adverse Cumulative Effect**

As the previous table details, Caltrans considered the potential cumulative effects to the above-referenced biological resources on five (5) projects within the RSA. The analysis shows that Projects No. 3, 4, and 5 (future projects which are presently undergoing independent environmental analysis) "May Effect" Rocky Intertidal/Black Abalone Habitat and Kelp Forest/Essential Fish Habitat, with a "No Effect" to the other resources. The analysis also shows that the proposed project (SR-1/PCH Drainage Restoration and Bridge Replacement at Solstice Canyon Creek) will have "No Effect" on Rocky Intertidal/Black Abalone Habitat and Kelp Forest/Essential Fish Habitat, therefore, no adverse cumulative effects are anticipated regarding those biological resources. None of the projects have the potential to cause an adverse effect to Endangered Steelhead Habitat, and therefore, no adverse cumulative effects are anticipated to that biological resource. Only the proposed project (SR-1/PCH Drainage Restoration and Bridge Replacement at Solstice Canyon Creek) and Project No. 2 have the potential to pose temporary adverse effects to vegetation habitats, but the effects are considered temporary, and will not result in a permanent net loss to those habitats. In conclusion, the proposed project (SR-1/PCH Drainage Restoration and Bridge Replacement at Solstice Canyon Creek) will not result in any adverse cumulative effect to any of the aforementioned biological resources.

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CHAPTER 3 | CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) EVALUATION

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3.1 DETERMINING SIGNIFICANCE UNDER CEQA

The proposed project is a joint project by the California Department of Transportation (Department) and the Federal Highway Administration (FHWA) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). FHWA's responsibility for environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 United States Code Section 327 (23 USC 327) and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans. The Department is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or a lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) as a whole has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require the Department to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of "mandatory findings of significance," which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

3.2 CEQA ENVIRONMENTAL CHECKLIST

This checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects will indicate that there are no impacts to a particular resource. A NO IMPACT answer in the last column reflects this determination. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

Project features, which can include both design elements of the project, and standardized measures that are applied to all or most Caltrans projects such as Best Management Practices (BMPs) and measures included in the Standard Plans and Specifications or as Standard Special Provisions, are considered to be an integral part of the project and have been considered prior to any significance determinations documented below; see Chapters 1 and 2 for a detailed discussion of these features. The annotations to this checklist are summaries of information contained in Chapter 2 in order to provide the reader with

the rationale for significance determinations; for a more detailed discussion of the nature and extent of impacts, please see Chapter 2. This checklist incorporates by reference the information contained in Chapters 1 and 2.

AESTHETICS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

CEQA Significance Determinations for Aesthetics

a) **No Impact.** The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential to affect scenic vistas in the project study area.

b) **No Impact.** The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential to affect or damage scenic resources in the project study area.

c) **No Impact.** The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential to affect or degrade the existing visual character or quality of the site and its surroundings in the project study area.

d) **No Impact.** The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and in consideration of the scope and nature of the proposed work, the associated physical changes do not present any potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the project study area.

AGRICULTURE AND FOREST RESOURCES

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

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

CEQA Significance Determinations for Agriculture and Forest Resources

a) **No Impact.** The proposed project is located in a semi-urban, somewhat rural setting, but consists only of improvements to existing roadway drainage facilities, and no potential exists for direct or indirect irreversible conversion of protected farmlands to non-agricultural uses.

b) **No Impact.** The proposed project is located in a semi-urban, somewhat rural setting, but consists only of improvements to existing roadway drainage facilities, and no potential exists for conflicts with existing zoning for agricultural use, or a Williamson Act contract.

c) **No Impact.** The proposed project is located in a semi-urban, somewhat rural setting, but consists only of improvements to existing roadway drainage facilities, and no potential exists for conflict with existing zoning for protected forest land or timberland in the project study area.

d) **No Impact.** The proposed project is located in a semi-urban, somewhat rural setting, but consists only of improvements to existing roadway drainage facilities, and no potential exists for loss or direct/indirect irreversible conversion of protected forest or timberlands to non-forest use.

e) **No Impact.** The proposed project is located in a semi-urban, somewhat rural setting, but consists only of improvements to existing roadway drainage facilities, and no potential exists for other changes in the existing environment that could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

AIR QUALITY

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

CEQA Significance Determinations for Air Quality

a, b, c, d) No Impact. The proposed project is located in the South Coast Air Basin and is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD) and the California Air Resources Board (CARB). The SCAQMD is the primary agency responsible for writing the Air Quality Management Plan (AQMP) in cooperation with SCAG, local governments, and the private sector. The AQMP provides the blueprint for meeting state and federal ambient air quality standards. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and is not capacity-increasing by nature – it will have no impact on traffic volumes and would generate a less than significant amount of pollutants during construction due to its very short duration. In consideration of the aforementioned and the scope of the proposed work, it is exempt from regional and/or project-level air quality conformity and the respective analyses. Therefore, the proposed project will not conflict with the AQMP, violate any air quality standard, result in a net increase of any criteria pollutant, or expose sensitive receptors to substantial pollutant concentrations, and no impacts are anticipated.

e) Less Than Significant Impact. Temporary construction activities could generate fugitive dust from the operation of construction equipment. The project will comply with construction standards adopted by the South Coast Air Quality Management District (SCAQMD) as well as Caltrans standardized procedures for minimizing air pollutants during construction. Impacts will be less than significant. No mitigation is required.

BIOLOGICAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife Service or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

CEQA Significance Determinations for Biological Resources

a) Less Than Significant Impact. The proposed undertaking will have no substantial adverse effect – either directly or through habitat modification – on any special status species listed in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife Service or U.S. Fish and Wildlife Service. It is anticipated that the proposed project would yield a beneficial effect to the endangered Southern steelhead trout population by restoring fish passage at Solstice Canyon Creek beneath the SR-1/PCH roadway at proposed Project Location No. 10.

b) Less Than Significant Impact. It is estimated that approximately 3,300 square feet of Alder/Sycamore riparian habitat and 50,094 square feet of Coastal scrub will be impacted at proposed project Location No. 10 as a result of the proposed project, though the loss of habitat will be mitigated through replanting at a ratio of 1:1. In consideration of the aforementioned, the proposed undertaking will have no substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

c) No Impact. Of the 19 proposed project locations, only Location No. 10 is classified as riverine wetland/riparian habitat, and removal of the existing culvert and construction of a new bridge structure with an underlying natural slope creek bottom is anticipated to restore the creek to its natural condition, and yield a net positive/increase to wetlands in the project study area. In consideration of the aforementioned, the proposed undertaking will have no substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. No mitigation is required.

d) No Impact. The proposed undertaking will not Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. It is anticipated that the proposed project would yield a beneficial effect to the endangered Southern steelhead trout population by restoring fish passage at Solstice Canyon Creek beneath the SR-1/PCH roadway at proposed Project Location No. 10. No mitigation is required.

e) Less Than Significant Impact. The proposed undertaking exists within areas that are designated as Environmentally Sensitive Habitat Areas (ESHAs) by the City of Malibu in the Local Coastal Program. It is estimated that approximately 3,300 square feet of Alder/Sycamore riparian habitat and 50,094 square feet of Coastal scrub will be impacted at proposed project Location No. 10 as a result of the proposed project, though the loss of habitat will be mitigated through replanting at a ratio of 1:1. No permanent loss of habitat is anticipated. In consideration of the aforementioned, it is not anticipated that the proposed undertaking would be in conflict with any local policies or ordinance protecting biological resources, such as tree preservation policy or ordinance.

f) **No Impact.** The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and the potential for conflict with the provisions of any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan solely exists at proposed project Location No. 10, where it is proposed that the existing culvert is replaced with a new bridge structure with an underlying natural slope creek bottom. In 2005, the California Coastal Conservancy authorized the disbursement of funds to the National Park Service (NPS) to initiate a plan to remove fish passage barriers and restore habitat conditions to facilitate passage for Southern steelhead trout in the Solstice Creek watershed. The proposed actions would support the removal of human-made fish passage barriers and restore stream habitat to both facilitate steelhead restoration and serve as a location for environmentally sensitive educational outreach and public use. The plan and proposal involved the removal of three check dams and four Arizona crossings (a low-water crossing that provides a bridge when water flow is low) to ensure a significant length of streambed is available for spawning of southern steelhead trout.

The proposed project was designed to complement two other projects in the Solstice Creek Watershed funded by other sources – the modification of the Corral Canyon Road Bridge and the modification of the culvert at Pacific Coast Highway (SR-1/PCH), both downstream of the proposed project area. In 2008, the City of Malibu, in conjunction with the California Department of Fish and Wildlife (CDFW), completed the removal of barriers preventing fish passage which included the demolition, removal, and replacement of the old concrete bridge located on Corral Canyon Road, and just north of the Caltrans facility at SR-1/PCH. Caltrans modification of the culvert at SR-1/PCH as proposed in this project, in combination with the aforementioned projects by the City of Malibu, CDFW, NPS and the California Coastal

Conservancy would provide the Southern steelhead trout with a continuous, unobstructed fish passage route to the rich upstream spawning areas of Solstice Canyon. In consideration of the aforementioned, it is not anticipated that the proposed undertaking would be in conflict with the provisions of any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. No mitigation is required.

CULTURAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☐	☒

CEQA Significance Determinations for Cultural Resources

a) No Impact. No historical resources were identified within the project study area, therefore there is no potential for adverse changes in the significance of a historical resource as defined in §15064.5.

b) No Impact. A potential for encountering intact archaeological deposits exists at project Locations No. 9 and 10, particularly as it pertains to excavation associated with construction of the new bridge structure at Solstice Canyon Creek, though the potential is low in consideration of an estimated maximum excavation depth of 15 feet – intact deposits are suspected at depths between 23 and 33 feet. Pursuant to Stipulation VIII.C.4 of the Section 106 PA and as applicable Stipulation VIII.C.4 of the PRC 5024 MOU, Caltrans has assumed eligibility of archaeological site CA-LAN-210, under Criterion D for the site's data potential for the purposes of this project only. For the project as a whole, Caltrans, in applying the Criteria of Adverse Effect, proposes that a Finding of No Adverse Effect without Standard Conditions (FNAE-No SC) is appropriate and is currently seeking the State Historic Preservation Officer's (SHPO's) concurrence in the finding, pursuant to 36 CFR 880.5(c) and Section 106 PA Stipulation X.B.2. Based on the aforementioned, the proposed undertaking does not have the potential to cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5.

c) No Impact. No unique paleontological resource sites or unique geologic features have been identified in the project study area, therefore there is no potential to directly or indirectly destroy such.

d) No Impact. Any potential to disturb human remains, including those interred outside of dedicated cemeteries is limited to Archaeological Site CA-LAN-210 at proposed project Locations No. 9 and 10, though the area has been previously disturbed by construction (including the associated culvert and drainage) and other development activities. Additionally, excavation

associated with the construction of the new bridge structure at proposed project Location No. 10 is estimated at depth of 15 feet - any intact archaeological deposits are expected at depths between 23 and 33 feet. Based on the aforementioned, the proposed undertaking does not have the potential to disturb human remains, including those interred outside of dedicated cemeteries.

GEOLOGY AND SOILS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

CEQA Significance Determinations for Geology and Soils

a, i) No Impact. While all proposed project locations are located in a seismically active region of Southern California, the proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities. While the proposed replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope creek bottom at Project Location No. 10 exists in an area close to a number of faults that are considered to be active or potentially active, the new structure will be designed and constructed in accordance with applicable seismic standards to reduce the risk of serious structure damage resulting from potential seismic events. Collectively, the proposed improvements do not have the potential to expose people or structures to potential adverse effects regarding the rupture of any known earthquake faults.

a, ii) No Impact. While all proposed project locations are located in a seismically active region of Southern California, the proposed project consists primarily of rehabilitation and restoration of

existing roadway drainage facilities. The proposed replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope creek bottom at Project Location No. 10 exists in an area close to a number of faults that are considered to be active or potentially active, with a shear wave velocity (VS30) of 883 feet/second (270 meters/second). This location exists in an area 0.05 miles north of the Malibu Coast on a strike-slip fault, for which the magnitude of the maximum credible earthquake (MCE) is 6.6. The design median peak ground acceleration (PGA) at Location No. 10 is approximately 0.69g. Other nearby faults, including the Anacapa-Dume Alt 1 fault and the Santa Monica fault would be expected to have a lesser effect on the proposed bridge structure. Collectively, the proposed improvements do not present any impact scenario in terms of potential to expose people or structures to potential adverse effects regarding strong seismic ground shaking as the new structure will be designed and constructed in accordance with applicable seismic standards to reduce the risk of serious structure damage resulting from potential seismic events.

a, iii) No Impact. While all proposed project locations are located in a seismically active region of Southern California, The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities. While the proposed replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope creek bottom at Project Location No. 10 exists in an area close to a number of faults that are considered to be active or potentially active, the map of the Earthquake Fault Zones and Seismic Hazard Zones of Malibu Beach 7.5 Minute Quadrangles released on August 16, 2007, shows this project within an area delineated as a liquefaction zone. Based on the SPT N values and groundwater table levels from previous logs of test borings, the on-site soils have a minimal potential to be liquefiable during a seismic event therefore, the proposed improvements do not present any impact scenario in terms of potential for seismic-related ground failure, including liquefaction. This will be bolstered by design and construction of the new structure in accordance with applicable seismic standards to reduce the risk of serious structure damage resulting from potential seismic events.

a, iv) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities. As a result, geotechnical and subsurface exploration was then focused on project Location No. 10, where the replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope is proposed. Based on geotechnical and subsurface exploration information, proposed project does not have the potential to expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

b) No Impact. While all proposed project locations exist within an area susceptible to erosion, the proposed drainage restoration along the route, and construction of a new bridge structure with an underlying natural bottom will improve conditions overall, particularly in the conveyance of storm water, ensuring proper drainage and a customary reduction in erosion in comparison to the existing condition. Therefore, the proposed project will not result in substantial soil erosion or the loss of topsoil.

c) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities. As a result, subsurface exploration was then focused on project Location No. 10, where the replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope is proposed. Based on subsurface exploration information, the new structure would not be located on a geologic unit or soil that is unstable, or that would become

unstable as a result of the proposed improvements and would not pose the potential for on-or-off-site landslides, lateral spreading, subsidence, liquefaction, or collapse.

d) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities. As a result, subsurface exploration was then focused on project Location No. 10, where the replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope is proposed. Based on subsurface exploration information, the new structure would not result in potential substantial risks to life or property as a result of being located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994).

e) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and a proposed new bridge structure with an underlying natural slope creek bottom at project Location No. 10 and does not involve the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water – customarily, there is no potential for impact within this context.

GREENHOUSE GAS EMISSIONS

<table>
<tr><th>Would the project:</th><th>Significant and Unavoidable Impact</th><th>Less Than Significant with Mitigation Incorporated</th><th>Less Than Significant Impact</th><th>No Impact</th></tr>
<tr><td>a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?</td><td colspan="4" rowspan="2">Caltrans has used the best available information based to the extent possible on scientific and factual information, to describe, calculate, or estimate the amount of greenhouse gas emissions that may occur related to this project. The analysis included in the climate change section of this document provides the public and decision-makers as much information about the project as possible. It is Caltrans' determination that in the absence of statewide-adopted thresholds or GHG emissions limits, it is too speculative to make a significance determination regarding an individual project's direct and indirect impacts with respect to global climate change. Caltrans remains committed to implementing measures to reduce the potential effects of the project. These measures are outlined in the climate change section that follows the CEQA checklist and related discussions.</td></tr>
<tr><td>b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?</td></tr>
</table>

HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

CEQA Determinations for Hazards and Hazardous Waste

a) **No Impact.** Soils within the project vicinity, particularly in areas that are unpaved, have the potential for contamination from Aerially Deposited Lead (ADL), related to previous and historical use of leaded gasoline additives. However, the potential for occurrence of ADL contamination at hazardous levels in the project study area is low because most proposed work and soil disturbance is anticipated to occur at culvert inlets and outlets that are 30-to-60 feet from the roadway. A previous ADL Site Investigation (SI) completed in 2013 indicated that concentrations of total lead and soluble lead in soil samples were less than the regulatory threshold concentrations to be considered hazardous waste. In general, soils within the project study area are most likely non-hazardous, and sediment inside drainage systems are likely derived from the same soils and considered to have a low potential to be considered hazardous. During construction, any excess ADL soils generated during earth-moving activities will require special handling and waste management, and off-site disposal at a permitted Class I California hazardous waste (RCRA) disposal facility. A Lead Compliance Plan (LCP) will be required under

California Code of Regulations (8CCR), Title 8, Section 1532.1, "Lead," and Cal-OSHA Construction Safety Order that would ensure that there is no potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of ADL.

Structural demolition work relating to the replacement of the bridge/culvert at Project Location No. 10 at has the potential to generate Asbestos Containing Materials (ACMs) as the structure was built in the 1960s. ACM may be present in construction materials used in drainage piping, joint seals, and railing shim plates. Bridges are considered regulated structures by the U.S. Environmental Protection Agency (USEPA) and local air quality management district, which states that demolition and renovation activities relating to such structures require an asbestos survey, which will be performed during the next project phase. The survey will more accurately evaluate the potential of ACMs in the existing bridge/culvert structure to be replaced during construction and will prescribe procedures in the proper handling and disposal of ACM, which would ensure that there is no potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of ACM.

b) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and the replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope at project Location No. 10. The proposed improvements would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Thus, no impacts are anticipated.

c) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and the replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope at project Location No. 10. The proposed improvements would not emit hazardous emissions and would not handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. Therefore, no impacts would be expected to occur.

d) Less Than Significant Impact. Only the soil and groundwater in the area of proposed project Location No. 10 has the potential to be impacted by hazardous materials and wastes from past activities at properties within, adjacent, or near the site. If impacted soil or groundwater were encountered and were not properly managed, the potential exists for exposure of construction workers and the public to potential health hazards and degradation of the environment. Implementation of the appropriate ADL Site Investigation (SI) and Lead Compliance Plan (LCP), and compliance with Regional Water Quality Control Board (RWQCB) regulations for the proper discharge/treatment of all groundwater would reduce and/or eliminate the effects of such, yielding a less than significant impact and no mitigation is required.

e) No Impact. The proposed project is not located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport. Therefore, the proposed project will not result in a safety hazard for people residing or working in the project area, and no impact is anticipated.

f) No Impact. The proposed project is not located within the vicinity of a private airstrip. Therefore, the proposed project will not result in a safety hazard for people residing or working in the project area.

g) Less Than Significant Impact. This Draft IS/EA will be circulated to local police and fire departments, and hospitals to solicit any feedback and any concerns will be addressed regarding this subject matter. The proposed project would not impair implementation of, or physically

interfere with an adopted emergency response plan or emergency evacuation plan. All construction activity would occur at each proposed project site. However, in the event an activity is planned that could affect traffic (i.e. equipment delivery necessitating lane closures), Caltrans would consult with local agencies and implement the appropriate traffic management plan. All traffic-related impacts would be reduced to less than significant levels, and no mitigation is required.

h) Less Than Significant Impact. As with all construction operations, there exists a negligible risk of fire danger, primarily related to smoking, refueling, and operating vehicles and other equipment off roadways. Welding during construction could also potentially result in the combustion of native materials in close proximity to the welding site, though these activities would be limited to project Location No. 10 where most work will occur within Solstice Canyon Creek. Implementation of Best Management Practices and compliance with Cal/OSHA standards would reduce any potential impacts to less than significant levels, and no mitigation is required.

HYDROLOGY AND WATER QUALITY

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☒	☐

CEQA Determinations for Hydrology and Water Quality

a) **Less Than Significant Impact.** The proposed project is subject to Section 404 of the Clean Water Act (CWA), which was established to regulate the discharge of dredged or fill material into Waters of the United States, including wetlands. A Section 404 Nationwide Permit will be obtained from the United State Army Corps of Engineers (ACOE) for full compliance with the CWA for proposed activities in "Waters of the United States," thus reducing the potential for impacts related to violation of any water quality standards, or waste discharge requirements, to a less than significant level. No mitigation is required.

b) **Less Than Significant Impact.** Work associated with the proposed project does not have the potential to substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. While a potential to incidentally encounter groundwater is anticipated at project Location No. 10, the proposed work is temporary in nature and will not cause any significant change in groundwater levels.

c) **No Impact.** The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and the associated improvements do not have the potential to substantially alter the existing drainage patterns at any of the project locations. While alterations are proposed at the outlet of Solstice Canyon Creek at Location No. 10 (replacement of the existing bridge/culvert with a new bridge structure with an underlying natural slope), the proposed improvements will not alter the course of the creek in a manner than would result in substantial erosion or situation on-or-off-site. Therefore, no impacts are anticipated within this context.

d) **Less Than Significant Impact.** The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and the associated improvements do not have the potential to substantially alter the existing drainage patterns at any of the project locations. While it is anticipated that proposed project operations would slightly increase runoff volume at project Location No. 10, the improvements are not anticipated to affect downstream flow, discharge to lined channels, potential sediment loading, or cause other hydraulic changes to the storm drain system affecting downstream channel stability as a result of increases in Disturbed Soil Areas (DSAs) and Net Additional Impervious Areas (AIA). Therefore, the effects of such are considered less than significant, and no mitigation is required.

e) **Less Than Significant Impact.** The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, and the associated improvements do not have the potential to create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems. While it is anticipated that proposed project would slightly increase runoff volume at project Location No. 10, the improvements are not anticipated to affect downstream flow, discharge to lined channels, potential sediment loading, or cause other hydraulic changes to the storm drain system affecting downstream channel stability as a result of increases in Disturbed Soil Areas (DSAs) and Net Additional Impervious Areas (AIA). Discharges through storm drain systems are regulated by the Clean Water Act (CWA) and through development of Total Maximum Daily Loads (TMDLs) based on the severity of pollution in receiving water bodies and the sensitivity of the uses to be made of the waters. Essentially, TMDLs are a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A Water Pollution Control Program (WPCP) will be prepared prior to commencement of soil-disturbing activities/construction for compliance, and implementation of

the WPCP will improve construction site water quality practices, and control the impacts of storm water pollution through Best Management Practices (BMPs) to be in compliance with the CWA, and reduce any impacts to less than significant levels. No mitigation is required. The proposed project will require Section 401 water quality certification from the State Water Board.

f) **No Impact.** Compliance with the Clean Water Act (CWA) and pertinent Total Maximum Daily Loads (TMDL) standards, implementation of treatment controls, and consultation with the Caltrans National Pollutant Discharge Elimination System Storm Water Coordinator will bring the proposed project in compliance and eliminate any potential for scenarios that would otherwise substantially degrade water quality. Therefore, no impacts are anticipated within this context. The proposed project will require a Section 401 water quality certification from the State Water Board.

g) **No Impact.** The proposed project does not include the placement of any housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. Therefore, no impacts are anticipated within this context.

h) **No Impact.** While modeling and analyses show a general increase in water surface elevation relative to the existing condition at project Location No. 10, the increases are not anticipated to inundate the roadway or inhibit the proposed structure from properly conveying flows outside of the floodway and onto the beach environment. While the proposed project's scope of work includes removal of a culvert at project Location No. 10, it is not considered a flood control structure. Therefore, no impacts are anticipated within this context.

i) **Less Than Significant Impact.** Coastal communities in Southern California, including the coastal areas within the City of Malibu, are vulnerable to tsunamis. Tsunamis may be generated immediately offshore of Malibu by surface ground rupture of faulting or by the occurrence of submarine landslides. Run-up heights along the City of Malibu shoreline are estimated between five and seven feet for the 100-year zone, and between eight and twelve feet for the 500-year zone. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities, with the only new structure proposed at project Location No. 10. While modeling and analyses show a general increase in water surface elevation relative to the existing condition at this location, the increases are not anticipated to inundate the roadway or significantly affect the proposed structure from properly conveying flows outside of the floodway and onto the beach environment. Additionally, the new structure is not located within a 100-year base floodplain, and exists within a FEMA Zone X (unshaded) area, which is considered to be of minimal flood hazard. In consideration of the aforementioned, the impacts related to inundation by seiche, tsunami, or mudflow are considered to be less than significant and no different than that of the surrounding areas. No mitigation is required.

LAND USE AND PLANNING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

CEQA Significance Determinations for Land Use and Planning

a) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure which do not have the potential to physically divide an established community. Therefore, no impacts are anticipated within this context.

b) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure to restore full functionality to drainage along the route and enhance habitat for the Southern steelhead trout at project Location No. 10. Therefore, the proposed project does not present any conflicts with any applicable land use plan, policy, or regulation of any agency with jurisdiction over the project, and no impacts are anticipated.

c) No Impact. Caltrans continues to be in close coordination and in compliance with regulations set forth by the United States Fish and Wildlife Service (USFWS), National Marine Fisheries (NMFS), California Department of Fish and Wildlife (CDFW) and other jurisdictional agencies in the project area. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure to restore full functionality to drainage along the route, and the enhancement of habitat for the Southern steelhead trout at project Location No. 10. In consideration of the aforementioned, the proposed project does not present the potential for conflict with any applicable habitat conservation plan or natural community conservation plan. Therefore, no impacts are anticipated within this context.

MINERAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

CEQA Significance Determinations for Mineral Resources

a) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure which collectively, do not have the potential to result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. Therefore, no impacts are anticipated within this context.

b) No Impact. There are no locally-important mineral resource recovery sites delineated in any local/jurisdictional general plan, specific plan, or other land use plan within the project study area. Therefore, no impacts are anticipated within this context.

NOISE

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

CEQA Determinations for Noise

a) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure which collectively, do not have the potential to generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Therefore, no impacts are anticipated within this context.

b) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure which collectively, do not have the potential to expose persons to or generate excessive groundborne vibration or groundborne noise levels.

c) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure which collectively, are not traffic capacity increasing or noise generating by nature, and do not have the potential for a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. Therefore, no impacts are anticipated within this context.

d) Less Than Significant Impact. While ambient noise levels may temporarily or periodically increase above existing levels (without project) in the vicinity during construction, these levels are not considered substantial and the associated impacts are considered less than significant, and no mitigation is required.

e) No Impact. The proposed project is not located in an area within an airport land use plan or within two miles of a public airport or public use airport, therefore, it would not expose people residing or working in the project area to excessive noise levels associated with such, and no impacts are anticipated within this context.

f) No Impact. The proposed project is not located within the vicinity of a private airstrip, therefore, it would not expose people residing or working in the project area to excessive noise levels associated with such, and no impacts are anticipated within this context.

POPULATION AND HOUSING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

a) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure, and does not have the potential to induce substantial population growth in the project study area, either directly or indirectly. Therefore, no impacts are anticipated within this context.

b) No Impact. The proposed project does not include acquisitions which would necessitate the displacement of any existing housing. Construction of replacement housing is not required, and no impacts are anticipated within this context.

c) No Impact. The proposed project does not include acquisitions which would necessitate the displacement of any existing housing or people. Construction of replacement housing is not required, and no impacts are anticipated within this context.

PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☒	☐
Parks?	☐	☐	☒	☐

CEQA Significance Determination for Public Services

a) Less Than Significant Impact. The proposed project does not have the potential to result in substantial adverse physical impacts associated with the provision of any new or physically altered governmental facility, nor the need for new or physically altered governmental facilities. The construction of such is not required, and therefore, would not cause any significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for any public services. Additionally, a Transportation Management

Plan (TMP) would be implemented to provide detailed access and detour strategies that would minimize any effects on response times for fire, police, and emergency services. Caltrans shall maintain close coordination with local agencies and jurisdictions, including fire protection services, police, schools, and park agencies via a public outreach campaign during the construction phase of the proposed project. In consideration of the aforementioned, impacts related to public services are considered to be less than significant, and no mitigation is required.

RECREATION

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

CEQA Significance Determinations for Recreation

a) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure, and does not have the potential to increase the use of existing neighborhood and regional parks, or other recreational facilities. Therefore, there is no potential for physical deterioration of any facilities, or the acceleration of such. In consideration of the aforementioned, no impacts are anticipated within this context.

b) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure, and does not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. In consideration of the aforementioned, no impacts are anticipated within this context.

TRANSPORATION/TRAFFIC

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

CEQA Significance Determinations for Transportation/Traffic

a) Less Than Significant Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure, and any conflicts related to plans, ordinances, or policies establishing measures of effectiveness for the performance of the circulation system would be temporary, and construction-related only. Caltrans continues to coordinate with local jurisdictions, and a Transportation Management Plan (TMP) will be implemented accordingly to provide detailed access and detour strategies that would minimize any effects related to such. In consideration of the aforementioned, impacts related to such are considered to be less than significant, and no mitigation is required.

b) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure, and no conflicts are anticipated with any applicable congestion management programs or other standards established by any congestion management agency for designated roads or highways. In consideration of the aforementioned, no impacts are anticipated within this context.

c) No Impact. Implementation of the proposed project will not result in any change in air traffic patterns, including either an increase in traffic levels or a change in location that would result in substantial safety risks. Therefore, no impacts are anticipated within this context.

d) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure, is “in-kind” in

nature, and no meaningful changes geometry are anticipated in the design of the new bridge structure. Therefore, no impacts are anticipated within this context.

e) Less Than Significant Impact. A Transportation Management Plan (TMP) will be implemented to provide detailed access and detour strategies that would minimize any effects on response times for fire, police, and emergency services. In consideration of the aforementioned, impacts related to emergency access are considered to be less than significant.

f) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure, with no permanent alterations proposed to existing public transit, bicycle, or pedestrian facilities. Therefore, no impacts are anticipated within this context.

TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

CEQA Significance Determinations for Tribal Cultural Resources

a/b) No Impact. While Caltrans has identified a California Native American Tribal site at proposed project locations No. 9 and 10 (Archaeological Site CA-LAN-210) and assumed its eligibility for inclusion in the California Register of Historic Resources, it is solely for planning purposes associated with the proposed undertaking and not because the site's primary value warrants preservation in place. Excavation associated with the construction of the new bridge structure at proposed project Location No. 10 is estimated at maximum depth of 15 feet - any intact archaeological deposits are expected at depths between 23 and 33 feet. Additionally, the area has been previously disturbed by construction (including the associated culvert and drainage) and other development activities. In consideration of the aforementioned, the proposed undertaking does not have the potential to cause a substantial adverse change in the significance of the tribal cultural resource.

UTILITIES AND SERVICE SYSTEMS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

CEQA Significance Determinations for Utilities and Service Systems

a) No Impact. Improvements associated with the proposed project are not anticipated to exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board; thus, no impacts are anticipated within this context.

b) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure. Construction and/or expansion of new/existing water or wastewater treatment facilities is not required; thus, no impacts are anticipated within this context.

c) No Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure. Construction and/or expansion of new/existing storm water drainage facilities is not required; thus, no impacts are anticipated within this context.

d) No Impact. Improvements associated with the proposed project are not anticipated to require new or expanded entitlements to provide sufficient water supply thus, no impacts are anticipated within this context.

e) No Impact. Improvements associated with the proposed project are not anticipated to require additional demand for wastewater treatment in addition to existing commitments or require a determination from any wastewater treatment provider thus, no impacts are anticipated within this context.

f) No Impact. Solid waste generated as a result of implementation of the proposed project is not expected to inundate any landfills beyond expected capacities; thus, no impacts are anticipated within this context.

g) No Impact. The proposed project shall comply with all federal, state, and local statutes and regulations related to solid waste; thus, no impacts are anticipated within this context.

MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

CEQA Determinations for Mandatory Findings of Significance

a) Less Than Significant Impact. The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and replacement of an existing bridge structure. While minor effects on biological habitats are anticipated during construction, they are not considered significant, and are temporary and construction-related by nature. Replacement of the existing bridge/culvert structure with a new bridge structure with an underlying natural slope creek bottom at project Location No. 10 is anticipated to improve hydraulic conditions between Solstice Canyon Creek and the Pacific Ocean, enhance upstream habitat, and facilitate the movement of the endangered Southern steelhead trout population in the project study area. Collectively, and in consideration of the aforementioned, the proposed project does not have the potential to adversely degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause of fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of major periods of California history or prehistory, and impacts related to such are considered to be less than significant.

b) Less Than Significant Impact. The proposed project is anticipated to have a beneficial cumulative effect when considering the effect of past projects, the effects of other current project, and the effect of probably future projects. Therefore, any impacts related to such are considered to be less than significant.

c) Less Than Significant Impact. While construction-related impacts are anticipated in regard to noise and traffic, the effects are temporary and considered to be less than significant.

3.3 CLIMATE CHANGE

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), HFC-23 (fluoroform), HFC-134a (1,1,1,2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation.[3] In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) are the largest contributors of GHG emissions.[4] The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

Two terms are typically used when discussing how we address the impacts of climate change: "greenhouse gas mitigation" and "adaptation." Greenhouse gas mitigation covers the activities and policies aimed at reducing GHG emissions to limit or "mitigate" the impacts of climate change. Adaptation, on the other hand, is concerned with planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).

Regulatory Setting

This section outlines federal and state efforts to comprehensively reduce GHG emissions from transportation sources.

[3] https://www.epa.gov/ghgemissions/us-greenhouse-gas-inventory-report-1990-2014
[4] https://www.arb.ca.gov/cc/inventory/data/data.htm

Federal

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.
The Federal Highway Administration (FHWA) recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices.[5] This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—"the triple bottom line of sustainability."[6] Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life. Addressing these factors up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

The Energy Policy Act of 1992 (EPACT92, 102nd Congress H.R.776.ENR): With this act, Congress set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. EPACT92 consists of 27 titles detailing various measures designed to lessen the nation's dependence on imported energy, provide incentives for clean and renewable energy, and promote energy conservation in buildings. Title III of EPACT92 addresses alternative fuels. It gave the U.S. Department of Energy administrative power to regulate the minimum number of light-duty alternative fuel vehicles required in certain federal fleets beginning in fiscal year 1993. The primary goal of the Program is to cut petroleum use in the United States by 2.5 billion gallons per year by 2020.

Energy Policy Act of 2005 (109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Indian energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Standards: This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the Corporate Average Fuel Economy (CAFE) program on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States.

[5] https://www.fhwa.dot.gov/environment/sustainability/resilience/
[6] https://www.sustainablehighways.dot.gov/overview.aspx

U.S. EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in Massachusetts v. EPA (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions.

U.S. EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010[7] and significantly increased the fuel economy of all new passenger cars and light trucks sold in the United States. The standards required these vehicles to meet an average fuel economy of 34.1 miles per gallon by 2016. In August 2012, the federal government adopted the second rule that increases fuel economy for the fleet of passenger cars, light-duty trucks, and medium-duty passenger vehicles for model years 2017 and beyond to average fuel economy of 54.5 miles per gallon by 2025. Because NHTSA cannot set standards beyond model year 2021 due to statutory obligations and the rules' long timeframe, a mid-term evaluation is included in the rule. The Mid-Term Evaluation is the overarching process by which NHTSA, EPA, and ARB will decide on CAFE and GHG emissions standard stringency for model years 2022–2025. NHTSA has not formally adopted standards for model years 2022 through 2025. However, the EPA finalized its mid-term review in January 2017, affirming that the target fleet average of at least 54.5 miles per gallon by 2025 was appropriate. In March 2017, President Trump ordered EPA to reopen the review and reconsider the mileage target.[8]

NHTSA and EPA issued a Final Rule for "Phase 2" for medium- and heavy-duty vehicles to improve fuel efficiency and cut carbon pollution in October 2016. The agencies estimate that the standards will save up to 2 billion barrels of oil and reduce CO_2 emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

State

With the passage of legislation including State Senate and Assembly bills and executive orders, California has been innovative and proactive in addressing GHG emissions and climate change.

Assembly Bill 1493, Pavley Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

Executive Order S-3-05 (June 1, 2005): The goal of this executive order (EO) is to reduce California's GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of Assembly Bill 32 in 2006 and SB 32 in 2016.

[7] https://one.nhtsa.gov/Laws-&-Regulations/CAFE-%E2%80%93-Fuel-Economy
[8] http://www.nbcnews.com/business/autos/trump-rolls-back-obama-era-fuel-economy-standards-n734256 and https://www.federalregister.gov/documents/2017/03/22/2017-05316/notice-of-intention-to-reconsider-the-final-determination-of-the-mid-term-evaluation-of-greenhouse

Assembly Bill 32 (AB 32), Chapter 488, 2006: Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

Executive Order S-01-07 (January 18, 2007): This order sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.

Senate Bill 97 (SB 97), Chapter 185, 2007, Greenhouse Gas Emissions: This bill requires the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

Senate Bill 391 (SB 391), Chapter 585, 2009, California Transportation Plan: This bill requires the State's long-range transportation plan to meet California's climate change goals under AB 32.

Executive Order B-16-12 (March 2012) orders State entities under the direction of the Governor, including ARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

Executive Order B-30-15 (April 2015) establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent ($MMTCO_2e$). Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, Safeguarding California, every 3 years, and to ensure that its provisions are fully implemented.

Senate Bill 32 (SB 32) Chapter 249, 2016, codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

Environmental Setting

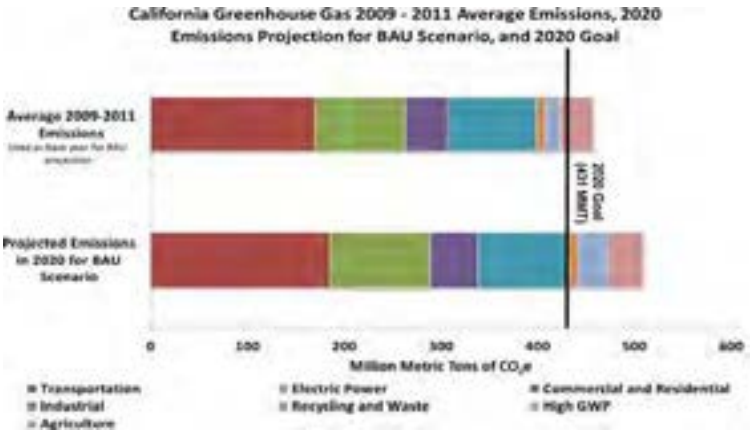
In 2006, the Legislature passed the California Global Warming Solutions Act of 2006 (AB 32), which created a comprehensive, multi-year program to reduce GHG emissions in California. AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020. The Scoping Plan was first approved by ARB in 2008 and must be updated every 5 years. The second updated plan, *California's 2017 Climate Change Scoping Plan*, adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32.

The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the updated Scoping Plan, ARB released the GHG inventory for California.[9] ARB is responsible for maintaining and updating California's GHG Inventory per H&SC Section 39607.4. The associated forecast/projection is an estimate of the emissions anticipated to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented.

An emissions projection estimates future emissions based on current emissions, expected regulatory implementation, and other technological, social, economic, and behavioral patterns. The projected 2020 emissions provided in Figure 3.3a represent a business-as-usual (BAU) scenario assuming none of the Scoping Plan measures are implemented. The 2020 BAU emissions estimate assists ARB in demonstrating progress toward meeting the 2020 goal of 431 MMTCO2e[10]. The 2018 edition of the GHG emissions inventory found total California emissions of 429 $MMTCO_2e$ for 2016.

The 2020 BAU emissions projection was revisited in support of the First Update to the Scoping Plan (2014). This projection accounts for updates to the economic forecasts of fuel and energy demand as well as other factors. It also accounts for the effects of the 2008 economic recession and the projected recovery. The total emissions expected in the 2020 BAU scenario include reductions anticipated from Pavley I and the Renewable Electricity Standard (30 $MMTCO_2e$ total). With these reductions in the baseline, estimated 2020 statewide BAU emissions are 509 $MMTCO_2e$.

Figure 3.3a 2020 Business as Usual (BAU) Emissions Projection, 2014 Edition



https://www.arb.ca.gov/cc/inventory/data/bau.htm

[9] 2018 Edition of the GHG Emission Inventory released (July 2018). https://www.arb.ca.gov/cc/inventory/data/data.htm
[10] The revised target using Global Warming Potentials (GWP) from the IPCC Fourth Assessment Report (AR4)

Project Analysis

An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its incremental change in emissions when combined with the contributions of all other sources of GHG.[11] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

GHG emissions for transportation projects can be divided into those produced during operations and those produced during construction. The following represents a best faith effort to describe the potential GHG emissions related to the proposed project.

Operational Emissions

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities and is not capacity-increasing. It does not have the potential to increase traffic volumes, and accordingly presents a low-to-no potential for an increase in operational GHG emissions. Construction emissions will be unavoidable, but Caltrans standard specifications to reduce air pollutants will also help reduce GHG emissions, as discussed below.

Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

In addition, with innovations such as improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

Utilizing the Road Constructions Emissions Model, Version 9.0.0, it is estimated that construction of the proposed project would yield approximately 2,650.63 metric tons of carbon dioxide equivalent (CO_2e) per year, for a duration of 3 years (36 months). CO_2e is a standard unit for measuring carbon footprints. The idea is to express the quantity of each different greenhouse gas in terms of the amount of CO_2 that would create the same amount of warming. That way, a carbon footprint consisting of several different greenhouse gases can be expressed as a single number. In this estimate, CO_2e consists of CO_2, CH_4, and N_2O.

[11] This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the US Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

In accordance with Caltrans Standard Specifications, the contractor will comply with all South Coast Air Quality Management District (SCAQMD) and state rules, ordinances, and regulations in regard to air quality restrictions. Rules such as restricted equipment idling time and properly tuning and maintaining engines help reduce GHG emissions.

CEQA Conclusion

While the project will result in GHG emissions during construction, it is anticipated that the project will not result in any increase in operational GHG emissions. While it is Caltrans' determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct impact and its contribution on the cumulative scale to climate change, Caltrans is firmly committed to implementing measures to help reduce GHG emissions. These measures are outlined in the following section.

Greenhouse Gas Reduction Strategies

Statewide Efforts

In an effort to further the vision of California's GHG reduction targets outlined an AB 32 and SB 32, Governor Brown identified key climate change strategy pillars (concepts). These pillars highlight the idea that several major areas of the California economy will need to reduce emissions to meet the 2030 GHG emissions target. These pillars are (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farm and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, *Safeguarding California*.

Figure 3.3c The Governor's Climate Change Pillars; 2030 Greenhouse Gas Reduction Goals

The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that we build on our past successes in reducing criteria and toxic air pollutants from transportation and goods movement activities. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled. One of Governor Brown's key pillars sets the ambitious goal of reducing today's petroleum use in cars and trucks by up to 50 percent by 2030.

Governor Brown called for support to manage natural and working lands, including forests, rangelands, farms, wetlands, and soils, so they can store carbon. These lands have the ability to remove carbon dioxide from the atmosphere through biological processes, and to then sequester carbon in above- and below-ground matter.

Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the ARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. EO B-30-15, issued in April 2015, and SB 32 (2016), set a new interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

California Transportation Plan (CTP 2040). The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future statewide, integrated, multimodal transportation system. It serves as an umbrella document for all of the other statewide transportation planning documents.

SB 391 (Liu 2009) requires the CTP to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

Caltrans Strategic Management Plan. The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that will help to reduce GHG emissions include:

- Increasing percentage of non-auto mode share
- Reducing VMT per capita
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions

Funding and Technical Assistance Programs. In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several funding and technical assistance programs that have GHG reduction benefits. These include the Bicycle Transportation Program, Safe Routes to School, Transportation Enhancement Funds, and Transit Planning Grants. A more extensive description of these programs can be found in *Caltrans Activities to Address Climate Change* (2013).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a department policy that will ensure coordinated efforts to incorporate climate change into departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013) provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce GHG emissions resulting from agency operations.

Project-Level GHG Reduction Strategies

The following measures will also be implemented in the project to reduce GHG emissions and potential climate change impacts from the project:

- Per Caltrans Standard Specifications Provisions, the contractor shall comply with all South Coast Air Quality Management District (SCAQMD) rules, ordinances, and regulations in regard to air quality restrictions.
- The project proposes to replace approximately 0.08 acre of Alder/Sycamore riparian habitat and 1.15 acres of Coastal scrub that will be disturbed at proposed project Location No. 10 (Solstice Canyon Creek Bridge) by replanting on-site and off-site at a ratio of 1:1. Determinations and appropriate measures will be reviewed by the City of Malibu during the Local Coastal Development permit application process. Replacing vegetation will help absorb CO_2 in the project area over the long term.

Adaptation Strategies

"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage—or, put another way, planning and design for resilience. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. These types of impacts to the transportation infrastructure may also have economic and strategic ramifications.

Federal Efforts

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the CEQ, the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011[12], outlining the federal government's progress in expanding and strengthening the nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provided an update on actions in key areas of federal adaptation, including: building resilience in local communities,

[12] https://obamawhitehouse.archives.gov/administration/eop/ceq/initiatives/resilience

safeguarding critical natural resources such as fresh water, and providing accessible climate information and tools to help decision-makers manage climate risks.

The federal Department of Transportation issued *U.S. DOT Policy Statement on Climate Adaptation* in June 2011, committing to "integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely and that transportation infrastructure, services and operations remain effective in current and future climate conditions."[13]

To further the DOT Policy Statement, in December 15, 2014, FHWA issued order 5520 (*Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events*).[14] This directive established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. The FHWA will work to integrate consideration of these risks into its planning, operations, policies, and programs in order to promote preparedness and resilience; safeguard federal investments; and ensure the safety, reliability, and sustainability of the nation's transportation systems.
FHWA has developed guidance and tools for transportation planning that fosters resilience to climate effects and sustainability at the federal, state, and local levels.[15]

State Efforts

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea-level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea-level rise and directed all state agencies planning to construct projects in areas vulnerable to future sea-level rise to consider a range of sea-level rise scenarios for the years 2050 and 2100, assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea-level rise. Sea-level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high-water levels, and storm surge and storm wave data.

Governor Schwarzenegger also requested the National Academy of Sciences to prepare an assessment report to recommend how California should plan for future sea-level rise. The final report, *Sea-Level Rise for the Coasts of California, Oregon, and Washington* (Sea-Level Rise Assessment Report)[16] was released in June 2012 and included relative sea-level rise projections for the three states, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates; and the range of uncertainty in selected sea-level rise projections. It provided a synthesis of existing information on projected sea-level rise impacts to state infrastructure (such as roads, public facilities, and beaches), natural areas, and coastal and marine ecosystems; and a discussion of future research needs regarding sea-level rise.

In response to EO S-13-08, the California Natural Resources Agency (Resources Agency), in coordination with local, regional, state, federal, and public and private entities, developed *The California Climate*

[13] https://www.fhwa.dot.gov/environment/sustainability/resilience/policy_and_guidance/usdot.cfm
[14] https://www.fhwa.dot.gov/legsregs/directives/orders/5520.cfm
[15] https://www.fhwa.dot.gov/environment/sustainability/resilience/
[16] *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at: http://www.nap.edu/catalog.php?record_id=13389.

Adaptation Strategy (Dec 2009),[17] which summarized the best available science on climate change impacts to California, assessed California's vulnerability to the identified impacts, and outlined solutions that can be implemented within and across state agencies to promote resiliency. The adaptation strategy was updated and rebranded in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan).

Governor Jerry Brown enhanced the overall adaptation planning effort by signing EO B-30-15 in April 2015, requiring state agencies to factor climate change into all planning and investment decisions. In March 2016, sector-specific Implementation Action Plans that demonstrate how state agencies are implementing EO B-30-15 were added to the Safeguarding California Plan. This effort represents a multi-agency, cross-sector approach to addressing adaptation to climate change-related events statewide.

EO S-13-08 also gave rise to the *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance), produced by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), of which Caltrans is a member. First published in 2010, the document provided "guidance for incorporating sea-level rise (SLR) projections into planning and decision making for projects in California," specifically, "information and recommendations to enhance consistency across agencies in their development of approaches to SLR."[18]

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is actively engaged in in working towards identifying these risks throughout the state and will work to incorporate this information into all planning and investment decisions as directed in EO B-30-15.

Effects of Seal Level Rise (SLR)

In 2008, California Governor's Executive Order S-13-08 was issued to direct State agencies' planning of construction projects in areas vulnerable to Sea Level Rise (SLR) to address the potential impacts of such by considering a range of SLR scenarios for the years 2050 and 2100. Changes in climate have caused the global mean sea level to rise, primarily due to rising of global temperatures that cause ocean water to expand and land ice to melt. When Caltrans implements projects on the State Highway System in areas that are vulnerable to SLR, various scenarios are integrated into the assessment of existing conditions and modeling within the context of proposed improvements.

The proposed project consists primarily of rehabilitation and restoration of existing roadway drainage facilities that do not require sea level rise analyses, with the exception of improvements at proposed project Location No. 10. The proposed improvements at Location No. 10 (bridge replacement and culvert modification) at Solstice Canyon Creek are close to the coast of the Pacific Ocean, and the potential impacts of SLR must be taken into account. Using the guidance in the National Research Council's 2012 report entitled, "*Sea Level Rise for the Coasts of California, Oregon, and Washington: Past Present, and Future*" as adopted by the California Coastal Commission, the preliminary hydraulic analyses for this project location accounted for the varying degree of SLR projections (depth above

[17] http://www.climatechange.ca.gov/adaptation/strategy/index.html
[18] http://www.opc.ca.gov/2013/04/update-to-the-sea-level-rise-guidance-document/

existing ocean sea levels) for the Pacific Ocean near Los Angeles, California for the projected year of 2100, and further scrutinized for Low (B1), Medium (A1B), and High (A1FI) scenarios for projected GHG emissions. The Low (B1) GHG scenario illustrates the possible emissions implications of a scenario in which the world chooses consistently and effectively a development path that favors efficiency of resource use and "dematerialization" of economic activity. The Medium (A1B) GHG scenario assumes "balanced" progress actions across all resources and technologies from energy supply to end use, as well as "balanced" land use changes. The High (A1FI) GHG scenario assumes a more "fossil intensive" development path and customary emissions implications (i.e., "business as usual").

Table 3.3a Sea Level Rise (SLR) Projections for Los Angeles, California Relative to the Year 2100

Projected Year	GHG Scenario	Sea Level Rise Projection (feet)
2100	Low (B1)	1.5
	Medium (A1B)	3.1
	High (A1FI)	5.5

The hydraulics analysis for the proposed replacement Solstice Canyon Creek Bridge accounted for projected changes in SLR factored in with high tides, El Niño, storm surge, and wave effects, combined with peak creek flood flows based on the gage data from analogous creeks in the area. (Because Solstice Canyon Creek is not gaged, direct flow measurements are not available.) Section 2.3.1, Hydrology and Floodplain, and the Preliminary Hydraulic Evaluation Report (hydraulics report) (Caltrans 2018) provide detailed explanation of the analysis. The hydraulics report concluded that the proposed bridge and culvert design would accommodate projected flood flows under all five scenarios evaluated—Normal Depth Flow Conditions, Ocean Flow Conditions, Low SLR Conditions, Medium SLR Conditions, and High SLR Conditions. With the increase in conveyance to the waterway provided by the longer proposed bridge length, more of the river flows would flow through the bridge and push against the coastal flooding effects, thus dampening coastal influence on upstream flooding. While water surface elevations would increase under some conditions, all floodwaters would stay within the banks of Solstice Canyon Creek. The proposed bridge design provides ample freeboard and SR-1 at the bridge location would not be inundated under the highest-flow scenario.

CHAPTER 4 – COMMENTS AND COORDINATION

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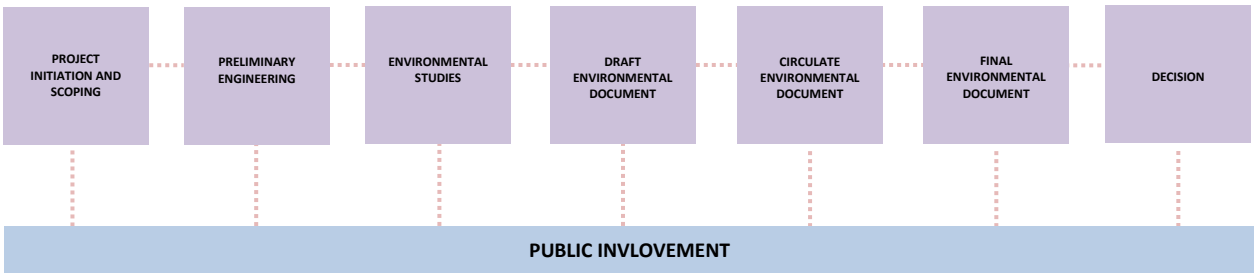
4.1 INTRODUCTION

Early and continuing coordination with the general public and public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation and the level of analysis required, and to identify potential impacts and avoidance, minimization, and/or mitigation measures and related environmental requirements. Agency and tribal consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including interagency coordination meetings, public meetings, public notices, Project Development Team (PDT) meetings, and interagency coordination meetings. This chapter summarizes the results of the Department's efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

Figure 4.1-a The Environmental Process



4.2 TRANSPORTATION PLANNING, PROJECT INITIATIATION AND PRELIMINARY DESIGN AND ENVIRONMENTAL STUDIES

In 2003, Caltrans and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) entered into an agreement to restore fish passage for Southern steelhead trout on SR-1/PCH at Solstice Canyon Creek. At the time, the project development team consisted mostly of external representatives from the National Park Service (NPS), the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW), in addition to Caltrans and NOAA Fisheries.

Caltrans commenced project development and proposed a modification of the existing culvert at SR-1/PCH at Solstice Canyon Creek utilizing a hydraulic-based design that proposed construction of a fish ladder system through the Caltrans Environmental Enhancement and Mitigation Program. Caltrans performed a series of environmental studies to assess any potential environmental impacts as a result of the proposed design, and after review from the California Department of Fish and Wildlife, it was determined that the proposed design was insufficient in restoring fish passage at Solstice Canyon Creek.

In 2004, Caltrans revived its efforts to contribute to the recovery plan to restore fish passage for Southern steelhead trout on SR-1/PCH at Solstice Canyon Creek, and in May of that year, a field meeting

was initiated with an expanded project development team that included representatives from the National Park Service (NPS), Coastal Conservancy, the City of Malibu, Los Angeles County, California Department of Fish and Wildlife, the Office of Senator Sheila Kuehl, and Save the Santa Monica Bay, in addition to Caltrans and NOAA Fisheries.

Agency coordination, project development, and programming continued, but it was not until 2008 that an alternative design for the culvert modification emerged that proposed a removal of the concrete bottom and aprons of the existing culvert and construction of a stable channel consisting of rock weirs and step-pools. In 2008, Caltrans again, performed a series of environmental studies to assess any potential environmental impacts as a result of the proposed design, but during the process to obtain a Coastal Development Permit from the California Coastal Commission (CCC)/City of Malibu, further analysis was requested to assess the stability of the design for the proposed beach section. It was determined that that proposed design was insufficient, and programming issues ultimately shelved the proposed undertaking indefinitely.

In 2015, Caltrans again revived its efforts to contribute to the recovery plan to restore fish passage for Southern steelhead trout on SR-1/PCH at Solstice Canyon Creek, and initiated preliminary design and environmental studies for conceptual approval of yet another alternative for modification of the culvert that aimed to remove the existing concrete slab – considered to be a barrier for upstream steelhead passage – and replace it with a cobble/boulder lined bottom at a lower elevation than the current invert of the culvert. It was proposed that cobble and boulder lined step pools would be constructed upstream and downstream of the culvert.

Caltrans re-initiated coordination with the NOAA Fisheries to review the proposed modification of the culvert as developed by Caltrans, and address any deficiencies, if any, and to develop concepts to potentially improve the proposed design. In August 2017, R2 Resource Consultants, Inc., in collaboration with Caltrans and NOAA Fisheries published the Steelhead Passage Stability Study to address the aforementioned and found that upstream and downstream of the proposed culvert modification, the proposed design flow depths within the step pool structures were deemed too shallow for leaping in some flow ranges, the head drop from pool-to-pool exceeded standards for upstream passage, and the accumulation of sediment as a result of the proposed design presented concerns.

4.3 CONTINUNED DEVELOPMENT OF DESIGN AND ENVIRONMENTAL STUDIES

The NOAA Fisheries Steelhead Passage Stability Study recommended three alternatives for the modification of the culvert at Solstice Canyon Creek. Caltrans utilized this study as a baseline and guidance in the continued development of design for fish passage at this location, and the current design iteration (replace existing bridge/culvert with a new bridge structure with an underlying natural slope creek bottom) is a hybrid of all three proposed alternatives as outlined in the study. The current design combines features to provide optimum hydraulic conditions for flood water conveyance, and facilitation of movement of the endangered Southern steelhead trout population in the project study area. NOAA Fisheries coordination is continuing regarding these matters.

Caltrans again, initiated a series of environmental studies to assess any potential environmental impacts as a result of this iteration of the proposed design through an internal project development team consisting of technical specialists from the following disciplines – urban and environmental planning,

hydraulics and water quality, geology, hazardous waste and materials, biology, and right-of-way/acquisitions. The results of these studies are presented in this Initial Study/Environmental Assessment (IS/EA).

The design and scope of work for the other 18 project locations included in the proposed project continued to develop in parallel with Location No. 10 (Solstice Canyon Creek). Initially, the scope of work proposed for these locations entailed a simple relining of existing drainage structures along the route, but culvert assessments indicated the need for more extensive rehabilitation and restoration, particularly where full and/or partial structure/pipe replacements were required. The expansion of the scope of work and footprint of construction at some locations mandated consultation/coordination with jurisdictional agencies regarding Section 4(f) and the protection of publicly owned parks and recreation areas along the route.

4.4 SECTION 4(F) CONSULTATION/COORDINATION

Caltrans considered the proposed project alternatives within the context of Section 4(f), and because it was found that there was no potential for effects on waterfowl/wildlife refuges, and/or historic sites considered to have national, state, or local significance, analysis was centered on publicly owned parks and recreation areas within the project study area. While the proposed undertaking does not require any permanent acquisition of Section 4(f) protected resources/facilities at any of the proposed project locations, coordination was initiated with the State of California Department of Parks and Recreation and the Los Angeles County Department of Beaches and Harbors as a result of proposed temporary construction easements required for drainage access and/or construction staging. The temporary construction easements constitute a "temporary occupancy" under Section 4(f). The intent of consultation/coordination with the aforementioned agencies is to initiate consultation/coordination required under Section 4(f), and to solicit any feedback as it pertains to the protection of jurisdictional facilities. Caltrans aims to abide by all established policies as required by agencies with jurisdiction of Section 4(f) protected facilities, and any recommended measures to preserve the operation and maintenance of facilities during construction. Section 4(f) consultation/coordination with the State of California Department of Parks and Recreation and Los Angeles County Department of Beaches and Harbors is continuing, and summarized as follows.

State of California Department of Parks and Recreation

On July 5, 2018, Section 4(f) consultation/coordination was initiated with the State of California Department of Parks and Recreation. A Section 4(f) Coordination Summary Report/Memorandum was transmitted via e-mail to Suzanne Goode/Senior Environmental Scientist and Danielle LeFer/Environmental Scientist that included information regarding project background, need for Section 4(f) consultation/coordination, the identification of potential effects to Section 4(f) protected properties under State of California Department of Parks and Recreation jurisdiction, and the intent in seeking concurrence for a "temporary occupancy exception."

On July 13, 2018, Danielle LeFer/Environmental Scientist with the State of California Department of Parks and Recreation provided a preliminary response which is summarized in the following table along with Caltrans' response to comments.

Table 4.4-a State of California Department of Parks and Recreation Section 4(f) Consultation/Coordination Comments, July 16, 2018

Comment	Response
State Parks will require that you obtain a Right-of-Entry (ROE) Permit for all project and may require additional mitigation and BMPs along with the ROE. Will Rogers is managed by Los Angeles County and they will also require their own ROE. You can contact Stephen (snguyen@bh.lacounty.gov) to follow up with them.	We are aware of right of entry permitting, and our Right-of-Way division will be coordinating these efforts after publication of the environmental document/during the next project phase. We are currently in contact with Stephen Nguyen regarding the LACBH locations you mention.
It would be best to avoid scheduling the project that involve access through State Parks during holidays and summer.	Our construction team is currently planning work outside of holidays and the summer season, but we will specify that this order of work is adhered to.
Will there be vegetation removal? If so, we will require restoration.	The majority of vegetation removal will occur only at the inlets and outlets of drainages where access to drainage is required, and where it is obstructing the flow of storm water. Biological studies are almost complete, which include surveys of vegetation in the project study area, and specification for protection and replacement of such as necessary – the results of this study will be available for review in the Draft Initial/Study/Environmental Assessment to be published in August.
Any excavation will require the presence of a biological monitor to avoid harming silvery legless lizards.	Full-time biological monitoring is already specified for the proposed project, so it is no problem to be on the lookout for the silvery legless lizard.
At Location No. 15, we would like to discuss options to dissipate water velocity and reduce erosion at this site.	Our design team is aware of the erosion issues at this particular drainage and are in the process of designing solutions to minimize such, which may include regrading and stabilization measures.

Section 4(f) consultation/coordination with the State of California Department of Parks and Recreation is continuing and when consensus is achieved on the protection of jurisdictional facilities, Caltrans is seeking concurrence for a "temporary occupancy exception."

Los Angeles County Department of Beaches and Harbors

On July 5, 2018, Section 4(f) consultation/coordination was initiated with the Los Angeles County Department of Beaches and Harbors. A Section 4(f) Coordination Summary Report/Memorandum was transmitted via e-mail to Stephen Nguyen/Los Angeles County Department of Beaches and Harbors that included information regarding project background, need for Section 4(f) consultation/coordination, the identification of potential effects to Section 4(f) protected properties under Los Angeles County Department of Beaches and Harbors jurisdiction, and the intent in seeking concurrence for a "temporary occupancy exception."

On July 18, 2018, Stephen Nguyen/Los Angeles County Department of Beaches and Harbors provided a preliminary response which is summarized in the following table along with Caltrans' response to comments.

Table 4.4-b Los Angeles County Department of Beaches and Harbors Section 4(f) Consultation/Coordination Comments, July 18, 2018

Comment	Response
Only work location No. 10 will require temporary ingress-egress through county land. This will require a right-of-entry permit from the County. We will need about two weeks to process the permit.	In addition to the beach access proposed at project location No. 10, a temporary access road on the beach will also be required at project locations No. 13/14 from Nicholas Beach Road. Our Right-of-Way data shows that the affected parcels would be APNs 4473-024-904, 4473-024-906, and 4473-024-914 under ownership of LA County.
Application for Right-of-Entry Permit should be accompanied by the State's certificate of insurance. Ensure the LA County is named as the additionally insured and your permit number (issued after you've completed the online application) is referenced inside the Certificate Holder box. The State may also submit a letter of self-insured.	Caltrans will initiate right-of-entry permitting during the next phase of the project, but these requirements will be documented in the environmental document in both the Comments/Coordination section, and in the Environmental Commitments Record (ECR) so that these guidelines are clearly communicated to Design and Construction teams going forward. During this environmental study phase, Caltrans is soliciting any special guidelines for protection of LACBH facilities beyond Caltrans' typical best management practices (BMPs) [returning facilities to existing conditions, litter disposal guidelines, etc].
Application for Right-of-Entry Permit should be accompanied by a copy of all required permits for the proposed work, including, but not limited to any building permit and coastal development permit.	
Application for Right-of-Entry Permit should be accompanied by remittance for the $841 permit processing fee.	

The Los Angeles County Department of Beaches and Harbors also provided a fully-executed right-of-entry permit for an alternate Caltrans project with similar conditions was provided as an example – Caltrans can expect to see similar requirements as listed in the special conditions section of the fully-executed right-of-entry permit. Additionally, The Los Angeles County Department of Beaches and Harbors advised that the same listed comments/provisions would be extended to Project Locations No. 13/14 through a series of e-mail responses on July 26, 2018. In the same correspondence, they expressed their concerns with the proposed beach access at Nicholas Beach Road as the terminus of the road, or proposed access point is deteriorating/washed-out and not feasible.

An on-site meeting is currently pending to include Caltrans Design and Environmental Planning, and Los Angeles County Beaches and Harbors to explore options for access at Project Locations No. 13/14. Section 4(f) consultation/coordination with the State of California Department of Parks and Recreation is continuing and when consensus is achieved on jurisdictional beach access and the protection of jurisdictional facilities, Caltrans is seeking concurrence for a "temporary occupancy exception."

4.5 SUMMARY OF CURRENT BIOLOGICAL AGENCY COORDINATION

Agency	Agency Contact	Topic
National Oceanic and Atmospheric Administration (NOAA) Fisheries	Jay Ogawa	Early coordination including review of design alternatives for fish passage/Southern steelhead trout. See below.
National Park Service	Katy Delaney, Mark Mendelsohn	Ongoing fish passage restoration discussions and California Red-Legged Frog Habitat Analysis.
United States Fish and Wildlife Service (USFWS)	Chris Dellith	Early coordination regarding Snowy plover, Tidewater goby, and California red-Legged frog
California Dept. of Fish and Wildlife	Mary Larson, Dan Blankenship, Matt Chiridon	Project status updates regarding changes in project design and scope.

NOAA Fisheries Coordination

1999-2004
Caltrans and NOAA Fisheries entered into an agreement to restore fish passage on SR-1/PCH at Solstice Canyon Creek.

2004-2012
From 1999 through 2012, Caltrans coordinated with multiple agencies and stake holders during the previous iteration of this project, including NOAA Fisheries Service, the National Park Service (NPS), California Department of Fish and Wildlife (CDFW), and the City of Malibu. This proposed design was eventually shelved in 2012.

2012-2018
Once this iteration of the project was halted in 2012, routine coordination with NOAA Fisheries continued. In 2016 NOAA Fisheries notified Caltrans that they had obtained a grant to initiate a study of Caltrans' proposed Solstice Creek fish passage design. NOAA Fisheries contracted R2 Resource Consultants to review Caltrans' plans and to address any deficiencies, as well as provide concepts on how Caltrans could improve its design. Caltrans staff coordinated with R2 Resource Consultants to provide existing hydraulic studies to aid in their analysis. This report titled ***Steelhead Passage Stability Study Solstice Creek, California Highway 1 Culvert*** was completed in August 2017 and prompted Caltrans to reconsider its design and move towards replacing the existing culvert with a bridge structure.

National Park Service Coordination

2003-2004
The National Park Service (NPS) took the lead in organizing a multi-agency effort to remove fish passage barriers within Solstice Canyon Creek, including those previously constructed by the NPS and the City of Malibu. Plans also included the removal of the exiting Caltrans culvert barrier at SR-1/PCH, which this project proposes to replace with a new bridge with an underlying natural creek bottom to restore fish passage for the Southern steelhead trout.

2012-2018
In March 2018 Caltrans coordinated with NPS Staff (Katy Delaney and Mark Mendelsohn) regarding the change in the project scope and Solstice Creek's potential to be habitat for California red-legged frog (CRLF).

U.S. Fish and Wildlife Service Coordination

2012-2018
Between March and April 2018 Caltrans conducted early coordination with U.S. Fish and Wildlife Service (USFWS) regarding Snowy plover, Tidewater goby, and California red-legged frog (CRLF). The early coordination resulted in Caltrans conducting protocol surveys for CRLF during June-July of this year. Informal consultation was initiated in October 2018 and is expected to be finalized by the end of 2018.

California Department of Fish and Wildlife Coordination

2004-2012
Caltrans applied for and obtained a CDFW 1600 Streambed Alteration Agreement in 2009 for a previous iteration of this project.

2012-2018
Caltrans initiated project-related consultation with CDFW in 2017, and continues to meet twice yearly for participation in the Southern California Fish Passage Advisory Committee. Caltrans continues to utilize these meetings to provide CDFW and NOAA Fisheries with updates regarding the current status of the proposed project. Caltrans anticipates a new 1600 Streambed Alteration Agreement for this project during the next design phase.

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CHAPTER 5 | LIST OF PREPARERS

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CHAPTER 6 | DISTRIBUTION LIST

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Chief Deputy Lisa Mandel	Office of Los Angeles County Supervisor Sheila Kuehl, District 3
County Supervisor Linda Parks	Office of Ventura County Supervisor Linda Parks – District 2

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Councilmember Kevin McKeown	City of Santa Monica
Councilmember Pam O'Connor	City of Santa Monica
Councilmember Terry O'Day	City of Santa Monica
Councilmember Tony Vazquez	City of Santa Monica

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Patricia Port	U.S. Department of the Interior
Leslie T. Rodgers	U.S. Federal Transit Agency
Ray Telles	U.S. Federal Transit Agency
Christine Lehnertz	U.S. National Park Service
Melanie Beck, Outdoor Recreation Planner	U.S. National Park Service
Paul Souza, Regional Director	U.S. Fish and Wildlife Service
Lena Chang, Senior Biologist	U.S. Fish and Wildlife Service
Karen A. Goebel, Assistant Field Supervisor	U.S. Fish and Wildlife Service
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	U.S. Department of Agriculture, Natural Resources Conservation Services
	U.S. Department of Energy
	U.S. Department of Health and Human Services
	U.S. Department of Housing and Urban Development
	Native American Heritage Commission
	Santa Monica Mountains National Recreation Area

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	California Department of Toxic Substances Control
	California Highway Patrol
	California Native American Heritage Commission
	California Public Infrastructure Advisory Commission
	California Regional Water Quality Control Board
	California State Clearinghouse
	California Transportation Commission
	Headquarters Division of Environmental Analysis (for CTC Submission)
	Native American Tribal Councils
	Santa Monica Mountains Conservancy

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	Malibu Community Alliance
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Stephanie Medina, Interim Preseident & Chief Executive Officer	Heal The Bay, Environmental Program
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	The Getty Villa
	Frederick R. Weisman Museum, Pepperdine University
	Gan Malibu Preschool

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David Szymanski	Santa Monica Mountains National Recreation Area
	Leo Carrillo State Park
	Malibu Pier
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	Malibu Riding & Tennis Club
	Promises Malibu
	Malibu West Beach Club
	Zuma Beach Properties

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APPENDIX A | RESOURCES EVALUATED RELEVANT TO THE REQUIREMENTS OF SECTION 4(F)

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Section 4(f) / Code of Federal Regulations, Title 23, Part 774 (23 CFR 774)

Since the mid-1960s, federal transportation policy has reflected an effort to preserve publicly owned parks and recreation areas, waterfowl and wildlife refuges, and historic sites considered to have national, state, or local significance. The Department of Transportation Act of 1996 included a special provision to carry out this effort, which was 23 CFR 774, or Section 4(f). Section 4(f) stipulated that the Federal Highway Administration (FHWA) and other U.S. Department of Transportation agencies, including Caltrans, cannot approve the use of land from a significant publicly owned park, recreation area, wildlife or waterfowl refuge, or any significant historic site unless there is no feasible and prudent alternative to the use of land; and the action includes all possible planning to minimize harm to the property resulting from use.

Screening of Potentially Affected Section 4(f) Properties in the Project Study Area

Caltrans considered the proposed project alternatives within the context of Section 4(f), and because it was found that there is no potential for effects on waterfowl and wildlife refuges, analyses were focused on 1) publicly owned parks and recreation areas within the project study area, and 2) historic sites considered to have national, state, or local significance. After a preliminary screening of all Section 4(f) protected resources in the project study area, it was found that the proposed project had the potential to affect the following properties as summarized in the following table.

Table A-1 Potentially Affected Section 4(f) Properties in the Project Study Area

Section 4(f) Protected Property	Post Mile	Jurisdiction
Publicly Owned Parks and Recreation Areas		
Will Rogers State Beach	38.45	State of California Department of Parks and Recreation
Dan Blocker Beach	50.48	Los Angeles County Department of Beaches and Harbors
Nicholas Canyon Beach	61.23	
Leo Carillo State Park and Beach	62.35	State of California Department of Parks and Recreation
Historic Sites Considered to Have National, State, or Local Significance		
Archaeological Site CA-LAN-210	50.48	No public ownership ties to any jurisdictional agency

Determining "Use" of Potentially Affected Section 4(f) Properties in the Project Study Area

Section 4(f) defines "use" in three ways; 1) permanent incorporation/permanent easement; 2) temporary occupancy; and 3) constructive use. Permanent incorporation/permanent easement involves a right-of-way acquisition of Section 4(f) protected land as part of the transportation project. In other words, the transportation agency or project sponsor directly purchases the property (fee simple acquisition), and the property sustains a permanent impact—essentially, changing the Section 4(f) protected property to a transportation facility.

Temporary occupancy results when a Section 4(f) property, in whole or in part, is required for project construction-related activities. The property is not permanently incorporated into a transportation

facility but the activity is considered to be adverse in terms of the preservation purpose of Section 4(f). Alternatively, Section 23 CFR 774.13(d) provides the conditions under which "temporary occupancies of land…are so minimal as to not constitute a use within the meaning of Section 4(f)." Those conditions are as follows:

1) Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land;
2) Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the Section 4(f) property are minimal;
3) There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis;
4) The land being used must be fully restored, i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project; and
5) There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.

Lastly, a constructive use of Section 4(f) lands occurs only in the absence of a permanent incorporation of land or a temporary occupancy of the type that constitutes a Section 4(f) use. Constructive use occurs when the proximity impacts of the proposed project on an adjacent or nearby Section 4(f) protected property are substantially impaired. Substantial impairment occurs when the protected activities, features, or attributes of the Section 4(f) property are substantially diminished. In those situations where a potential constructive use can be reduced below a substantial impairment by the inclusion of mitigation measures, there will be no constructive use and Section 4(f) will not apply. After preliminary screening of potentially affected Section 4(f) properties in the project study area, analysis was performed to determine the "use", if any, of each property within the context of Section 4(f). Potentially affected Section 4(f) properties are detailed in the previous table, and the "use" determinations for each property are summarized in the following section.

Will Rogers State Beach (State of California Department of Parks and Recreation). Will Rogers State Beach is located adjacent to Pacific Palisades and parallel to SR-1/PCH on Santa Monica Bay. In the 1920s, actor Will Rogers bought the land and developed a ranch along the coast. Rogers owned 186 acres in total in what is now Pacific Palisades until he died in a plane crash in 1935. His widow, Betty, died in 1944, and the ranch became a state park. Will Rogers State Beach extends roughly one and three-quarter miles along SR-1/PCH and in addition to beach areas, the facilities include volleyball courts, gymnastic equipment, restrooms, a playground, and a bike path that extends roughly 19 miles along the shore to Torrance, in the South Bay.

Table A-2 Will Rogers State Beach – Proposed Project Locations within Vicinity and Proposed Section 4(f) Use Determinations

Project Location	Scope of Work	Proposed Section 4(f) Use Determination	Remarks
Location 1 PM 37.67	Remove debris from corrugated steel drainage pipe, replace cured-in place pipe lining	Temporary occupancy (Exception)	No permanent acquisition of lands required. Beach access required for temporary access road. Duration of access less than duration of construction of full project.
Location 2 PM 39.08	Replace existing pipe with 24" reinforced concrete pipe	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
Location 3 PM 40.16	Replace 36" corrugated metal pipe	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
Location 4 PM 40.18	Install culvert barrel lining (CIP) in upstream section of pipe, replace in-kind 24" reinforced concrete pipe middle section of downstream pipe using Cut-and-Cover method, install CIP section of pipe	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway and partially on beach to replace drainage pipe.
Location 5 PM 40.23	Remove debris from corrugated steel drainage pipe, replace cured-in place pipe lining	Temporary occupancy (Exception)	No permanent acquisition of lands required.
Location 6 PM 40.24	Replace 36" reinforced concrete pipe and 18" corrugated metal pipe sections	Temporary occupancy (Exception)	No permanent acquisition of lands required.

None of the listed proposed project locations require permanent acquisition of any land associated with Will Rogers State Beach, essentially ruling out a permanent incorporation/permanent easement "use" within the context of Section 4(f). No substantial proximity impacts are anticipated as a result of construction of the improvements overall, and the nature of the proposed work at project locations within the vicinity of Will Rogers State Beach is "in-kind," and considered general maintenance of existing drainage facilities – ruling out any "constructive use" of Will Rogers State Beach within the context of Section 4(f). Caltrans has determined that the scope of work associated with the proposed project at Will Rogers State Beach does not constitute a "use" within the context of Section 4(f), but that temporary occupancy will be required to complete the improvements as listed in the previous table. The following figures illustrate the limits of disturbance during construction for project Locations No. 1-6 at Will Rogers State Beach.

Figure A-1 Will Rogers State Beach – Limits of Construction at Proposed Project Location No. 1 (PM 37.67)

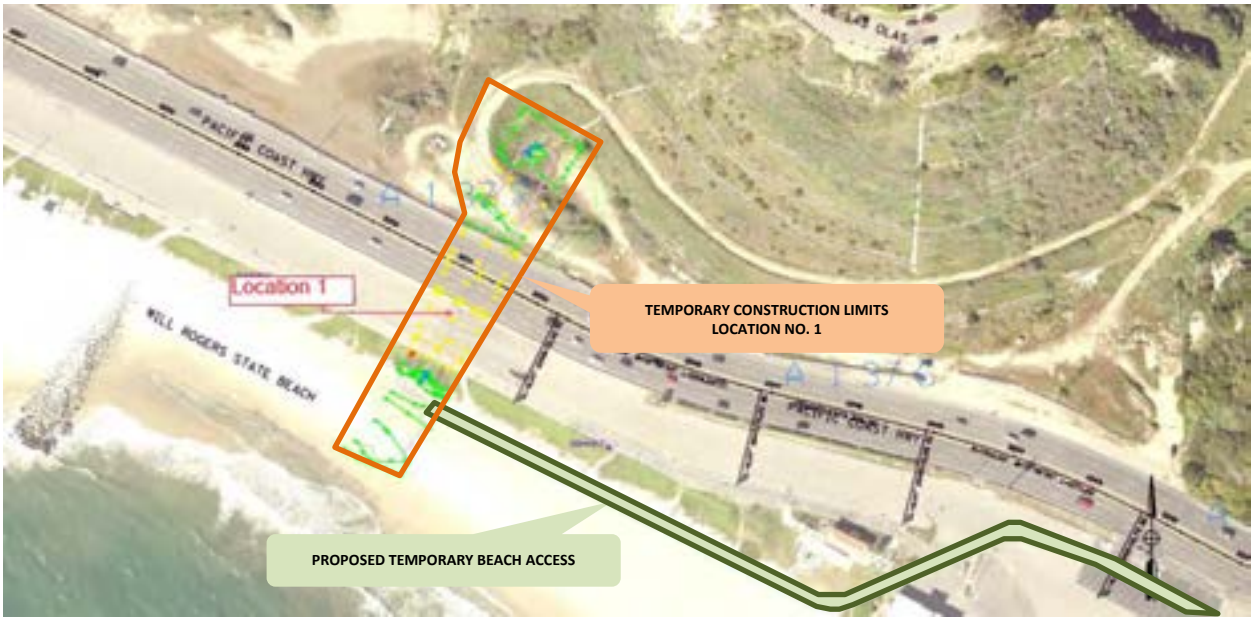


Figure A-2 Will Rogers State Beach – Limits of Construction at Proposed Project Location No. 2 (PM 39.08)

Figure A-3 Will Rogers State Beach – Limits of Construction at Proposed Project Locations No 3-6 (PM 40.16/40.18/40.23/40.24)

As illustrated in the previous figures, Caltrans has determined that the scope of work associated with proposed project Locations No. 1-6 do not constitute a "use" within the context of Section 4(f), but that temporary occupancy will be required to construct the improvements at each location. In general, the first order or work will take place on the beach side where existing drainage outlets currently terminate. Brush will be cleared to access drainage outlets, and also at the inlets on the northern side of the SR-1/PCH roadway. At proposed project Location No. 1, a temporary beach access road will be required for an estimated duration of one (1) year, but access will be intermittent (use by truck, Bobcat, backhoe). Public access to facilities will not be obstructed and construction of all locations will be phased to minimize effects to traffic and circulation. When construction is complete, all facilities will be returned to existing conditions.

Consultation/coordination was initiated with the California Department of Parks and Recreation on July 5, 2018 and is continuing. The intent of the initial consultation/coordination is to comply with requirements under Section 4(f), and to solicit any feedback as it pertains to the protection of the Will Rogers State Beach facilities, and any jurisdictional recommendations or measures to preserve the operation and maintenance of such during construction. For more details on related Section 4(f) consultation, reference Chapter 4 – Comments and Coordination.

Dan Blocker Beach (Los Angeles County Department of Beaches and Harbors). Dan Blocker Beach was originally donated to the State of California by Lorne Greene and Michael Landon of the TV series Bonanza in memory of Dan Blocker. Mr. Blocker played Eric Hass Cartwright, affectionately known as "Hoss" on the popular TV series. The state then transferred the property over to Los Angeles County in September 1995. With 15.2 acres of bluff and beach property, and over one mile of ocean frontage, Dan Blocker State Beach draws surfers, divers, and scuba enthusiasts. Other activities as this beach include

swimming and fishing, and the facilities include public restrooms, picnic tables, and a public viewing area. In 2014, Los Angeles County completed various improvements to the beach, such as a public viewing area, a parking lot, ADA-compliant restrooms, ocean-facing benches, and two picnic tables.

Table A-3 Dan Blocker Beach – Proposed Project Locations within Vicinity and Proposed Section 4(f) Use Determinations

Project Location	Scope of Work	Proposed Section 4(f) Use Determination	Remarks
Location 7 PM 50.05	Replace 18" reinforced concrete pipe	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
Location 8 PM 50.08	Replace 24" corrugated metal pipe	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
Location 9 PM 50.28	Install culvert barrel lining (CIP), repair joint seals at headwall and pipe, regrade channel and remove debris and vegetation at outlet	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
Location 10 PM 50.39	Replace bridge/culvert with new bridge with underlying natural slope creek bottom	Temporary occupancy (Exception)	No permanent acquisition of lands required. Excavation for new bridge structure within creek and existing easements only.

None of the listed proposed project locations require permanent acquisition of any land associated with Dan Blocker Beach, essentially ruling out a permanent incorporation/permanent easement "use" within the context of Section 4(f). No substantial proximity impacts are anticipated as a result of construction of the improvements overall, and the nature of the proposed work at project locations within the vicinity of Dan Blocker Beach is "in-kind," and considered general maintenance of existing drainage facilities – ruling out any "constructive use" of Dan Blocker Beach within the context of Section 4(f). Caltrans has determined that the scope of work associated with the proposed project at Dan Blocker Beach does not constitute a "use" within the context of Section 4(f), but that temporary occupancy will be required to complete the improvements as listed in the previous table. The following figures illustrate the limits of disturbance during construction for project Locations No. 7-10 at Dan Blocker Beach.

Figure A-4 Dan Blocker Beach – Limits of Construction at Proposed Project Location No. 7/8 (PM 50.05/50.08)

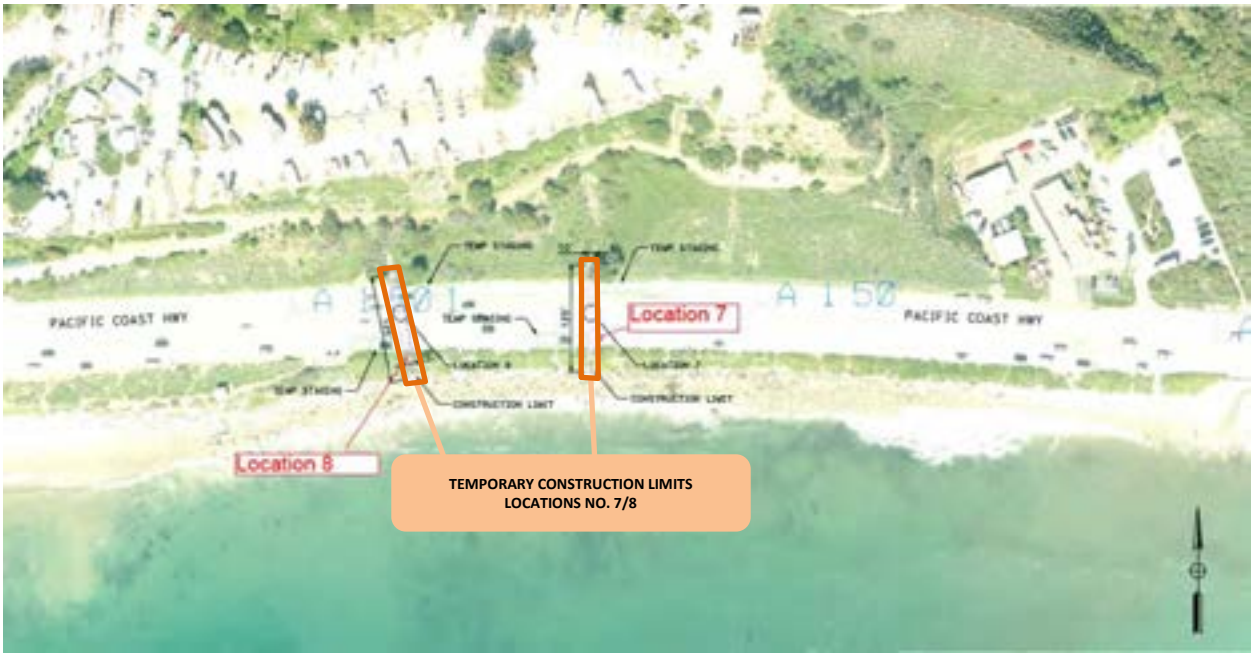


Figure A-5 Dan Blocker Beach – Limits of Construction at Proposed Project Location No. 9 (PM 50.28)

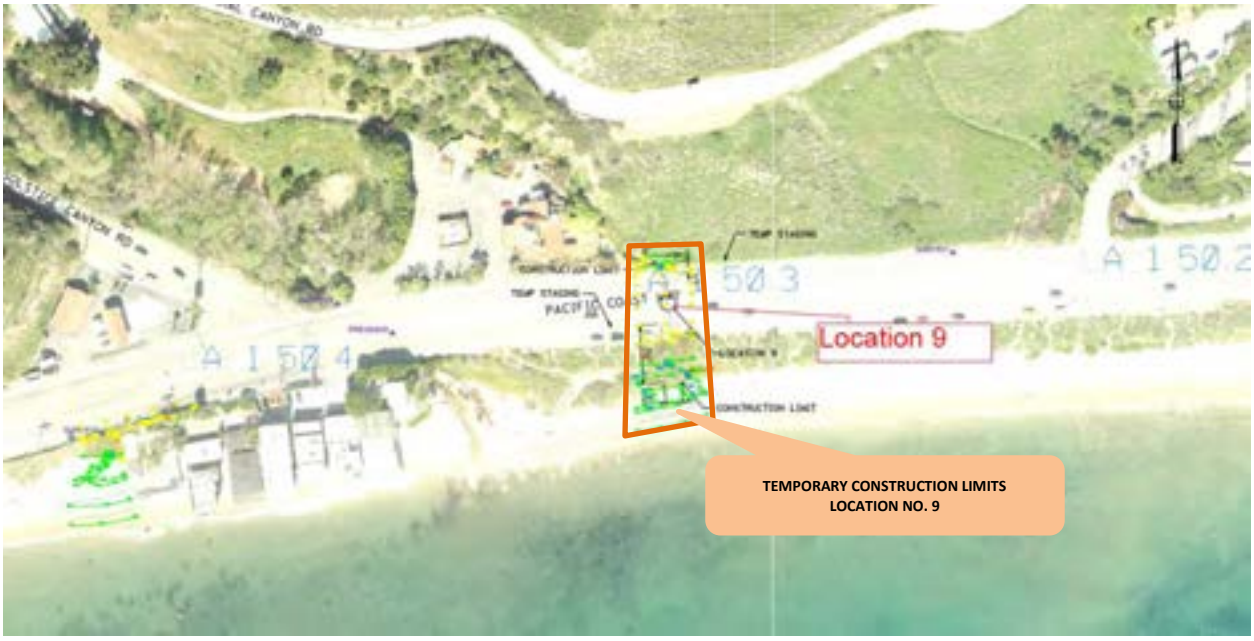
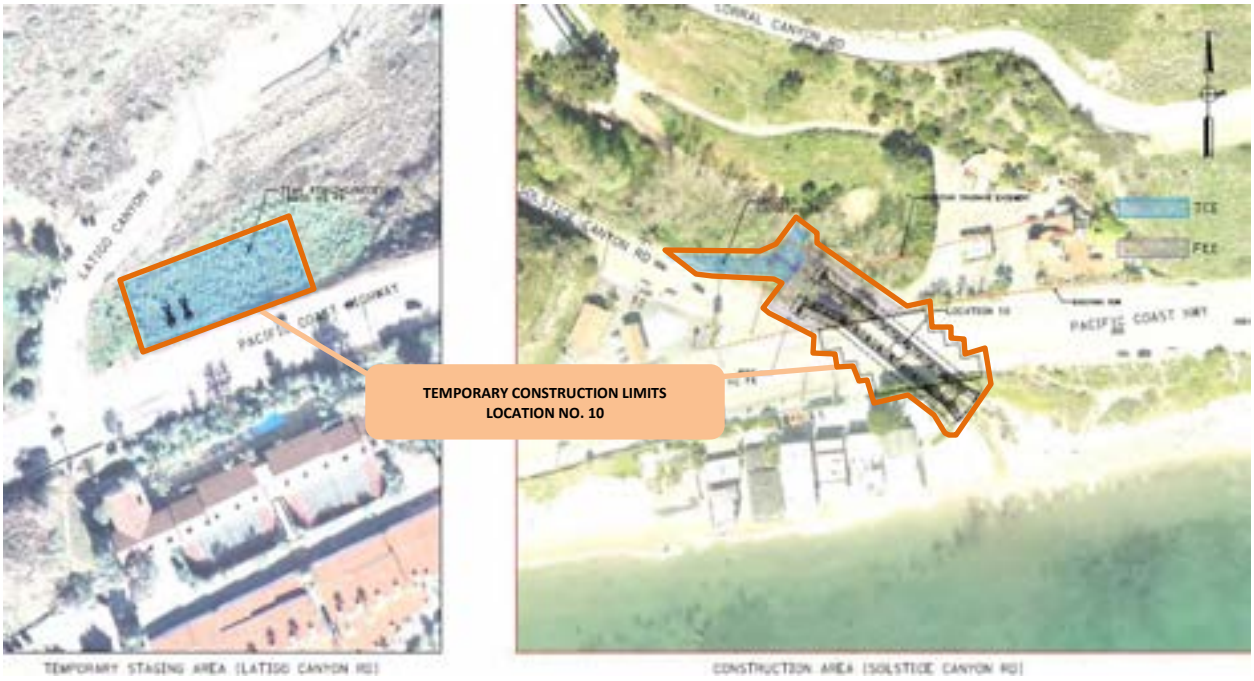


Figure A-6 Dan Blocker Beach – Limits of Construction at Proposed Project Location No. 10 (PM 50.39)



As illustrated in the previous figures, Caltrans has determined that the scope of work associated with proposed project Locations No. 7-10 do not constitute a "use" within the context of Section 4(f), but that temporary occupancy will be required to construct the improvements at each location. For project Locations No. 7-9, the first order of work will take place on the downslope of the roadway and beachside, where existing drainage outlets currently terminate. Brush will be cleared to access drainage outlets, and also at the inlets on the northern side of the SR-1/PCH roadway. At project Location No. 10, removal of the existing culvert and excavation for construction of the new bridge structure will be limited to the creek, and within existing easements on Dan Blocker Beach. Public access to facilities will not be obstructed and construction of all locations will be phased to minimize effects to traffic and circulation. When construction is complete, all facilities will be returned to existing conditions.

Consultation/coordination was initiated with the Los Angeles County Department of Beaches and Harbors on July 5, 2018 and is continuing. The intent of the initial consultation/coordination is to comply with requirements under Section 4(f), and to solicit any feedback as it pertains to the protection of the Dan Blocker Beach facilities, and any jurisdictional recommendations or measures to preserve the operation and maintenance of such during construction. For more details on related Section 4(f) consultation, reference Chapter 4 – Comments and Coordination.

Nicholas Canyon Beach (Los Angeles County Department of Beaches and Harbors). Nicholas Canyon Beach, locally referred to as "Zeros" or "Point Zero," is a highly regarded surf point break within Los Angeles County, but is also a great beach for surfing, body surfing, body boarding, swimming, windsailing, and scuba diving. With over one mile of beach frontage and 23 acres of property, the facility features several picnic tables, parking, and the Wishtoyo Foundation's Chumash Village – an outdoor working Native American village that showcases a typical day in the life of the Chumash people who once inhabited the area.

Table A-4 Nicholas Canyon Beach – Proposed Project Locations within Vicinity and Proposed Section 4(f) Use Determinations

Project Location	Scope of Work	Proposed Section 4(f) Use Determination	Remarks
Location 13 PM 61.29	Replace 24" reinforced concrete pipe	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe. Beach access required for temporary access road. Duration of access less than duration of construction of full project.
Location 14 PM 61.35	Replace 24" reinforced concrete pipe	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe. Beach access required for temporary access road. Duration of access less than duration of construction of full project.

None of the listed proposed project locations require permanent acquisition of any land associated with Nicholas Canyon Beach, essentially ruling out a permanent incorporation/permanent easement "use" within the context of Section 4(f). No substantial proximity impacts are anticipated as a result of construction of the improvements overall, and the nature of the proposed work at project locations within the vicinity of Nicholas Canyon Beach is "in-kind," and considered general maintenance of existing drainage facilities – ruling out any "constructive use" of Dan Blocker Beach within the context of Section 4(f). Caltrans has determined that the scope of work associated with the proposed project at Nicholas Canyon Beach does not constitute a "use" within the context of Section 4(f), but that temporary occupancy will be required to complete the improvements as listed in the previous table. The following figures illustrate the limits of disturbance during construction for project Locations No. 13 and 14 at Nicholas Canyon Beach.

Figure A-7 Nicholas Canyon Beach – Limits of Construction at Proposed Project Locations No. 13/14 (PM 61.29/61.35)

As illustrated in the previous figures, Caltrans has determined that the scope of work associated with proposed project Locations No. 13 and 14 do not constitute a "use" within the context of Section 4(f), but that temporary occupancy will be required to construct the improvements at each location. A temporary beach access road will be required for an estimated duration of one (1) year, but access will be intermittent (use by truck, Bobcat, backhoe). The proposed temporary beach access road will originate on an adjacent jurisdictional facility to the west of these project locations (Leo Carillo State Park and Beach) and is necessary for access to existing drainage outlets that currently terminate on the beach side. Public access to facilities will not be obstructed and construction of all locations will be phased to minimize effects to traffic and circulation. When construction is complete, all facilities will be returned to existing conditions.

Consultation/coordination was initiated with Los Angeles County Department of Beaches and Harbors on July 5, 2018 and is continuing. The intent of the initial consultation/coordination is to comply with requirements under Section 4(f), and to solicit any feedback as it pertains to the protection of Nicholas Canyon Beach facilities, and any jurisdictional recommendations or measures to preserve the operation and maintenance of such during construction. For more details on related Section 4(f) consultation, reference Chapter 4 – Comments and Coordination.

Leo Carillo State Park and Beach (State of California Department of Parks and Recreation). Leo Carillo State Park and Beach are adjacent to SR-1/PCH, located just west of Point Dume State Beach, and at the terminus of Mulholland Highway. The 2,513-acre park was established in 1953 and named for the actor, preservationist, and conservationist, Leo Carillo (18821-1961), who once served on the State Parks commission. The facility includes 1.5 miles of beachfront adjacent to SR-1/PCH and extends up the Santa Monica Mountains to Malibu Springs. The facility features camping with RV access, hiking trails,

picnic areas, a learning/visitor center, fishing, scuba diving/snorkeling, swimming, nature/wildlife viewing, windsurfing/surfing, and geocaching.

Table A-5 Leo Carillo State Park and Beach – Proposed Project Locations within Vicinity and Proposed Section 4(f) Use Determinations

Project Location	Scope of Work	Proposed Section 4(f) Use Determination	Remarks
Location 15 PM 61.68	Replace 24" RCP	Temporary occupancy (Exception)	No permanent acquisition of lands required. Beach access required for temporary access road. Duration of access less than duration of construction of full project. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
Location 16 PM 62.51	Replace 24" RCP on upstream section, joint seal manhole	Temporary occupancy (Exception)	No permanent acquisition of lands required.
Location 17 PM 62.55	Install culvert barrel lining (CIP), remove debris and clear manhole, and replace 18" CMP on downstream section	Temporary occupancy (Exception)	No permanent acquisition of lands required.
Location 19 PM 0.92	Install culvert barrel lining (CIP)	Temporary occupancy (Exception)	No permanent acquisition of lands required.

None of the listed proposed project locations require permanent acquisition of any land associated with Leo Carillo State Park and Beach, essentially ruling out a permanent incorporation/permanent easement "use" within the context of Section 4(f). No substantial proximity impacts are anticipated as a result of construction of the improvements overall, and the nature of the proposed work at project locations within the vicinity of Leo Carillo State Park and Beach is "in-kind," and considered general maintenance of existing drainage facilities – ruling out any "constructive use" of Leo Carillo State Park and Beach within the context of Section 4(f). Caltrans has determined that the scope of work associated with the proposed project at Leo Carillo State Park and Beach does not constitute a "use" within the context of Section 4(f), but that temporary occupancy will be required to complete the improvements as listed in the previous table. The following figures illustrate the limits of disturbance during construction for project Locations No. 15-17, and No. 19 at Leo Carillo State Park and Beach.

Figure A-8 Leo Carillo State Park and Beach – Limits of Construction at Proposed Project Locations No. 15 (PM 61.68)

Figure A-9 Leo Carillo State Park and Beach – Limits of Construction at Proposed Project Locations No. 16/17 (PM 61.29/61.35)

Figure A-10 Leo Carillo State Park and Beach – Limits of Construction at Proposed Project Location No. 19 (VEN PM 0.92)

As illustrated in the previous figures, Caltrans has determined that the scope of work associated with proposed project Locations No. 15-17, and No. 19 do not constitute a "use" within the context of Section 4(f), but that temporary occupancy will be required to construct the improvements at each location. Temporary beach access roads will be required for construction at project Locations No. 15, 16, and 17 for an estimated duration of one (1) year, but access will be intermittent (use by truck, Bobcat, backhoe). The proposed temporary beach access road are necessary for access to existing drainage outlets that currently terminate on the beach side. Public access to facilities will not be obstructed and construction of all locations will be phased to minimize effects to traffic and circulation. When construction is complete, all facilities will be returned to existing conditions.

Consultation/coordination was initiated with State of California Department of Parks and Recreation on July 5, 2018 and is continuing. The intent of the initial consultation/coordination is to comply with requirements under Section 4(f), and to solicit any feedback as it pertains to the protection of Leo Carillo State Park and Beach facilities, and any jurisdictional recommendations or measures to preserve the operation and maintenance of such during construction. For more details on related Section 4(f) consultation, reference Chapter 4 – Comments and Coordination.

Archaeological Site CA-LAN-210. In addition to publicly owned parks and recreation areas, Section 4(f) protections also extend to historic sites, sometimes referred to as cultural resources. In order to qualify for protection under Section 4(f), a historic site must meet the following criteria:

- It must be of national, state or local significance.
- It must be on or eligible for listing on the National Register of Historic Places (NRHP).

Unlike the other Section 4(f) property categories—parks, recreation areas, and refuges—historic sites do not require public ownership in order to qualify for protection under Section 4(f). Additionally, Section 4(f) applies to cultural resources such as archeological sites that are on or eligible for listing on the NRHP, including those discovered during construction, except when the resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place. Judgments about a site's importance and preservation value are made by the Caltrans after consultation with the State Historic Preservation Officer (SHPO), Federally recognized Indian Tribe as appropriate, and the Advisory Council on Historic Preservation (ACHP) if participating in the project.

Table A-6 Archaeological Site CA-LAN-210 – Proposed Project Locations within Vicinity and Proposed Section 4(f) Use Determinations

Project Location	Scope of Work	Proposed Section 4(f) Use Determination	Remarks
Location 9 PM 50.28	Install culvert barrel lining, repair joint seals at headwall and pipe, regrade channel and remove debris and vegetation at outlet	Temporary occupancy (Exception)	No permanent acquisition of lands required. Minor excavation on downslope of highway (beach side) to replace drainage pipe.
Location 10 PM 50.39	Replace bridge/culvert with new bridge with underlying natural slope creek bottom	Temporary occupancy (Exception)	No permanent acquisition of lands required. Excavation for new bridge structure within creek and existing easements only.

The project Area of Potential Effects (APE) encompasses the known boundaries of Section 4(f) protected archaeological site CA-LAN-210, and particularly where work is proposed at project Location No. 9 (rehabilitation of existing reinforced concrete drainage pipe) and Location No. 10 (replace existing bridge/culvert with new bridge structure with underlying natural slope creek bottom). The site is assumed eligible for inclusion in the National Register of Historic Places (NRHP) and the California Register of Historic Places (CRHR) under Section 106 of the National Historic Preservation Act (NHPA), but solely for the purposes of this project. The site has been identified as a Native American habitation site with associated burials, yet previous archaeological investigations of the portion of the site within the current APE indicate that the cultural deposits in this area are sparse and consist of redeposited materials, with intact deposits suspected at depths between 23 and 33 feet under State Route 1.

The entire study area at Solstice Canyon Creek has experienced some form of alteration for the last 80-90 years, including redirection of the creek itself, and construction of SR-1 and the existing culvert/bridge structure, as well as the nearby buildings and parking lot. Intact cultural deposits, if any, at Solstice Canyon Creek and within the APE are likely to occur at depths between 23 and 33 feet. Thus, the potential is low for encountering intact deposits as a result of the proposed project (maximum estimated excavation depth of 15 feet). Regardless, archaeological monitoring of project construction at Solstice Creek will be carried out because of the archaeological sensitivity of the immediate surrounding area. A detailed map of the archaeological site is not provided in this document as the location of archaeological sites and confidential information provided by California Native American tribes are exempt from disclosure to the public by law, and in part, to protect sites from looters.

Archaeological Site CA-LAN-210 – Determining "use" within the Context of Section 4(f). While Caltrans has assumed that Archaeological Site CA-LAN-210 is eligible for inclusion in the NHRP and the CRHR, it is solely for planning purposes associated with the proposed undertaking and not because the site's primary value warrants preservation in place. Therefore, excavation associated with the scope of work at proposed project Locations No. 9 and 10 do not constitute a "use" within the context of Section 4(f), which is supported by archaeological studies that show a low potential to encounter intact cultural deposits during excavation in consideration of maximum vertical excavation depths.

In compliance with AB52, Caltrans contacted the Native American Heritage Commission (NAHC) to request a search of the Sacred Lands file on February 1, 2018. The NAHC responded in writing on February 2, 2018. The NAHC stated that their Sacred Lands File search did not show Native American cultural resources within the project locations. The NAHC provided a list of 16 Native American contacts throughout Los Angeles and Ventura Counties, and letters describing the project locations were sent to the individuals on February 9, 2018. Customarily, Caltrans, in applying the Criteria of Adverse Effect, proposes that a Finding of No Adverse Effect (FNAE) without Standard Conditions is appropriate and is seeking concurrence from the State Historic Preservation Officer (SHPO) as the official with jurisdiction over Archaeological Site CA-LAN-210. Caltrans' "no use" determination under Section 4(f) is considered finalized and approved with SHPO concurrence on the FNAE. SHPO consultation was initiated on September 7, 2018 and concurrence with the FNAE is currently pending.

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APPENDIX B | TITLE VI POLICY STATEMENT

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Director's Policy

Number:	DP-28-R1
Effective Date:	3/19/15
Supersedes:	DP-28 (12-2006)
Responsible Program:	Office of Business and Economic Opportunity

TITLE Title VI of the Civil Rights Act of 1964 and Related Nondiscrimination Statutes

POLICY

The California Department of Transportation (Caltrans), as a recipient of federal financial assistance, incorporates Title VI of the Civil Rights Act of 1964, Section 162 (a) of the Federal-Aid Highway Act of 1973, Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973/Americans With Disabilities Act of 1990 (Title VI) into its programs, policies, activities, and services. This ensures that no person in the state of California is excluded from participation in, denied the benefits of, or otherwise subjected to discrimination in Caltrans programs, policies, activities, and services on the grounds of race, color, national origin, sex, age, or disability.

INTENDED RESULTS

The intent of this policy is to identify, resolve, and include Title VI considerations in the planning and project delivery process, and with Caltrans partners, to ensure the public is not discriminated against, either intentionally or unintentionally, as a result of transportation decisions. This policy is consistent with other Caltrans policies: Equal Employment Opportunity (DP-01-R10); Environmental Policy (DP-04); Caltrans' Workforce (DP-11); Caltrans' Disadvantaged Business Enterprise Program (DP-13-R2); Working with Native American Communities (DP-19); Environmental Justice (DP-21); and Context Sensitive Solutions (DP-22) to ensure nondiscrimination, equal and equitable activities, and access to services.

RESPONSIBILITIES

Director:

- Ensures Caltrans actions and services are consistent with Title VI laws and regulations. (28 Code of Federal Regulations (C.F.R.) § 42.101 (2014).)
- Appoints a Title VI Coordinator pursuant to 23 C.F.R. part 200.9(a)(4) and (b)(1) (2014).
- Delegates daily operations of the Caltrans Title VI Program to the Assistant Director, Office of Business and Economic Opportunity (OBEO).

Assistant Director, OBEO:

- Promotes awareness of Title VI issues.
- Administers the Caltrans Title VI Program in the development and implementation of the Federal Highway Administration, Federal Transit Administration, and Federal Aviation Administration Title VI compliance program.
- Serves as the Caltrans Title VI Coordinator.
- Maintains the Title VI Program Plan.
- Provides technical expertise and training on Title VI matters.
- Conducts compliance reviews of divisions and districts to ensure compliance with Title VI requirements.
- Prepares and submits federal mandated reports.

Deputy Directors for Planning and Modal Programs and Project Delivery:

- Promote awareness of Title VI issues.
- Promote Title VI considerations in statewide planning and project delivery by ensuring compliance with Title VI requirements.
- Ensure local partners, as subrecipients, comply with Title VI Program requirements in planning and project delivery and ensure nondiscrimination.

District Directors:

- Promote awareness of Title VI issues.
- Appoint a Title VI Liaison.
- Submit Title VI Program Accomplishments/Goals Report annually, including program updates, as required by the Title VI Program Plan.

Chiefs, Divisions of Engineering Services and Procurement & Contracts:

- Promote awareness of Title VI issues.
- Ensure Caltrans' federally assisted contracts and procurements are consistent with Title VI requirements, including, but not limited, to the inclusion of nondiscrimination clauses.

Division Chiefs:

- Promote awareness of Title VI issues.
- Appoint a Title VI Liaison if required by the Title VI Program Plan.
- Submit Title VI Program Accomplishments/Goals Report annually, including program updates, as required by the Title VI Program Plan.

Managers and Supervisors:

- Promote awareness of Title VI issues.
- Actively support Title VI and ensure their employees understand and comply with Caltrans policies.
- Ensure employees receive Title VI training every two years.

District and Division Title VI Liaisons:

- Promote awareness of Title VI issues, requirements, policies, and procedures.
- Provide technical assistance to internal and external stakeholders regarding Title VI requirements.
- Collect data and report on Title VI activities, including outreach events and trainings.
- Assist with Title VI monitoring and compliance activities.

Employees:

- Comply with Caltrans policies regarding Title VI in their day-to-day activities.
- Complete Title VI training every two years.

APPLICABILITY

This policy applies to all Caltrans employees and extends to subrecipients, such as contractors, grantees, and local agencies that receive federal financial assistance from Caltrans.

MALCOLM DOUGHERTY
Director

3/19/2015
Date Signed

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APPENDIX C | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION SUMMARY

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CULTURAL RESOURCES

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
ARC-01	Archaeological and Native American Monitoring During Construction Excavation Activities	Resident Engineer/ Project Archaeologist		Construction		HPSR, ASR, FOE, IS/EA	The portion of the Area of Potential Effects (APE) at proposed project Locations No. 9 and 10 have been identified as potentially sensitive for subsurface archaeological deposits, with intact deposits expected at depths below 20 feet. Maximum excavation for construction of the bridge at proposed project Location No. 10 is estimated at 15 feet, so the potential to encounter intact deposits is low, though archaeological and Native American monitoring will be required during all excavation activities at these locations. These activities shall be governed by an Environmentally Sensitive Area (ESA) Action Plan, which can be referenced in Table 2.2.6-a of the IS/EA.
CUL-01	Discovery of Cultural Materials	Resident Engineer/ Project Archaeologist		Construction		HPSR, ASR, FOE, IS/EA	If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
CUL-02	Discovery of Human Remains	Resident Engineer/ Project Archaeologist		Construction		HPSR, ASR, FOE, IS/EA	If human remains are discovered, California Health and Safety Code (H&SC) Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), who, pursuant to PRC Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact Sarah Mattiusi-Gutierrez, PQS Co-Principal Investigator Prehistoric Archaeology at Caltrans District 7 Division of Environmental Planning, so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

UTILITIES AND EMERGENCY SERVICES

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
UTL-01	Early and Continuing Coordination with Utility Providers	Design Engineer		Design/ Construction		IS/EA	Early communication and planning with affected utility providers before and during construction will ensure that all affected infrastructure will be relocated with consideration, and to minimize any disruption of service and any effects as much as possible.
TMP-01	Transportation Management Plan (TMP)	Design Engineer, Resident Engineer, Generalist		Design/ Construction		IS/EA	A Transportation Management Plan (TMP) shall be implemented to provide detailed access and detour strategies that would minimize any effects on response times for fire, police, and emergency services. Caltrans shall maintain close coordination with local agencies and jurisdictions, including fire protection services, police, schools, and park agencies via a public outreach campaign during the construction phase of the proposed project.
TMP-02	Early and Continuing TMP Coordination with the City of Malibu	Design Engineer, Resident Engineer, Generalist		Design/ Construction		IS/EA	Caltrans shall initiate early coordination with the City of Malibu to achieve consensus and obtain concurrence on traffic management strategies during construction, and to ensure public access and availability of emergency and public services during the construction period.

WATER QUALITY AND STORM WATER RUNOFF

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
WDP-01	Water Diversion Plan	Design/ Hydraulics/ Biologist/ Resident Engineer		Design/ Construction		SWDR, IS/EA, NES, Section 404 Permit	A Water Diversion Plan shall be developed and implemented in consultation with the National Oceanic and Atmospheric Administration (NOAA), California Department of Fish and Wildlife (CDFW), United States Fish and Wildlife Service (USFWS) and the Regional Water Quality Control Board (RWQCB) to divert water through the project site to reduce turbidity and prevent sediments from entering the lagoon downstream of the project site.

WATER QUALITY AND STORM WATER RUNOFF (CONTINUED)

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
GDP-01	Stream Restoration Plan	Design/ Hydraulics/ Biologist/ Resident Engineer		Design/ Construction		SWDR, IS/EA, NES, Section 404 Permit,	A Stream Restoration Plan will be developed by Caltrans in conjunction with a qualified hydraulics engineer to ensure that the morphology of the stream ill not be affected in such a way as to prevent fish migration and passage through the project area.
WPC-01	Water Pollution Control Program (WPCP) and Temporary Construction BMPs	Design/ Hydraulics/ Resident Engineer		Design/ Construction		SWDR, IS/EA, NES	A WPCP shall be implemented to improve construction site water quality practices, and control the impacts of storm water pollution through Best Management Practices (BMPs) to include, but not limited to soil stabilization measures, sediment control measures, tracking control, non-storm water management, and waste management and materials pollution control.

GEOLOGY/SOILS/SEISMIC/TOPOGRAPHY

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
GW-01	Groundwater and Soil Excavation Effects Minimization	Design/ Geologist/ Hazardous Waste Specialist/ Biologist/ Resident Engineer		Design/ Construction		Geotechnical Report, IS/EA	Remedial measures shall be taken to minimize the effects of groundwater and soil excavation during construction. Shoring and a dewatering system may be required during footing construction and the stability of these excavations is dependent on the total time the excavation is exposed, groundwater conditions, granular nature of the soil, and contractor operations.
GT-01	Additional Geologic Testing	Design/ Geologist/ Resident Engineer		Design/Pre-Construction/ Construction		Geotechnical Report, IS/EA	Further engineering analyses are required to provide the appropriate recommendations to ensure the design of the proposed bridge structure, foundation, paving, and grading associated with the proposed project is geologically sound. The result of these efforts shall be presented in the final Foundation Report (FR).

HAZARDOUS WASTE/MATERIALS

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
ADL-01	Aerially Deposited Lead (ADL) Site Investigation (SI) and Lead Compliance Plan (LCP)	Design/ Hazardous Waste Specialist/ Resident Engineer		Design/ Construction		ISA, IS/EA	A project-specific ADL site investigation will be performed to evaluate excess soils with ADL contamination and determine whether they are classified as Federal waste, which will require off-site disposal at a permitted Class I California hazardous waste (RCRA) disposal facility. Collectively, the site investigation data will assist in the preparation of the necessary Lead Compliance Plan as required under California Code of Regulations (8CCR), Title 8, Section 1532.1, "Lead," and Cal-OSHA Construction Safety Order.
ACM-01	Asbestos Containing Materials (ACM) and completion of Asbestos Compliance Plan (ACP) and Dust Control Plan (DCP)	Design/ Hazardous Waste Specialist/ Resident Engineer		Design/ Construction		ISA, IS/EA	Surveying and sampling will be required to determine procedures for the proper removal, handling and disposal of ACM during construction. Upon completion and analyses of surveys and sampling, an Asbestos Compliance Plan (ACP) shall be completed and signed by a Certified Asbestos Consultant (CAC), which outlines potential risks and appropriate monitoring plans, as well as safety measures to reduce the risk of worker exposure to contamination. Additionally, a Dust Control Plan (DCP) will be required that will outline procedures to prevent dust emissions during excavation, stockpiling, transportation, or placement of materials containing ACM.
SIR-01	Site Investigation (SI) and Remediation of Parcels Associated with the Proposed Project	Design/ Hazardous Waste Specialist/ Resident Engineer		Design/ Construction		ISA, IS/EA	A Site Investigation (SI) is required to include sampling and evaluation of any residual concentrations of contamination that may be present at Project Location No. 10, and all proposed parcels requiring acquisition. The results of the additional site investigations will be used to prepare the appropriate remediation cost estimates to manage, handle, and dispose of any impacted soils during construction and following construction, should long-term monitoring or remedial actions be required.

BIOLOGICAL RESOURCES

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
BIO-01	Biological Monitoring	Resident Engineer/ Project Biologist		Construction		NES, IS/EA	A biological monitor will be on-site at all times while work is occurring within or adjacent to a beach or tidal environment. This includes on-site monitoring during construction at proposed project Location No. 10 at Solstice Canyon Creek.
BIO-02	Delineation of Environmentally Sensitive Areas (ESAs)	Resident Engineer/ Project Biologist		Construction		NES, IS/EA	Project work limits shall be delineated by ESA fencing at each proposed project location prior to the initiation of any construction activities.
BIO-03	Bat Surveys Prior to Vegetation Removal	Resident Engineer/ Project Biologist		Construction		NES, IS/EA	No trees will be cut down or trimmed without first being surveyed by a qualified biologist for the presences of bats roosting. Should bats be located within trees that are to be removed or trimmed, Caltrans will coordinate with CDFW to determine how best to minimize impacts to these species.
BIO-04	Construction Window and Restrictions (Partial)	Resident Engineer/ Project Biologist		Construction		NES, IS/EA	No construction work shall occur at proposed project Locations No. 13 and 14 (PMs 61.29 and 61.35) between the months of January and August. Construction work at these sites shall be restricted to the time period between September 1st and December 31st.
BIO-05	Fish Exclusionary Measures at Solstice Canyon Creek	Resident Engineer/ Project Biologist		Construction		NES, IS/EA	Exclusionary nets shall be installed at proposed project Location No. 10 to exclude fish from the project site prior to installation of the proposed water diversion in Solstice Canyon Creek. Any fish found within the project site shall be moved upstream of the project site and released. All exclusionary and removal activities shall be conducted by an ichthyologist as approved by the National Oceanic and Atmospheric Administration (NOAA) and the United States Fish and Wildlife Service (USFWS), who possesses experience in identification and handling of Southern Steelhead trout and Arroyo chub.
BIO-06	Multi-Agency Project Reporting	Project Biologist		Post-Construction		NES, IS/EA	Upon completion all monitoring and construction of the proposed project, a Final Project Report will be submitted to the United States Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), California Department of Fish and Wildlife (CDFW). United States Army Corps of Engineers (ACOE), and the Regional Water Quality Control Board (RWQCB).

BIOLOGICAL RESOURCES (CONTINUED)

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
BIO-07	Pre-Construction Protocol Surveys for California Gnatcatcher	Project Biologist		Pre-Construction		NES, IS/EA	Caltrans will conduct pre-construction protocol surveys at least one year prior to the initiation of construction activities. The surveys shall follow the appropriate protocols for locating and identifying coastal California gnatcatcher (*Polioptila californica californica*), and shall be performed by a qualified ornithologist, approved by USFWS prior to initiation of work. No construction work shall commence until Caltrans has completed formal consultation with the USFWS.
BIO-08	Pre-Construction Protocol Surveys for California Red-Legged Frog	Project Biologist		Pre-Construction		NES, IS/EA	Caltrans shall conduct pre-construction protocol surveys for California red-legged frog at seasonal intervals beginning in 2018 and continuing through the start of construction in 2021. The surveys shall be conducted in conjunction with a permitted herpetologist with experience in locating and identifying California red-legged frog (*Rana draytonii*).
BIO-09	Pre-Construction Surveys for Cooper's Hawk	Project Biologist		Pre-Construction		NES, IS/EA	Caltrans shall conduct pre-construction surveys for Cooper's Hawk Accipiter cooperii) in conjunction with a qualified ornithologist as approved by CDFW. Work shall not commence f any Cooper's hawk are found within 500 feet of the project site, and cannot recommence until nesting is complete and the birds have left the area.
BIO-10	Pre-Construction Surveys for Nesting Birds	Resident Engineer/ Project Biologist		Pre-Construction, Construction		NES, IS/EA	Caltrans shall conduct nesting bird surveys prior to any vegetation removal. Nesting surveys must be done within 72 hours of commencement of vegetation removal. If any active nests are found, all work shall halt within 150 feet of the active nest (500 feet for Raptors). Work shall not recommence until the young have fledged and the nest is considered inactive.
BIO-11	Pre-Construction Surveys for Rare Plants	Project Biologist		Pre-Construction		NES, IS/EA	Caltrans shall conduct pre-construction surveys in conjunction with a qualified botanist with experience in locating and identifying rare plants, prior to initiation of work. If any rare plants are located within the project footprint they will be re-located to a safe location as determined by the botanist and in coordination with the California Department of Fish and Wildlife (CDFW).
BIO-12	Pre-Construction Surveys for Southern Steelhead Trout and Arroyo Chub	Project Biologist		Pre-Construction		NES, IS/EA	Caltrans shall conduct pre-construction surveys in conjunction with an NOAA/CDFW approved and qualified ichthyologist who possesses experience in locating and identifying Southern Steelhead trout and Arroyo.

BIOLOGICAL RESOURCES (CONTINUED)

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
BIO-13	Pre-Construction Surveys for Southwestern Willow Flycatcher and Least Bell's Vireo	Project Biologist		Pre-Construction		NES, IS/EA	Caltrans shall conduct pre-construction surveys in conjunction with a qualified ornithologist [approved by the United States Fish and Wildlife Service (USFWS)] following the appropriate protocols for locating and identifying Southwestern willow flycatcher (*Empidonax traillii extimus*) and Least Bell's vireo (*Vireo bellii pusillus*). Work shall not commence if any Southwestern willow flycatcher or Least Bell's vireo are found within 500 feet of the construction site. Work shall not recommence until nesting is complete and the birds have left the area, and Caltrans has completed formal consultation.
BIO-14	Pre-Construction Surveys for Two-Striped Garter Snake, California Mountain Kingsnake, and Coastal Whiptail	Project Biologist		Pre-Construction		NES, IS/EA	Caltrans shall conduct pre-construction surveys in conjunction with a qualified herpetologist with experience in locating and identifying Two-striped garter snake (*Thamnophis hammondii*), California mountain kingsnake (*Lampropeltis multifasciata*), and Coastal whiptail (*Aspidoscelis tigris stejnegeri*). If any of these species are identified within project limits, they shall be relocated to a safe location as deemed by the herpetologist, and in coordination with CDFW.
BIO-15	Pre-Construction Surveys for Western Snowy Plover	Project Biologist		Pre-Construction		NES, IS/EA	Caltrans shall conduct pre-construction surveys in conjunction with a qualified ornithologist approved by the USFWS, following appropriate protocols for locating and identifying Western snowy plover (*Charadrius alexandrinus nivosus*). Work cannot commence if any snowy plover are found within 500 feet of the construction site. Work shall not recommence until nesting is complete and the birds have left the area, and Caltrans has completed formal consultation.
BIO-16	Presence of Marine Mammals During Construction	Resident Engineer, Project Biologist		Construction		NES, IS/EA	All work shall stop/halt if any marine mammals are observed within 500 feet of construction activities, including access roads. Work shall not recommence until the observed marine mammal has left the project area on its own accord.
BIO-17	Stream Restoration Plan	Project Biologist, Project Hydraulics Engineer		Pre-Construction, Construction		NES, IS/EA	Caltrans shall develop a Stream Restoration Plan in conjunction with a qualified hydraulics engineer to ensure that the morphology of the stream will not be affected in such a way as to prevent fish migration and passage through the project area.

BIOLOGICAL RESOURCES (CONTINUED)

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
BIO-18	Water Diversion Plan at Solstice Canyon Creek	Resident Engineer, Project Biologist		Pre-Construction, Construction		NES, IS/EA	A Water Diversion Plan shall be developed and implemented in consultation with NOAA, CDFW, USFWS, ACOE, and the RWQCB, to divert water through the project site at Solstice Canyon Creek to reduce turbidity and prevent sediments from entering the lagoon during construction and downstream of the project site (Location No. 10).
BIO-19	Water Quality Best Management Practices (BMPs)	Design Engineer, Resident Engineer, Project Biologist		Pre-Construction, Construction		NES, IS/EA	All applicable construction BMPs for water quality shall be implemented to minimize effects to downstream areas.
BIO-20	Sandy Beach Grunion Work Window	Resident Engineer, Project Biologist		Pre-Construction, Construction		NES, IS/EA	No equipment shall access sandy beach habitat during the Grunion spawning season (March 1st – August 31st) except to access the Solstice Canyon Creek bridge site with appropriate night surveys to ensure that Grunion are not spawning in the area.
BIO-21	Decontamination Protocols for Proposed Project Location No. 19 at Solstice Canyon Creek	Resident Engineer		Pre-Construction, Construction		NES, IS/EA	All construction equipment/rigs shall be thoroughly washed/scrubbed down with hot water at the construction yard before being transported to the project site to avoid spreading invasive weeds to the project site. Additionally, Caltrans shall implement the California Department of Fish and Wildlife's Aquatic Invasive Species (AIS) Decontamination Protocol.
BIO-22	Executive Order 13112 on Invasive Species	Design Engineer, Resident Engineer		Design, Pre-Construction, Construction		NES, IS/EA	In compliance with the Executive Order on Invasive Species, EO 13112, and guidance from the Federal Highway Administration (FHWA), the landscaping and erosion control included in the proposed project will not use any species on the California Noxious Weed List. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or near construction areas. This includes the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.
BIO-23	Removal and Disposal of Invasive Species	Resident Engineer		Pre-Construction, Construction		NES, IS/EA	Any invasive species present shall be removed and disposed of offsite at an appropriate disposal location.

CONSTRUCTION IMPACTS

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
CON-01	Caltrans Complete Street Directed DD-64-R2	Design Engineer, Resident Engineer		Design, Pre-Construction, Construction		NES, IS/EA	A "complete street" is a facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit riders, and motorists appropriate to the function and context of the facility. This directive shall ensure that the proposed project is designed in such a manner that all travelers of all ages and abilities can move safely and efficiently along and across a network of "complete streets."
CON-02	Transportation Management Plan	Design Engineer, Resident Engineer		Design, Pre-Construction, Construction		NES, IS/EA	A TMP shall be developed to implement practical measures to minimize any traffic delays that may result from lane restrictions or closures in the work zone. TMP strategies shall be planned and designed to improve mobility, as well as increase safety for the traveling public and highway workers. These strategies include, but are not limited to, dissemination of information to motorists and the greater public, traffic incident management, construction management strategies, traffic demand management, and alternate route planning/detouring.
CON-03	Roadway Closure Planning	Design Engineer, Resident Engineer		Design, Pre-Construction, Construction		NES, IS/EA	Closure plans shall be developed to minimize traffic disruption during peak periods, and to the extent possible, such closures (when required) shall occur during off-peak and/or overnight periods. Customarily, construction staging plans shall complement closure plans to minimize the need for roadway and/or ramp closures. No full closures of SR-1/PCH shall occur during peak periods whatsoever. In advance of any closure periods, appropriate temporary signage (in accordance with Caltrans and City guidelines) shall be used to alert motorists of the closure and direct them to alternate routes.
CON-04	Temporary Traffic Controls	Design Engineer, Resident Engineer		Design, Pre-Construction, Construction		NES, IS/EA	Temporary traffic controls, signage, barriers, and flagmen shall be deployed as necessary and appropriately for the efficient movement of traffic (in accordance with standard traffic engineering practices) to facilitate construction of the project improvements while maintaining traffic flows and minimizing disruption.
CON-05	Temporary Noise Barriers	Resident Engineer		Pre-Construction, Construction		NES, IS/EA	Effective temporary noise barriers, when they are feasible, shall be used in an attempt to minimize any noise between construction equipment and noise-sensitive receptors.

CONSTRUCTION IMPACTS (CONTINUED)

Log No.	Commitment Type	Responsible Party	Monitoring Frequency	Implementation/ Monitoring Phase	SSP#/ NSSP#	Env Doc/ Permits/Specs/ Plans/ Estimates REFERENCE	Commitment Measure
CON-06	Equipment Noise Control	Resident Engineer		Pre-Construction, Construction			Noise-generating equipment in operation at each project site shall be fully equipped with effective nose control devices (i.e. mufflers, lagging, and/or motor enclosures). Noise from each piece of construction equipment shall not exceed 86 dBA (L_{max}) at a distance of 15 meters (50 feet). All equipment shall be properly maintained to assure that no additional noise, due to worn or improperly maintained parts, would be generated.
CON-07	Noise Control within Vicinity of Residential Units	Resident Engineer		Pre-Construction, Construction			Noise generating construction activities within 50 meters (165 feet) of residential units shall be restricted to hours between 7:00AM and 8:00PM, Monday through Friday and 8:00AM and 6:00PM on Saturday. No noise-generative construction activities shall take place on Sundays and holidays.

APPENDIX D | USFWS/NMFS SPECIES LISTS

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish And Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003-7726
Phone: (805) 644-1766 Fax: (805) 644-3958

In Reply Refer To:
Consultation Code: 08EVEN00-2018-SLI-0378
Event Code: 08EVEN00-2018-E-02267
Project Name: Solstice Creek Culvert Replacement

September 26, 2018

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed list identifies species listed as threatened and endangered, species proposed for listing as threatened or endangered, designated and proposed critical habitat, and species that are candidates for listing that may occur within the boundary of the area you have indicated using the U.S. Fish and Wildlife Service's (Service) Information Planning and Conservation System (IPaC). The species list fulfills the requirements under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the species list should be verified after 90 days. We recommend that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists following the same process you used to receive the enclosed list. Please include the Consultation Tracking Number in the header of this letter with any correspondence about the species list.

Due to staff shortages and excessive workload, we are unable to provide an official list more specific to your area. Numerous other sources of information are available for you to narrow the list to the habitats and conditions of the site in which you are interested. For example, we recommend conducting a biological site assessment or surveys for plants and animals that could help refine the list.

If a Federal agency is involved in the project, that agency has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the project is a major construction project*, the Federal agency has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species or critical habitat. If the Federal agency determines that a listed species or critical habitat is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species or their critical habitat prior to a

written request for formal consultation. During this review process, the Federal agency may engage in planning efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

Federal agencies are required to confer with the Service, pursuant to section 7(a)(4) of the Act, when an agency action is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10(a)). A request for formal conference must be in writing and should include the same information that would be provided for a request for formal consultation. Conferences can also include discussions between the Service and the Federal agency to identify and resolve potential conflicts between an action and proposed species or proposed critical habitat early in the decision-making process. The Service recommends ways to minimize or avoid adverse effects of the action. These recommendations are advisory because the jeopardy prohibition of section 7(a)(2) of the Act does not apply until the species is listed or the proposed critical habitat is designated. The conference process fulfills the need to inform Federal agencies of possible steps that an agency might take at an early stage to adjust its actions to avoid jeopardizing a proposed species.

When a proposed species or proposed critical habitat may be affected by an action, the lead Federal agency may elect to enter into formal conference with the Service even if the action is not likely to jeopardize or result in the destruction or adverse modification of proposed critical habitat. If the proposed species is listed or the proposed critical habitat is designated after completion of the conference, the Federal agency may ask the Service, in writing, to confirm the conference as a formal consultation. If the Service reviews the proposed action and finds that no significant changes in the action as planned or in the information used during the conference have occurred, the Service will confirm the conference as a formal consultation on the project and no further section 7 consultation will be necessary. Use of the formal conference process in this manner can prevent delays in the event the proposed species is listed or the proposed critical habitat is designated during project development or implementation.

Candidate species are those species presently under review by the Service for consideration for Federal listing. Candidate species should be considered in the planning process because they may become listed or proposed for listing prior to project completion. Preparation of a biological assessment, as described in section 7(c) of the Act, is not required for candidate species. If early evaluation of your project indicates that it is likely to affect a candidate species, you may wish to request technical assistance from this office.

Only listed species receive protection under the Act. However, sensitive species should be considered in the planning process in the event they become listed or proposed for listing prior to project completion. We recommend that you review information in the California Department of Fish and Wildlife's Natural Diversity Data Base. You can contact the California Department of Fish and Wildlife at (916) 324-3812 for information on other sensitive species that may occur in this area.

[*A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.]

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Ventura Fish And Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003-7726
(805) 644-1766

Project Summary

Consultation Code: 08EVEN00-2018-SLI-0378

Event Code: 08EVEN00-2018-E-02267

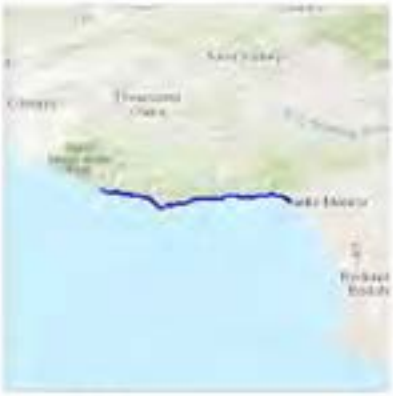
Project Name: Solstice Creek Culvert Replacement

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Remove and Replace the SR-1 Solstice Creek Culvert with a Bridge, also repair/replace 19 other culverts along SR-1 between Will Rodgers State Beach and County Line Beach in Ventura County.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/34.034410860372645N118.68657854037095W



Counties: Los Angeles, CA | Ventura, CA

Endangered Species Act Species

There is a total of 23 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Coastal California Gnatcatcher *Polioptila californica californica* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8178	Threatened
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered
Light-footed Clapper Rail *Rallus longirostris levipes* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6035	Endangered
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Crustaceans

NAME	STATUS
Riverside Fairy Shrimp *Streptocephalus woottoni* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8148	Endangered
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
Braunton's Milk-vetch *Astragalus brauntonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5674	Endangered
California Orcutt Grass *Orcuttia californica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4923	Endangered
Coastal Dunes Milk-vetch *Astragalus tener var. titi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7675	Endangered
Gambel's Watercress *Rorippa gambellii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4201	Endangered
Lyon's Pentachaeta *Pentachaeta lyonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4609	Endangered
Marcescent Dudleya *Dudleya cymosa ssp. marcescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7145	Threatened
Marsh Sandwort *Arenaria paludicola* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2229	Endangered
Salt Marsh Bird's-beak *Cordylanthus maritimus ssp. maritimus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6447	Endangered
Santa Monica Mountains Dudleyea *Dudleya cymosa ssp. ovatifolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2538	Threatened
Spreading Navarretia *Navarretia fossalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1334	Threatened
Ventura Marsh Milk-vetch *Astragalus pycnostachyus var. lanosissimus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1160	Endangered
Verity's Dudleya *Dudleya verityi* No critical habitat has been designated for this species.	Threatened

NAME	STATUS

Species profile: https://ecos.fws.gov/ecp/species/4342

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi* https://ecos.fws.gov/ecp/species/57#crithab	Final

NOAA Species List for Caltrans Projects

State Route 1 (Pacific Coast Highway) Drainage Restoration Project and Bridge Replacement at Solstice Canyon Creek

Quad Name Malibu
Quad Number 34118-A6

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) - X
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) - X

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -

CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat - X
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) - X
Range White Abalone (E) - X

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) - X
Olive Ridley Sea Turtle (T/E) - X
Leatherback Sea Turtle (E) - X
North Pacific Loggerhead Sea Turtle (E) - X

ESA Whales

Blue Whale (E) - X
Fin Whale (E) - X
Humpback Whale (E) - X
Southern Resident Killer Whale (E) - X
North Pacific Right Whale (E) - X
Sei Whale (E) - X
Sperm Whale (E) - X

ESA Pinnipeds

Guadalupe Fur Seal (T) - X

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH -
Groundfish EFH - X
Coastal Pelagics EFH - X
Highly Migratory Species EFH - X

MMPA Species (See list at left)
ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult Monica DeAngelis
monica.deangelis@noaa.gov
562-980-3232
MMPA Cetaceans - X
MMPA Pinnipeds - X

Quad Name **Topanga**
Quad Number **34118-A5**

ESA Anadromous Fish
SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) - X
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) - X

ESA Anadromous Fish Critical Habitat
SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat - X
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates
Range Black Abalone (E) - X
Range White Abalone (E) - X

ESA Marine Invertebrates Critical Habitat
Black Abalone Critical Habitat -

ESA Sea Turtles
East Pacific Green Sea Turtle (T) - X
Olive Ridley Sea Turtle (T/E) - X
Leatherback Sea Turtle (E) - X
North Pacific Loggerhead Sea Turtle (E) - X

ESA Whales
Blue Whale (E) - X
Fin Whale (E) - X
Humpback Whale (E) - X
Southern Resident Killer Whale (E) - X
North Pacific Right Whale (E) - X
Sei Whale (E) - X
Sperm Whale (E) - X

ESA Pinnipeds
Guadalupe Fur Seal (T) - X

Essential Fish Habitat
Coho EFH -
Chinook Salmon EFH -
Groundfish EFH - X
Coastal Pelagics EFH - X
Highly Migratory Species EFH - X

MMPA Species (See list at left)
ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult Monica DeAngelis
monica.deangelis@noaa.gov
562-980-3232
MMPA Cetaceans - X
MMPA Pinnipeds - X

Quad Name **Triunfo Pass**
Quad Number **34118-A8**

ESA Anadromous Fish
SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -

NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) - X
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) - X

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat - X
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) - X
Range White Abalone (E) - X

ESA Marine Invertebrates Critical Habitat

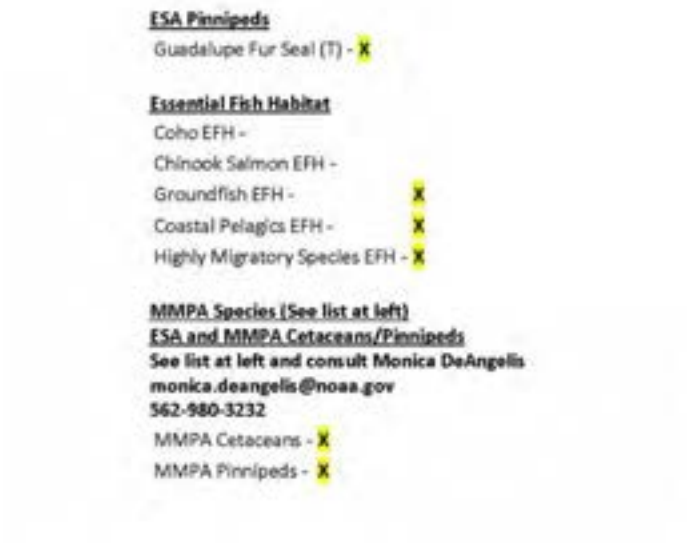
Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) - X
Olive Ridley Sea Turtle (T/E) - X
Leatherback Sea Turtle (E) - X
North Pacific Loggerhead Sea Turtle (E) - X

ESA Whales

Blue Whale (E) - X
Fin Whale (E) - X
Humpback Whale (E) - X
Southern Resident Killer Whale (E) - X
North Pacific Right Whale (E) - X
Sei Whale (E) - X
Sperm Whale (E) - X


ESA Pinnipeds
Guadalupe Fur Seal (T) - X
Essential Fish Habitat
Coho EFH -
Chinook Salmon EFH -
Groundfish EFH - X
Coastal Pelagics EFH - X
Highly Migratory Species EFH - X
MMPA Species (See list at left)
ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult Monica DeAngelis
monica.deangelis@noaa.gov
562-980-3232
MMPA Cetaceans - X
MMPA Pinnipeds - X

APPENDIX E | CDFW CNDDB REPORT

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Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Topanga (3411815) OR Malibu Beach (3411816) OR Point Dume (3411817) OR Triunfo Pass (3411818))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBX80020	None	Candidate Endangered	G2G3	S1S2	SSC
Aglaothorax longipennis Santa Monica shieldback katydid	IIORT32020	None	None	G1G2	S1S2	
Anniella stebbinsi southern California legless lizard	ARACC01060	None	None	G3	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Aspidoscelis tigris stejnegeri coastal whiptail	ARACJ02143	None	None	G5T5	S3	SSC
Astragalus brauntonii Braunton's milk-vetch	PDFAB0F1G0	Endangered	None	G2	S2	1B.1
Astragalus pycnostachyus var. lanosissimus Ventura Marsh milk-vetch	PDFAB0F7B1	Endangered	Endangered	G2T1	S1	1B.1
Astragalus tener var. tener coastal dunes milk-vetch	PDFAB0F8R2	Endangered	Endangered	G2T1	S1	1B.1
Atriplex coulteri Coulter's saltbush	PDCHE040E0	None	None	G3	S1S2	1B.2
Atriplex pacifica south coast saltscale	PDCHE041C0	None	None	G4	S2	1B.2
Atriplex parishii Parish's brittlescale	PDCHE041D0	None	None	G1G2	S1	1B.1
Atriplex serenana var. davidsonii Davidson's saltscale	PDCHE041T1	None	None	G5T1	S1	1B.2
Baccharis malibuensis Malibu baccharis	PDAST0W0W0	None	None	G1	S1	1B.1
Bombus crotchii Crotch bumble bee	IIHYM24480	None	None	G3G4	S1S2	
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
California Walnut Woodland California Walnut Woodland	CTT71210CA	None	None	G2	S2.1	
Calochortus clavatus var. gracilis slender mariposa-lily	PMLIL0D096	None	None	G4T2T3	S2S3	1B.2
Calochortus plummerae Plummer's mariposa-lily	PMLIL0D150	None	None	G4	S4	4.2

Government Version -- Dated September, 1 2018 -- Biogeographic Data Branch — Page 1 of 4

Report Printed on Wednesday, September 26, 2018 — **Information Expires 3/1/2019**

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Chaenactis glabriuscula var. orcuttiana Orcutt's pincushion	PDAST20095	None	None	G5T1T2	S1	1B.1
Chloropyron maritimum ssp. maritimum salt marsh bird's-beak	PDSCR0J0C2	Endangered	Endangered	G4?T1	S1	1B.2
Chorizanthe parryi var. parryi Parry's spineflower	PDPGN040J2	None	None	G3T2	S2	1B.1
Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101	None	None	G5T2	S2	
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
Danaus plexippus pop. 1 monarch - California overwintering population	IILEPP2012	None	None	G4T2T3	S2S3	
Deinandra minthornii Santa Susana tarplant	PDAST4R0J0	None	Rare	G2	S2	1B.2
Diadophis punctatus modestus San Bernardino ringneck snake	ARADB10015	None	None	G5T2T3	S2?	
Dithyrea maritima beach spectaclepod	PDBRA10020	None	Threatened	G1	S1	1B.1
Dudleya blochmaniae ssp. blochmaniae Blochman's dudleya	PDCRA04051	None	None	G3T2	S2	1B.1
Dudleya cymosa ssp. agourensis Agoura Hills dudleya	PDCRA040A7	Threatened	None	G5T1	S1	1B.2
Dudleya cymosa ssp. marcescens marcescent dudleya	PDCRA040A3	Threatened	Rare	G5T2	S2	1B.2
Dudleya cymosa ssp. ovatifolia Santa Monica dudleya	PDCRA040A5	Threatened	None	G5T1	S1	1B.1
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eriogonum crocatum conejo buckwheat	PDPGN081G0	None	Rare	G1	S1	1B.2
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Euderma maculatum spotted bat	AMACC07010	None	None	G4	S3	SSC
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G5T4	S3S4	SSC
Euphydryas editha quino quino checkerspot butterfly	IILEPK405L	Endangered	None	G5T1T2	S1S2	
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Gila orcuttii arroyo chub	AFCJB13120	None	None	G2	S2	SSC

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Horkelia cuneata var. puberula mesa horkelia	PDROS0W045	None	None	G4T1	S1	1B.1
Isocoma menziesii var. decumbens decumbent goldenbush	PDAST57091	None	None	G3G5T2T3	S2	1B.2
Lampropeltis zonata (pulchra) California mountain kingsnake (San Diego population)	ARADB19063	None	None	G4G5	S1S2	WL
Lasiurus blossevillii western red bat	AMACC05060	None	None	G5	S3	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasthenia glabrata ssp. coulteri Coulter's goldfields	PDAST5L0A1	None	None	G4T2	S2	1B.1
Monardella hypoleuca ssp. hypoleuca white-veined monardella	PDLAM18DA3	None	None	G4T3	S3	1B.3
Myotis ciliolabrum western small-footed myotis	AMACC01140	None	None	G5	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Navarretia ojaiensis Ojai navarretia	PDPLM0C130	None	None	G2	S2	1B.1
Neotoma lepida intermedia San Diego desert woodrat	AMAFF08041	None	None	G5T3T4	S3S4	SSC
Oncorhynchus mykiss irideus pop. 10 steelhead - southern California DPS	AFCHA0209J	Endangered	None	G5T1Q	S1	
Pentachaeta lyonii Lyon's pentachaeta	PDAST6X060	Endangered	Endangered	G1	S1	1B.1
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3	S2	2B.2
Sidalcea neomexicana salt spring checkerbloom	PDMAL110J0	None	None	G4	S2	2B.2
Socalchemmis gertschi Gertsch's socalchemmis spider	ILARAU7010	None	None	G1	S1	
Southern California Coastal Lagoon Southern California Coastal Lagoon	CALE1220CA	None	None	GNR	SNR	
Southern California Steelhead Stream Southern California Steelhead Stream	CARE2310CA	None	None	GNR	SNR	
Southern Coast Live Oak Riparian Forest Southern Coast Live Oak Riparian Forest	CTT61310CA	None	None	G4	S4	

Government Version -- Dated September, 1 2018 -- Biogeographic Data Branch

Report Printed on Wednesday, September 26, 2018

Page 3 of 4

Information Expires 3/1/2019

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Southern Coastal Salt Marsh Southern Coastal Salt Marsh	CTT52120CA	None	None	G2	S2.1	
Southern Sycamore Alder Riparian Woodland Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	G4	S4	
Spermolepis lateriflora western bristly scaleseed	PDAPI23080	None	None	G5	SH	2A
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis hammondii two-striped gartersnake	ARADB36160	None	None	G4	S3S4	SSC
Thelypteris puberula var. sonorensis Sonoran maiden fern	PPTHE05192	None	None	G5T3	S2	2B.2
Tortula californica California screw moss	NBMUS7L090	None	None	G2G3	S2S3	1B.2
Trimerotropis occidentiloides Santa Monica grasshopper	IIORT36300	None	None	G1G2	S1S2	
Valley Oak Woodland Valley Oak Woodland	CTT71130CA	None	None	G3	S2.1	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	

Record Count: 71

Government Version -- Dated September, 1 2018 -- Biogeographic Data Branch — Page 4 of 4

Report Printed on Wednesday, September 26, 2018 — **Information Expires 3/1/2019**

APPENDIX F | NOAA/NMFS STEELHEAD PASSAGE STABILITY STUDY

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Steelhead Passage Stability Study
Solstice Creek, California
Highway 1 Culvert
FINAL

Prepared for:

NOAA
National Marine Fisheries Service
West Coast Region
NMFS Project Officer: Jay Ogawa
501 W. Ocean Blvd. Ste. 4200
Long Beach, CA 90802

Prepared by:

R2 Resource Consultants, Inc.
15250 NE 95th Street
Redmond, Washington 98052

Contract No. RA-133F-16-SE-0887

August 9, 2017

Steelhead Passage Stability Study
Solstice Creek, California
Highway 1 Culvert
FINAL

Prepared for:

NOAA
National Marine Fisheries Service
West Coast Region
NMFS Project Officer: Jay Ogawa
501 W. Ocean Blvd. Ste. 4200
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Contract No. RA-133F-16-SE-0887

August 9, 2017

CONTENTS

FIGURES

TABLES

1. INTRODUCTION

In 1947, a culvert was constructed on Solstice Creek to pass flow under the Pacific Coast Highway, Route 1 within the city limits of Malibu in Los Angeles County (Figure 1-1). The culvert delivers flow to Dan Blocker State Beach and the Pacific Ocean (Figure 1-2). The culvert is a reinforced concrete arch (Figure 1-3) with a span of 21 feet, a length of 162 feet, a center height of 17.45 feet and a concrete bottom slab with a thickness of six inches (California Department of Transportation, Caltrans 2005). The slope through the culvert is approximately 1.3 percent.

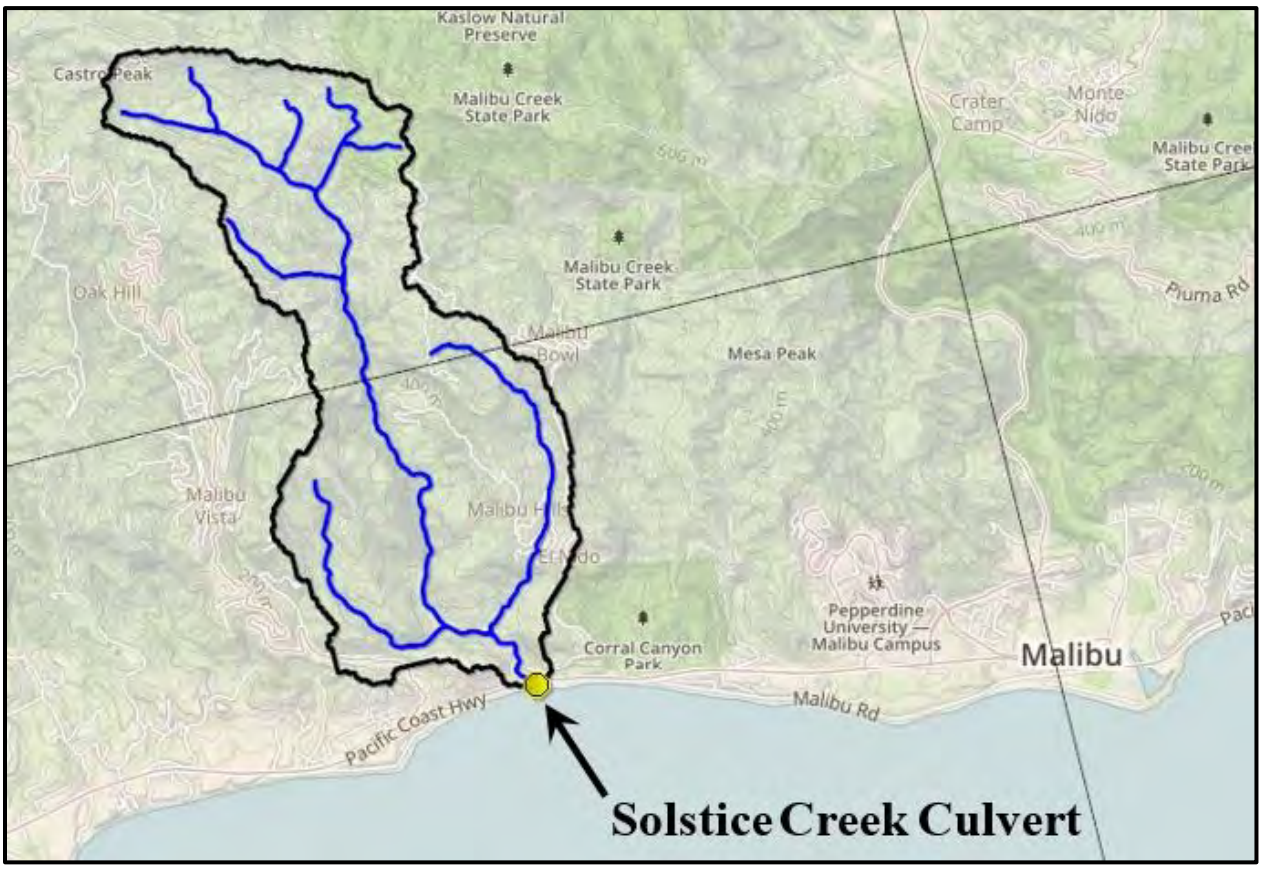

Figure 1-1. Solstice Creek Basin and Solstice Creek Culvert, Pacific Coast Highway, Malibu, California.

The drop at the culvert outlet varies based on aggradation and degradation of sand on the beach. Following the storms in 2017 when steelhead would be migrating; there was a four-foot drop at the culvert outlet (Figure 1-3). This drop is considered to be a barrier for upstream steelhead passage. To improve conditions for steelhead passage, a preliminary drainage plan was

developed by Caltrans. The concept was to remove the concrete slab and replace it with a cobble and boulder lined bottom at a lower elevation than the current invert of the culvert. Cobble and boulder lined step pools would be constructed upstream and downstream from the culvert.

R2 Resource Consultants (R2) was hired by the National Marine Fisheries Service (NMFS) to review the plan developed by Caltrans, address any deficiencies, if any, and to develop some concepts to potentially improve the design (Contract No. RA-133F-16-SE-0887). This report includes a summary of background information, a review of existing conditions, a review of the plan developed by Caltrans, a description of alternatives, discussion of results, and recommendations for next steps.

Figure 1-2. Solstice Creek Culvert at Dan Blocker State Beach, Malibu, California.

Figure 1-3. Looking upstream towards Solstice Creek Culvert, February 2, 2017. Following storms in late January, there was a four-foot drop at the culvert outlet.

2. BACKGROUND INFORMATION

Background information, common to all of the alternatives were reviewed, and are summarized in this section. This information includes hydrology, geomorphology, tide/wave characteristics, and hydrologic/hydraulic fish passage metrics.

2.1 HYDROLOGY

Solstice Creek is ungaged, and flows in the creek are unregulated. Flow duration was estimated using data from Topanga Creek located approximately 9.5 linear miles northwest of Solstice Creek. Flood frequency was estimated using regional methods developed by the US Geological Survey (USGS 2012).

2.1.1 Flow Duration

Flow records were obtained from Topanga Creek near Topanga Beach, California (USGS 11104000). Daily flows at this gage were available for a total of 38 Water Years (1931 to 1938 and 1940 to 1979). During these periods flows were unregulated in Topanga Basin upstream from this gage. The drainage area at the gage is 18.0 square miles and the mean annual precipitation is 23.4 inches.

Flows in Solstice Creek are also unregulated. The drainage area of Solstice Creek at the culvert is 4.7 square miles and the mean annual precipitation is 19.9 inches. Daily flows in Solstice Creek were obtained from daily flows in Topanga Creek based on the ratio of the product of drainage area and mean annual precipitation.

Equation 2-1

$$Q_{sc} = \frac{DA_{sc}\, MAP_{sc}}{DA_{tc}\, MAP_{tc}}\, Q_{tc}$$

Where:
Q_{sc} = flow in Solstice Creek (cfs)
DA_{sc} = drainage area in Solstice Creek (square miles)
MAP_{sc} = mean annual precipitation in Solstice Creek (inches)
DA_{tc} = drainage area in Topanga Creek (square miles)
MAP_{tc} = mean annual precipitation in Topanga Creek (inches)
Q_{tc} = flow in Topanga Creek (cfs)

Annual flow duration was derived from the measured daily flows in Topanga Creek and the estimated daily flows in Solstice Creek, and the results are shown in Figure 2-1.

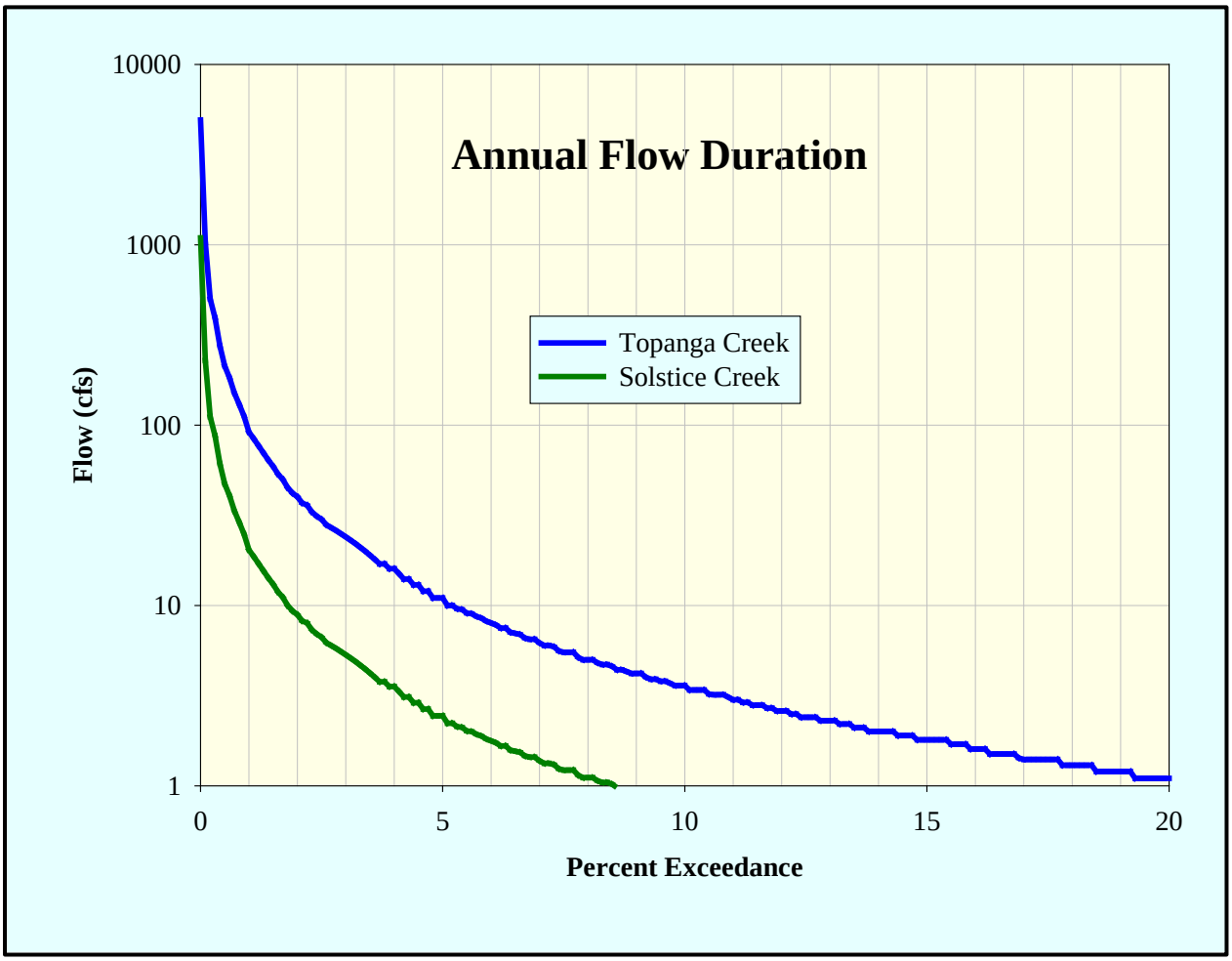

Figure 2-1. Annual flow duration in Solstice Creek at mouth and in Topanga Creek near Topanga Beach (USGS 11104000).

Measurable flows (greater than 1 cfs), occur at the gage site in Topanga Creek less than 20 percent of the time, and are estimated to occur in Solstice Creek at the Hwy 1 culvert site less than 8.5 percent of the time. Longer durations are expected during the winter when adult steelhead would be migrating upstream to spawn.

2.1.2 Flood Frequency

Flood frequency relationships for Solstice Creek were determined using regional regression techniques developed by the United States Geological Survey (USGS 2012, 2017). Solstice Creek is located within the South Coast Hydrologic Region (Region 5, USGS 2012). Peak flows for recurrence intervals ranging from 2 to 500 years can be estimated using regression equations based on drainage area (4.7 square miles) and mean annual precipitation (19.9 inches).

Peak flows for recurrence intervals ranging from 2 to 100 years are listed in Table 2-1 and shown in Figure 2-2. Theses peak flows are compared with peak flows used in a previous study (California Watershed Engineering 2011) in Table 2-1 and in Figure 2-2. The results obtained from the previous study are relatively conservative compared to the peak flows obtained from StreamStats (USGS 2012, 2017). Documentation of the flood peaks used in the previous study was unavailable.

Table 2-1. Flood frequency relationships for Solstice Creek at mouth.

	Peak Flow (cfs)			
		Obtained from StreamStats		
			90 Percent Prediction Interval	
Recurrence Interval (years)	**Obtained from Previous Study**	**Peak Flow**	Lower Limit	Upper Limit
2	258	97	18	520
5		316	96	1,040
10		541	206	1,420
25	2,440	884	399	1,960
50	3,310	1,190	570	2,470
100		1,510	727	3,150

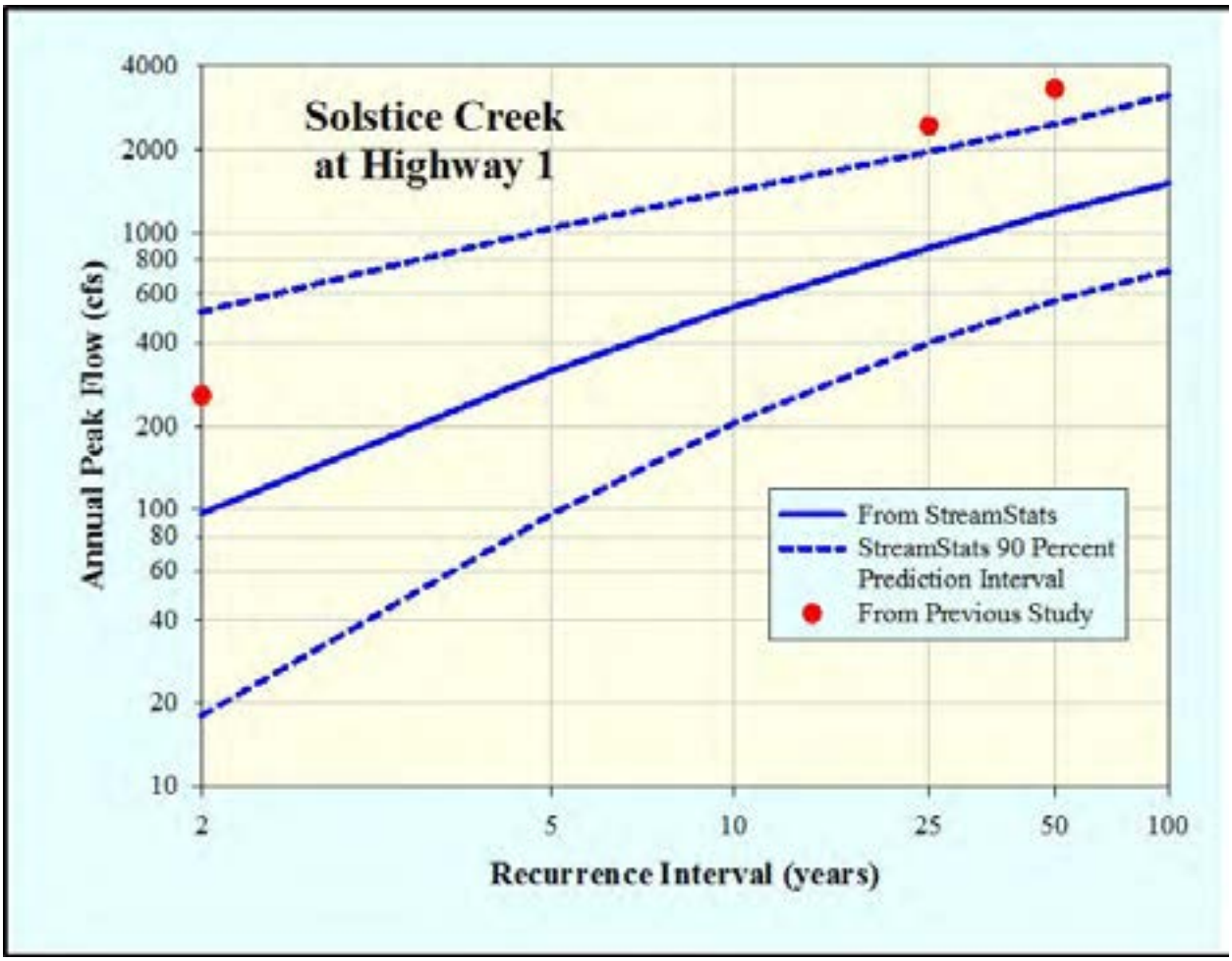

Figure 2-2. Flood frequency relationship at the mouth of Solstice Creek.

2.2 GEOLOGY AND GEOMORPHOLOGY

2.2.1 Regional Geologic History

The regional geologic history of Coastal Southern California was studied by the California Institute of Technology (Caltech 1981). The geological history of the Solstice Creek Canyon was studied by the California Department of Transportation (Caltrans 2005). Solstice Creek is located within the Santa Monica Mountains in the western Transverse Range province (Figure 2-3).

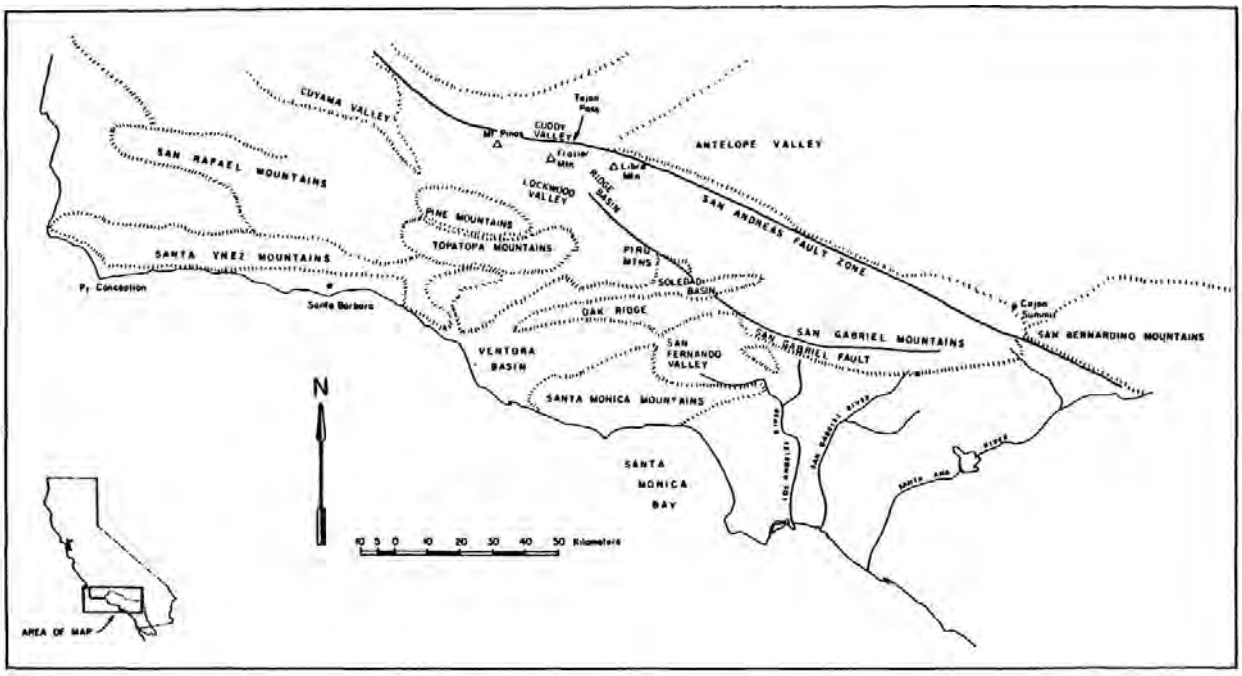

Figure 2-3. Map of the western Transverse Range province. Solstice Creek is located in the Santa Monica Mountains. Figure adapted from California Institute of Technology (Caltech 1981).

Tectonic activity has played a historical role in shaping the geology of the Solstice Creek Basin. Solstice Creek is located south of the Malibu Coast Fault (Caltrans 2005). The western Transverse Range province has undergone intense deformation. Bedrock units near the project include lower to middle Miocene Trancas Formation (marine sandstone, mudstone, silty shale, and claystone), Zuma Volcanics (mudstone breccia), and the Monterey Formation (marine clay shale, laminated to platy siltstone, and interbedded altered vitric tuffs and fine to medium grained sandstone). These bedrock units are very tightly folded, fractured, and faulted.

2.2.2 Valley Morphology

Topographic maps for the region were developed by the United States Geological Survey (USGS 2015). These maps, based on 20-foot contours, were reviewed in the vicinity of the Solstice Canyon Creek Culvert (Figure 2-4). As the creek approaches the culvert, the valley widens. This suggests that an alluvial fan had formed prior to construction of the culvert in 1947.

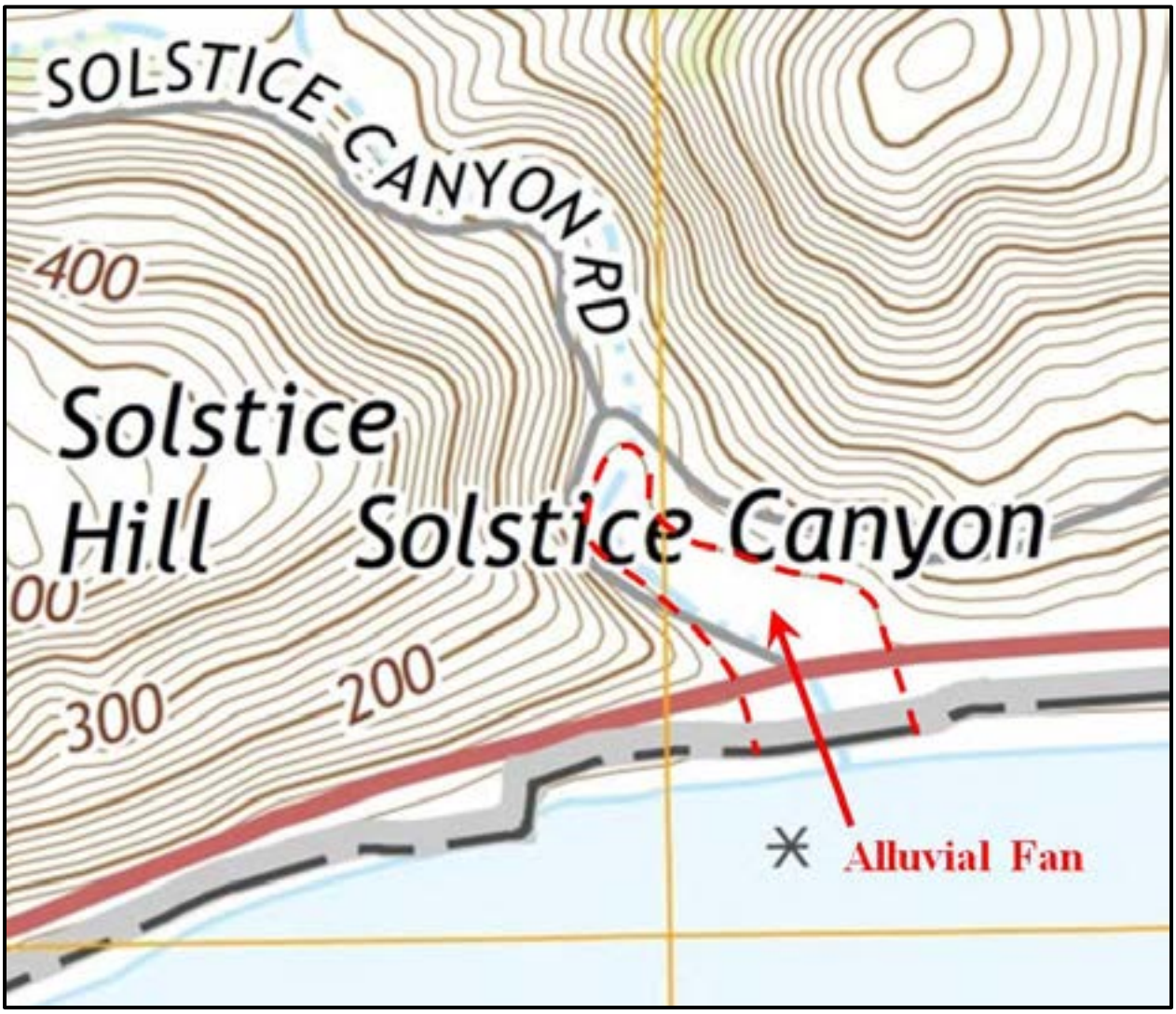

Figure 2-4. USGS topographic map of Solstice Creek near the mouth. Contours suggest the formation of an alluvial fan prior to construction of the culvert in 1947. Contour interval is 20 feet.

2.2.3 Channel Geometry

A one-dimensional (1D) hydraulic model was obtained from the California Department of Transportation (Caltrans 2016). The model was based on HEC-RAS (United States Army Corps of Engineers [USACE] Version 4.1 2010). The model was run based on existing conditions with a flow of 258 cfs. This flow represents a 2-year flood, commonly used as a surrogate for bankfull flows.

Another culvert (Corral Canyon Culvert) is located about 860 feet upstream from the Highway 1 Culvert. Hydraulic conditions in Solstice Creek were examined within a reach extending from

the downstream end of the Corral Canyon culvert to a distance of 560 feet downstream. Under 2-year flood conditions, the median wetted width in this reach Solstice Creek was 24 feet (very similar to the width of the culvert). The median velocity and median depth (at thalweg) were 7.5 fps and 2.3 feet, respectively. The high velocities are consistent with the steep gradient (2.9 percent). Under fish passage conditions (discussed in Section 2.4.1), the flows would be lower, and the velocities would also be lower.

The median shear stress in this reach of Solstice Creek is 2.3 psf under 2-year flood conditions. As discussed in Section 2.2.5, the creek would be capable of moving sediment ranging from 4.4 to 5.6 inches in size (small to large cobble).

2.2.4 Channel Substrate Characteristics

Photographs of the creek upstream from the culvert suggest the substrate consists primarily of cobbles and boulders (Figure 2-5), consistent with the steep slope (2.9 percent). Subsurface geotechnical investigations of the beach downstream of the culvert found cobbles and boulders mixed with alluvial silt, sand, and gravel, and marine silt and sand. Cobbles and boulders on the beach become exposed when flows in the creek are high enough to carve a channel through the beach (Figure 2-6).

Figure 2-5. Solstice Creek upstream from culvert, February 21, 2017. Substrate composition following storms consisted primarily of cobbles and boulders.

Figure 2-6. Solstice Creek downstream from culvert, February 21, 2017. Recent high flows have exposed underlying cobbles and boulders.

2.2.5 Sediment Transport

A regional sediment yield study was performed in Coastal Southern California (Caltech 1981; Taylor 1983). The Solstice Creek Basin is located in Hydrographic Drainage Unit G (Santa Monica Mountains Group, Figure 2-7). The average annual sediment yield from this unit is about 729 cubic yards per square mile. Of this total, it was estimated that 80 percent would consist of fine sediments (less than 0.06 mm), and the remaining 20 percent would consist of sand (.06 to 2 mm).

Figure 2-7. Hydrographic drainage units map in coastal Southern California.

The drainage area of Solstice Creek is 4.7 square miles. Based on the results of the regional sediment yield study, the average annual sediment yield is estimated to be 2,740 cubic yards of fines and 680 cubic yards of sand. The actual sediment yield will also include coarser sediment particles (gravel, cobble, and boulders). However, this coarser portion of the sediment yield is likely to be small in relation to the fines and sands.

Sediment transport in streams is a function of grain size and shear stress (Figure 2-8). When the shear stress is low, no sediment transport occurs. When the shear stress increases then the sediment will start moving as bedload (coarse sediments) or a combination of suspended load and bed load (fine sediments). Conditions under which sediment starts to move were based on Brownlie's (1981) interpretation of the Shields (1936) diagram.

Under 2-year flood conditions, the median shear stress in a reach of Solstice Creek extending 560 feet downstream from the Corral Canyon culvert is 2.3 psf (Section 2.2.3). From Figure 2-8, Solstice Creek would be capable of moving sediment with a size of 4.4 inches (small cobble).

An alternate way to assess mobility is provided by Meyer-Peter and Muller (1948). When the shear stress is 2.3 psf, the creek would be capable of moving substrate with a median grain size of 5.6 inches (large cobble). Under 2-year flood conditions, Solstice Creek would be capable of moving small to large cobble.

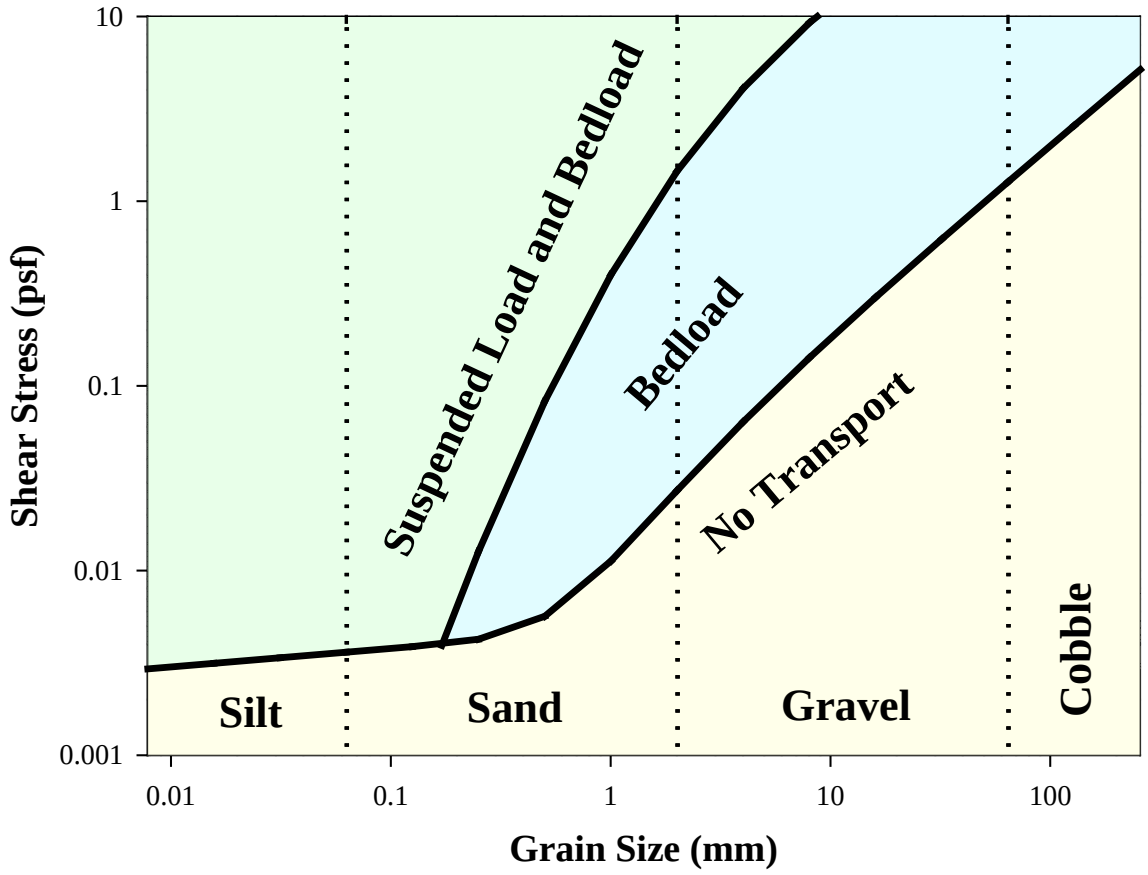

Figure 2-8. Sediment transport conditions in a stream, based on grain size and shear stress.

2.3 TIDE/WAVE CHARACTERISTICS

2.3.1 Tide Characteristics

The National Oceanic and Atmospheric Administration (NOAA) maintains a tide station in nearby Santa Monica (Station 9410840). Reference tide elevations from this station are listed in Table 2-2. Reference tide elevations obtained from NOAA were based on the period from 1983 to 2001. California Watershed Engineering (2011) reported tide elevations based on a more recent period (1990 to 2010) to account for rises in sea level. The data in Table 2-2 suggest that Mean Lower-Low Water (MLLW) has risen 0.06 feet, while Mean High Water (MHW) has dropped 0.01 feet.

Table 2-2. Tidal reference elevations obtained from National Oceanic and Atmospheric Administration (NOAA 2017) and from California Watershed Engineering (2011). The elevations obtained from NOAA were based on the period from 1983 to 2001, and the elevations obtained from California Watershed Engineering were based on the period from 1990 to 2010.

	Elevation (feet, NAVD 88)	
Reference Elevation	**National Oceanic and Atmospheric Administration (NOAA) 1983 to 2001**	**California Watershed Engineering 1990 to 2010**
Mean Higher-High Water (MHHW)	5.24	
Mean High Water (MHW)	4.50	4.49
Mean Tide Level (MTL)	2.62	
Mean Sea Level (MSL)	2.60	
Mean Diurnal Tide Level (DTL)	2.53	
Mean Low Water (MLW)	0.74	
Mean Lower-Low Water (MLLW)	-0.19	-0.13

2.3.2 Wave Characteristics

Wave analyses began with the Stillwater level (the elevation that the water would assume with no wave action). Wave effects were then superimposed on the Stillwater level. Some very conservative assumptions went into determining the Stillwater level. The 100-year peak tide elevation was determined to be 7.36 feet NAVD 88. It was also assumed that the sea level would rise 0.50 feet over the next 100 years (NOAA 2017). The Stillwater elevation was therefore determined to be 7.86 feet NAVD 88 (7.36 feet plus 0.50 feet). This Stillwater elevation is equivalent to 7.99 feet above MLLW.

A design wave height of 3.3 feet and a design wave period of 10 seconds were assumed in the analysis. In previous studies, it was found by California Watershed Engineering (CWE 2011) that this combination of design wave height and design wave period was the most significant wave to influence the beach area near the culvert. Another design wave was analyzed, with a design wave height of 11.7 feet and design wave period of 18 seconds. It was found that this wave broke further out and had less impact on the project area than the 3.3 foot wave. The breaking wave height and breaking wave depth were determined to be 5.62 feet and 3.86 feet, respectively. Wave runup was determined to be 4.15 above the Stillwater level (elevation 12.01 feet, NAVD 88).

2.4 HYDROLOGIC/HYDRAULIC FISH PASSAGE METRICS

Hydrologic and hydraulic metrics with regard to fish passage metrics are described herein.

2.4.1 Design Flow Range

A design flow range from 3 cfs to 129 cfs was adopted for this assessment. The low flow corresponds with the 50 percent annual exceedance flow or 3 cfs, whichever is greater (NMFS 2001; CDFG 2002). The high flow corresponds with 50 percent of the 2-year flood (NMFS 2001; CDFG 2002). These hydrologic criteria are used in California (Lang and Love 2014). They differ from criteria used in Oregon (ODFW 2006), Washington (WDFW 2013), and the NMFS Northwest Region of Washington, Oregon, and Idaho (NMFS 2011). California hydrologic criteria differs from other western states, especially in southern California, due to the dynamic (dry-extremely wet) and flashy nature of the natural hydrology.

2.4.2 Pool to Pool Head Drop

The proposed passage facilities are located at the mouth of Solstice Creek, and upstream passage of adult steelhead is the focus of this assessment. Under these circumstances, the head drop from pool to pool should not exceed 1.0 feet (NMFS 2011).

2.4.3 Minimum Flow Depth

Minimum flow depth criteria for upstream steelhead passage range from 0.7 feet (CDFG 2013) to 1.0 feet (NMFS 2011). The more conservative value of 1.0 feet was used for this assessment. When fish are leaping, a minimum pool depth of 2.0 feet is needed for passage (AECOM et al. 2016).

2.4.4 Minimum Passage Corridor Width

The passage corridor width should not be less than 1.0 feet (NMFS 2011). This criterion will be important for the low design flow. In addition to this criterion, at least 25 percent of the total wetted width should have a depth greater than the minimum flow depth, and at least 10 percent of the total wetted width must have a contiguous width with a depth greater than the minimum flow depth (CDFG 2013).

2.4.5 Maximum Flow Velocity

Steelhead swimming speed criteria are defined based on how long it would take an individual fish to become exhausted at a certain swimming speed (Bell 1991; Powers and Orsborn 1985). These criteria are commonly referred to as sustained, prolonged and burst speed criteria. Swimming speeds from zero to 4.6 fps are referred to as sustained swimming speeds for

steelhead. A steelhead swimming at 4.6 fps will reach exhaustion after 200 minutes. Swimming speeds from 4.6 fps to 13.7 fps are referred to as prolonged swimming speeds for steelhead. A steelhead swimming at 13.7 fps will reach exhaustion after 20 seconds. Swimming speeds from 13.7 fps to 26.5 fps are referred to as burst swimming speeds for steelhead. A steelhead swimming at 26.5 fps will reach exhaustion after six seconds.

An adult steelhead migrating upstream will typically use a combination of these different swimming speeds, depending on the hydraulic conditions that they may encounter. In natural systems, steelhead will use resting areas to recover before resuming upstream migration. Thus, it is important to include resting areas in the design of upstream passage, especially if the fish encounters high water velocities.

2.4.6 Maximum Energy Dissipation Factor

Energy dissipation factors provide a measure of turbulence. Fish passage is more effective with lower energy dissipation factors, while sediment transport is more effective with higher energy dissipation factors. Energy dissipation in pools should not exceed 4 ft-lbs per second per cubic foot (NMFS 2011). Recognizing that this threshold is not supported by empirical data, WDFW (2013) requires that energy dissipation in pools should not exceed 5 ft-lbs per second per cubic foot.

2.4.7 Maximum Weir Length

Steelhead will need to leap over weirs to migrate upstream using bursting speeds. Adult steelhead bursting speed criteria ranges from 13.7 fps to 26.5 fps (Bell 1991; Powers and Orsborn 1985). The weir length should not exceed the leaping distances for adult steelhead based on bursting speed criteria.

If a fish leaps out of the water, ballistic trajectory equations can be used to analyze the path that it takes through the air. The horizontal and vertical coordinates of the trajectory are obtained from the following equations:

Equation 2-2
$$X = V_o \, COS(\theta) \, t$$

Equation 2-3
$$Y = V_o \, SIN(\theta) \, t - \frac{g \, t^2}{2}$$

Where: X = horizontal position (feet)
Y = vertical position (feet)

Vo = magnitude of velocity of fish as it exits the water (feet/second)
θ is the angle of exit velocity with respect to horizontal
t is the time (seconds)
g is the acceleration due to gravity (32.2 feet per second^2)

If the fish velocity is assumed to be 13.7 feet/second (low end of steelhead leaping velocity range) and the angle of the exit velocity is assumed to be 45 degrees, then a fish would travel 4.6 feet horizontally before entering the water in the upstream pool (one foot higher in elevation than the downstream pool). A one-foot buffer was assumed between the fish trajectory and the weir. If the weir is constructed with two boulders (Figure 2-9), then steelhead would be able to leap past the weir if the boulder diameter does not exceed two feet. If the weir is constructed with one boulder (Figure 2-10), then steelhead would be able to leap past the weir if the boulder diameter does not exceed seven feet. Assumptions and results of these calculations are provided in Table 2-3.

Table 2-3. Summary of assumptions and results of leaping calculations.

Parameter	**Assumption or Result**
Leaping Velocity	13.7 fps
Angle of Exit Velocity	45 degrees
Buffer Around Boulders	One foot
Maximum Boulder Diameter with Double Boulder Arrangement	Two Feet
Maximum Boulder Diameter with Single Boulder Arrangement	Seven Feet

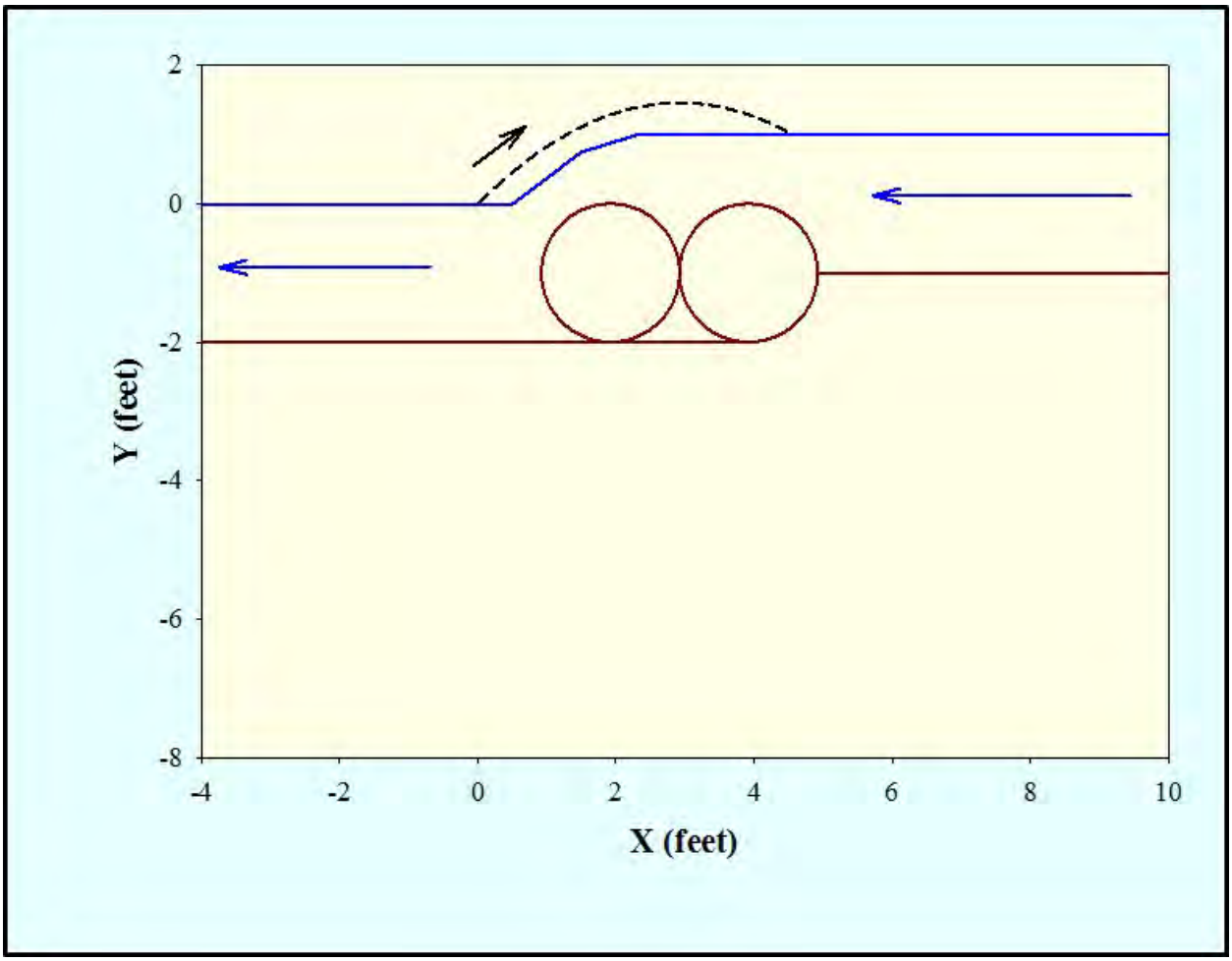

Figure 2-9. Steelhead trajectory (dashed line) with a two-boulder weir configuration. The diameter of each boulder is two feet.

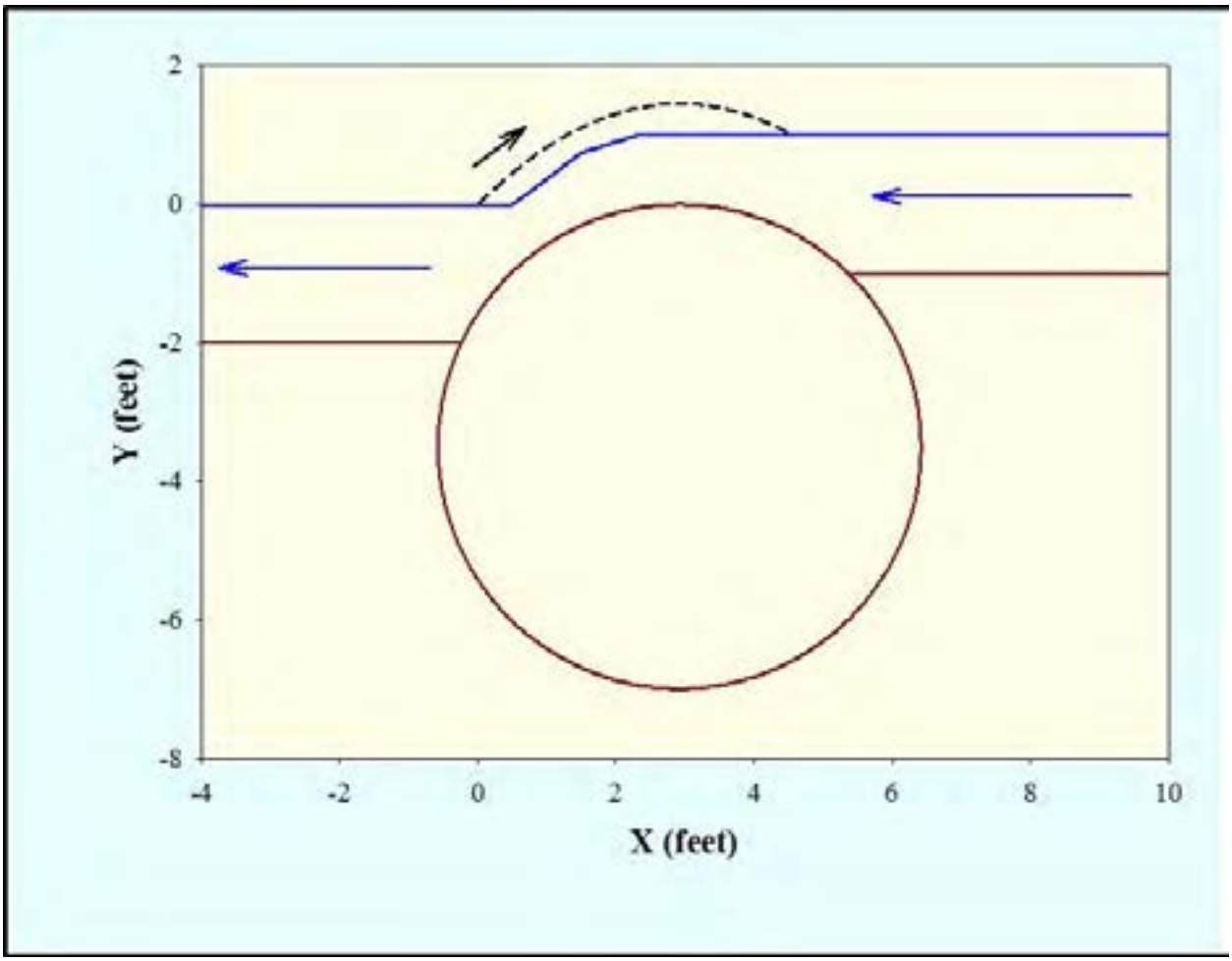

Figure 2-10. Steelhead trajectory (dashed line) with a one-boulder weir configuration. The diameter of the boulder is seven feet.

3. EXISTING CONDITIONS

Solstice Creek is an intermittent stream. During periods when there is no flow in the creek, the beach gets reworked by tide and wave action, and no channel can be detected on the beach (Figure 3-1).

Figure 3-1. Dan Blocker State Beach downstream from Solstice Creek Culvert on May 2, 2016, following a dry period with no flow in the creek.

Site visits to Solstice Creek were performed following two recent floods. Solstice Creek is ungaged and Topanga Creek has not been gaged since 1979. To gain some understanding of the severity of the recent floods, flow records from the gages on Santa Paula Creek (USGS 11113500) and Sespe Creek (USGS 11113000) were reviewed. These two streams are tributaries of the Santa Clara River. Flows on these two tributaries are considered to be unregulated.

In Santa Paula Creek, the first flood peaked at 3,500 cfs on January 22, 2017, and the second flood peaked at 7,800 cfs on February 17, 2012 (Figure 3-2). The recurrence interval for the first

flood is estimated to be 4 years (Figure 3-3), and the recurrence interval for the second flood is estimated to be 9 years (Figure 3-3).

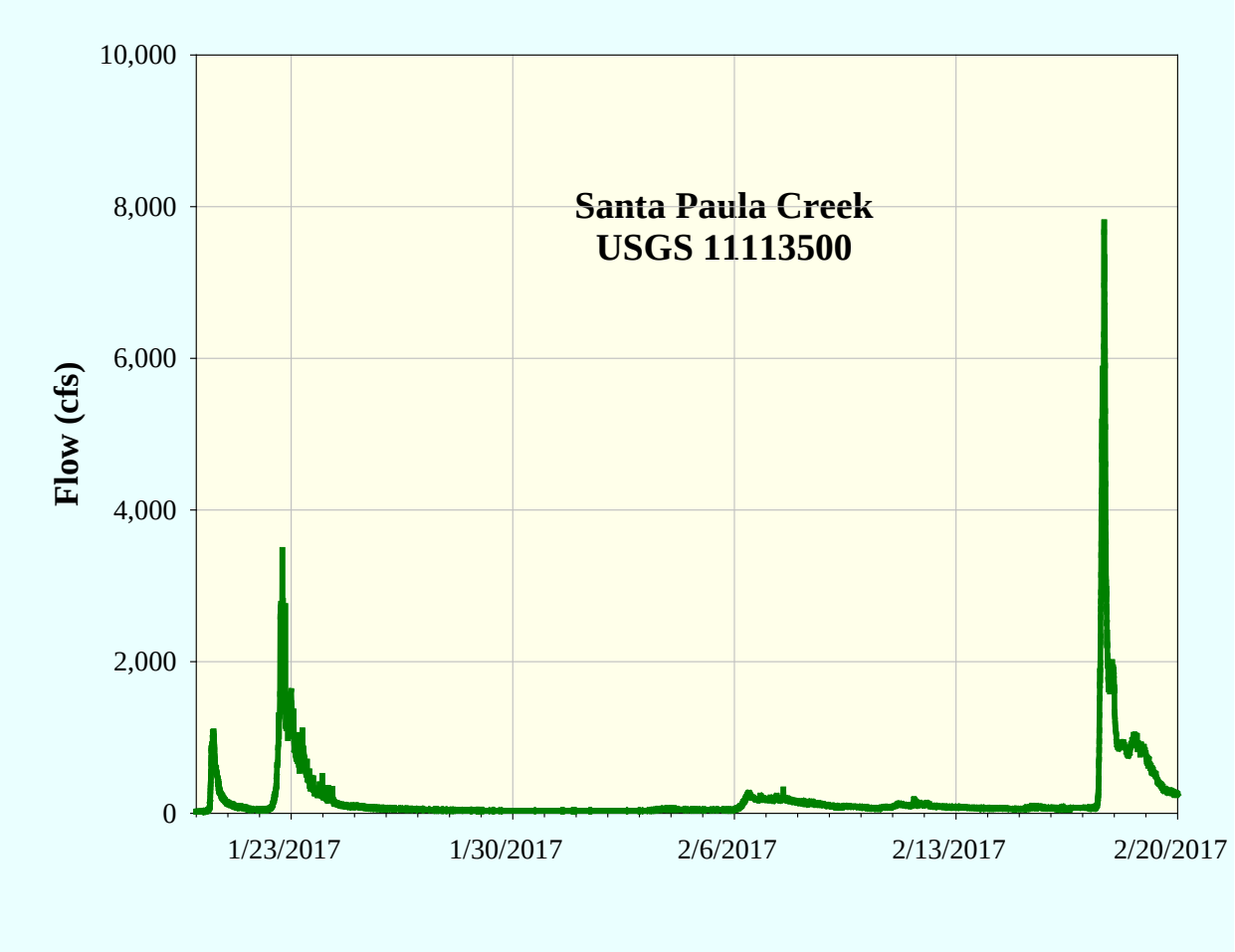

Figure 3-2. Flows measured at USGS gage on Santa Paula Creek (USGS 11113500) during two recent floods.

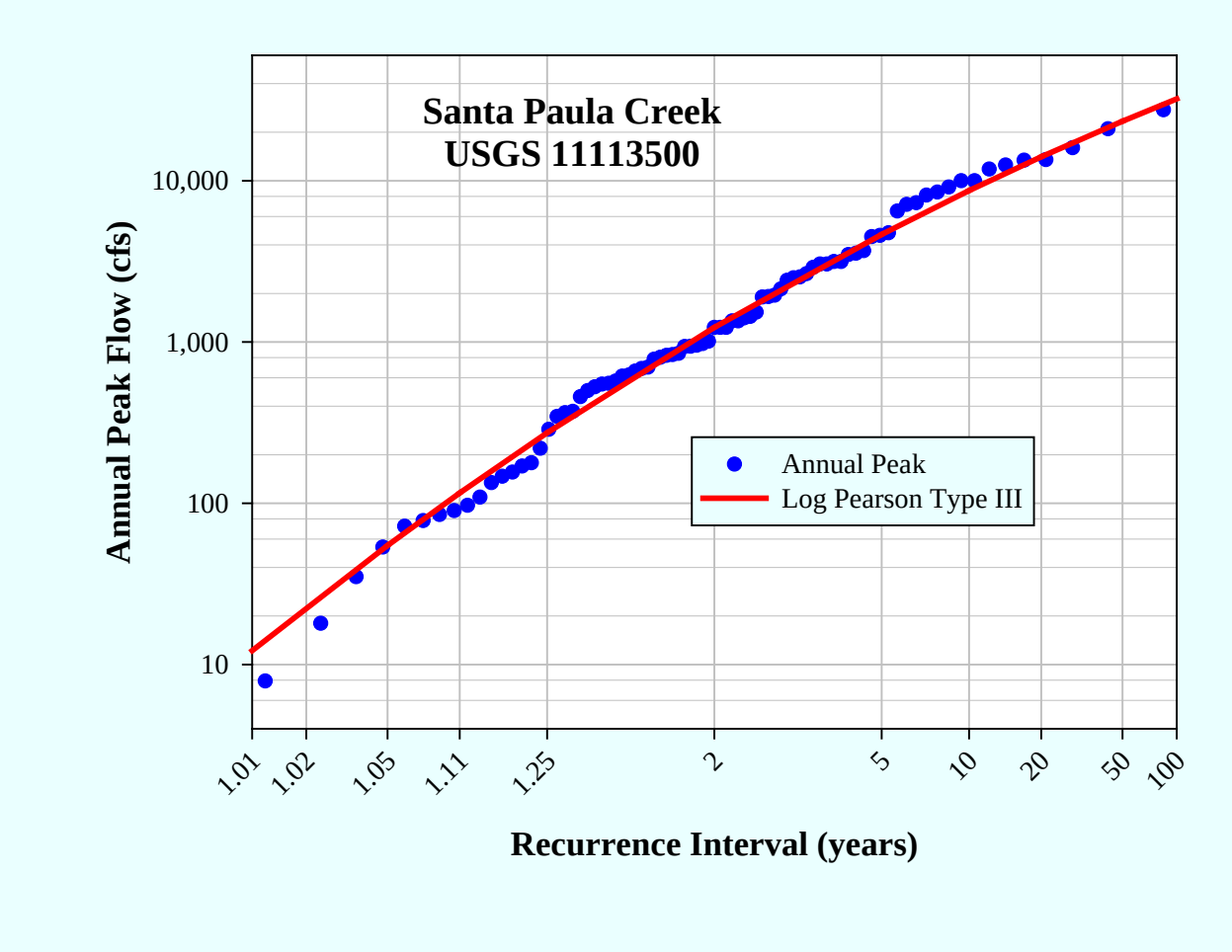

Figure 3-3. Flood frequency relationship for Santa Paula Creek (USGS 11113500).

In Sespe Creek, the first flood peaked at 13,200 cfs on January 22, 2017, and the second flood peaked at 44,500 cfs on February 17, 2012 (Figure 3-4). The recurrence interval for the first flood is estimated to be 3 years (Figure 3-5), and the recurrence interval for the second flood is estimated to be 11 years (Figure 3-5).

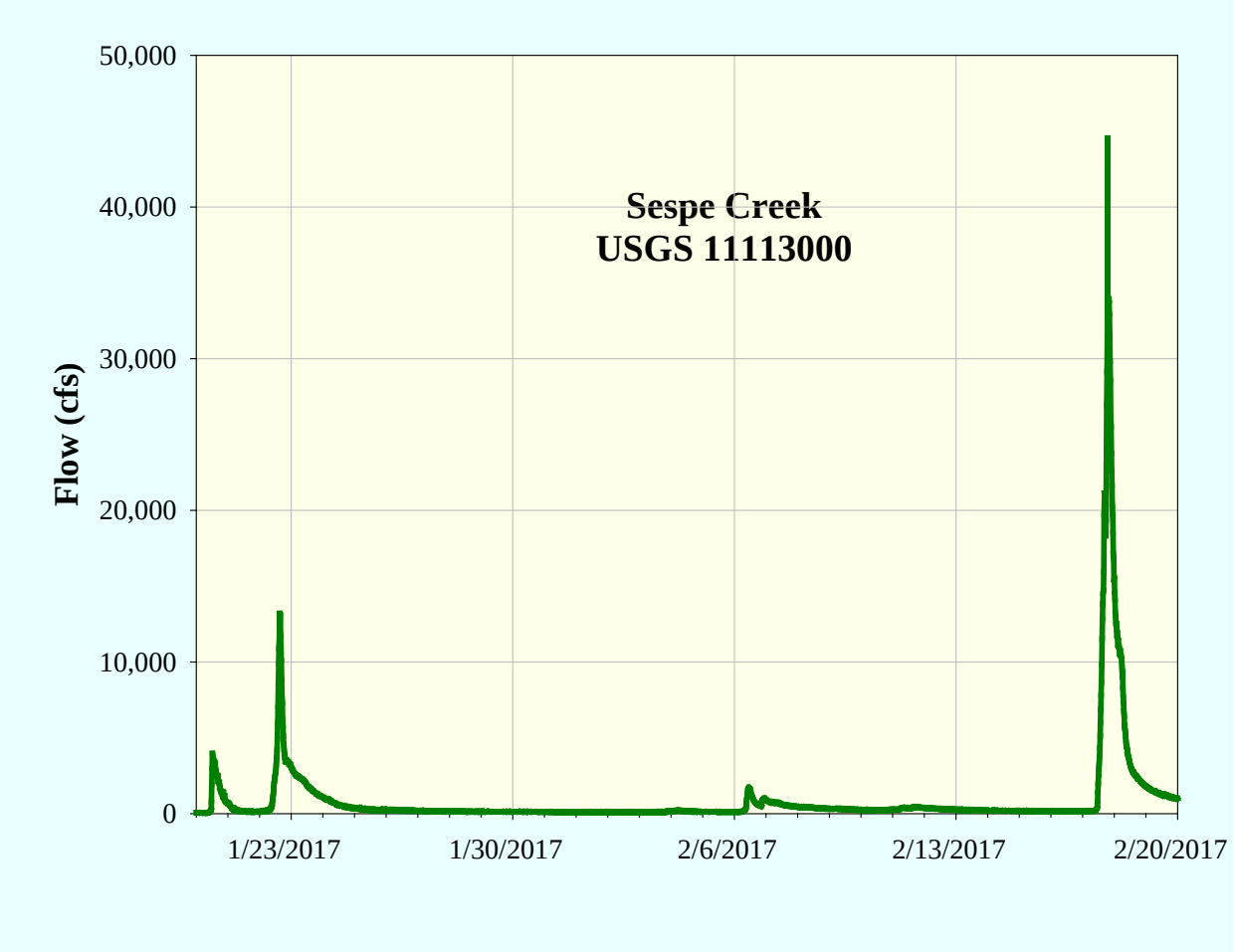

Figure 3-4. Flows measured at USGS gage on Sespe Creek (USGS 11113000) during two recent floods.

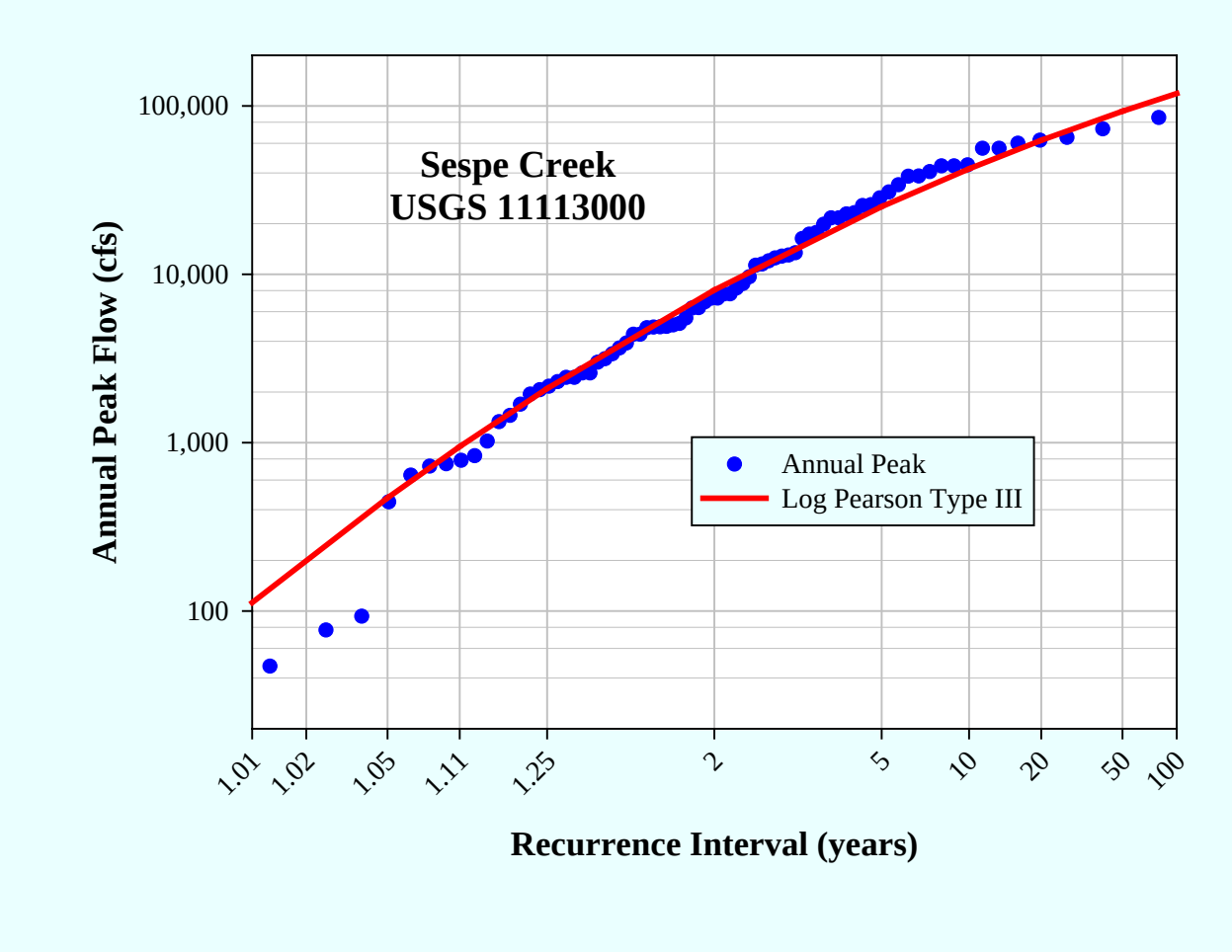

Figure 3-5. Flood frequency relationship for Sespe Creek (USGS 11113000).

Solstice Creek recently formed a channel on the beach. During a site visit on February 2, 2017, a channel with a bend was observed (Figure 3-6 and Figure 3-7). These observations were made following a flood that occurred on January 22, 2017 with a recurrence interval estimated to range from 3 to 4 years.

A more recent storm straightened out this bend (Figure 3-8). The straighter channel was observed on February 21, 2017. These observations were made following a flood that occurred on February 17, 2017 with a recurrence interval estimated to range from 9 to 11 years. Cobbles and boulders were observed on the streambed, and deposits of vegetation were observed on the beach on both sides of the channel.

Figure 3-6. Solstice Creek, looking upstream towards culvert on February 2, 2017. The creek carved out a channel with a bend.

Figure 3-7. Solstice Creek, looking downstream from culvert on February 2, 2017. The creek carved out a channel with a bend.

Figure 3-8. Solstice Creek, downstream from Solstice Creek Culvert on February 21, 2017. The creek carved out a channel with a relatively straight alignment.

A longitudinal profile of Solstice Creek extending from the Pacific Ocean to several hundred feet upstream from the Corral Canyon Culvert is shown in Figure 3-9. At the downstream end of the Highway 1 Culvert there is a four-foot drop that would be a barrier to upstream passage (Figure 2-6 and Figure 3-9). Upstream from the Highway 1 Culvert, there is a sediment deposit (Figure 3-9). This sediment deposit appears to be a transient feature. No evidence of a sediment deposit was observed on February 21, 2017 following an estimated a 9 to 11 year flood (Figure 3-10).

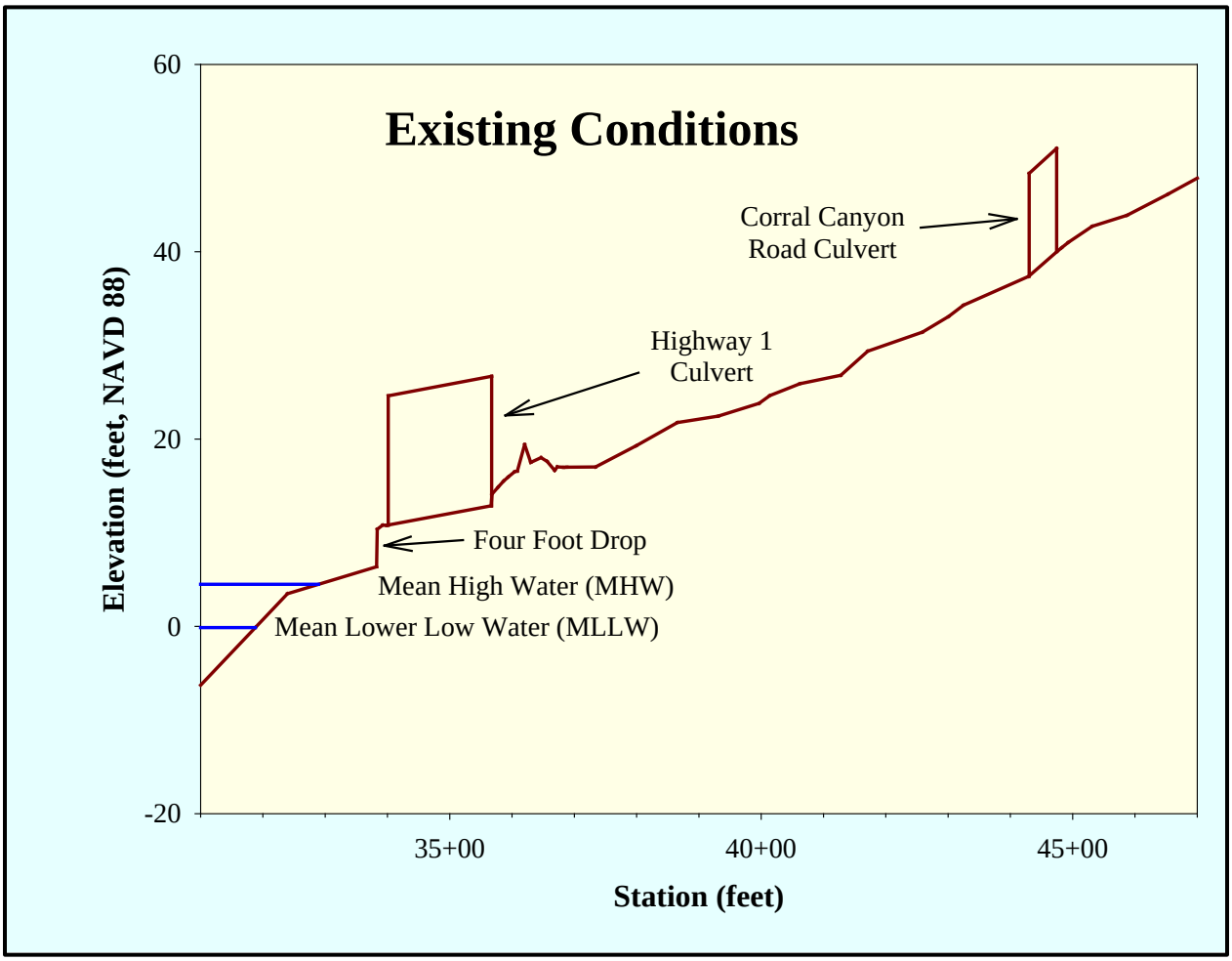

Figure 3-9. Longitudinal profile of Solstice Creek under existing conditions.

During the site visit on February 21, 2017, the flow in Solstice Creek was estimated to be 20 to 25 cfs. Flow through the Highway 1 Culvert would be too shallow for passage under those flow conditions (Figure 2-6 and Figure 3-10). Flow depths in Solstice Creek were deeper upstream from the Highway 1 Culvert (Figure 3-11 and Figure 3-12) and through the Corral Canyon Culvert (Figure 3-8) and appeared to provide suitable passage conditions for adults. Sediment deposits were observed in the Corral Canyon Culvert (Figure 3-13).

Figure 3-10. Highway 1 Culvert on Solstice Creek, February 21, 2017. No sediment deposits were observed in the culvert. Flow conditions in the culvert would be too shallow for passage.

Figure 3-11. Solstice Creek looking upstream from the Highway 1 Culvert, February 21, 2017.

Figure 3-12. Solstice Creek looking upstream towards Corral Canyon Culvert, February 21, 2017.

Figure 3-13. Solstice Creek looking downstream through Corral Canyon Culvert, February 21, 2017.

3.1 SUMMARY OF EXISTING CONDITIONS

Within this section, a summary of observations of existing conditions is provided downstream from the Highway 1 culvert, within the Highway 1 culvert, and upstream from the Highway 1 culvert.

3.1.1 Downstream from the Highway 1 Culvert

- Following dry periods, the waves and ocean currents rework the sand on the beach, and no channel can be detected (Figure 3-1)
- When flows increase from zero, the creek carves a new channel through the beach. When flows are high (9 to 11-year flood), the creek carves a relatively straight channel (Figure 3-8). When flows are lower (3 to 4-year flood), the creek carves a channel that curves to the right (looking downstream (Figure 3-6 and Figure 3-7)).
- Just downstream from the culvert there is a four-foot drop that prevents upstream passage (Figure 2-6).

3.1.2 Within the Highway 1 Culvert

- The flow will be wide and shallow (Figure 3-10). The depths will be too shallow for upstream passage.

3.1.3 Upstream from the Highway 1 Culvert

- Sediment may temporarily accumulate just upstream from the culvert (Figure 3-9). The creek will remove this deposit during high flows.
- Upstream from the Highway 1 culvert, the creek appears to be passable for adults when the flows are in the 20 to 25 cfs range (Figure 3-11 and Figure 3-12).
- Sediment accumulations were observed within the Corral Canyon culvert (Figure 3-13). The Corral Canyon culvert appeared passable for adults when flows are in the 20 to 25 cfs range.

4. PROPOSED CALTRANS DESIGN

A plan view of the alignment of the proposed Caltrans design is shown in Figure 4-1 and a longitudinal profile is shown in Figure 4-2. The concrete bottom of the culvert would be removed and replaced with a trapezoidal rock-lined channel. Upstream and downstream from the culvert, a rock-lined step-pool channel would be constructed. Downstream from the culvert the rock-lined channel initially follows a straight alignment and then curves to the right to become perpendicular to the beach.

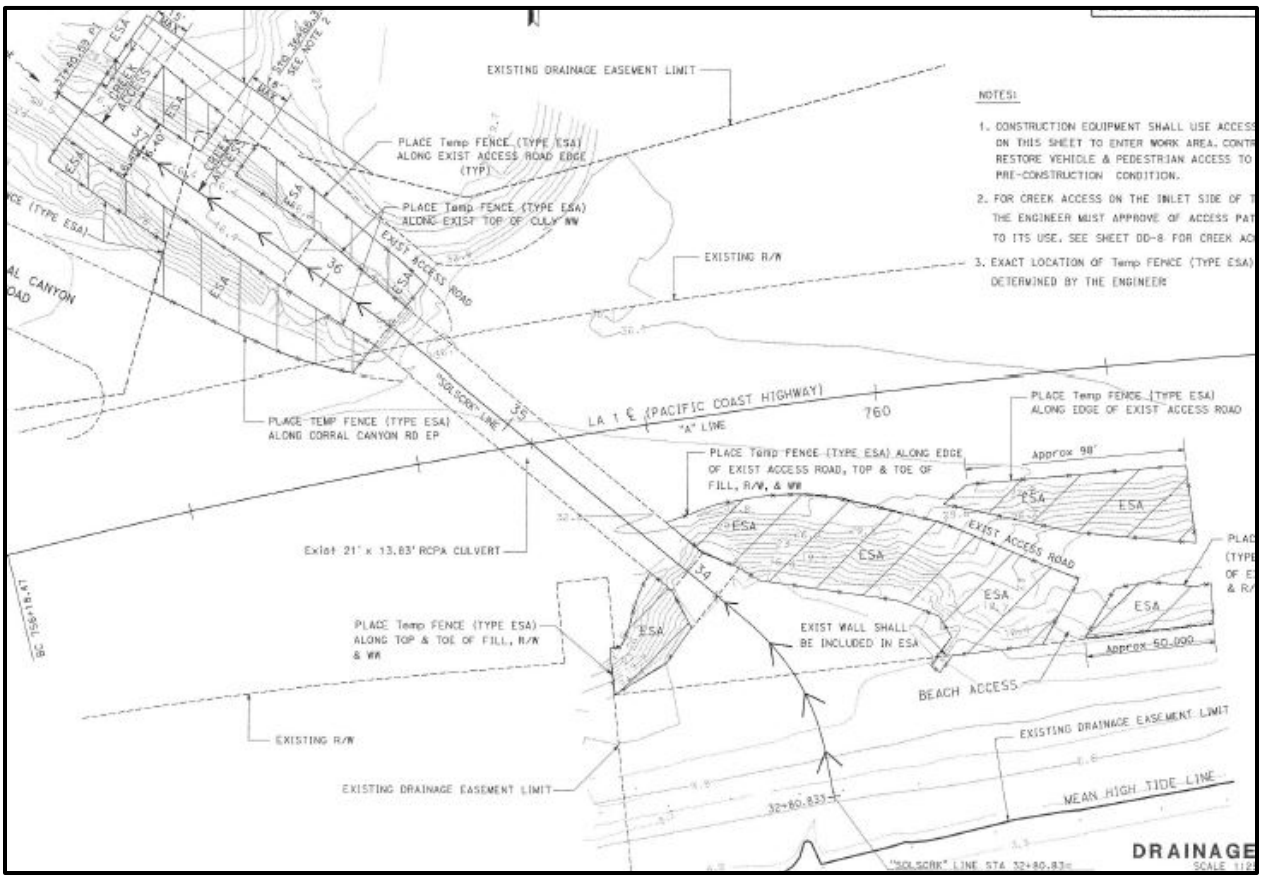

Figure 4-1. Plan view of alignment of proposed Caltrans design.

Mean Low Water (MLLW, elevation = -0.13 feet) is located about 93 feet downstream from the downstream end of the proposed rock-filled channel. MLLW is 5.06 feet lower in elevation than the invert of the proposed rock-lined channel. Mean High Water (MHW, elevation = 4.49 feet) is about 0.44 feet lower in elevation than the downstream end of the proposed rock-lined channel.

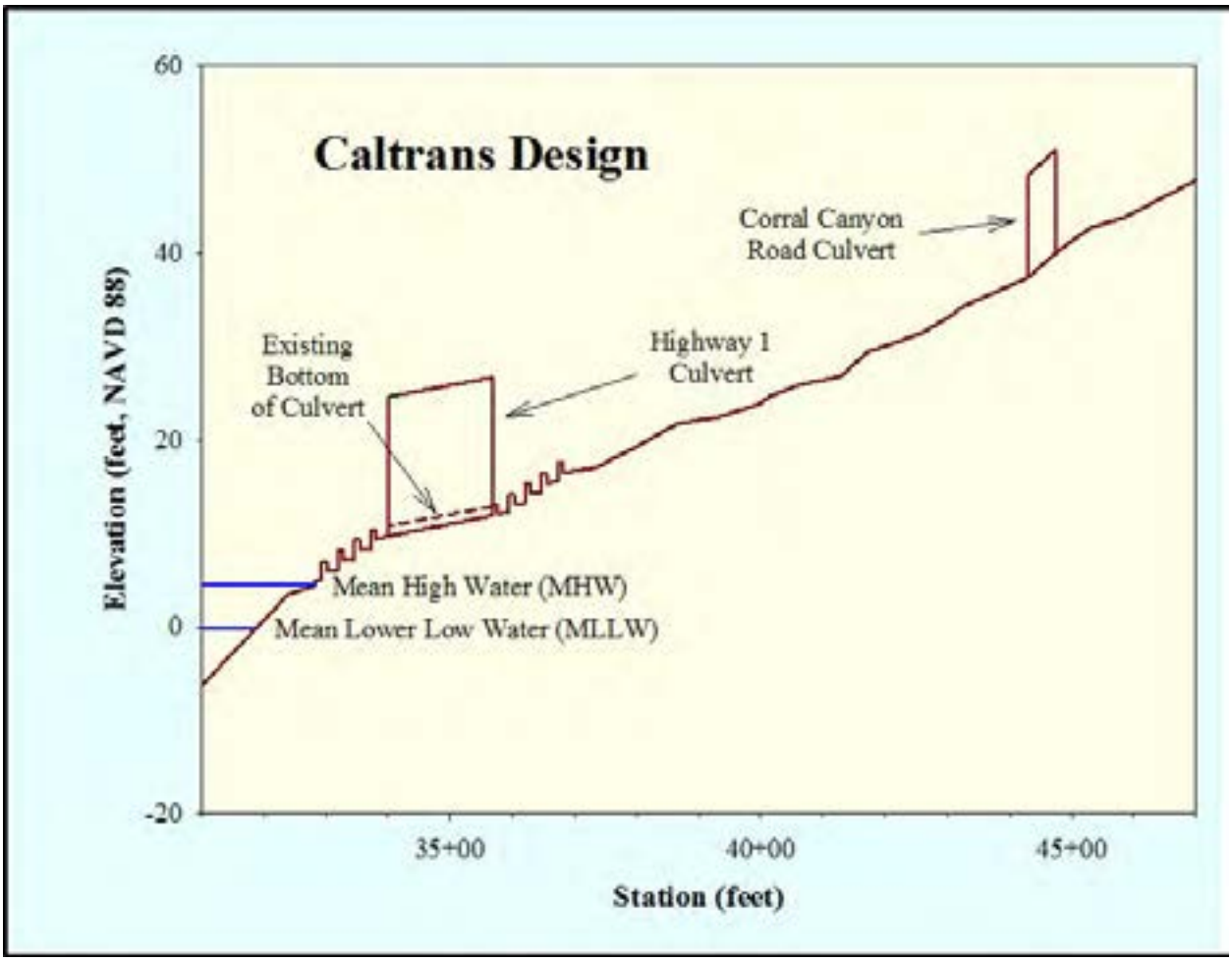

Figure 4-2. Longitudinal profile of Solstice Creek based on plan proposed by Caltrans.

4.1 DESCRIPTION OF CALTRANS DESIGN

A longitudinal profile of the proposed rock-lined channel from the downstream end of the channel to the downstream end of the culvert is shown in Figure 4-3. The gradient through this reach is about 4.3 percent. This reach includes a sequence of step-pools with four weirs. The weirs are eight feet long and the drop from pool to pool is 1.13 feet.

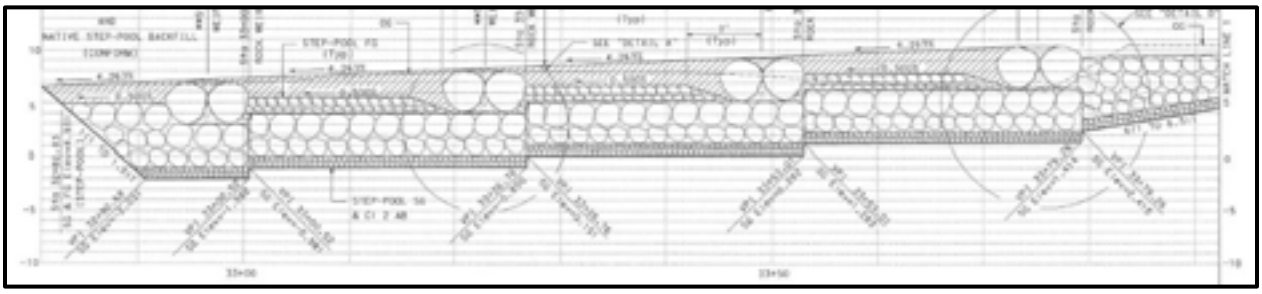

Figure 4-3. Longitudinal profile of proposed rock-lined channel from the downstream end of the channel to the downstream end of the culvert.

A typical cross-section in a pool between downstream end of proposed rock-filled channel and downstream end of culvert is shown in Figure 4-4. The rock weir is not shown in this cross-section.

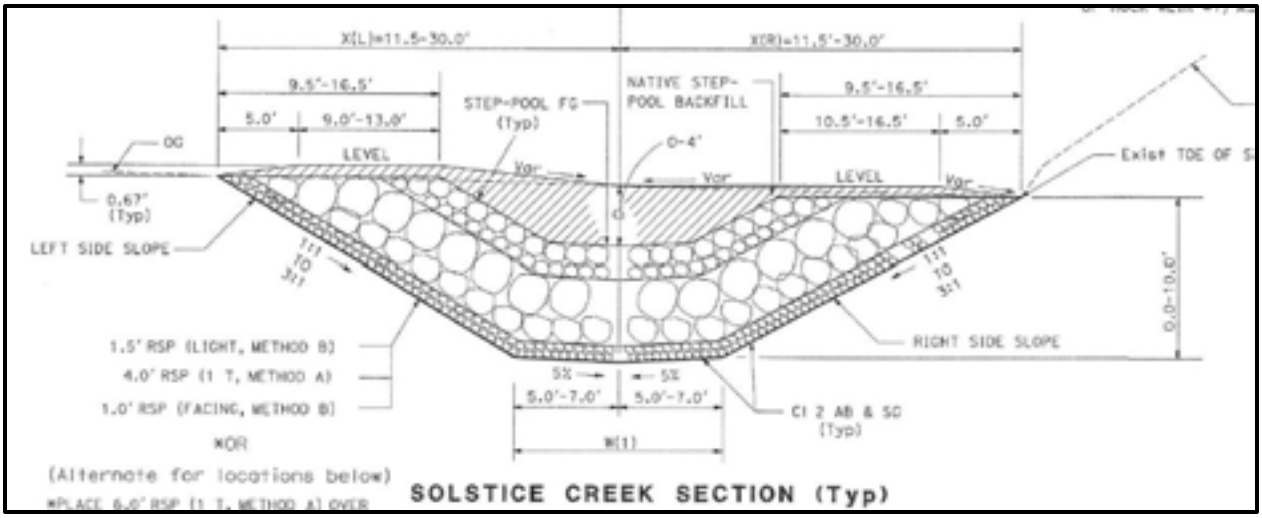

Figure 4-4. Typical cross-section in pool between downstream end of proposed rock-filled channel and downstream end of culvert. The rock weir is not shown in this cross-section.

A longitudinal profile of the proposed rock-lined channel from the downstream end of the culvert to the upstream end of the culvert is shown in Figure 4-5. The gradient through this reach is about 1.3 percent. There are no step-pools within the culvert, presumably to prevent accumulation of sediment.

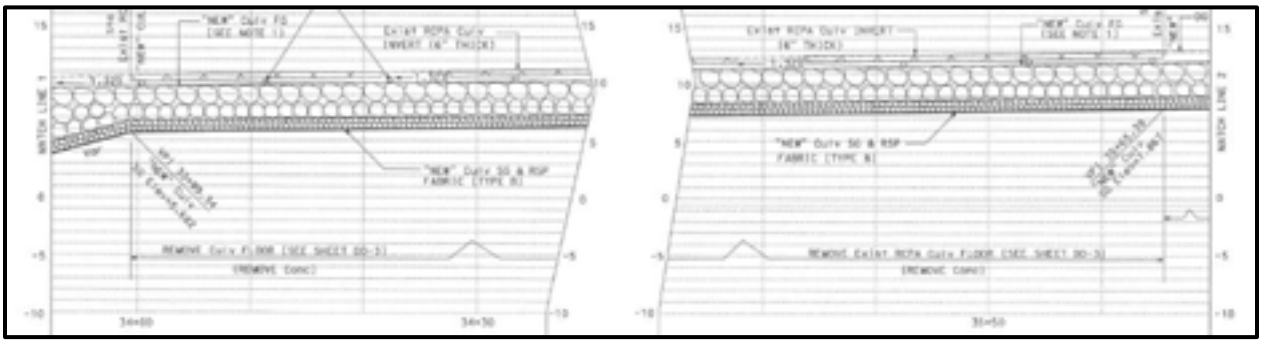

Figure 4-5. Longitudinal profile of proposed rock-lined channel from the downstream end of the culvert to the upstream end of the culvert.

A typical cross-section in the culvert is shown in Figure 4-6. Steel pipes would be installed to connect the bottom of the two sides of the culvert and provide structural integrity. The pipes would be spaced about 10 feet apart in the longitudinal direction. During construction, it is estimated that there will be 5 feet of excavation below the existing invert followed by 4 feet of fill.

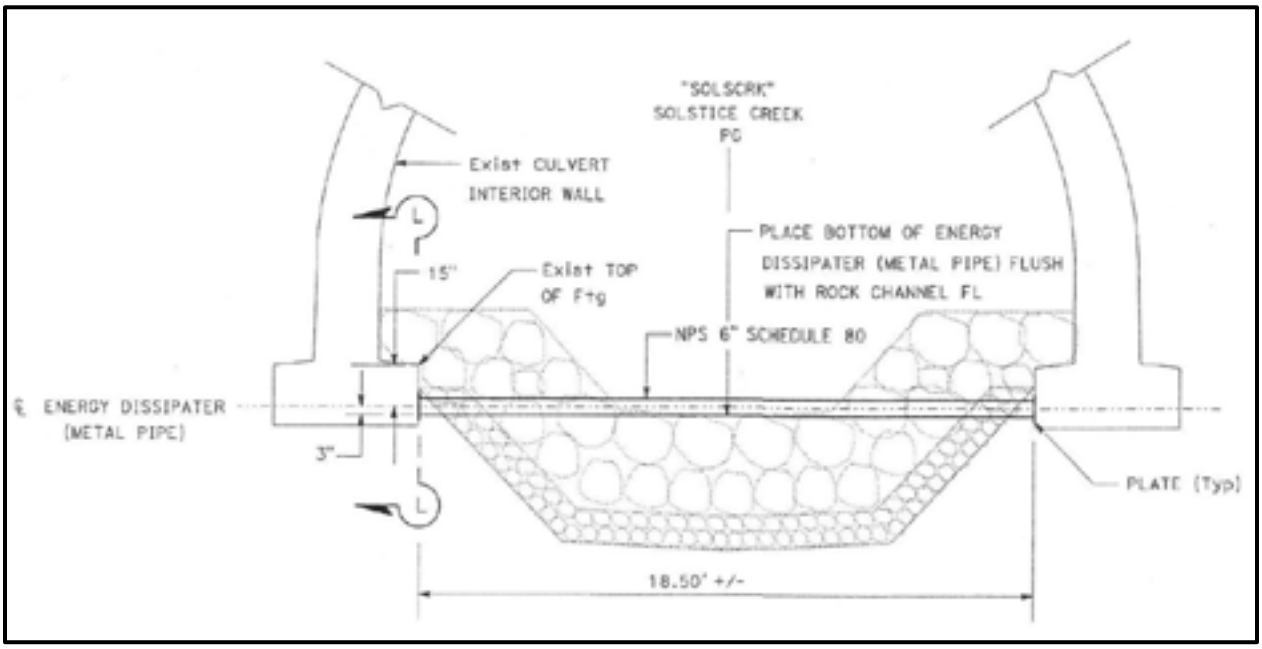

Figure 4-6. Typical cross-section within culvert. Structural support at the bottom of the culvert would be provided by six-inch steel pipes, spread 10 feet apart in the longitudinal direction.

A longitudinal profile of the proposed rock-lined channel from the upstream end of the culvert to the upstream end of the proposed rock-lined channel is shown in Figure 4-7. The gradient

through this reach is about 4.3 percent. This reach includes a sequence of step-pools with four weirs. The weirs are eight feet long and the drop from pool to pool is 1.13 feet.

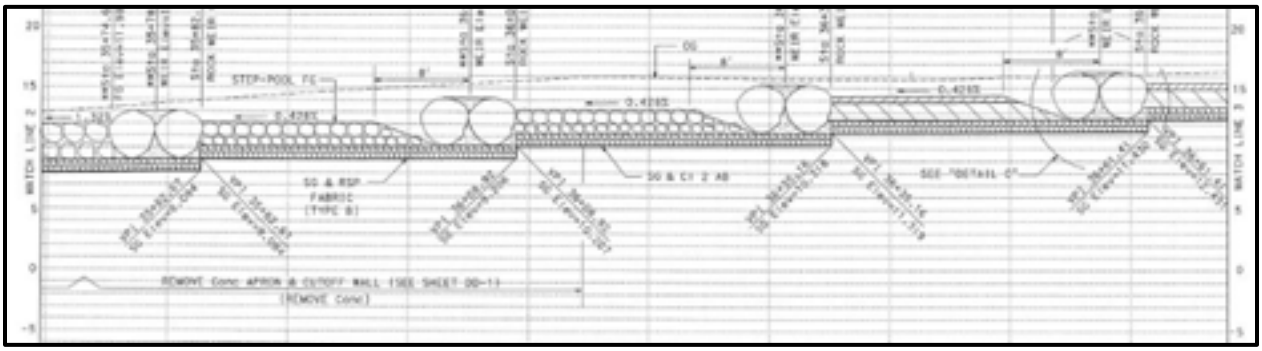

Figure 4-7. Longitudinal profile of proposed rock-lined channel from the upstream end of the culvert to the upstream end of the proposed rock-lined channel.

A typical cross-section in a pool between the upstream end of the culvert to the upstream end of the proposed rock-lined channel is shown in Figure 4-8. The rock weir is not shown in this cross-section.

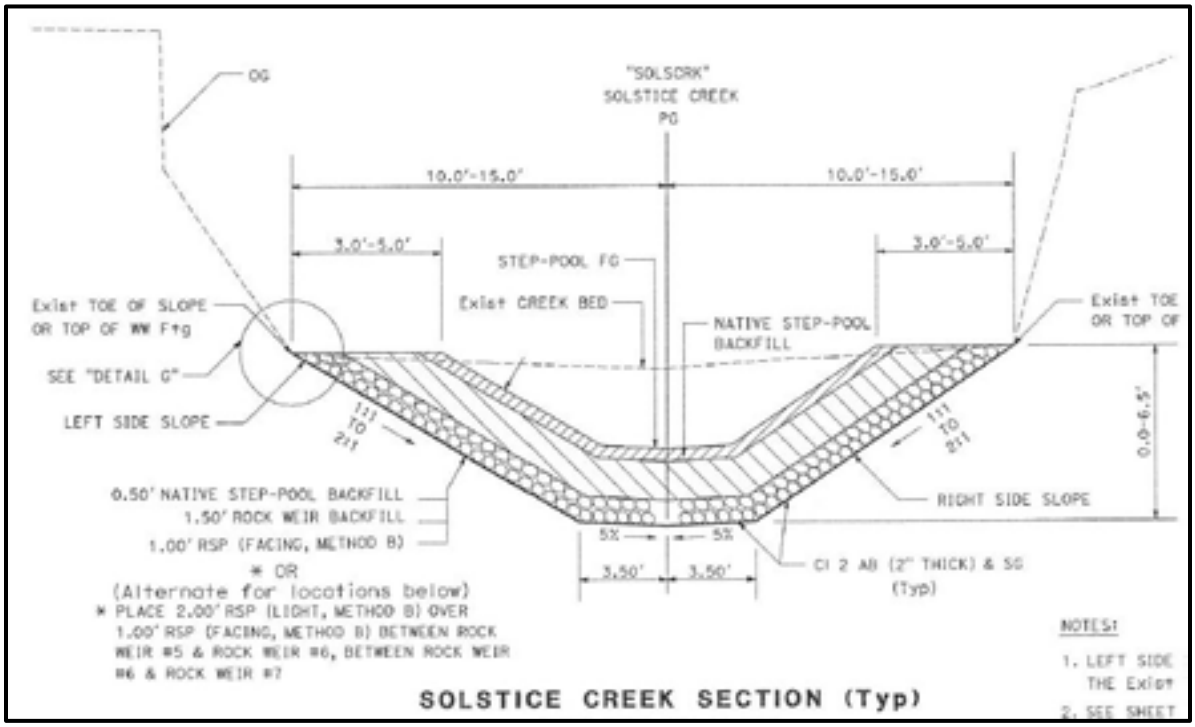

Figure 4-8. Typical cross-section in a pool between upstream end of culvert and upstream end of proposed rock-lined channel. The rock weir is not shown in this cross-section.

4.2 ASSESSMENT OF CALTRANS DESIGN

Caltrans (2016) provided a HEC-RAS model based on the proposed Caltrans design. This model was used to evaluate hydraulic conditions in the step pools and the culvert for 3 cfs, 8 cfs, 20 cfs, 50 cfs, and 129 cfs. This flow range encompasses the desired range for passage.

4.2.1 Step Pools

The weirs consist of two boulders. Each boulder has a diameter of four feet, and the combined length of the weir is eight feet. As discussed, in Section 2.4.7, the weir length would be too long for steelhead to pass upstream over the entire range of bursting velocities (13.7 fps to 26.5 fps).

The drop in head from pool to pool is 1.13 feet, slightly larger than the 1.0-foot head differential criteria. At the downstream end of each step pool configuration, flow depths would be too shallow for fish to leap over the first weir for flows ranging from 3 cfs to 50 cfs (Figure 4-9 and Figure 4-10).

Within the pools, flow depths are generally suitable for swimming (greater than 1.0 feet). However, they are too shallow for leaping (less than 2.0 feet deep) for flows ranging from 3 cfs to 20 cfs.

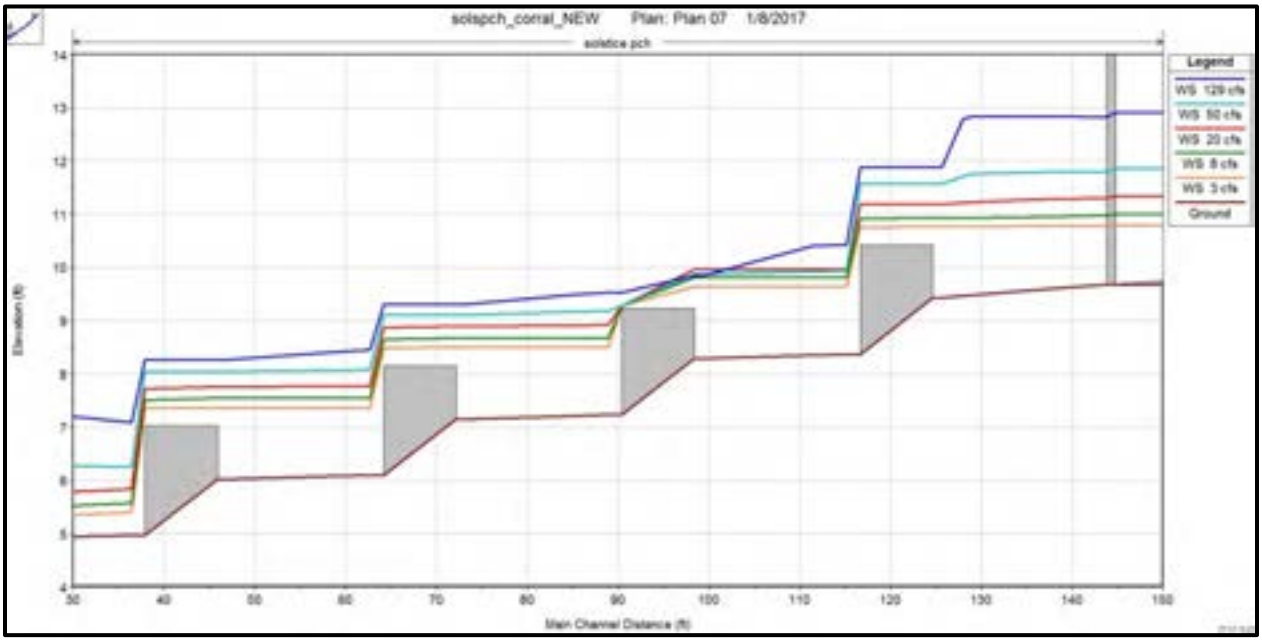

Figure 4-9. Longitudinal water surface profiles through step pools downstream from culvert with proposed Caltrans design for flows ranging from 3 cfs to 129 cfs.

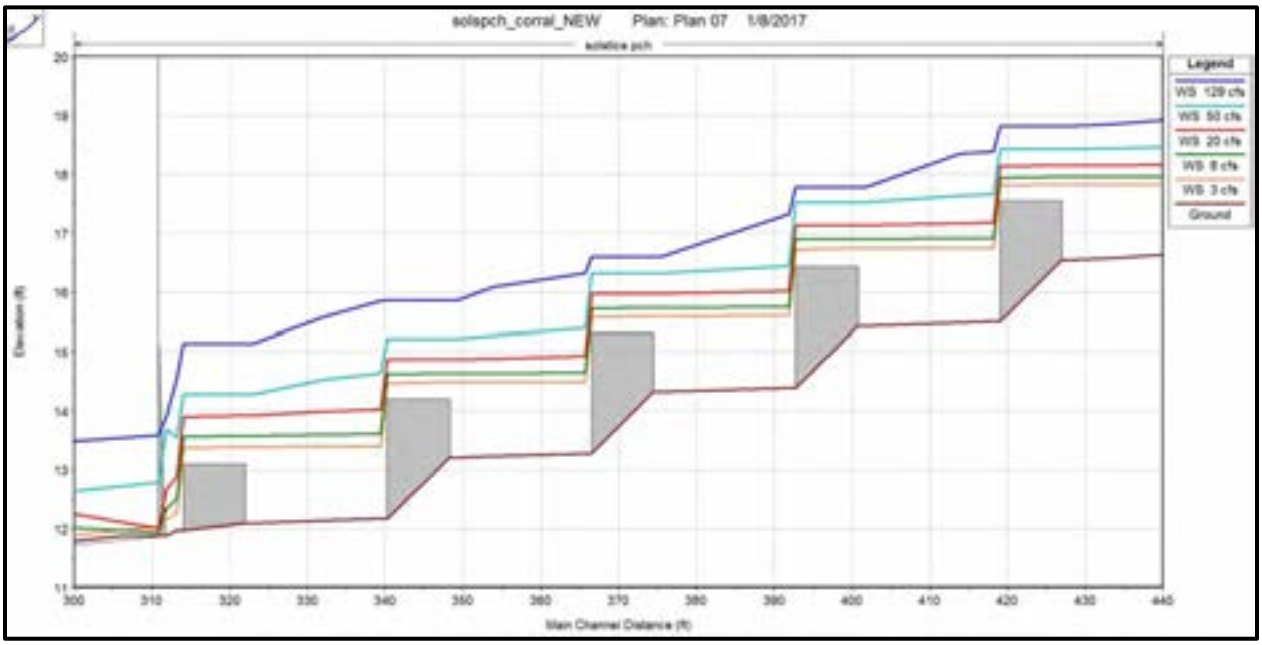

Figure 4-10. Longitudinal water surface profiles through step pools upstream from culvert with proposed Caltrans design for flows ranging from 3 cfs to 129 cfs.

Within the pools, energy dissipation factors are less than 4 ft-lbs per second per cubic foot for flows ranging from 3 cfs to 8 cfs, and are greater than 4 ft-lbs per second per cubic foot for flows ranging from 20 cfs to 129 cfs.

4.2.2 Culvert

At the upstream end of the culvert, flow depths would be too shallow for swimming (less than 1.0 feet) for flows ranging from 3 cfs to 20 cfs (Figure 4-11).

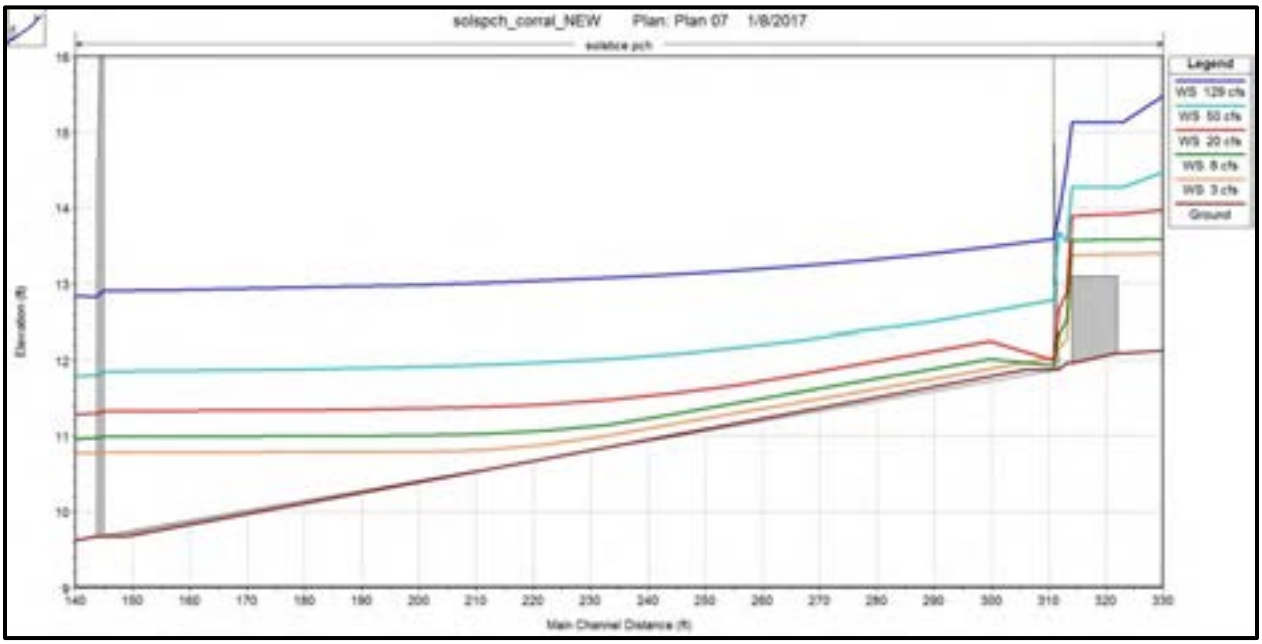

Figure 4-11. Longitudinal water surface profiles from the downstream end of the culvert to the upstream end of the culvert for fish passage flows ranging from 3 cfs to 129 cfs.

4.2.3 Sediment Transport

Solstice Creek is capable of transporting cobbles and boulders (Figure 2-5 and Figure 2-6). Under 2-year flood conditions, it is estimated that the creek can transport small to large cobbles. At higher flows, the creek will be capable of moving larger particles, and greater quantities of coarse sediment. These larger sediment sizes are likely to accumulate and fill in the pools within the step pool structure. Accumulation would begin in the most upstream pool in the step pool structure upstream from the culvert. The culvert and step pools would need to be inspected periodically. The pools would need to be maintained by excavating the accumulated sediment in the pools to maintain suitable passage conditions.

4.2.4 Scour

In the study performed by California Watershed Engineering (2011), it was estimated that scour could occur to a depth of four feet below MLLW (elevation minus 4.13 feet). The downstream end of the step pool rock structure (Figure 4-3) is above the potential scour depth. There may be some risk of the downstream end of the step pool structure becoming undermined by scour. The risk of scour may be greater when tide conditions are low and flows in Solstice Creek are high. The creek would have greater capacity to erode sediment from the steep (seven percent) slope between MHW and MLLW.

4.2.5 Potential Constraints

Under existing conditions, Solstice Creek is an intermittent stream. During periods when there is no flow in the creek, the beach gets reworked by tide and wave action, and no channel can be detected on the beach (Figure 3-1). With the proposed Caltrans design, tide and wave action would likely act to deposit sand on the step pool structure downstream from the culvert.

Under existing conditions, Solstice Creek carves out a channel on the beach when flows are sufficient to transport sand. The creek does not follow the same alignment each time a new channel is formed (Figure 3-6, Figure 3-7, and Figure 3-8). There is some concern that the creek may bypass any step pool structures placed on the beach and create a channel in the sand adjacent to the step pool structure (Figure 4-12).

From a geomorphic and aesthetic perspective, the step pool structure downstream from the culvert would be an unnatural structure on a sand beach. River sediment deposition and sand buildup from longshore drift could create frequent maintenance issues. Observations at other, similar structures in southern California (Arroyo Hondo Creek and Santa Paula Creek) provide evidence that accumulation of river sediments following wet years into dry years can result in riparian growth in these sediments creating extensive maintenance issues in these pool structures (Figure 4-13). If maintenance is not properly implemented following large flow events, the creek can bypass the structure similar to what occurred in Santa Paula Creek (Figure 4-12) temporarily disrupting passage opportunities for steelhead until maintenance is complete. At Santa Paula Creek, the passage structure was out of commission during much of the migration season for that year.

Accumulation of sand from longshore drift could also inundate any structure placed on the beach, acting much like perpendicular beach groins that are common on many southern California beaches. A buildup of sand at this location could create problems at the adjacent property and temporarily compromise fish passage though the structure (Figure 4-14).

Figure 4-12. Sediment accumulation and pool damage at fish passage structure following 2004/2005 storm events in Santa Paula Creek. The creek bypassed the structure on the right bank (looking downstream).

Figure 4-13. Sediment accumulation and vegetation growth in the Arroyo Hondo Creek culvert in Santa Barbara County 2017. This culvert ends at the beach similar to Solstice Creek.

Figure 4-14. Property adjacent to culvert outlet that could be effected by increased sand buildup from any structure placed on the beach perpendicular to the ocean.

4.3 SUMMARY OF CALTRANS DESIGN ANALYSIS

Within this section, a summary of the analyses of the Caltrans Design is provided downstream from the Highway 1 culvert, within the Highway 1 culvert, and upstream from the Highway 1 culvert.

4.3.1 Downstream from the Highway 1 Culvert

- There is a risk of scour at the downstream end of the rock-filled structure
- The weirs in the step pools are too long for steelhead to leap over
- The flow depth at the downstream end of the rock-filled channel would be too shallow for leaping at flows ranging from 3 cfs to 50 cfs.
- Within the step-pool structures, the flows depths would be too shallow for leaping at flows ranging from 3 cfs to 20 cfs
- The energy dissipation factors within the pools would exceed 4 ft-lbs per second per cubic foot at flows ranging from 20 cfs to 129 cfs.

- The head drop from pool to pool slightly exceeds the 1-foot standard for upstream passage.
- There is a risk of the creek bypassing the rock-filled structure where the creek exits the culvert
- The rock-filled structure would not look like a natural feature on the beach

4.3.2 Within the Highway 1 Culvert

- Flow depths would be too shallow for swimming at the upstream end of the culvert for flows ranging from 3 cfs to 20 cfs.
- During construction, the depth of excavation in the culvert is estimated to be about 5 feet, followed by 4 feet of fill. There are concerns about the structural integrity of the 70-year old culvert during and following construction

4.3.3 Upstream from the Highway 1 Culvert

- Within the step-pool structures, the flows depths would be too shallow for leaping for flows ranging from 3 cfs to 20 cfs
- The energy dissipation factors within the pools would exceed 4 ft-lbs per second per cubic foot for flows ranging from 20 cfs to 129 cfs.
- The head drop from pool to pool slightly exceeds the 1-foot standard for upstream passage.
- Coarse sediment (gravels and larger size particles) are likely to accumulate in the pools starting at the upstream end of the rock-filled structure. These accumulations of sediment would need to be periodically excavated to maintain passage conditions.

5. PROPOSED ALTERNATIVES

Within this section, three alternatives to the proposed Caltrans design are discussed. These alternatives consist of the following:

1. **Modified Caltrans Design** – the proposed Caltrans design would be modified to address concerns discussed in Section 4.2.
2. **Natural Slope Concept** – the bottom of the culvert would be removed, and the creek would be re-graded to mimic a natural slope through the culvert.
3. **Replace Culvert with Bridge** – the existing culvert was constructed 70 years ago. Depending on the current structural integrity of the culvert, replacement with a bridge may be worth considering.

5.1 MODIFIED CALTRANS DESIGN

To address concerns raised in Section 4.2 about the proposed Caltrans design, the proposed design was modified. A longitudinal profile of the modified Caltrans design is shown in Figure 5-1. The following modifications are proposed:

- **Weir length** – the two 4-foot diameter boulders (Figure 4-3 and Figure 4-7) would be replaced with a single five-foot diameter boulder (Figure 5-2). This would allow passage for the full range of steelhead bursting speeds (13.7 fps to 26.5 fps). In addition, two 2-foot diameter boulders (Figure 5-2) would be placed downstream from the weir to provide stability for the weir and to provide scour protection at the base of the drop. A scour depth analysis was performed of the configuration shown in Figure 5-2. The method developed by Thomas et al. (2000) and recommended by the Natural Resources Conservation Service (NRCS 2007) was used to perform this analysis. It was determined that there would be no scour on the downstream side of the 5-foot diameter boulders. The depths in the pool would be sufficient to dissipate the energy in the plunging flow.
- **Slope of step pool structures** – the head drop from pool to pool would be reduced from 1.13 feet to 1.00 feet. This would reduce the slope of the step pool structures from 4.3 percent to 3.8 percent.
- **Passage from the ocean to the first set of step pools** – to provide sufficient flow depths for leaping at the downstream end of the step pool structure, seven weirs (ranging in elevations from 4.88 feet to 10.88 feet) would be constructed (Figure 5-1). This would allow passage under MHW tide conditions. However, construction would extend beyond the current drainage easement and it would be necessary to obtain a permit for construction.

- **Passage from the culvert to the second set of step pools** – to provide sufficient flow depths for leaping from the culvert to the second set of step pools, the upstream end of the culvert would be lowered down to elevation 8.88 feet (two feet below the elevation of the weir just downstream from the culvert).
- **Upstream Weirs**- to accommodate the lower elevation of the Highway 1 culvert, the number of weirs upstream from the culvert would be increased to thirteen.
- **Passage from pool to pool** – to provide sufficient flow depths for passage from pool to pool, the bottom of each pool would be constructed two feet lower than the top of the downstream weir. This would also lower the energy dissipation factors in each pool, and provide suitable resting conditions.
- **Scour protection** – California Watershed Engineering (2011) has estimated a potential scour depth of four feet below MLLW. Scour protection should be provided down to this level at the downstream end of the step pool structure.
- **Training structures** – to ensure that the creek flows from the culvert into the step pool structure, training walls should be incorporated from the culvert to the downstream end of the step pool structure.

With these modifications, the accumulation of cobbles and boulders in the pools will remain an ongoing maintenance concern. Accumulation would initially occur in the most upstream pool. The culvert and step pools should be periodically inspected. Any accumulated coarse sediment in the pools would need to be excavated.

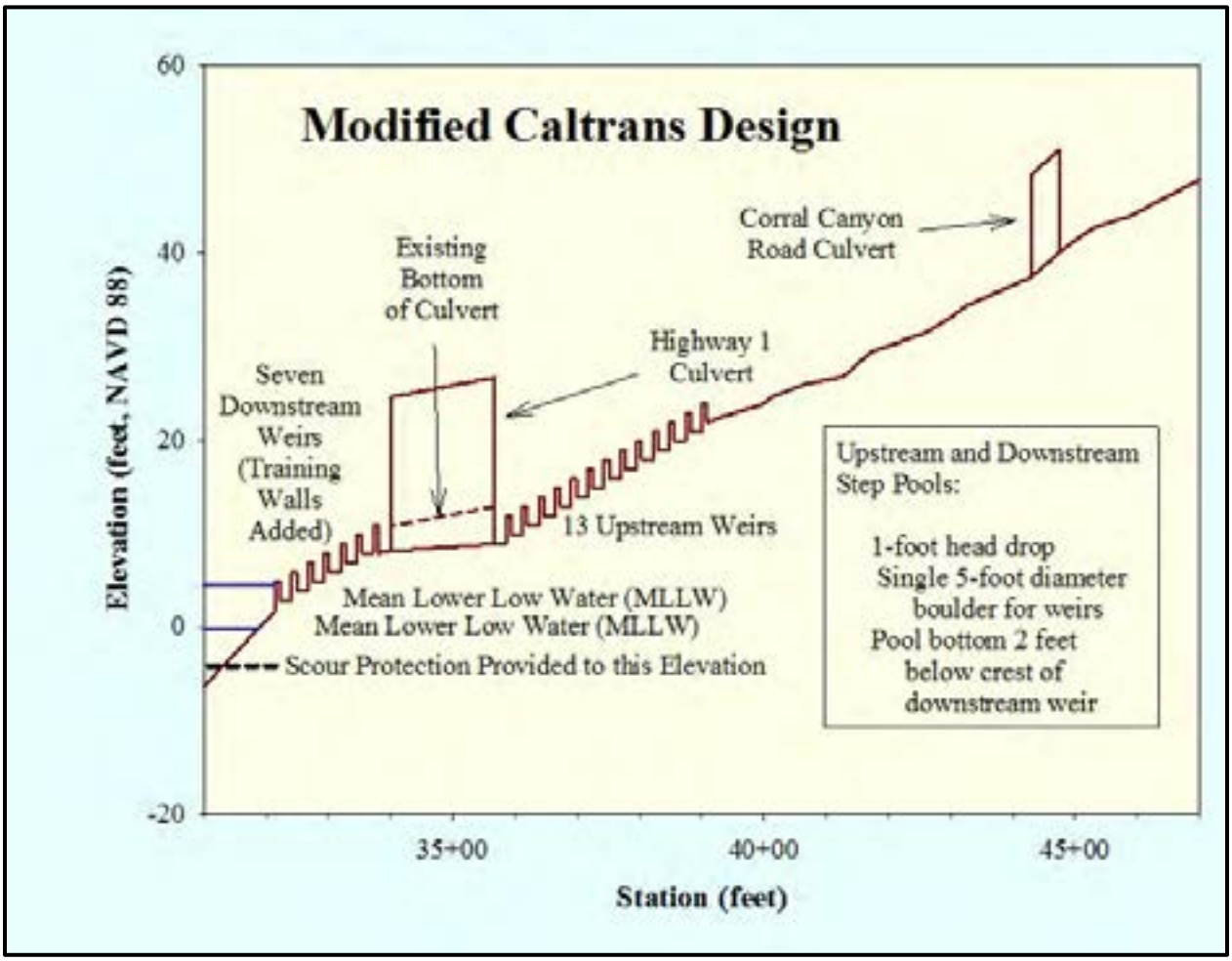

Figure 5-1. Longitudinal profile of Solstice Creek based on modified Caltrans proposal.

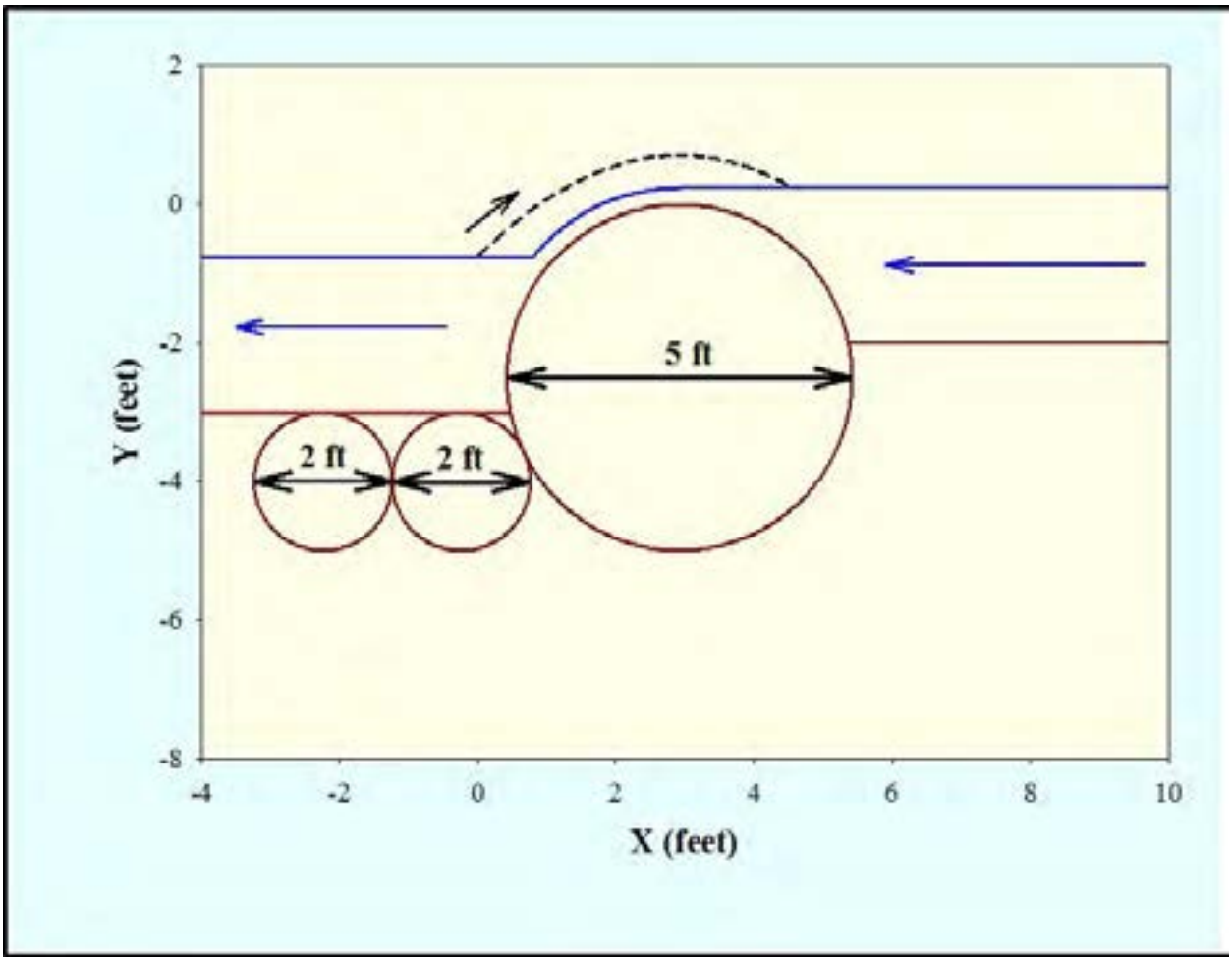

Figure 5-2. Single five-foot diameter weir configuration with two 2-foot diameter boulders placed downstream to provide stability for the five-foot diameter boulder and to provide scour protection.

5.2 SUMMARY OF MODIFIED CALTRANS DESIGN

Within this section, a summary of modifications to the Caltrans Design is provided downstream from the Highway 1 culvert, within the Highway 1 culvert, and upstream from the Highway 1 culvert.

5.2.1 Downstream from the Highway 1 Culvert

- Seven weirs would be constructed.
- At the downstream end of the structure, scour protection would be provided to and elevation of 4 feet below MLLW.
- The head drop from pool to pool would be 1 foot.

- Weirs would be constructed with a single row of 5-foot boulders.
- The bottom of each pool would be 2 feet below the crest elevation of the downstream weir. This will provide sufficient depths for leaping, and will reduce the energy dissipation factors.
- Training walls would be constructed along each side of the rock-filled structure to prevent the creek from bypassing the rock-filled structure.
- The rock-filled structure with training walls would not look like a natural feature on the beach.

5.2.2 Within the Highway 1 Culvert

- The upstream end of the culvert would be lowered to Elevation 8.88 feet (2 feet below the crest elevation of the downstream weir. This will provide sufficient depth for leaping over the first weir encountered upstream from the culvert.
- During construction, the depth of excavation at the upstream end of the culvert is estimated to be about 8 feet, followed by 4 feet of fill. There are concerns about the structural integrity of the 70-year old culvert during and following construction.

5.2.3 Upstream from the Highway 1 Culvert

- Thirteen weirs would be constructed.
- The head drop from pool to pool would be 1 foot.
- Weirs would be constructed with a single row of 5-foot boulders.
- The bottom of each pool would be 2 feet below the crest elevation of the downstream weir. This will provide sufficient depths for leaping, and will reduce the energy dissipation factors.
- Coarse sediment (gravels and larger size particles) are likely to accumulate in the pools starting at the upstream end of the rock-filled structure. These accumulations of sediment would need to be periodically excavated to maintain passage conditions.

5.3 NATURAL SLOPE CONCEPT

Upstream from the culvert, Solstice Creek provides conditions that appear to be suitable for upstream passage (Figure 2-5, Figure 3-11, and Figure 3-12) even though the slope is relatively steep (3.7 percent, Figure 5-3). To mimic these conditions, the downstream end of the culvert could be lowered four feet below the current culvert invert. This would eliminate the four-foot head drop at the downstream end of the culvert.

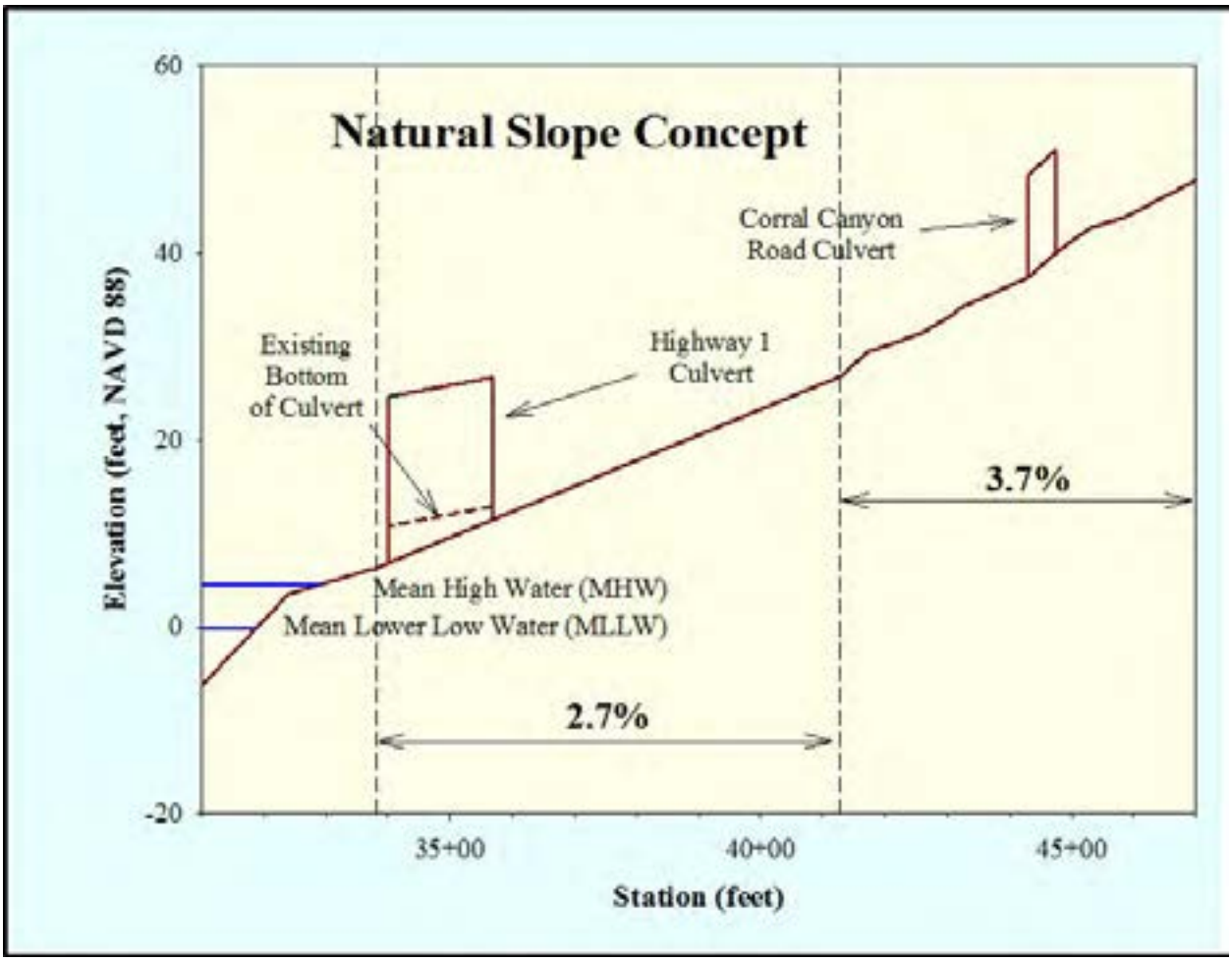

Figure 5-3. Longitudinal profile of Solstice Creek based on natural slope concept.

Through the culvert and upstream from the culvert, the creek could be excavated to provide a 2.7 percent slope until it intercepted the current stream grade (560 feet upstream from culvert, and shown in Figure 5-3). The excavated surface would need to be lined with cobbles and boulders, similar in size composition to Solstice Creek upstream from the culvert. High flows in Solstice Creek would shape the stream bottom in the excavated reach and help to provide hydraulic diversity needed for upstream passage.

Advantages of this concept include the following:

- There would be no need to place any structures in the sand beach downstream from the culvert. The creek, through natural geomorphic processes, would carve its own channel through the beach under high flow conditions and eliminate the need for maintenance.
- The four-foot head drop at the downstream end of the culvert would be eliminated.

- High flows through the creek would alter the morphology of the stream bed through the reached with constructed slope of 2.7 percent, and naturally create pools for resting. There would be no need for maintenance excavation because the pools would be naturally maintained.

5.3.1 Summary of Natural Slope Concept

A summary of the Natural Slope concept is provided below:

- Downstream from the Highway 1 culvert
- No structural modifications to the creek are envisioned downstream from the culvert. The beach would maintain its natural appearance
- Within the Highway 1 culvert:
    - The downstream end of the culvert will be lowered four feet to eliminate the current head drop at that location, and allow passage.
    - The culvert will be lined with gravel, cobble, and boulders similar in size composition to Solstice Creek upstream from Highway 1 Culvert
    - During construction, the depth of excavation at the downstream end of the culvert is estimated to be about 8 feet, followed by 4 feet of fill. There are concerns about the structural integrity of the 70-year old culvert during and following construction
- Upstream from the Highway 1 culvert:
    - The streambed of the creek will be lowered to provide a smooth transition to the current streambed upstream from the culvert.
    - The streambed will be lined with gravel, cobble, and boulders similar in size composition to Solstice Creek upstream from Highway 1 Culvert.
    - There will be no deep pools to collect sediment like there would be with the step-pool structures.

5.4 REPLACE CULVERT WITH BRIDGE

The existing culvert was constructed 70 years ago, and it may have outlasted its original design life. Depending on the current structural integrity, it may be worth considering replacement of the culvert with a bridge. A bridge would have a smaller geomorphic footprint, and would allow a more natural channel to form at the crossing.

The bridge could span Solstice Creek, or it could span the width of the apparent alluvial fan (Figure 2-4). A significant disadvantage of this concept is that it would disrupt traffic for an extended period. It would be necessary to route traffic around the construction site.

5.4.1 Summary of Culvert Replaced with Bridge

A summary of the bridge alternative is provided below:

- Downstream from the bridge
    - No structural modifications to the creek are envisioned downstream from the bridge. The beach would maintain its natural appearance
- Within the Bridge footprint
    - There would be a major disruption to traffic during bridge construction
    - Concerns about the structural integrity of the 70-year old culvert would be relieved.
    - Over time, the creek may migrate from side to side within the footprint of the historic alluvial fan
- Upstream from the Highway 1 culvert
    - No structural modifications to the creek are envisioned upstream from the bridge. There will be no deep pools to collect sediment like there would be with the step-pool structures.

6. DISCUSSION AND RECOMMENDATIONS

Under existing conditions, the Highway 1 culvert is a barrier to upstream steelhead passage in Solstice Creek. There is a four-foot drop at the downstream end of the culvert, and flow conditions within the culvert are too shallow for steelhead passage at certain flows and velocities are too high at higher flows. Various structural modifications to the culvert have been considered to improve passage conditions.

Previous studies have considered the structural stability of modifications to the culvert. Within this study, hydraulic conditions for steelhead passage are also considered. Steelhead migrate upstream through a combination of swimming and leaping. Along their passage routes, steelhead will recover from fatigue in resting areas. To design structures for upstream passage, hydraulic conditions for swimming, leaping, and resting need to be considered. The following hydraulic conditions are considered adequate for steelhead swimming, leaping, and resting:

- **Swimming** – Minimum depth of one foot. Swimming velocities less than 4.6 fps are referred to as sustained swimming (steelhead can swim at these speeds without accumulation of fatigue). At higher velocities, steelhead will need to rest to recover from fatigue. Swimming velocities ranging from 4.6 fps to 13.7 fps are referred to as prolonged swimming. Swimming velocities ranging from 13.7 to 26.5 fps are referred to as burst swimming, and steelhead will swim at these speeds for leaping.
- **Leaping** – A minimum depth of two feet in the downstream pool. As previously discussed in this report, steelhead will be capable of leaping over a single seven-foot diameter boulder with burst swimming speeds, and a one-foot head drop from pool-to-pool.
- **Resting** – Energy dissipation factor less than 4 ft-lb per second per cubic foot.

Passage conditions are typically provided for low flow conditions (up to one half of the 2-year flood). The culvert must also be capable of passing large floods, and transporting sediment. The Highway 1 culvert has been in place for 70 years. The current culvert appears to be adequately sized to convey floods, and to transport sediment (including cobbles and boulders) without accumulation of sediment within the culvert.

An overall summary and comparison of existing conditions, Caltrans design, modified Caltrans design, natural slope concept, and replacement of culvert with bridge is provided in Table 6-1.

Table 6-1. Overall summary and comparison of existing conditions, Caltrans design, modified Caltrans design, natural slope concept, and replacement of culvert with bridge

	Existing Conditions	Caltrans Design	Modified Caltrans Design	Natural Slope Concept	Replace Culvert with Bridge
Downstream from the Highway 1 Culvert	• Following dry periods, the waves and ocean currents rework the sand on the beach, and no channel can be detected (Figure 3-1) • When flows increase from zero, the creek carves a new channel through the beach. When flows are high (9 to 11-year flood), the creek carves a relatively straight channel (Figure 3-8). When flows are lower (3 to 4-year flood), the creek carves a channel that curves to the right (looking downstream (Figure 3-6 and Figure 3-7). • Just downstream from the culvert there is a four-foot drop that prevents upstream passage (Figure 2-6).	• There is a risk of scour at the downstream end of the rock-filled structure • The weirs in the step pools are too long for steelhead to leap over • The flow depth at the downstream end of the rock-filled channel would be too shallow for leaping at flows ranging from 3 cfs to 50 cfs. • Within the step-pool structures, the flows depths would be too shallow for leaping at flows ranging from 3 cfs to 20 cfs • The energy dissipation factors within the pools would exceed 4 ft-lbs per second per cubic foot at flows ranging from 20 cfs to 129 cfs. • The head drop from pool to pool slightly exceeds the 1-foot standard for upstream passage. • There is a risk of the creek bypassing the rock-filled structure where the creek exits the culvert • The rock-filled structure would not look like a natural feature on the beach	• Seven weirs would be constructed • At the downstream end of the structure, scour protection would be provided to and elevation of 4 feet below MLLW • The head drop from pool to pool would be 1 foot • Weirs would be constructed with a single row of 5-foot boulders • The bottom of each pool would be 2 feet below the crest elevation of the downstream weir. This will provide sufficient depths for leaping, and will reduce the energy dissipation factors. • Training walls would be constructed along each side of the rock-filled structure to prevent the creek from bypassing the rock-filled structure. • The rock-filled structure with training walls would not look like a natural feature on the beach	• No structural modifications to the creek are envisioned downstream from the culvert. The beach would maintain its natural appearance	• No structural modifications to the creek are envisioned downstream from the bridge. The beach would maintain its natural appearance
Within the Highway 1 Culvert	• The flow will be wide and shallow (Figure 3-10). The depths will be too shallow for upstream passage.	• Flow depths would be too shallow for swimming at the upstream end of the culvert for flows ranging from 3 cfs to 20 cfs. • During construction, the depth of excavation in the culvert is estimated to be about 5 feet, followed by 4 feet of fill. There are concerns about the structural integrity of the 70-year old culvert during and following construction	• The upstream end of the culvert would be lowered to Elevation 8.88 feet (2 feet below the crest elevation of the downstream weir). This will provide sufficient depth for leaping over the first weir encountered upstream from the culvert. • During construction, the depth of excavation at the upstream end of the culvert is estimated to be about 8 feet, followed by 4 feet of fill. There are concerns about the structural integrity of the 70-year old culvert during and following construction	• The downstream end of the culvert will be lowered four feet to eliminate the current head drop at that location, and allow passage. • The culvert will be lined with gravel, cobble, and boulders similar in size composition to Solstice Creek upstream from Highway 1 Culvert • During construction, the depth of excavation at the downstream end of the culvert is estimated to be about 8 feet, followed by 4 feet of fill. There are concerns about the structural integrity of the 70-year old culvert during and following construction	• There would be a major disruption to traffic during bridge construction • Concerns about the structural integrity of the 70-year old culvert would be relieved. • Over time, the creek may migrate from side to side within the footprint of the historic alluvial fan
Upstream from the Highway 1 Culvert	• Sediment may temporarily accumulate just upstream from the culvert (Figure 3-9). The creek will remove this deposit during high flows. • Upstream from the Highway 1 culvert, the creek appears to be passable for adults when the flows are in the 20 to 25 cfs range (Figure 3-11 and Figure 3-12) • Sediment accumulations were observed within the Corral Canyon culvert (Figure 3-13). The Corral Canyon culvert appeared passable for adults when flows are in the 20 to 25 cfs range.	• Within the step-pool structures, the flows depths would be too shallow for leaping for flows ranging from 3 cfs to 20 cfs • The energy dissipation factors within the pools would exceed 4 ft-lbs per second per cubic foot for flows ranging from 20 cfs to 129 cfs. • The head drop from pool to pool slightly exceeds the 1-foot standard for upstream passage. • Coarse sediment (gravels and larger size particles) are likely to accumulate in the pools starting at the upstream end of the rock-filled structure. These accumulations of sediment would need to be periodically excavated to maintain passage conditions.	• Thirteen weirs would be constructed • The head drop from pool to pool would be 1 foot • Weirs would be constructed with a single row of 5-foot boulders • The bottom of each pool would be 2 feet below the crest elevation of the downstream weir. This will provide sufficient depths for leaping, and will reduce the energy dissipation factors. • Coarse sediment (gravels and larger size particles) are likely to accumulate in the pools starting at the upstream end of the rock-filled structure. These accumulations of sediment would need to be periodically excavated to maintain passage conditions.	• The streambed of the creek will be lowered to provide a smooth transition to the current streambed upstream from the culvert. • The streambed will be lined with gravel, cobble, and boulders similar in size composition to Solstice Creek upstream from Highway 1 Culvert. • There will be no deep pools to collect sediment like there would be with the step-pool structures.	• No structural modifications to the creek are envisioned upstream from the bridge. There will be no deep pools to collect sediment like there would be with the step-pool structures.

Three of the alternatives considered (Proposed Caltrans Design, Modified Caltrans Design, and Natural Slope Concept) include removal of the bottom of the culvert, and excavation below the bottom of the culvert. It would be important to maintain the structural integrity of the culvert. The Proposed Caltrans Design includes the placement of pipes to connect the bottom sides of the culvert and prevent buckling. Stabilization of the exposed soil below the sidewalls of the culvert would need to be considered.

Two of the concepts (Proposed Caltrans Design and Modified Caltrans Design) include the construction of a step pool structure across the sand beach downstream from the culvert. This structure would look out of place from both a geomorphic and an aesthetic perspective. Under existing conditions, the creek does not follow the same alignment when it carves a channel in the beach (Figure 3-7, Figure 3-8, Figure 3-8, and Figure 6-1). There is some risk of the creek bypassing the step pool structure. This risk could be minimized by building training walls along the step pool structure as discussed in the Modified Caltrans Design.

These same two concepts (Proposed Caltrans Design and Modified Caltrans Design) would also have the potential to create significant maintenance issues from creek sediment and debris accumulation in the pools of the step pool structures and from sand buildup on the beach. Accumulation would initially occur at the most upstream pool. It would be necessary to periodically inspect the culvert and the step pools. In order to maintain suitable passage conditions, accumulated sediment in the pools would need to be excavated.

Given these considerations, we recommend the following:

- Review the results of the most recent inspection of the culvert. If necessary, perform an updated inspection.
- If the culvert is in good structural condition, then further consideration should be given to the Natural Slope Concept. Removal of the bottom of the culvert and excavation below the bottom of the culvert will require further structural analysis to ensure that this concept can be constructed while maintaining structural integrity.
- If the culvert is in poor structural conditions, then further consideration should be given to replacement of the culvert with a bridge.

Figure 6-1. Solstice Creek (unknown date). After exiting the culvert, the creek took a sharp left turn, followed the base of the highway embankment, and then took a sharp right turn towards the ocean.

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