

Miner Slough Bridge Project

SOLANO COUNTY, CALIFORNIA
DISTRICT 4 – SOL – 84 (PM 12.0/12.4)
EA: 0G660/Project ID: 0400000343

Initial Study with Proposed Mitigated Negative Declaration/ Environmental Assessment



Prepared by the
California Department of Transportation

The 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.



November 2015

General Information About This Document

What's in this document?

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), has prepared this Initial Study/Environmental Assessment (IS/EA), which examines the potential environmental impacts of the alternatives being considered for the proposed Miner Slough Bridge Project (project) located in Solano County, California. Caltrans is the lead agency under both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). This document tells you why the project is being proposed, what alternatives we have considered for the proposed project, how the existing environment could be affected by the proposed project, the potential impacts of each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

What you should do:

- Please read this document.
- Attend the public meeting on November 18, 2015 from 5:30 p.m. to 7:30 p.m. at the Rio Vista Fire Department Conference Room, 350 Main Street, Rio Vista, CA 94571.
- Additional copies of this document and related technical studies (listed in Appendix F) are available for review at the Caltrans District 4 office and the Rio Vista and Suisun City Libraries:

Caltrans District 4
Office of Environmental Analysis
111 Grand Avenue
Oakland, CA 94612
(510) 286-5610

Rio Vista Library
44 South Second St.
Rio Vista, CA 94571

Suisun City Library
33 Sunset, Suite 280 (2nd Floor)
Suisun City, CA 94585

- This document may be downloaded at the following website:
<http://www.dot.ca.gov/dist4/envdocs.htm>.

- We'd like to hear what you think. If you have any comments about the proposed project, please send your written comments to Caltrans by 5:00 p.m. on December 4, 2015.
- Send comments via postal mail to:
Zachary Gifford, Associate Environmental Planner
Caltrans Office of Environmental Analysis/Mail Station 8B
Department of Transportation, District 4
111 Grand Avenue
Oakland, CA 94612
- Send comments via email to: zachary.gifford@dot.ca.gov
- A public meeting will be held on November 18, 2015 from 5:30 p.m. to 7:30 p.m. at the Rio Vista Fire Department Conference Room, 350 Main Street Rio Vista, CA 94571.

What happens next?

After comments are received from the public and reviewing agencies, Caltrans, as assigned by the FHWA, may: (1) give environmental approval to the proposed project, (2) do additional environmental studies, or (3) abandon the project. If the project is given environmental approval and funding is obtained, Caltrans could design and construct all or part of the proposed project.

For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Department of Transportation, Attn: Zachary Gifford, Office of Environmental Analysis/Mail Station 8B, Department of Transportation District 4, 111 Grand Avenue, Oakland, CA 94612; (510) 286-5610 (Voice), or use the California Relay Service: 1 (800) 735-2929 (TTY), 1 (800) 735-2929 (Voice), or 711.

Construct a replacement bridge along a new alignment approximately 100 feet west of current alignment, or rehabilitate the existing bridge, between post miles (PMs) 12.0 and 12.4 of State Route (SR) 84 in Solano County, California.

**Initial Study with Proposed Mitigated Negative Declaration/
Environmental Assessment**

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 U.S.C. 4332(2)(C)

THE STATE OF CALIFORNIA
Department of Transportation

Cooperating Agencies: U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service,
National Marine Fisheries Service

Responsible Agencies: California Transportation Commission, Regional Water Quality
Control Board, California Department of Fish and Wildlife,
State Historic Preservation Office, Solano County, U.S. Coast Guard

11-4-15
Date of Approval


Bijan Sartipi
District Director
California Department of Transportation
CEQA/NEPA Lead Agency

The following person may be contacted for more information about this document:

California Department of Transportation
Attn: Zachary Gifford
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Oakland, CA 94612
(510) 286-5610

Proposed Mitigated Negative Declaration

Pursuant to Division 13: Public Resources Code

Project Description

The California Department of Transportation (Caltrans) proposes to rehabilitate or replace the bridge on State Route (SR) 84 over Miner Slough in Solano County.

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 Caltrans decision regarding the project is final. This MND is subject to change based on 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 land use, growth, coastal zone, wild and scenic rivers, parks and recreational facilities, community character and cohesion, environmental justice, utilities/emergency service systems, air quality, hazards and hazardous materials, noise, or paleontology.
- In addition, the proposed project would have less than significant effects to agricultural and farmlands, community impacts, traffic, visual and aesthetics, cultural resources, hydrology and floodplains, water quality, and geology and soils.
- With the following mitigation measures incorporated, the proposed project would have less than significant effects to biological resources: Revegetation and Planting; Compensatory Mitigation for Jurisdictional Features; Compensatory Mitigation for Delta Smelt and Longfin Smelt; Compensatory Mitigation for Giant Garter Snake; and Compensatory Mitigation for Swainson's Hawk.

Bijan Sartipi
District Director
District 4
California Department of Transportation
CEQA/NEPA Lead Agency

Date

Summary

The California Department of Transportation (Caltrans) proposes to rehabilitate or replace the existing bridge on State Route (SR) 84 over Miner Slough (the Miner Slough Bridge Project [project]). The project proposes two alternatives for the bridge based on a current planning study. The first alternative, Alternative 1 (bridge replacement), is to build a new swing-span bridge approximately 100 feet (ft) west of the existing alignment. The second alternative, Alternative 2 (bridge rehabilitation), is to rehabilitate the existing bridge. The project limits extend from SR 84 post mile (PM) 12.0 to 12.4. The bridge is approximately 30 miles southwest of Sacramento, California, connecting Ryer Island in the Sacramento-San Joaquin River Delta (the Delta) to the mainland, over Miner Slough. SR 84 traverses the Delta area as a levee road. It is a north-south, two-lane conventional highway that runs adjacent to agricultural, as well as limited residential, commercial, and industrial land. Caltrans is the lead agency responsible for preparing this Initial Study/Environmental Assessment (IS/EA) in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

The purpose of the project is to maintain connectivity to and from Ryer Island via the Miner Slough Bridge on SR 84. Alternative 1 or Alternative 2 would improve the seismic, safety, and operational characteristics (roadway geometry and curb correction) of the bridge to meet current design standards; maintain current vehicular capacity; and avoid further deterioration of the existing structure (including bridge pier footings). In addition, the proposed project would reduce maintenance efforts and costs associated with upkeep of the existing bridge. The project is needed to remedy deficiencies in the existing bridge, including cracks in the deck surface and spans and slumping of the levee and roadway fill materials near Abutment 12.

The existing Miner Slough Bridge includes two approach spans and a swing span (i.e., a span that rotates sideways on a central pivot to allow tall watercraft to pass through), and has two 9-foot-wide lanes. The proposed replacement structure would be a four-span bridge consisting of two pre-cast/pre-stressed I-girder approach spans (Spans 1 and 4) and a concrete deck over steel I-beams for the swing span (which consists of Spans 2 and 3 on either side of the pivoting pier), all over cast-in-steel-shell concrete piles. The proposed bridge would be similar in appearance to the existing bridge. Under the other Build Alternative the existing bridge would be rehabilitated by constructing three new approach spans with new foundations, performing substructure work at the center swing span pier, and replacing the bridge

deck and wooden stringers. The load rating for the bridge, the characteristics of the existing truss swing span superstructure, and the limited existing bridge width (18 ft 7 inches) would remain unchanged.

This proposed project would result in no impacts to resources related to land use, growth, coastal zone, wild and scenic rivers, parks and recreational facilities, community character and cohesion, environmental justice, utilities/emergency service systems, air quality, hazards and hazardous materials, noise, or paleontology because the project would repair or replace an existing transportation facility with no new access or expanded capacity.

The proposed project has the potential to impact resources related to agricultural and farmlands, community impacts, traffic, visual and aesthetics, cultural resources, hydrology and floodplain, water quality, geology and soils, and biological resources.

This IS/EA evaluates three Alternatives. The two Build Alternatives are to construct a replacement bridge on a new alignment and demolish the existing bridge (Alternative 1) or to rehabilitate the existing bridge in its current location (Alternative 2). Under the No-Build (No-Action) Alternative, the existing Miner Slough Bridge would continue to operate and Caltrans would continue to maintain the existing structure.

Table S-1 summarizes the potential impacts of the three Alternatives. The avoidance, minimization, and/or mitigation measures for the proposed project are summarized below in Table S-1 and in Appendix C. The proposed project would result in less than significant impact with implementation of mitigation.

Table S-1 Summary of Potential Impacts

Resource	Alternative 1 Bridge Replacement	Alternative 2 Bridge Rehabilitation	No-Build (No-Action) Alternative	Avoidance, Minimization, and/or Mitigation Measures
Human Environment				
Land Use				
Existing and Future Land Use	No conflict	No conflict	No conflict	None
Consistency with State, Regional, and Local Plans and Programs	Yes consistent	Yes consistent	No impact	None
Coastal Zone	No impact	No impact	No impact	None
Wild and Scenic Rivers	No impact	No impact	No impact	None

Table S-1 Summary of Potential Impacts

Resource	Alternative 1 Bridge Replacement	Alternative 2 Bridge Rehabilitation	No-Build (No-Action) Alternative	Avoidance, Minimization, and/or Mitigation Measures
Parks and Recreational Facilities	None in project site. Temporary effect to recreational use of Miner Slough	None in project site. Temporary effect to recreational use of Miner Slough	No impact	None
Growth	Not growth inducing	Not growth inducing	No impact	None
Farmlands/Timberlands	5.72 ac of farmland would be acquired	1.95 ac of farmland would be acquired	No impact	None
Community Impacts				
Community Character and Cohesion	No impact	No impact	No impact	None
Relocations and Real Property Acquisition	No relocations; acquisition of portions of three parcels	No relocations; acquisition of portions of three parcels	No impact	None
Environmental Justice	No impact	No impact	No impact	None
Utilities/Emergency Service Systems	None affected or relocated	None affected or relocated	No impact	None
Traffic and Transportation/Pedestrian and Bicycle Facilities	Temporary impacts during construction. None during operation	Temporary impacts during construction; temporary detour. None during operation	No impact	None
Visual/Aesthetics	None, consistent with existing setting.	None, consistent with existing setting.	No impact	None
Cultural Resources	None expected. Avoidance and minimization measures (AMMs) in event of unanticipated discovery.	None expected. AMMs in event of unanticipated discovery.	No impact	Measure CUL-1: Unanticipated Discovery of Cultural Resources. Measure CUL-2: Discovery of Human Remains.
Physical Environment				
Hydrology and Floodplain	Not significant	Not significant	No impact	None
Water Quality and Storm Water Runoff	Less than significant with AMMs	Less than significant with AMMs	No impact	Measure WATER-1: SWPPP. Measure WATER-2: Stockpile Area. Measure WATER-3: Temporary Construction Site BMPs. Measure WATER-4: Waste Management from Bridge Removal. Measure WATER-5: Permanent Treatment BMPs.

Table S-1 Summary of Potential Impacts

Resource	Alternative 1 Bridge Replacement	Alternative 2 Bridge Rehabilitation	No-Build (No-Action) Alternative	Avoidance, Minimization, and/or Mitigation Measures
Geology	None expected	None expected	No impact	None
Soils	None expected	None expected	No impact	None
Seismic	Less than significant with AMMs	Less than significant with AMMs	No impact	Measure GEO-1: Engineering design of project structures will be carried out in accordance with the latest version of the Caltrans Standard Design Criteria (SDC).
Topography	No impact	No impact	No impact	None
Paleontology	No impact	No impact	No impact	None
Hazardous Waste/Materials	No increased risk construction or operation	No increased risk construction or operation	No impact	None
Air Quality	No impact, exempt from conformity requirement	No impact, exempt from conformity requirement	No impact	Measure AIR-1: Construction Period Best Management Practices
Noise	No increase in traffic capacity; no impact	No increase in traffic capacity; no impact	No impact	None
Biological Environment				
Natural Communities	Less than significant with AMMs and mitigation	Less than significant with AMMs	No impact	Measure AIR-1 Measures WATER 1, 2, 3 and 4. Measure BIO-1: ESA Fencing. Measure BIO-2: Vegetation Control. Measure BIO-3: Wetland Avoidance and Minimization. Measure BIO-4: Worker Environmental Awareness Training. Measure BIO-5: Avoidance of Entrapment. Measure BIO-6: Pre-construction Surveys. Measure BIO-7: Handling of Listed Species. Measure BIO-8: Vegetation Removal. Mitigation Measure BIO-A: Revegetation and Planting.
Wetlands and Other Waters	Less than significant with AMMs and mitigation	Less than significant with AMMs	No impact	Measures WATER-1, 2, 3 and 4. Measures BIO-1 and 2. Measure BIO-9: Wetland Avoidance and Minimization. Mitigation Measure BIO-B: Compensatory Mitigation for Jurisdictional Features.

Table S-1 Summary of Potential Impacts

Resource	Alternative 1 Bridge Replacement	Alternative 2 Bridge Rehabilitation	No-Build (No-Action) Alternative	Avoidance, Minimization, and/or Mitigation Measures
Plant Species	Less than significant with AMMs	Less than significant with AMMs	No impact	Measure AIR-1 Measures WATER 1, 2, 3 and 4. Measures BIO 1, 2, 3, 4, 5, 6, 7, 8 and 9.
Animal Species	Less than significant with AMMs	Less than significant with AMMs	No impact	Measure AIR-1, Measures WATER 1, 2, 3 and 4. Measures BIO 1, 2, 3, 4, 5, 6, 7 and 8. Measure BIO-10: Pre-construction Surveys for Birds.
Threatened and Endangered Species	Less than significant with AMMs and mitigation	Less than significant with AMMs	No impact	Measure BIO-11: Biological Monitoring. Measure BIO-12: In-Water Work Window. Measure BIO-13: Dewatering. Measure BIO-14: Underwater Sound Pressures. Measure BIO-15: Valley Elderberry Longhorn Beetle Fencing and Signage. Measure BIO-16: Giant Garter Snake Habitat Work Window. Measure BIO-17: Aquatic Habitat Dewatering. Measure BIO-18: Erosion Control Materials. Measure BIO-19: Site Restoration. Measure BIO-20: Swainson's Hawk Work Window. Measure BIO-21: Tree Removal. Measure BIO-22: Swainson's Hawk Surveys. Mitigation Measure BIO-C: Compensatory Mitigation for Delta Smelt and Longfin Smelt. Mitigation Measure BIO-D: Compensatory Mitigation for Giant Garter Snake. Mitigation Measure BIO-E: Compensatory Mitigation for Swainson's Hawk.
Invasive Species	Less than significant with AMMs	Less than significant with AMMs	No impact	Measure AIR-1 Measures WATER-1, 2, 3 and 4. Measures BIO-1, 2, 3, 4, 5, 6, 7 and 8. Measure BIO-23: Invasive Species.

Anticipated permits for this project include a California Department of Fish and Wildlife Section 1602 Lake and Streambed Alteration Agreement and Section 2081 Incidental Take Permit; a Clean Water Act (CWA) Section 404 Nationwide Permit and a Section 10 Consultation with the U.S. Army Corps of Engineers; a CWA Section 401 Water Quality Certification from the Central Valley Regional Water Quality Control Board; a Biological Opinion from the U.S. Fish and Wildlife Service; a Biological Opinion from the National Marine Fisheries Service; and a Bridge Permit from the U.S. Coast Guard.

Table of Contents

General Information About This Document	iii
Proposed Mitigated Negative Declaration	vii
Summary	ix
List of Abbreviated Terms	xix
Chapter 1 Proposed Project	1-1
1.1 Introduction.....	1-1
1.2 Purpose and Need	1-2
1.2.1 Purpose.....	1-2
1.2.2 Need	1-2
1.2.3 Independent Utility and Logical Termini.....	1-9
1.3 Project Description	1-9
1.4 Project Alternatives.....	1-10
1.4.1 Build Alternatives	1-10
1.4.2 No-Build (No-Action) Alternative.....	1-24
1.5 Alternatives Considered but Eliminated from Further Discussion	1-24
1.6 Permits and Approvals Needed.....	1-25
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures	2-1
2.1 Human Environment.....	2-4
2.1.1 Farmlands/Timberlands	2-4
2.1.2 Community Impacts.....	2-11
2.1.3 Traffic and Transportation/Pedestrian and Bicycle Facilities	2-14
2.1.4 Visual/Aesthetics	2-18
2.1.5 Cultural Resources	2-21
2.2 Physical Environment	2-27
2.2.1 Hydrology And Floodplain	2-27
2.2.2 Water Quality and Storm Water Runoff	2-33
2.2.3 Geology/Soils/Seismic/Topography	2-45
2.3 Biological Environment.....	2-51
2.3.1 Natural Communities	2-51
2.3.2 Wetlands and Other Waters	2-60
2.3.3 Plant Species	2-69
2.3.4 Animal Species	2-76
2.3.5 Threatened and Endangered Species.....	2-81
2.3.6 Invasive Species.....	2-105
2.4 Cumulative Impacts	2-107
2.4.1 Regulatory Setting	2-107
2.4.2 Affected Environment.....	2-107
2.4.3 Issues with No Cumulative Effect	2-110
2.4.4 Issues with the Potential to Contribute to Cumulative Effects	2-111
2.5 Climate Change.....	2-112
Chapter 3 Comments and Coordination	3-1
Chapter 4 List of Preparers.....	4-1
Chapter 5 Distribution List	5-1
Chapter 6 References Cited.....	6-1

List of Figures

Figure 1-1	Project Vicinity	1-3
Figure 1-2	Project Location.....	1-5
Figure 1-3	Profile Drawings of the Existing and Proposed Bridges	1-7
Figure 1-4	Bridge Replacement Project Components	1-11
Figure 1-5	Bridge Rehabilitation Project Components	1-13
Figure 2-1	Parcel Acquisitions: Bridge Replacement	2-7
Figure 2-2	Parcel Acquisitions: Bridge Rehabilitation.....	2-9
Figure 2-3	State Routes and Ferry Crossings in the Project Vicinity.....	2-16
Figure 2-4	Archaeological and Architectural Areas of Potential Effects	2-23
Figure 2-5	Federal Emergency Management Agency Flood Insurance Rate Map	2-29
Figure 2-6	Flow Path from Miner Slough Bridge to the San Joaquin River at the Delta.....	2-39
Figure 2-7	Natural Resource Conservation Service Soils Map	2-47
Figure 2-8	Habitat Types within the Biological Study Area	2-53
Figure 2-9	Impacts to Potential Wetlands and Other Waters: Bridge Replacement ..	2-65
Figure 2-10	Impacts to Potential Wetlands and Other Waters: Bridge Rehabilitation.	2-67
Figure 2-11	Impacts to Special-status Plant Species: Bridge Replacement	2-71
Figure 2-12	Impacts to Special-status Plant Species: Bridge Rehabilitation	2-73
Figure 2-13	Fisheries Impacts: Bridge Replacement	2-91
Figure 2-14	Giant Garter Snake Habitat: Bridge Replacement.....	2-93
Figure 2-15	Fisheries Impacts: Rehabilitation Alternative.....	2-97
Figure 2-16	Giant Garter Snake Habitat Impacts: Rehabilitation Alternative.....	2-99
Figure 2-17	California Greenhouse Gas Forecast	2-117
Figure 2-18	Mobility Pyramid.....	2-118

List of Tables

Table S-1	Summary of Potential Impacts.....	x
Table 1-1	New Bridge Piers and Foundations	1-16
Table 1-2	Required Permits and Approvals	1-25
Table 2-1	Anticipated Right-of-Way Requirements Under Alternative 1	2-13
Table 2-2	Anticipated Right-of-Way Requirements Under Alternative 2	2-14
Table 2-3	Fault Data	2-49
Table 2-4	Natural Communities Area of Effects – Alternative 1.....	2-56
Table 2-5	Natural Communities Area of Effects – Alternative 2.....	2-57
Table 2-6	Plant Species and Habitats of Concern within the Study Area.....	2-70
Table 2-7	Cumulative Impacts Analysis by Resource Area	2-107
Table 2-8	Cumulative Projects: Past, Present, and Reasonably Foreseeable Projects in the State Route 84 Vicinity	2-109
Table 2-9	Climate Change/CO ₂ Reduction Strategies	2-120
Table 3-1	Agency Coordination Meetings and Correspondence	3-2

List of Appendices

Appendix A	CEQA Checklist
Appendix B	Title VI Policy Statement
Appendix C	Avoidance, Minimization, and/or Mitigation Summary
Appendix D	Special-status Plant and Animal Species
Appendix E	CNDDDB, USFWS, and NMFS Species Lists
Appendix F	List of Technical Studies
Appendix G	Layout Plans

List of Abbreviated Terms

AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
ac	acre(s)
AC	asphaltic concrete
ADA	Americans with Disabilities Act
AMM	avoidance and minimization measure
APE	Area of Potential Effects
APN	Assessor's Parcel Number
ARB	California Air Resources Board
BMP	Best Management Practice
BT&H	Business, Transportation and Housing Agency
Cal/EPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CASGEM	California Statewide Groundwater Elevation Monitoring
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGF	California Fish and Game Code
CFR	Code of Federal Regulations
CGP	Construction General Permit

CISS	cast-in-steel-shell
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO ₂	carbon dioxide
CTP	California Transportation Plan 2040
CWA	Clean Water Act
Delta	Sacramento-San Joaquin River Delta
DPS	Distinct Population Segment
DSA	Disturbed Soil Area
DWR	California Department of Water Resources
EA	Environmental Assessment
EFH	Essential Fish Habitat
EO	Executive Order
ESA	Environmentally Sensitive Area
ESU	Evolutionarily Significant Unit
FESA	federal Endangered Species Act
ft	foot/feet
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
FSTIP	Federal Statewide Transportation Improvement Program
GGG	giant garter snake
GHG	greenhouse gas

IS	Initial Study
LOS	Level of Service
MBTA	Migratory Bird Treaty Act
mph	miles per hour
MPO	Metropolitan Planning Organization
MS4	municipal separate storm sewer system
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRC	National Research Council
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PA	Programmatic Agreement
PM	post mile
PRC	California Public Resources Code
PS&E	plans, specifications, and estimates
RAP	Relocation Assistance Program
RC	reinforced concrete
ROW	right-of-way

RWQCB	Central Valley Regional Water Quality Control Board
SB	Senate Bill
SDC	Seismic Design Criteria
SHPO	State Historic Preservation Officer
SLR	sea level rise
SR	State Route
STRAIN	Structure Replacement and Improvements Needs
SWH	shallow water habitat
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TMDL	total maximum daily load
TMP	Traffic Management Plan
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VELB	valley elderberry longhorn beetle
WDR	Waste Discharge Requirement
WSE	water surface elevation

Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans) proposes to rehabilitate or replace the Miner Slough Bridge (No. 23-0035) to address deterioration and meet design standards. The Miner Slough Bridge is part of State Route (SR) 84 in Solano County and connects Ryer Island in the Sacramento-San Joaquin River Delta (Delta) to the mainland, over Miner Slough. The bridge is located in a rural area where crossings of Delta waterways, including Miner Slough, are limited in number and far between. The continued connection of Ryer Island to the mainland via SR 84 is an important component of regional connectivity. The bridge is located approximately 30 miles southwest of Sacramento; the project limits extend from SR 84 post mile (PM) 12.0 to 12.4. Figures 1-1 and 1-2 show the proposed Miner Slough Bridge Project (project) vicinity and location maps, respectively.

Caltrans is the lead agency under both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) for this Initial Study/Environmental Assessment (IS/EA). The project is funded by the 2012 State Highway Operation and Protection Program, under the Bridge Rehabilitation Program 201.110. The proposed project is not included in the 2015 Federal Statewide Transportation Improvement Program (FSTIP). The 2007 Structure Replacement and Improvements Needs (STRAIN) Report recommended replacement of the bridge superstructure.

The existing Miner Slough Bridge includes two approach spans and a swing span (i.e., a span that rotates sideways on a central pivot to allow tall watercraft to pass through), and has two 9-foot (ft)-wide lanes. The existing bridge has a soffit elevation (i.e., the height of the underside of the bridge) of 20.3 ft NAVD88 (North American Vertical Datum of 1988).

This IS/EA discusses two Build Alternatives and a No-Build Alternative. Two Build Alternatives are proposed to either replace or rehabilitate the Miner Slough Bridge. In the first Build Alternative, Caltrans proposes to replace the existing bridge over Miner Slough with a new bridge approximately 100 ft west of the existing bridge. The proposed replacement structure is a four-span bridge consisting of two pre-cast/pre-stressed I-girder approach spans (Spans 1 and 4) and a concrete deck over steel I-beams for the swing span (which consists of Spans 2 and 3 on either side of the

pivoting pier), all over cast-in-steel-shell (CISS) concrete piles. The replacement bridge would be approximately 220 ft long and have a soffit elevation of 24.09 ft NAVD88. The second Build Alternative is to rehabilitate the existing bridge by constructing three new approach spans with new foundations, performing substructure work at the center swing span pier, and replacing the bridge deck and wooden stringers. The rehabilitated bridge would have a soffit elevation of 20.22 ft NAVD88. Profile drawings of the existing and proposed bridges are shown in Figure 1-3. Project layout plans for the Build Alternatives are shown in Appendix G.

1.2 Purpose and Need

1.2.1 Purpose

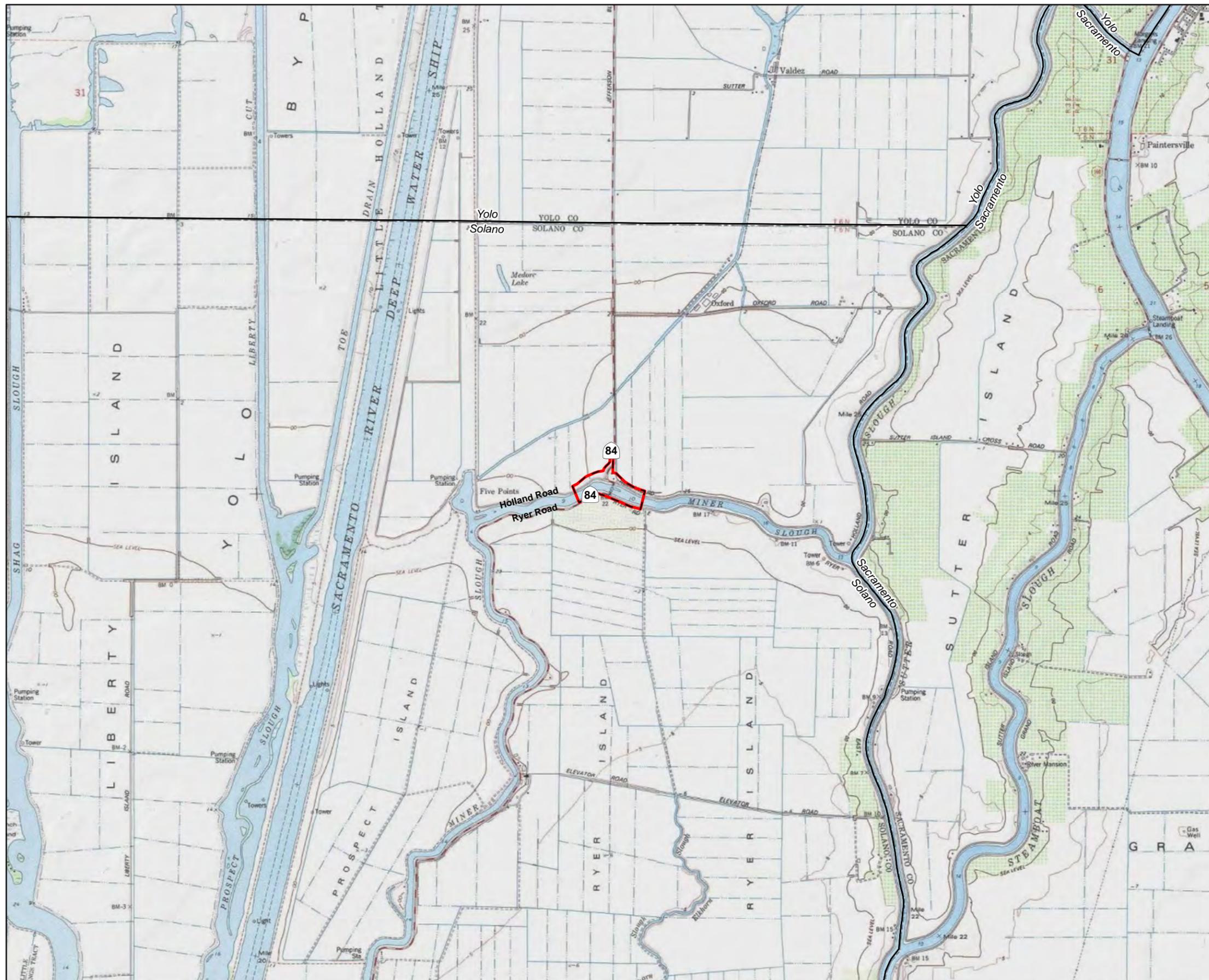
The purpose of the project is to remedy deficiencies of the existing Minor Slough Bridge to maintain connectivity on SR 84 to and from Ryer Island.

1.2.2 Need

The proposed Miner Slough Bridge Project is needed to remedy the following deficiencies:

- The deck surface of all spans exhibits extensive cracks caused by the differential deflection (change in elevation from one framing member to the adjacent one) of its parallel wooden planks, which deteriorate into spalls (fragments or chips) that create voids in the pavement.
- All spans contain checks (cracks in wood caused by tension) and other cracks which may decrease the weight-carrying capability of the bridge as they expand.
- The levee and roadway fill material are slumping near Abutment 12, exposing timber piles and resulting in roadway settlement.

The 2007 STRAIN Report recommended replacement of the bridge superstructure, including replacing the entire timber deck and timber stringers.



LEGEND
 Project Study Area
 County Boundary

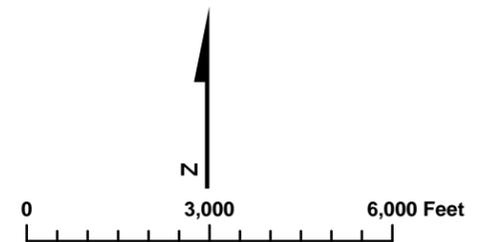
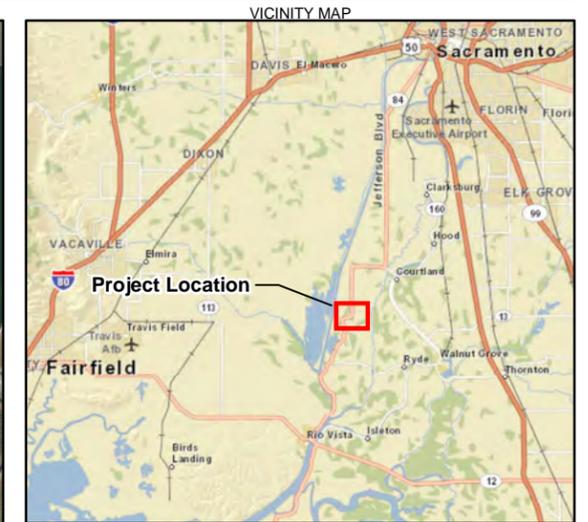


FIGURE 1-1
Project Vicinity
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California



LEGEND

- Project Limits
- Project Study Area

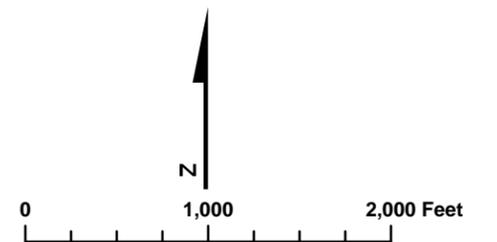
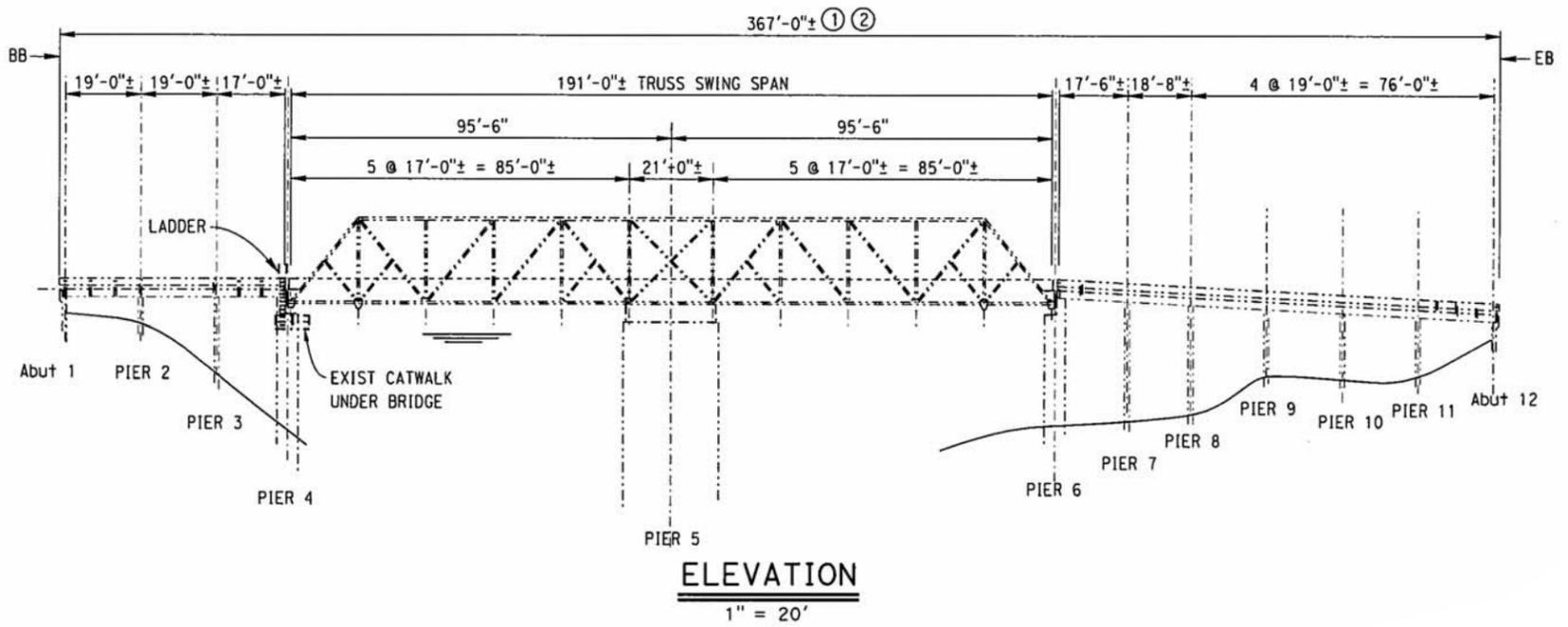
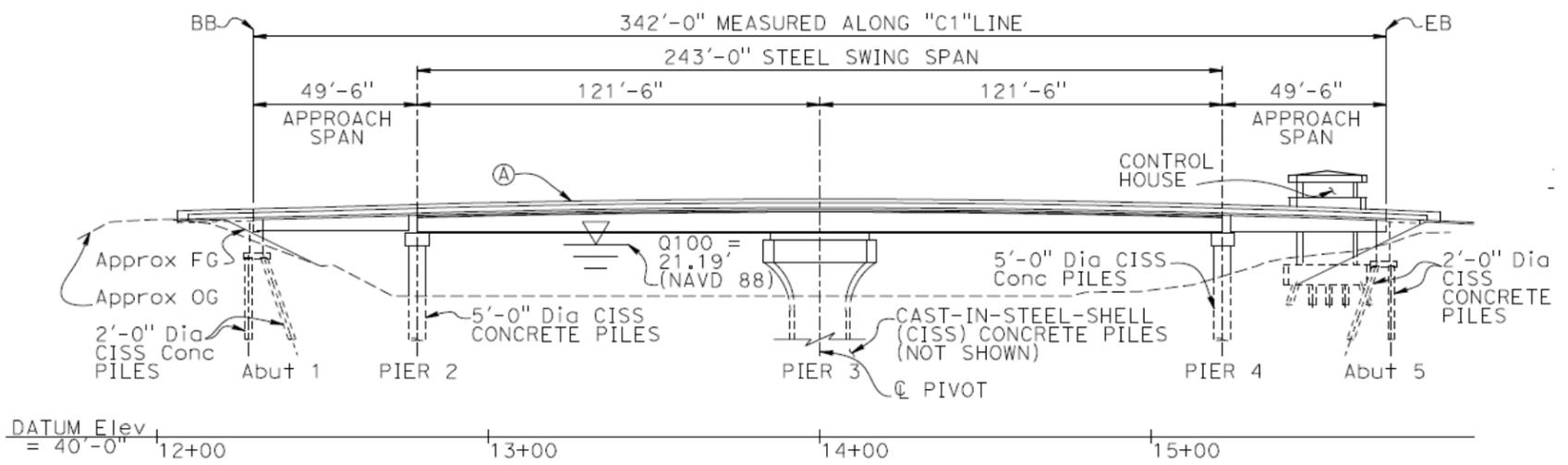


FIGURE 1-2
Project Location
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

Existing



Bridge Replacement



Bridge Rehabilitation

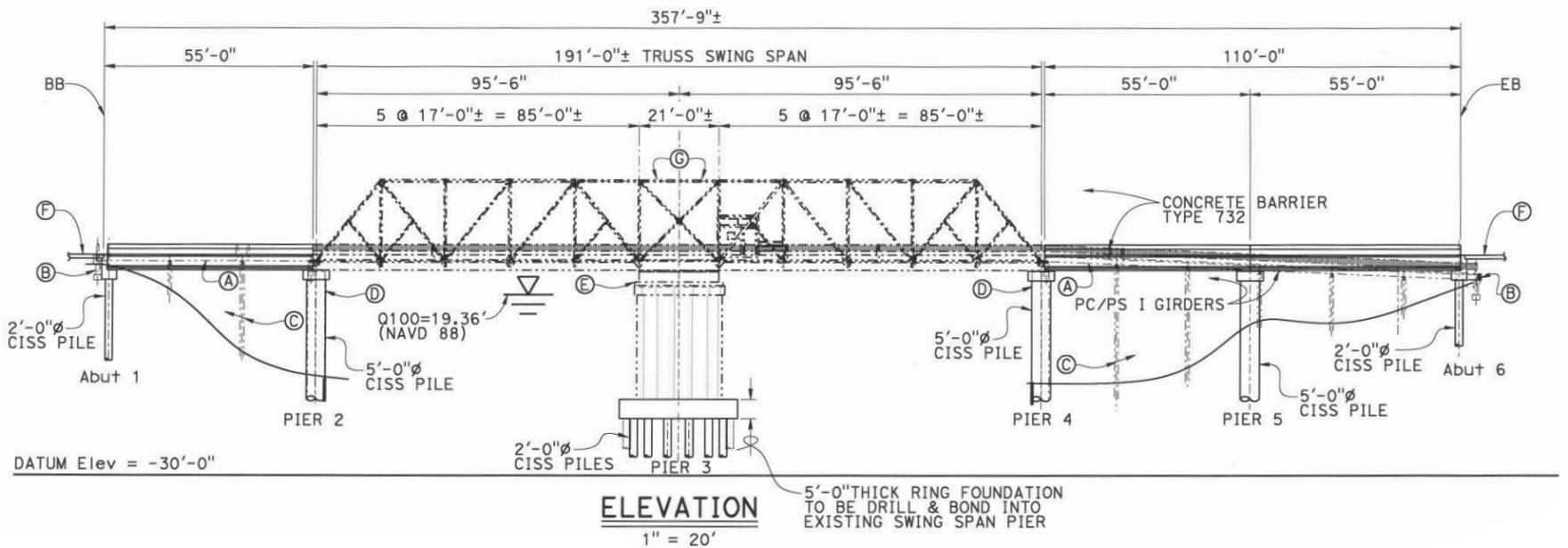


FIGURE 1-3
Profile Drawings of the Existing and Proposed Bridges
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

1.2.3 Independent Utility and Logical Termini

Federal Highway Administration (FHWA) regulations (23 Code of Federal Regulations [CFR] 771.111[f]) require that the proposed action being evaluated would:

- Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
- Have independent utility or independent significance (be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made); and
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The project limits extend from SR 84 PMs 12.0 to 12.4. The Miner Slough Bridge completes the connection of SR 84 over Miner Slough. The proposed project has independent utility in and of itself, would not restrict other reasonably foreseeable transportation improvements nor trigger new transportation projects, and would provide a long-term physically stable segment of SR 84 by replacement or rehabilitation of the Miner Slough Bridge to maintain the SR 84 crossing of Miner Slough.

1.3 Project Description

This section describes the proposed action and the project alternatives that were developed to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts. The alternatives are Alternative 1: Bridge Replacement, Alternative 2: Bridge Rehabilitation, and the No-Build Alternative.

The existing bridge, No. 23-0035 on SR 84 in Solano County, was built in 1933 and is a swing bridge with nonstandard features and very low existing annual average daily traffic (440 vehicles). The existing bridge is 367 ft long and is composed of three sections with timber plank decks and a 2-inch-thick asphalt concrete (AC) wearing surface. The 191-ft center steel truss swing span is on a reinforced concrete (RC) cylindrical swing pier, with RC rest piers. The two approach spans are made of timber stringers on timber cap-and-pile bents with abutments of RC on timber piles.

1.4 Project Alternatives

1.4.1 Build Alternatives

1.4.1.1 COMMON DESIGN FEATURES OF THE BUILD ALTERNATIVES

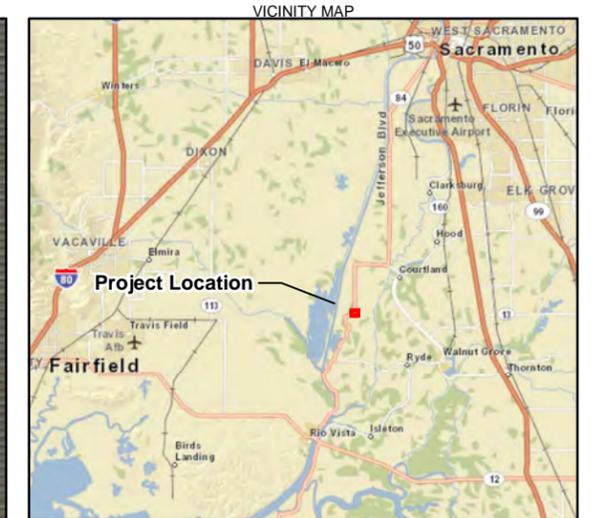
Temporary Trestles

Two temporary trestles would be installed in Miner Slough to facilitate construction of either Build Alternative, one next to each end of the bridge (see Figures 1-4 and 1-5). The one on the south end would be approximately 86 ft long, and the one on the north end would be approximately 204 ft long. This would leave an opening of about 85 ft for marine (boat) traffic to navigate between the two trestles. Each trestle would be 35 to 40 ft wide with a superstructure of timber decking, steel stringers, and prefabricated steel bents, as well as a safety railing. The bents would be spaced approximately 25 to 40 ft apart and would be supported by piles varying from 15 to 36 inches in diameter. The piles may be driven by an impact hammer or a vibratory hammer and would be spaced 5 to 10 ft apart. The number of piles is estimated to be 125. Each pile would be approximately 50 to 75 ft long. The elevation of the trestles would be below the soffit of the new bridge at about 18 ft. After construction is complete, the trestle superstructures would be removed by crane and the piles would be removed by a vibratory extraction method or cut 3 ft below the mudline.

Staging Areas

Under both Build Alternatives staging would occur in the triangular area between the existing and new alignment of SR 84 north of the bridge (see Figures 1-4 and 1-5). This area would be cleared by the construction contractor. Staging would also occur on barges anchored to piers located on the north bank of Miner Slough. Shipping traffic navigates through the slough close to the main channel near the southern bank; therefore, anchoring barges on the northern bank would not block the shipping channel.

A temporary construction easement would be obtained for staging at a 1.59-acre (ac) property located southeast of the existing bridge. A portion of this property (large driveway/storage area) would be used for storing materials and equipment for construction of either Build Alternative. This area is currently used by Caltrans for staging of bridge material for emergency repairs (see Figure 1-4).



- LEGEND**
- Project Limits
 - Project Study Area
 - Existing Staging Area
 - Cut & Fill
 - Edge of Pavement
 - Pavement Rework Area
 - Shade Impacts to Other Waters Only**
 - Existing Bridge (0.12 acre)
 - New Bridge (0.18 acre)
 - Permanent Impacts**
 - New Road
 - Proposed Bridge (Shade Area 0.34 acre)
 - Control House
 - Concrete Pier
 - Parking Lot
 - Staging Area
 - Temporary Impacts**
 - Cut and Fill
 - Control House Temporary Construction Area
 - Cofferdam
 - North Trestle
 - South Trestle
 - Removal of Existing Road
 - Existing Bridge to be Demolished (0.19 acre)

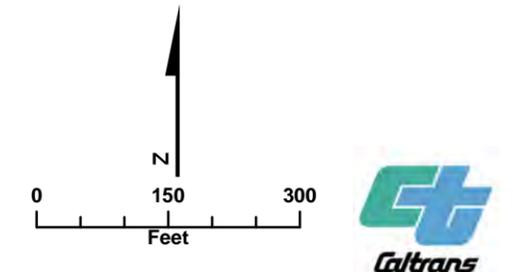


FIGURE 1-4
Bridge Replacement
Project Components
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California



- LEGEND**
- Project Limits
 - Project Study Area
 - Existing Staging Area
 - Cut & Fill
 - Edge of Pavement
 - Existing Control House
 - Existing Bridge (0.19 acre)
 - Shade Impacts to Other Waters Only**
 - Existing Bridge (0.12 acre)
 - Rehabilitated Bridge (0.02 acre)
 - Permanent Impacts**
 - Staging Area
 - Rehabilitated Bridge Area
 - Temporary Impacts**
 - Cut and Fill
 - North Trestle
 - South Trestle

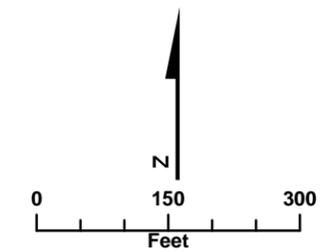


FIGURE 1-5
Bridge Rehabilitation
Project Components
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

Borrow and Disposal

For both Build Alternatives gravel and rock would be imported for road widening and stored in project staging areas. Any unused portion of these materials would be removed upon completion of the project, and removal and disposal of this material would be implemented through contractors and subcontractors in compliance with Caltrans standard Best Management Practices (BMPs) and the Stormwater Pollution Prevention Plan (SWPPP) that would be prepared for the project. BMPs and SWPPP measures are a standard part of the plans and specifications for the project and would be covered by the Central Valley Regional Water Quality Control Board (Central Valley RWQCB) 401 Water Quality Certification.

1.4.1.2 UNIQUE FEATURES OF BUILD ALTERNATIVES

Alternative 1: Bridge Replacement

The first alternative is to build a new swing span bridge approximately 100 ft west of the existing alignment. The new bridge would have standard features with a 12-ft-wide lane and 8-ft-wide shoulder in each direction. This Build Alternative would require construction of temporary trestles to be used during construction. There would be a control house structure on the levee to house operating equipment and provide parking for maintenance personnel. A section of SR 84 immediately north of the bridge would be permanently realigned for a stretch of approximately 900 ft north of Holland Road, beyond which it would conform to the existing highway. This section of SR 84 would also be realigned approximately 150 ft to the east of the existing SR 84 alignment. Figure 1-4 shows the existing location of SR 84 north of Miner Slough, and shows the location of the proposed realignment of SR 84 approximately 150 ft east of the existing alignment. Project components are also shown on Figure 1-4.

New Piers with Foundations

The project would construct three steel-reinforced cast concrete piers to support the bridge: one central pivot pier (Pier 3) and two independent piers (Pier 2 and Pier 4) that would support the approach spans and the swing span when the bridge is not in operation. Each pier would be supported through cap-on cast-in-steel-shell (CISS) piles. The cap would be constructed of steel-reinforced cast concrete over a group of CISS piles as summarized in Table 1-1.

For Pier 3, a 44-by-44-ft cofferdam would be constructed to facilitate the pile driving and the construction of caps and the pier. The cofferdam would be constructed by driving 2-ft-wide section sheet piles 30 ft deep into the streambed using vibratory

hammers. The piles would be tall enough so that the tops reach 5 ft above the surface of the water and would be placed adjacent to one another. The area within the cofferdam would then be dewatered and excavated to 2 ft below the footing elevation; water removed from the cofferdam would be discharged into the slough. A 2-ft-deep seal course of poured concrete would be placed at the base of the cofferdam to prevent water leakage. The CISS piles would be driven by impact hammer, with pile drivers situated on the temporary trestles. The material inside each pile would be drilled out using drills situated on the temporary trestles, leaving a plug of native material at the bottom. Then, rebar would be placed in the shell, and the shell would be filled with concrete using pumps operating from the temporary bridge. Forms and rebar would be placed over the pile ends and then filled with concrete to form the cap; the same process would be used to form the pier.

Table 1-1 New Bridge Piers and Foundations

	Pier 3	Piers 2 and 4
Number of piles	42	4
Depth of piles	40 ft	40 ft
Diameter of pile	2 ft	5 ft
Diameter of pier	18 ft	5 ft
Diameter of caps	32 ft	8 ft
Height of caps	8 ft	5 ft
Height of pier	18 ft	18 ft
Elevation of top of pier	24 ft	24 ft

For Pier 2 and Pier 4, CISS piles would be driven without cofferdams into the streambed using impact hammers situated on the temporary trestles, and the pile shells would be drilled out, leaving a plug of native material at the bottom. Rebar would be placed into the shells, which would then be filled with concrete. Forms would be constructed around the top of the shells to construct concrete caps approximately 9 ft wide by 26 ft long by 5 ft high, on which the bridge and abutment sections would rest after construction. Fenders with a 3-ft-wide cap on 2-ft-diameter piles spaced 5 to 8 ft apart would be placed adjacent to Pier 2 and Pier 3 only. The fenders would extend 10 ft past the edge of the deck on the east and west sides, and would then curve for another 20 ft.

Adjacent to Pier 2 and Pier 3 would be a fender system to protect the piers from navigable traffic. The fender system would consist of two 195 ft caps on piles spaced

from 5 to 8 ft. A cofferdam would be placed around the fender footprint, and water would be removed. Piles would be driven and caps would be formed on top of piles. Plastic lumber would be placed vertically around the cap. A design alternative would be to place a minimum of four dolphins (fixed structures that extend above the water level and are not connected to the shore or the bridge), two adjacent to each pier. The type of pier protection would need to be determined in design.

Operator Control House

An operator control house would be constructed approximately 50 ft north of the abutment on the levee, downslope, facing the slough. This would provide the control house operator a better view of the bridge opening from the bend in the slough on the northern side than one would have from the southern side. The control house structure would consist of a 25-ft-wide by 25-ft-long concrete structure with windows and a metal roof, with its operating floor approximately 25 ft above the levee road. A 20-by-30-ft parking area (parking slab) for personnel vehicles would be provided across from the control house on the northern side of Holland Road. Construction of the control house would include driving steel piles into the levee and installing bents. A rebar cage would be placed inside the piles and then the cage would be filled with concrete. A stairway leading to the control house would also be constructed.

The operator control house would be next to the north end of the bridge and would contain the switch gear and generator to be attached to the drive mechanism at Pier 3 via underwater cables. The main drive motor would be below the deck at Pier 3 on a platform near the drive gear machinery. A separate motor and hydraulic pump would be used to operate the end jack mechanisms via hydraulic pipes and hoses extending to both ends of the bridge.

Abutment Foundations

On the levees at the ends of each approach span at elevation 29.25 ft on the north end and 29.42 ft on the south end, and above the high-water elevation (16.84 ft), two rows of 28 2-ft-diameter piles with a 91-ft-long by 8-ft-wide concrete cap would be constructed. The seat abutments would be approximately 16.5 ft high by 89 ft in length. The area would be excavated to a depth of 5 ft for a length of 93 ft to construct an 8-ft-wide trench. In the trench, approximately 40-ft-long CISS piles would be placed in a predrilled hole and would then be driven into the trench, drilled out, and filled with rebar and concrete. The 91-ft-long by 8-ft-wide by 5-ft-deep cap would be constructed over the tops of the piles to support the abutment, which is an

approach span with a 4-to-5-ft abutment stem, either a precast abutment slab or cast in place.

Bridge Structure

A swing span, steel girder bridge would make up the superstructure of the proposed new bridge. Continuous steel I-girder beams longitudinally connected by cross-frames and diaphragms would provide support from the superstructure down to the piers. The dimensions of the bridge superstructure would consist of two 121.5-ft spans supported by a central pivot pier. The depth of the superstructure would be 7.8 ft at center, and 6.1 ft at the ends.

The bridge would be constructed from prefabricated girders that would be positioned into place using a crane mounted on a temporary trestle, from the edge of the levee, or from the approach structure, on paved or disturbed areas. Larger sections would be assembled in the staging area, while smaller sections would be assembled offsite and brought in by truck. A concrete deck would be poured on top of the girders.

Approach Structure

Precast, prestressed concrete I-girders evenly spaced would be mounted on top of all piers to form the lower part of the superstructure. Between the precast I-girders, forms would be placed to lay out the deck reinforcement, and then the forms would be filled with concrete and the curbs would be installed.

From Abutment 1 to Pier 2, the section would flare from approximately 89 to 44 ft wide, with a length of 49.5 ft. From Pier 4 to Abutment 5, the section would flare from approximately 89 to 44 ft wide, with a length of 49.5 ft. This part of the superstructure would be 4.3 ft deep, and the deck would be approximately 9 inches deep.

On the south end of the bridge, the approach slab would conform to the edge of the existing highway. On the north end of the bridge, the approach slab would be higher by 3 ft at the edge of Holland Road.

Pavement Section

The bridge deck would have standard RC for the swing span and approach spans. Caltrans standards would be followed for placing AC pavement sections conforming to the bridge deck. This would include excavating 12 inches of soil, adding a gravel sub-base, compacting, and then placing the AC.

A section of SR 84 immediately north of the bridge would be permanently realigned for a stretch of approximately 900 ft north of Holland Road, beyond which it would conform to the existing highway. This section of SR 84 would also be realigned approximately 150 ft to the east of the existing SR 84 alignment (see Figure 1-4). This realignment would have a standard 12-ft lane with an 8-ft paved shoulder in each direction. The realigned section of SR 84 would be on fill, ranging in depth from 0.25 ft to 15.5 ft, and its footprint from toe-of-fill to toe-of-fill would range from 80 to 160 ft. Before placement of the fill, the project area would undergo vegetation clearing and grubbing, scraping and excavating up to 1 ft below ground surface, compacting of soil, and addition of gravel base. An approximately 250-ft-long section of the existing SR 84 would be widened to conform to the realigned section of SR 84. To achieve this, there would be an approximately 2-to-3-ft excavation within the existing roadway and fill area. After the newly realigned section of SR 84 is open to the public, the old paved section would be scarified, removed, and revegetated.

Holland Road would be repaved for approximately 200 ft on either side of the new bridge, at which point it would conform to the existing Holland Road. The new toe line for fill on this stretch of the road would be 12 ft out from the edge of the existing pavement on the south side (slough side) of the local road, and would vary from 16 to 84 ft on the north side of the road from the edge of the existing pavement.

Electrical, Including Lighting

An armored underwater electrical cable would be laid on the bed of the slough to connect the control house with the central span. A generator would be used to run the bridge and the control gates; the generator would fit into the control house. No outside utilities or lighting are anticipated.

Drainage

Scuppers (outlets for water drainage) would be used for the concrete barriers on either side of the bridge shoulders. On the new stretch of SR 84 on the north side of the new bridge, cross culverts of up to 24 inches would be installed for maintenance of proper drainage.

Demolition of the Existing Bridge

The trestles described above would be used during demolition of the existing bridge. The barrier rail and posts would most likely be removed by hand. The swing span may need temporary supports to provide stability during the demolition of the truss.

The removal of the beams would require a crane that would be staged on a barge. The deck and concrete would be demolished with a hydraulic breaker; the pieces would be caught on a working platform and removed with a loader, to prevent debris from falling into the water below and introducing pollution to Miner Slough. Steel beams, cross beams, and stringers would be removed by crane, as would the steel plates of the pivot pier.

The approach spans' superstructure would be removed in a similar way.

The existing bents, caps and wood piles would be removed below the channel bed within a cofferdam in a similar manner as described above. Disturbed soil on the levees would be restored to Reclamation District requirements.

The pivot pier would be demolished with a hydraulic breaker, and the RC pieces would be removed from the cofferdam area. The pivot pier would be removed below the mud-sounding elevation. The removed soil would be replaced by hand.

The dolphins (fixed structures that extend above the water level and are not connected to the shore or the bridge) would be removed below the mud elevation. The trestles would be removed from a barge located in Miner Slough.

Utility Relocation

No utility relocation is anticipated.

Traffic Management Plan

Traffic coordination and limited closures of the existing bridge would occur for the construction of the temporary trestles near the abutments and the construction of the new approaches at the abutments. Aside from these limited closures, the existing bridge would remain open to traffic during new bridge construction and would be closed and removed only after the new bridge is open to traffic.

K-rails (concrete or plastic barriers) would be used as well as changeable message signs to notify motorists of construction zone activities. A Traffic Management Plan (TMP) would be prepared and implemented during construction to minimize or prevent delays and inconveniences to the traveling public.

The need for nighttime and weekend lane closures during off-peak hours (5:00 p.m. to 9:00 a.m.) would be identified during the plans, specifications, and estimates (PS&E) stage. Coordination with and a permit from the U.S. Coast Guard (USCG)

would be required to shut off watercraft access under the bridge during some stages of construction.

Construction Schedule

Construction is tentatively scheduled to begin in January 2018 and last approximately 3 years. Out-of-water work would occur for three seasons of each year, typically starting in April and ending in December, if weather permits and permit conditions are met. Work in the water (to include pile driving associated with the temporary trestles and construction of the Pier 3 cofferdam and Piers 2, 3, and 4, as well as demolition of the existing bridge's Piers 2, 3, 7, 8, 9, 10, and 11 and the abutment of Pier 12) would take place between August 1 and November 30. Foundation and bridge structure work could occur year-round once the trestles, cofferdam, and piers have been constructed. Nighttime and weekend lane closures for roadway realignment of SR 84 north of the bridge could occur to accommodate construction activities.

Alternative 2: Bridge Rehabilitation

This project alternative proposes to rehabilitate the existing bridge built in 1933. This alternative comprises three new approach spans with new foundations, and substructure work at the center swing span pier. The load rating for the bridge, the characteristics of the existing truss swing span superstructure, and the limited existing bridge width would remain the same.

Operator Control House

The control house for the existing bridge is located on the west side of the swing span and is attached to the edge of deck and side of the truss. No changes to the operator control house would occur during rehabilitation of the existing bridge. Project components are shown on Figure 1-5.

Approach Spans and Abutments

Prior to construction of new approach spans, the existing approach spans would be removed. A temporary platform would be constructed under the existing approach structures. The platform would be attached to the floor beams of the bridge or the existing timber piles. The deck surface would be removed by saw cutting and jack-hammering. Then the stringers, floor beams, and platform would be removed.

A new approach span would be constructed on the south end of the bridge from Abutment 1 to Pier 2 and would be 55 ft long, with width varying from 44 ft to 26 ft. On the north end of the bridge the new approach span from Pier 4 to Pier 5 would be

55 ft long with width varying from 26 ft to 50 ft. From Pier 5 to Abutment 6, the span would be 55 ft long with varying widths of 50 to 60 ft.

New abutments for the approach spans would be constructed. The width of the Abutment 1 pile cap would be 44 ft with 6 piles, and the width of the Abutment 6 pile cap would be 60 ft with 8 piles.

New Pier Supports

The existing wooden piers and RC piers would be removed. The existing truss would remain turned open for an extended time. To support the truss, a temporary cable system could be installed. An alternate method to support the truss while open could be two temporary bents positioned adjacent to the existing bridge. The north side holding bent would need to be adjacent to the trestle on the north side of the slough. Each bent would include two driven 5-ft-diameter CISS piles with a steel stringer on top of both. The existing Pier 2 and Pier 4 would be replaced with new piers. All existing bents would be removed. There would be a new Pier 5 between Pier 4 and the abutment on the north end. Each of the three new piers would be supported on three 5-ft-diameter pile extensions with cap. At Pier 2 and Pier 4 mechanical items would be built in each pier to include jack pads (for support of jacks) and center locks (stabilizing devices for movable bridges). New Pier 5 would have four 5-ft-diameter pile extensions with cap. An alternate design for Pier 2 and Pier 4 would be to drive two 5- to 6-ft-diameter CISS piles adjacent to each side of the bent. On top of the pile extensions would be an RC cap. The existing concrete could be chipped down and caught on a platform.

Bridge Structure

Work to be performed on the bridge structure would include placing precast/pre-stressed I-girders between the new piers. This would be accomplished by use of cranes located on the trestles. The deck would be built up and the deck and barrier rails would be formed.

On the swing span, the wooden stringers would be removed in the same manner as the approach spans, by use of a platform under the existing approach structures. Steel girders would be placed using a crane and the deck and barrier rails would be built.

Work on the center pier would be performed from the trestles and a barge. A 40-ft by 40-ft cofferdam would be constructed around the pier, and water would be evacuated. CISS piles 2 inches in diameter would be driven around the perimeter of the existing pile cap. A new pile cap would be connected with the existing one by drilling and

bonding rebar into the existing cap and then forming the cap on top of the piles. The mechanical system would be upgraded with a new motor.

Pavement Sections

As the profile of the bridge access span on the north side is raised, the Holland Road profile would need to be raised for a length of 500 ft to conform to the bridge access span. The new toe line for fill on this stretch of Holland Road would vary from 2 ft to 36 ft from edge of pavement on the south (slough) side of Holland Road. Along the north side of Holland Road it would vary from 3 ft to 76 ft from edge of pavement.

The profile of Route 84 to the north of Holland Road would also have to be raised for a stretch of 240 ft to conform to the newly paved Holland Road. The new toe line for fill would vary from 2 ft to 5 ft from the edge of pavement on the west side and would vary from 7 ft to 75 ft from edge of pavement on the east side. Before placement of the fill, the project area would undergo vegetation clearing and grubbing, scraping and excavating up to 1 ft below ground surface, and compacting of soil.

Traffic Management Plan

Closure of the existing bridge would be required for a period of approximately 6 months. During bridge closure traffic travelling north or south via SR 84 would be detoured to the west or east of Ryer Island via the Real McCoy Ferry on SR 84, or the J-Mack Ferry on SR 220 (see Figure 2-3 in Section 2.1.3). Holland Road (on the north levee) and SR 84/Ryer Road (on the south levee) would remain available for local traffic; however, for approximately 3 weekends of the construction period these roads would be also closed to traffic for construction activities. During weekend closures local traffic could detour via local roadways north of the levee (Holland Road and Oxford Road), and south of the levee (Ryer Road, East Ryer Road and Elevator Road).

The swing span would be accessible (able to open) for passage of boat traffic during the majority of the construction period. However, during rehabilitation of the swing span it would be non-operable. It is estimated that the swing span would be non-operable for a period of approximately 1 week. Coordination with and a permit from the USCG would be required to shut off watercraft access under the bridge during various stages of construction.

A Traffic Management Plan would be prepared and implemented during construction to minimize or prevent delays and inconveniences to the travelling public. Preparation

of a TMP would occur as part of the final design phase for the rehabilitation alternative. The need for weekend lane closures on Holland Road and Route 84/Ryer Road would be identified during the PS&E stage.

Construction Schedule

The project is tentatively scheduled to begin in January 2018 and would last approximately 1 year. Rehabilitation of the bridge and construction activities on SR 84 would last for approximately 6 months. Out-of-water and in-water work would occur as discussed under the bridge replacement alternative. Closure of SR 84 over Miner Slough is anticipated to last approximately 6 months. The detour of SR 84 around Miner Slough is further discussed in Section 2.1.3.3. Intermittent closures for raising the profiles of Holland Road and SR 84 would occur for approximately 3 weekends of the construction period.

1.4.1.3 TRANSPORTATION DEMAND MANAGEMENT, TRANSPORTATION SYSTEM MANAGEMENT AND MASS TRANSIT ALTERNATIVES

A discussion of Transportation Demand Management, Transportation System Management and Mass Transit Alternatives is not applicable because the project area is rural in nature and there are no urban centers with a population of over 200,000 nearby.

1.4.2 No-Build (No-Action) Alternative

Under the No-Build Alternative the existing Miner Slough Bridge would continue to deteriorate. The deficiencies in the Miner Slough Bridge that are identified in Section 1.2.2 would not be remedied. Maintenance efforts and costs associated with current upkeep of the existing bridge would continue, however over time continued structure deterioration would eventually lead to loss of service. The No-Build Alternative serves as the baseline for evaluation of the Replacement and Rehabilitation Alternatives.

1.5 Alternatives Considered but Eliminated from Further Discussion

One other alternative was considered, which was to maintain the existing SR 84 alignment on the north side of the new replacement bridge. This alternative was studied at length and rejected for the following reasons:

- Only a maximum design speed of 14 miles per hour (mph) could be used over the existing roadway alignment north of Miner Slough.

- The superelevation transition would not meet design standards because the runoff lengths would be below standard and would not allow safe distance to transition to the existing roadway. Also, the superelevation transition would need to be accommodated between two reverse curves at very steep transition rates due to the relatively short distance between these curves.
- Locating staging areas under this alternative would be difficult without closure of the existing traffic lanes of the highway for a long duration (up to 1 year).

1.6 Permits and Approvals Needed

The permits, reviews, and approvals required for project construction are summarized in Table 1-2.

Table 1-2 Required Permits and Approvals

Agency	Permit/Approval	Status
National Marine Fisheries Service	Biological Opinion and Incidental Take Permit	Pending
United States Army Corps of Engineers	Section 404 Nationwide Permit Section 10 Consultation	Pending
United States Fish and Wildlife Service	Biological Opinion	Pending
California Department of Fish and Wildlife	Section 1602 Lake and Streambed Alteration Agreement	Pending
California Department of Fish and Wildlife	Section 2081 Incidental Take Permit	Pending
United States Coast Guard	Bridge Permit	Pending
Central Valley Regional Water Quality Control Board	401 Water Quality Certification	Pending

Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter describes the environmental resources of the project areas and how the resources would be affected by the proposed project. Potential environmental impacts of the proposed project and recommended avoidance, minimization, and/or mitigation measures are discussed. Chapter 2 also addresses issues of concern pursuant to CEQA and NEPA. Please see Appendix A for the CEQA Checklist.

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.

Existing and Future Land Uses – The Miner Slough Bridge is an existing bridge and the proposed project would not conflict with or change existing or planned land uses or zoning codes.

Consistency with State, Regional, and Local Plans and Projects – The proposed project is also consistent with state, regional, and local plans and programs. The proposed project is not included in the 2015 FSTIP. The proposed project is consistent with applicable goals and policies (TC.G-1, TC.G-2, TC.P-1, TC.P-8, TC.P-11) in the Transportation and Circulation Element of the *Solano County General Plan* (Solano County 2008). No impact would occur.

Coastal Zone – The project site is located in northeastern Solano County, and outside of the coastal zone.

Wild and Scenic Rivers – The Miner Slough Bridge spans Miner Slough, which is not a designated Wild and Scenic River.

Parks and Recreation Facilities – The proposed project would not introduce any population-generating components such as long-term employment, housing, or commercial development; therefore, the project would not result in any additional demands for public park facilities. No parks or recreational facilities are located within the proposed project area or in the project vicinity. Navigational use along

Miner Slough includes small recreational and fishing boats. The horizontal and vertical clearances of either the rehabilitated or replacement bridge would accommodate current and future recreational demand. As described further in Section 2.1.3, Traffic and Transportation/Pedestrian and Bicycle Facilities, construction of the proposed project may temporarily affect recreational use of Miner Slough. However, such effects would occur only during limited stages of construction and coordination with the U.S. Coast Guard would be required. A Traffic Management Plan would be prepared to reduce temporary construction impacts to travelers, including recreational boaters. Therefore, the proposed project would not directly or indirectly affect any parks or recreation facilities.

Furthermore, no public parks and recreation lands, or wildlife and waterfowl refuges that provide opportunities for both active and passive outdoor recreation considered a Section 4(f) resource¹ are located within the project site. The proposed project would not result in permanent or temporary impacts to or constructive use of any park or recreation facilities requiring protection under Section 4(f). The proposed project would not alter the qualities, features, or attributes of a park, recreational facility, wildlife and waterfowl refuge, or historic site.

Growth – The proposed project would not affect growth within Solano County. The project is located in a rural area in unincorporated Solano County. The Solano County General Plan has the goal of focusing growth areas in existing incorporated cities and urban areas and their spheres of influence. Therefore, the project area is not anticipated to experience significant growth in the future. By providing safe traffic flow through the project site, the project would facilitate safe and convenient travel between Rio Vista and Sacramento.

Because the proposed project would not change accessibility, would have no influence on growth, and would not result in changes to land uses already planned and considered under the Solano County General Plan, the project would not result in project-related growth. Therefore, no resources of concern would be indirectly affected as a result of the project's influence on growth.

Community Character and Cohesion – The proposed project would replace or rehabilitate an existing bridge in a rural area. The project would continue to serve the

¹ “Section 4(f) resource” refers to the Department of Transportation Act of 1966, which prohibits FHWA from approving the use of land from a publicly owned park, recreation area, wildlife refuge, waterfront, or any significant historic site, unless there are no feasible or prudent alternatives.

region in the same manner as the existing bridge; therefore, no impact to community character and cohesion would occur.

Environmental Justice – No residential neighborhoods or employment centers are located in close proximity to the project site; therefore, no impact to environmental justice would occur.

Utilities/Emergency Service Systems – No existing utilities or emergency service systems would be affected or relocated as part of the proposed project. Caltrans will be in contact with the California Highway Patrol, Montezuma Fire Department, and emergency medical responders regarding bridge and road closures.

Paleontology – According to the *Preliminary Geotechnical Report* (Caltrans 2015a) for this project, many fossils have been found in the area, though none have been found dating to the Holocene epoch, and if found any such fossils would not be considered scientifically significant. Therefore no further paleontological study is necessary.

Hazards and Hazardous Materials – The proposed project would not result in any increased hazards or hazardous materials risks during or after construction; any hazardous materials determined to be present in the project area would be encapsulated or disposed of in accordance with applicable federal and state regulations and in coordination with the regulatory agency with jurisdiction.

Air Quality – The proposed project is to reconstruct a bridge with no additional travel lanes, and therefore qualifies for an exemption from project-level conformity requirements under 40 CFR 93.126. No air quality study is necessary. Effects to air quality could result during the project's construction phase, but would be temporary. A measure intended to reduce these temporary effects (Measure AIR-1) has been incorporated into the project and is listed in Appendix C.

Noise – The project would not cause or contribute to a substantial long-term increase in traffic noise or ground vibration levels because there would be no increase in traffic capacity. The project would not add traffic lanes or substantially alter the alignment of the existing roadway. It is not a Type I project as defined in 23 CFR 772. The nearest sensitive receptor is a residence located approximately 1,000 ft to the east of the existing bridge. Direct effects on Delta and longfin smelt resulting from hydro-acoustic noise levels resulting from pile driving are discussed in Section 2.3.5.

The proposed project's potential impacts to the remaining categories of environmental resources from the CEQA Checklist are discussed in the sections below.

2.1 Human Environment

2.1.1 Farmlands/Timberlands

2.1.1.1 REGULATORY SETTING

The National Environmental Policy Act (NEPA) and the Farmland Protection Policy Act (FPPA, 7 United States Code [U.S.C.] 4201-4209; and its regulations, 7 CFR Part 658) require federal agencies, such as the 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.

2.1.1.2 AFFECTED ENVIRONMENT

The majority of land in Solano County is classified by the California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) as farmland, including approximately 147,464 ac (25 percent) designated as Important Farmland² and an additional 209,195 ac designated as "Grazing Land." As of 2013, the County had 280,426 ac of farmland under a Williamson Act Contract (California Department of Conservation 2013), or approximately 78 percent of Agricultural Land³ in Sonoma County. The project site is surrounded by farmland, with most parcels actively farmed. All farmland in the project vicinity is designated as Prime Farmland under the FMMP and several parcel are under Williamson Act contracts. There are no timberlands in the project vicinity.

² Important Farmland is land designated by the Farmland Mapping and Monitoring Program (FMMP) as "Prime Farmland," "Farmland of Statewide Importance," "Unique Farmland," and "Farmland of Local Importance."

³ Agricultural Land is the total of land classified as Farmland and Grazing Land.

Farms in Solano County are used primarily for forage (e.g., hay), vegetables, and wheat.

2.1.1.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Under Alternative 1, approximately 5.72 ac of farmland would be acquired from three parcels abutting SR 84 and converted to transportation use. These lands are not currently in agricultural production. Two of the affected parcels (Assessor's Parcel Number [APN] 0042-200-200 and 0042-220-020) approximately 2.50 ac are under Williamson Act contract (Solano County Assessor/Recorder 2015). Planned property acquisition would not bisect any parcels; all new right-of-way (ROW) would be acquired along parcel edges. Figure 2-1 shows the location of agricultural land surrounding the project site and the property acquisition that would occur under Alternative 1.

Construction Phase

A permanent acquisition would be needed for construction staging, resulting in the indirect conversion of approximately 0.44 ac of land designated as Prime Farmland (APNs 0042-200-140 and 0042-200-200). A temporary construction easement would be obtained for staging at a 1.59-ac property located southeast of the existing bridge. All parcels would remain accessible throughout project construction and post-construction. Farming equipment access to productive agricultural parcels would remain unimpeded.

Operation Phase

Alternative 1 would result in the irreversible direct conversion of land designated as Prime Farmland (California Department of Conservation 2011) (APNs 0042-200-140 and 0042-200-200) and Williamson Act lands. Direct impacts include the permanent ROW acquisition required for the bridge replacement and roadway realignment. The direct impact resulting from the widening of the roadway is considered a permanent impact.

Implementation of Alternative 1 would affect soils designated for various crop production activities defined by the NRCS as having prime agricultural significance. However, these lands are not currently in agricultural production.

While loss in agriculturally productive land is expected from implementing the proposed project improvements, the losses would all occur along the edge of the roadway and are "sliver" losses. These losses occur in a very narrow strip adjacent to

the roadway and would not have any substantial effect on the agricultural operations for those affected parcels. No change in productivity related to project impacts is anticipated because the land is not currently in agricultural production.

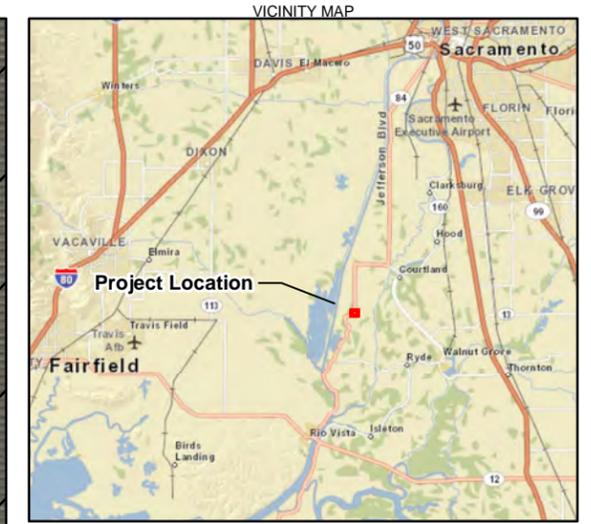
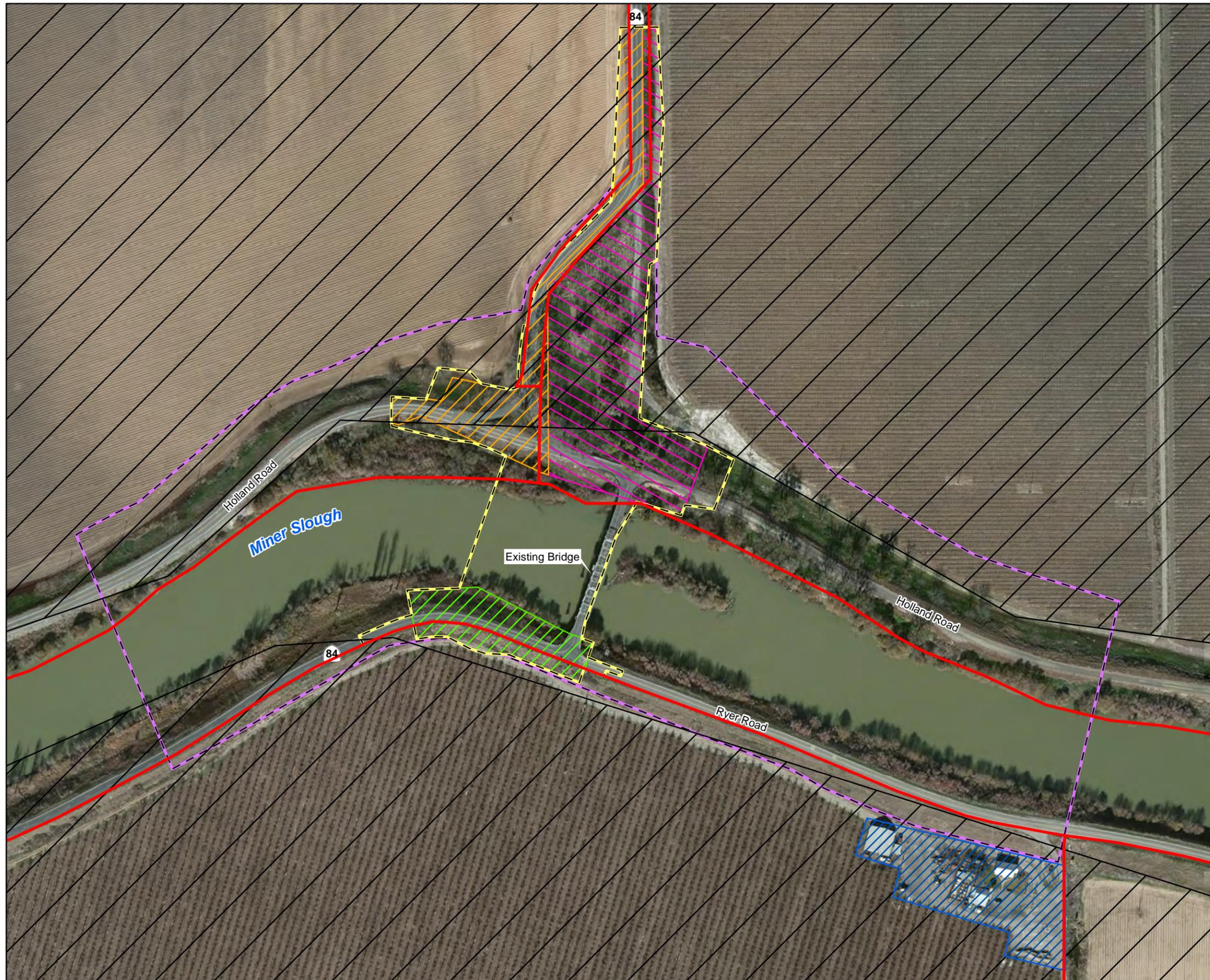
Caltrans is in ongoing coordination with NRCS and the California Department of Conservation regarding impacts to farmlands from parcel acquisition and temporary construction easements that would occur under Alternative 1. Acreage and parcel acquisition used to determine the loss of agricultural lands would be evaluated based on the NRCS's Farmland Conversion Impact Rating System (Form AD-1006), and reflected in the final IS/EA. The number of acres of Williamson Act contracted land and /or agricultural preserve land being considered for acquisition, and the findings required under Government Code 51292(a) and 51292(b), would also be reflected in the final IS/EA.

Alternative 2 – Bridge Rehabilitation

Under Alternative 2 approximately 1.95 ac of farmland would be acquired from three parcels abutting SR 84 and converted to transportation use. These lands are not currently in agricultural production. One of the affected parcels (APN 0042-200-200) is under Williamson Act contract (Solano County Assessor/Recorder 2015), approximately 0.61 ac of this parcel would be acquired. Planned property acquisition would not bisect any parcels; all new ROW would be acquired along parcel edges. Figure 2-2 shows the location of agricultural land surrounding the project site and the property acquisition that would occur under Alternative 2.

Construction Phase

Under Alternative 2, staging and permanent acquisition for construction staging would occur in the same location as discussed above under Alternative 1. All parcels would remain accessible throughout project construction and post-construction. Farming equipment access to productive agricultural parcels would remain unimpeded.



- LEGEND**
- Project Limits
 - Project Study Area
 - Prime Farmland
- Project Parcels**
- APN 0042-200-140 (3.21 acres)
 - APN 0042-200-200 (1.61 acres)
 - APN 0042-220-020 (0.88 acre)
 - APN 0042-220-020 (1.59 Acres)

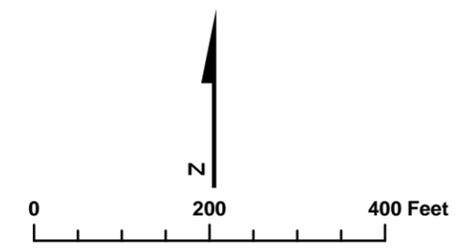
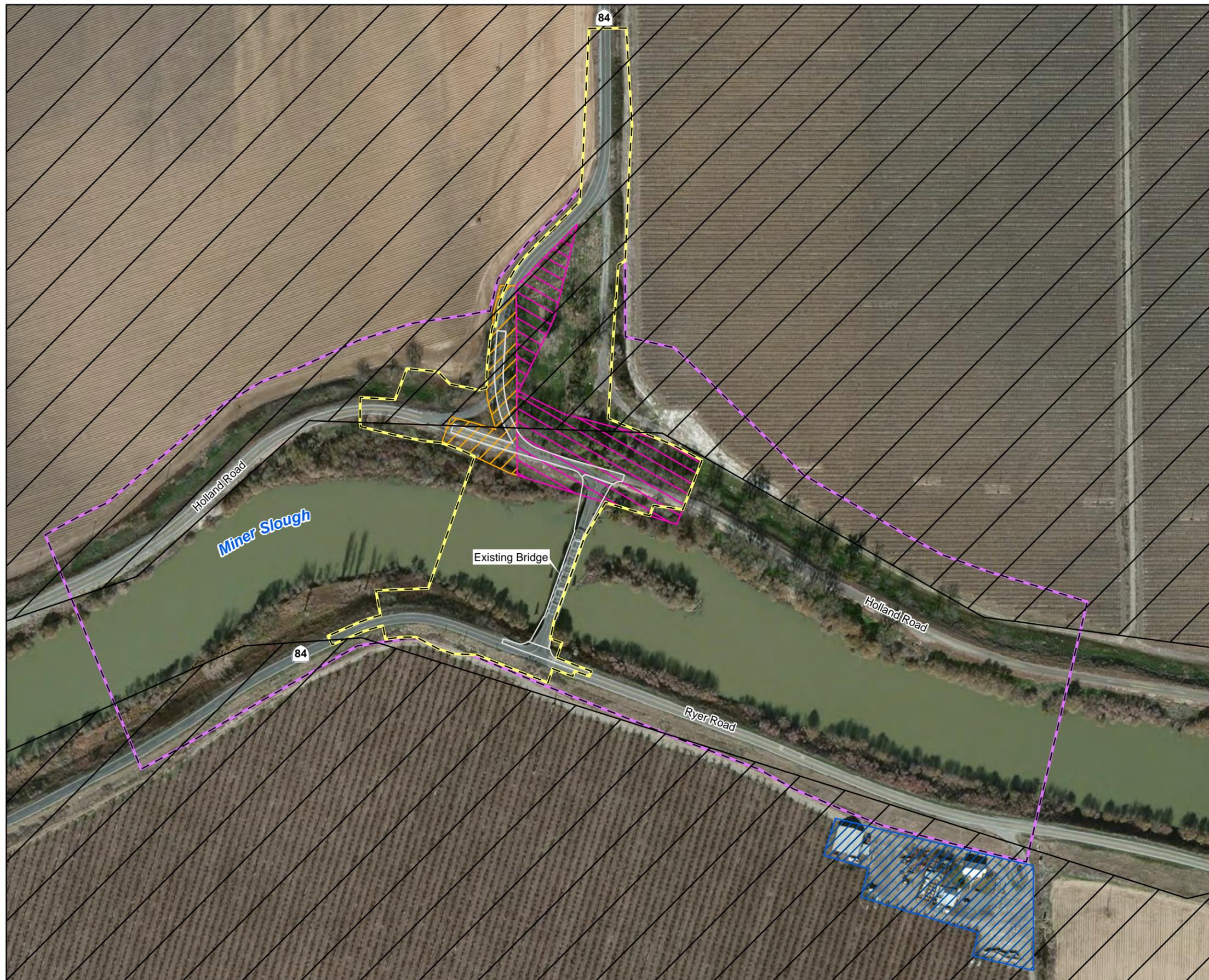


FIGURE 2-1
Parcel Acquisitions
Bridge Replacement
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California



LEGEND

- Project Limits
- Project Study Area
- Prime Farmland
- Project Parcels**
- APN 0042-200-140 (1.76 acres)
- APN 0042-200-200 (0.61 acre)
- APN 0042-220-020 (1.59 Acres)

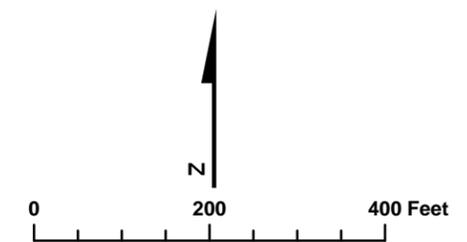


FIGURE 2-2
Parcel Acquisitions
Bridge Rehabilitation
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

Operation Phase

Alternative 2 would result in the irreversible direct conversion of land designated as Prime Farmland (California Department of Conservation 2011) (APNs 0042-200-140 and 0042-200-200) and Williamson Act lands. Direct impacts include the permanent ROW acquisition required for the widening of the roadway at the northern bridge approach. The direct impact resulting from the widening of the roadway is considered a permanent impact. Similar to Alternative 1, Alternative 2 would affect soils designated for various crop production activities defined by the NRCS as having prime agricultural significance. However, these lands are not currently in agricultural production.

Loss of agriculturally productive land is expected from implementing Alternative 2; however, the losses would all occur along the edge of the roadway and are “sliver” losses. These losses would occur adjacent to the roadway and would not have any substantial effect on the agricultural operations for those affected parcels. No change in productivity related to project impacts is anticipated because the land is not currently in agricultural production.

Ongoing coordination with NRCS and the California Department of Conservation regarding impacts to farmlands from parcel acquisition and temporary construction easements that would occur with implementation of Alternative 2 would be the same as discussed above under Alternative 1.

No-Build Alternative

Under the No-Build Alternative existing farmland operations would continue and no effect would occur.

2.1.1.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Alternatives 1 and 2 are designed to minimize impacts through farmland conversion using the smallest area possible while meeting the project’s purpose and need and fulfilling design and safety requirements.

2.1.2 Community Impacts

2.1.2.1 RELOCATIONS AND REAL PROPERTY ACQUISITION

Regulatory Setting

Caltrans’ Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 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, or sex in compliance with Title VI of the Civil Rights Act (42 U.S.C. 2000d et seq.). See Appendix B for a copy of Caltrans' Title VI Policy Statement.

Affected Environment

The project vicinity consists primarily of agricultural land, with a small number of farm-associated residences and outbuildings (barns, sheds, equipment storage, etc.). The closest community is Courtland, located approximately 5 miles northeast of the project site. Under Alternative 1 the new bridge would be realigned approximately 100 ft west of the existing alignment, and the highway north of the Slough would shift east, to align with the bridge. Under Alternative 2, the profile of Holland Road would need to be raised for a length of 500 ft to conform to the bridge access span, and the profile of Route 84 to the north of Holland Road would be raised for a stretch of 240 ft to conform to the newly paved Holland Road. Therefore, under either Build Alternative the proposed project would require the partial acquisition of properties to the north of the existing bridge.

Environmental Consequences

Alternative 1 – Bridge Replacement

Construction Phase

Staging would occur in the triangular area between the existing alignment and the new alignment to the north of the bridge. The staging area would be cleared by the construction contractor for use as staging and preparation of the new SR 84 alignment. Caltrans proposes to use a portion (large driveway/storage area) of a private parcel southeast of the existing bridge for storing equipment and materials for emergency repairs (see Figure 2-1). A temporary construction easement (1.59 ac) would be obtained for use of this property prior to construction. An existing house is located on this private property, but no impacts to the residence would result from construction staging in the property's driveway/storage area. Therefore, no existing residential or agricultural structures would be affected by construction of Alternative 1.

Under Alternative 1, construction of the proposed project would require roadway closures. These closures could result in short-term, temporary impacts to the travelling public during construction. Measures to minimize impacts to the travelling

public during construction are discussed in Section 2.1.3, Traffic and Transportation/Pedestrian and Bicycle Facilities.

Operation Phase

Table 2-1 summarizes the properties that are expected to be affected by Alternative 1, and the acreage of ROW that would be required. Project layout plans, including properties affected, are shown in Appendix G.

Table 2-1 Anticipated Right-of-Way Requirements Under Alternative 1

Solano County Assessor Parcel Number	Address (Type of Property)	Anticipated Right-of-Way Required
0042-200-140	Rio Vista (agriculture)	3.219 ac
0042-200-200	196 State Route 84, Rio Vista (agriculture)	1.618 ac
0042-220-020	State Route 84 (agriculture)	0.879

All ROW acquisitions required for Alternative 1 would be partial or “sliver” acquisitions of small portions of land adjacent to the roadway to accommodate the new bridge or highway alignment. Alternative 1 would not require full acquisition of any parcels, nor would it result in the need to relocate residences or businesses. Therefore, RAP services or payments would not be required.

Alternative 2 – Bridge Rehabilitation

Construction Phase

Under Alternative 2, environmental consequences would be the same for the construction phase as discussed above under Alternative 1.

Construction of Alternative 2 would require roadway closures and detours. These closures and detours could result in short-term, temporary impacts to the travelling public during construction. Measures to minimize impacts to the travelling public during construction are discussed in Section 2.1.3, Traffic and Transportation/Pedestrian and Bicycle Facilities.

Operation Phase

Table 2-2 summarizes the properties that are expected to be affected by the rehabilitation alternative and the ROW acreage that would be required. Project layout plans, including properties affected, are shown in Appendix G.

Table 2-2 Anticipated Right-of-Way Requirements Under Alternative 2

Solano County Assessor Parcel Number	Address (Type of Property)	Anticipated Right-of-Way Required
0042-200-140	Rio Vista (agriculture)	1.76 ac
0042-200-200	196 State Route 84, Rio Vista (agriculture)	0.613 ac

All ROW acquisitions required for the rehabilitation alternative would be partial or “sliver” acquisitions of portions of land adjacent to the roadway to accommodate the northern approach to the bridge or cut and fill adjacent to the existing highway alignment. The rehabilitation alternative would not require full acquisition of any parcels, nor would it result in the need to relocate residences or businesses. Therefore, RAP services or payments would not be required.

No-Build Alternative

Under the No-Build Alternative no changes would occur to the existing community; therefore no impact would occur.

Avoidance, Minimization, and/or Mitigation Measures

The proposed project is designed to minimize the ROW acquisition required for the project, while still meeting the project’s purpose and need, complying with roadway design criteria, and satisfying Caltrans and Solano County roadway design standards. No full parcel acquisitions or relocation of residences or businesses would be required for either Alternative 1 or 2; therefore, no RAP services or payments would be needed and no additional avoidance, minimization, and/or mitigation measures are proposed.

2.1.3 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.1.3.1 REGULATORY SETTING

Caltrans, 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 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 U.S.C. 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.

2.1.3.2 AFFECTED ENVIRONMENT

Roadway Transportation

SR 84 is a north-south route connecting communities from the Peninsula to inland areas of the East Bay and Delta. The route bisects four Bay Area counties and consists of four subsections as identified in the *State Route 84 Corridor System Management Plan* (Caltrans 2010a). The proposed project is located in the San Joaquin-Sacramento River Delta subsection of SR 84. North of Rio Vista, SR 84 is a north-south two-lane conventional highway that begins at SR 12 and passes via ferry to Ryer Island where it connects to Route 220, continuing north past the Solano/Yolo County line toward Sacramento. This segment of SR 84 traverses a rural area and has low traffic volumes and limited connectivity to the overall State Highway System. As such, this segment of SR 84 will remain a two-lane, conventional highway over the next 25 years (Caltrans 2010a).

According to the Traffic Report (Caltrans 2015c) prepared for the proposed project, the 2013 Annual Average Daily Traffic (AADT) on State Route 84 through the project area was 440 vehicles.

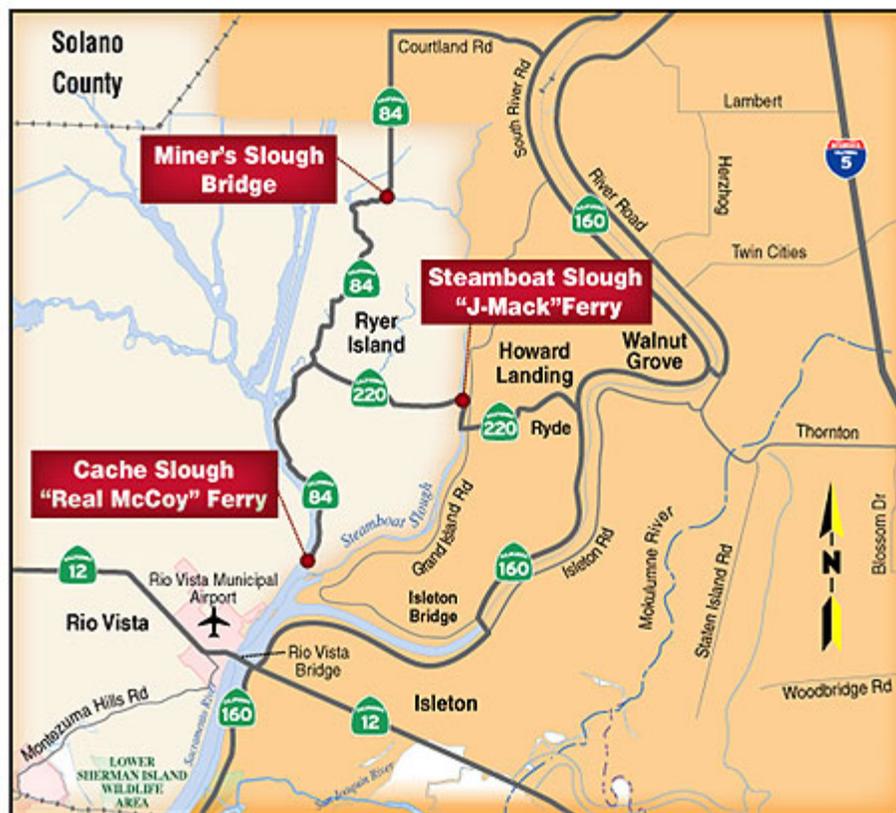
Within the project vicinity, bicyclists share the roadway with motor vehicles. There are no existing Class 1 bicycle paths on SR 84 near the project site, or on the Miner Slough Bridge. Caltrans is not proposing to create Class 1 bicycle paths as part of the proposed project. Surrounding land uses are agricultural. No sidewalks or other pedestrian facilities are located near the project site. This project would not conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Marine Transportation

Caltrans operates two ferries in the Sacramento Delta Region, The Real McCoy II and the J-Mack (see Figure 2-3). The Real McCoy II is classified as an extension of Highway 84 and provides service to Ryer Island by crossing the Cache Slough to Rio Vista. The J-Mack Ferry crosses Steamboat Slough connecting Grand Island to East Ryer Island, and is classified as an extension of Highway 220.

Both ferries operate 24 hours a day, 7 days a week and are free of charge (Caltrans 2015d).

Figure 2-3 State Routes and Ferry Crossings in the Project Vicinity



Source: "Delta Region Ferries" website (Caltrans 2015d)

2.1.3.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Construction Phase

Construction work is tentatively scheduled to begin in January 2018 and last approximately 3 years. The proposed construction and improvements would include road work that may require traffic control and limited closures for construction of the temporary trestles near the abutments and construction of the new approaches at the

abutments. Nighttime and weekend single-lane closures during off-peak hours (5:00 PM to 9:00 AM) for roadway realignment of SR 84 north of the bridge could occur to accommodate construction activities. The need for nighttime and weekend lane closures would be identified during the PS&E phase of the project. During construction the existing bridge would be open to traffic; it would be removed only after the new bridge was open to traffic.

Operation Phase

Traffic counts indicate that approximately 20 vehicles per hour cross the bridge during the AM peak hour (between 9:00 AM and 10:00 AM) and 31 vehicles per hour pass through the project site during the PM peak hour (between 4:00 PM and 5:00 PM). The existing bridge roadway segments have 9-ft travel lanes in each direction with no shoulders and operate at Level of Service (LOS) C (traffic density becomes noticeable with ability to maneuver limited by other vehicles; minimal delays could occur) during the PM peak hour. Based on the forecasted traffic volumes provided by the Caltrans Forecast Unit on March 15, 2015, a ten percent increase in traffic volumes is expected from the current year (2015) to the construction year (2018) (Caltrans 2015c). The project would widen the roadway to accommodate 12-ft travel lanes in each direction with 8-ft shoulders on each side. Although not part of the purpose and need of the project, implementation of Alternative 1 would improve traffic operations to LOS B (traffic flows freely, but drivers have slightly less freedom to maneuver; no delays are anticipated).

Alternative 2 – Bridge Rehabilitation

Construction Phase

Construction of Alternative 2 is tentatively scheduled to begin in January 2018 and last approximately 1 year (6 months for construction activities). The proposed construction and improvements would include road work that would require traffic detours and traffic control. The Miner Slough Bridge would be closed for the 6-month duration of construction activities. Traffic travelling on SR 84 would be detoured via the Real McCoy Ferry on SR 84, or the J-Mack Ferry on SR 220. The State Routes and local ferry crossings in the project vicinity are shown on Figure 2-3. The north and south levee roads would have limited closures depending on the phase of construction, but would otherwise be open to traffic travelling east-west on either the north or south levee of Miner Slough.

Operation Phase

Alternative 2 would retain the existing lane configurations, and therefore would continue to operate at LOS C during operation.

No-Build Alternative

Under the No-Build Alternative, deterioration of the existing bridge structure would continue as described in Section 1.2.2, and would over time result in bridge closure.

2.1.3.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Construction of the proposed project would require roadway closures. These closures could result in short-term, temporary impacts to the travelling public during construction. Concrete or plastic barriers would be used to redirect traffic around the construction area, and changeable message signs would notify motorists of detours and construction zone activity. In accordance with Caltrans standard practice, a Traffic Management Plan would be prepared during design and implemented during construction to minimize or prevent delays and inconvenience to the traveling public, including boaters passing through the project area on Miner Slough. To maintain the flow of traffic during construction, the TMP would facilitate accessibility through the project area for vehicles associated with essential services. The TMP would provide for public outreach and may include press releases to notify and inform motorists, boaters, businesses, community groups, local entities, emergency services, and local officials of times and locations of detours and closures. Detouring of traffic would occur under Alternative 2. Coordination prior to and during construction, and a permit from the U.S. Coast Guard would be required for bridge closures, preventing marine traffic from passing through the channel, during some stages of construction. Preparation of a TMP and coordination with the USCG would minimize project impacts to traffic and transportation and no significant impact would occur.

2.1.4 Visual/Aesthetics

2.1.4.1 REGULATORY SETTING

The National Environmental Policy Act of 1969 as amended (NEPA) establishes that the federal government must “use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* [emphasis added] and culturally pleasing surroundings” (42 U.S.C. 4331[b][2]). To further emphasize this point, the Federal Highway Administration in its implementation of NEPA (23 U.S.C. 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* [emphasis added], natural, scenic and historic environmental qualities” (California Public Resources Code [PRC] Section 21001[b]).

2.1.4.2 AFFECTED ENVIRONMENT

A Scenic Resource Evaluation and Visual Impact Assessment Memorandum (Caltrans 2015e) was prepared to assess the proposed project’s potential effects to visual quality and aesthetics in the area.

The proposed project is located on SR 84 in rural Solano County about 30 miles southwest of Sacramento, 10 miles west of Interstate 5, and 9.5 miles north of SR 12. The surrounding land is exclusively agricultural. The landscape in this region is comprised of a patchwork of agricultural fields, with a small number of farm-associated residences and outbuildings. Development is very sparse.

SR 84 in Solano County, including the location of the proposed project, is not part of the State Scenic Highway System. The roadway and surrounding land are flat. South of the bridge the highway is routed along the east bank of Miner Slough and follows its meandering course on a levee approximately 10 to 20 ft higher than the slough and cultivated fields that are east of the highway. People who see the bridge are recreational boaters on the slough and motorists traveling on SR 84. A narrow band of riparian forest occurs along the banks of the slough. Because of the flat topography and presence of the riparian band, the bridge is not visible from long distances. From the highway, the bridge does not come into view until northbound motorists are within approximately 1,000 ft and southbound motorists are within approximately 300 ft of the bridge. A private marina, boat launch, and campground are located off Holland Road on the north/west bank of Miner Slough approximately 0.75 mile west of the bridge. The bridge is not in view from the marina. No other viewpoints of the bridge are publicly accessible.

2.1.4.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Construction Phase

Construction activities, lighting, equipment, or staging, where visible, could represent an adverse effect to motorists or marine traffic for the duration of construction.

Construction staging areas could represent an adverse visual intrusion in the project

area for the duration of construction. Visual impacts during construction would be temporary and are therefore considered minimal.

Operation Phase

Under Alternative 1, the proposed new bridge would be similar to the existing bridge because it would be a swing-span bridge. The new bridge would be wider than the existing bridge and would include a new operator control house. A total of 43 trees would be removed from within the footprint of the proposed project to allow realignment of the highway and to accommodate the location of the new bridge (see Section 2.3.1.3 for additional details). Trees outside of the project site would not be affected. After the newly realigned section of SR 84 is open to the public, the pavement of the old section would be scarified, removed, and re-vegetated. Holland Road would be repaved for approximately 200 ft on either side of the new bridge, at which point it would conform to the existing county road. The existing swing bridge would be demolished and removed. Changes to the existing visual setting as a result of the proposed project would be noticeable, but not unsightly.

Review of the Alternative 1 site, plans, and other information indicate that the alternative would not result in substantial adverse impacts to the visual environment. The new bridge would not substantially alter the appearance of the highway corridor and would be consistent with the visual quality and character of the existing setting. Alternative 1 would not significantly affect any Designated Scenic Resource as defined by CEQA statutes or guidelines or by Caltrans policy.

Alternative 2 – Bridge Rehabilitation

Construction Phase

Visual impacts during construction of Alternative 2 would be the same as discussed for Alternative 1.

Operation Phase

Alternative 2 would involve repair of various components of the existing bridge, but would leave the bridge in place. The visual character of the bridge would remain unchanged. Repaving and raising of the road profiles of portions of Holland Road and SR 84 would occur. Alternative 2 would have minimal effect on the appearance of the bridge or its visual setting. Negative visual impacts associated with the rehabilitation alternative would be low to none.

A total of 30 trees would be removed from within the footprint of Alternative 2. Trees outside of the project site would not be affected.

Alternative 2 would not substantially alter the appearance of the highway corridor and would be consistent with the visual quality and character of the existing setting. Alternative 2 would not adversely affect any Designated Scenic Resource as defined by CEQA statutes or guidelines or by Caltrans policy.

No-Build Alternative

Under the No-Build Alternative the visual characteristics of the project area would not change.

2.1.4.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

No avoidance, minimization and/or mitigation measures are proposed.

2.1.5 Cultural Resources

2.1.5.1 REGULATORY SETTING

The term “cultural resources” as used in this document refers to all “built environment” resources (structures, bridges, railroads, water conveyance systems, etc.), culturally important resources, and archaeological resources (both prehistoric and historic), regardless of significance. 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 the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). On January 1, 2014, a Section 106 Programmatic Agreement (PA) between the Advisory Council, Federal Highway Administration, State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the Advisory Council’s regulations (36 CFR 800) streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA’s responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 U.S.C. 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.

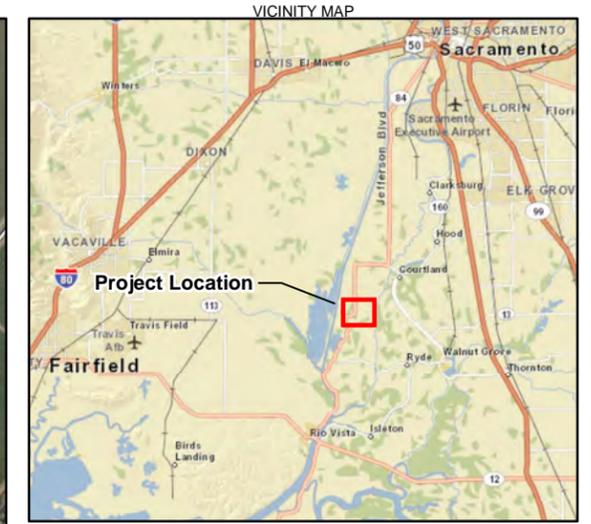
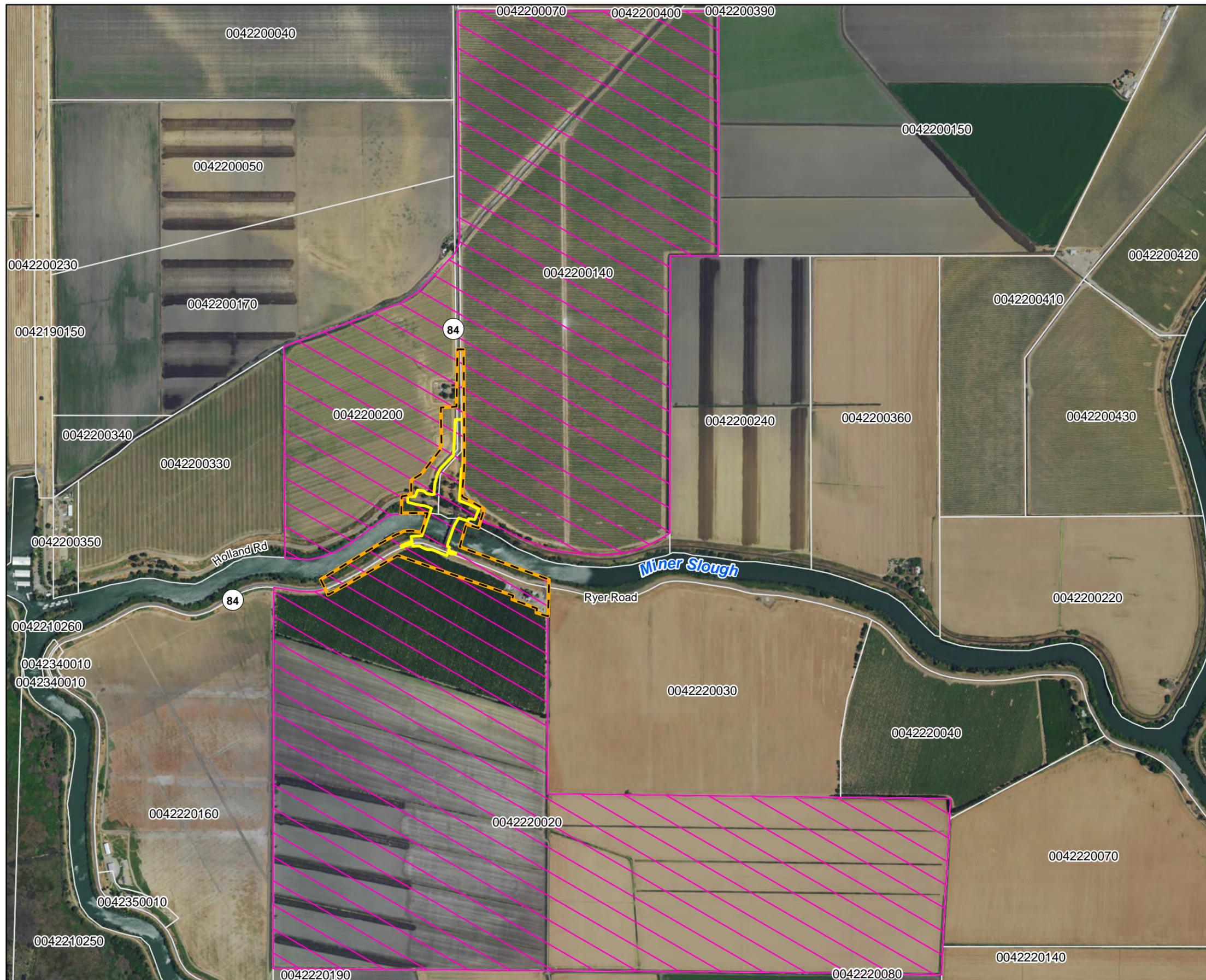
Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the “use” of land from historic properties.

Historical resources are considered under CEQA, as well as PRC Section 5024.1, which establishes the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect State-owned resources that meet the NRHP listing criteria. It further specifically requires Caltrans 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 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.

2.1.5.2 AFFECTED ENVIRONMENT

The proposed project's Areas of Potential Effects (APEs) for archaeological and architectural resources were established by Caltrans Professionally Qualified Staff (PQS) in the Office of Cultural Resource Studies in consultation with the Caltrans Project Manager. An APE is defined as the area where an undertaking may directly or indirectly impact a historic property. The project “footprint,” which includes ROW acquisition and construction staging areas, is within the APE. The APE map for this project, which was established in February 2015 and updated in August 2015, is shown on Figure 2-4. Both the archaeological and architectural APEs include the existing bridge and the new alignment of the proposed bridge replacement, approximately 100 ft to the west. North of the bridge the entire parcels both east and west of the highway from the bridge to PM 12.5 are included within the architectural APE. This area includes the new proposed road alignment of the northern approach to the bridge. The entire parcel south of the bridge is also included in the architectural APE. The smaller archaeological APE extends 200 ft from the project footprint to the north, east, and west of the bridge within the two northern parcels, and south of the bridge it extends approximately 1,000 ft east and west along SR 84 and Ryer Road (see Figure 2-4).

The cultural resources review consisted of a detailed search of Caltrans records, maps, plans, and an intensive pedestrian survey of the archaeological APE. A record search was conducted at the Northwest Information Center (NWIC) on November 6, 2014 (NWIC #13-0060).



- LEGEND**
-  Architectural Area of Potential Effects
 -  Archaeological Area of Potential Effects
 -  Project Limits
 -  County Parcels

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
 Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

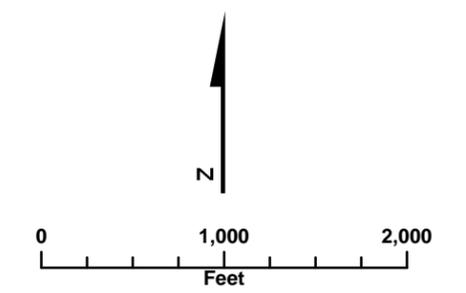


FIGURE 2-4
Archaeological and Architectural Areas of Potential Effects
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

Archaeological surveys of the archaeological APE were conducted on November 25, 2014 and January 9, 2015 by Caltrans PQS archaeologists. No archaeological resources were identified within the archaeological APE during these surveys.

The architectural APE was reviewed by a Caltrans PQS Architectural Historian. One bridge (the Miner Slough Bridge that would be replaced or rehabilitated by this project) was identified within the project APE. The bridge is listed as Category 5 – not eligible for the NRHP – in the California Historic Bridge Inventory, because while it is non-standard in design, the lack of a central tower was found to be common in California.

Two historic-era built resources were identified within the architectural APE. The resources were evaluated and found not eligible for the NRHP and are not considered historical resources for the purposes of CEQA.

The Caltrans Office of Cultural Resources Studies has prepared the required Historic Property Survey Report, Historic Resource Evaluation Report, and Archaeological Survey Report for the proposed project. These documents have been finalized and their findings summarized in the Section 106 Completion Memo and Addendum (which includes the bridge rehabilitation alternative), for the project (Caltrans 2015f, Caltrans 2015k).

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.

If human remains are discovered, State Health and Safety Code 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. Pursuant to PRC Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), which will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the District 4 Office of Cultural Resource Studies Chief 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.

2.1.5.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

For Alternative 1, Caltrans requested concurrence on the eligibility determinations from the State Historic Preservation Officer as part of its NEPA assignment of federal responsibilities by FHWA, effective October 1, 2012 and pursuant to 23 U.S.C. 326 and 327. Caltrans received SHPO concurrence on the determinations of eligibility for the Miner Slough Bridge Project on April 14, 2015. SHPO concurred that neither of the historic-era properties nor the bridge are eligible for the NRHP, and with the Caltrans finding of No Historic Properties Affected (Caltrans 2015f). Alternative 1 would not affect or use any Section 4(f) historic resource because no such properties were identified within the project vicinity.

Alternative 2 – Bridge Rehabilitation

The alternative to rehabilitate the bridge was included as part of the proposed project following SHPO concurrence of Alternative 1. Alternative 2 falls within the original APE boundary; therefore no additional survey work is required. In accordance with the Programmatic Agreement, the HPSR retains the finding of No Historic Properties Affected according to Section 106 PA Stipulation IX.A and 36 CFR 800.4(d)(1) (Caltrans 2015k). Alternative 2 would not affect or use any Section 4(f) historic resource because no such properties were identified within the project vicinity.

No-Build Alternative

The No-Build Alternative would not affect any historic properties.

2.1.5.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Caltrans has taken precautions to detect potential archaeological and architectural resources within their respective APEs. However, there always exists the possibility that cultural material or human remains may be discovered during construction of either Alternative 1 or 2. If cultural materials or human remains are discovered during construction, the following avoidance and minimization measures (AMMs) would be implemented:

- **Measure CUL-1: Unanticipated Discovery of Cultural Resources.** In the event of an unanticipated cultural resource discovery during construction, all ground disturbances within 60 feet of the discovery will be halted or redirected to other areas until the discovery has been documented by a qualified archaeologist and its potential significance evaluated in terms of applicable criteria.

- **Measure CUL-2: Discovery of Human Remains.** If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the District 4 Office of Cultural Resource Studies Chief 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.

2.2 Physical Environment

2.2.1 Hydrology And Floodplain

2.2.1.1 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 FHWA requirements for compliance are outlined in 23 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.”

2.2.1.2 AFFECTED ENVIRONMENT

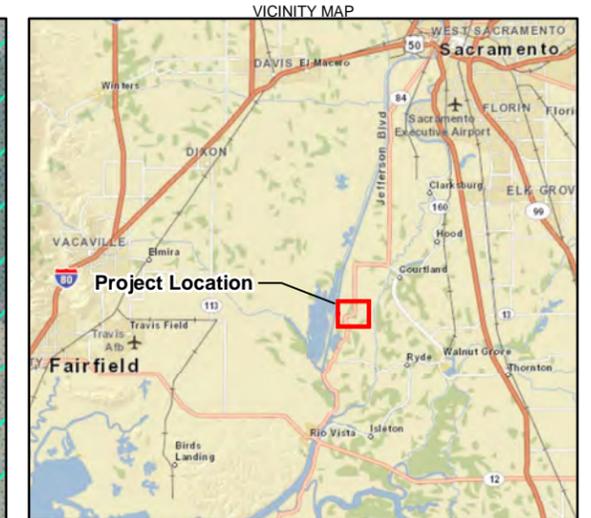
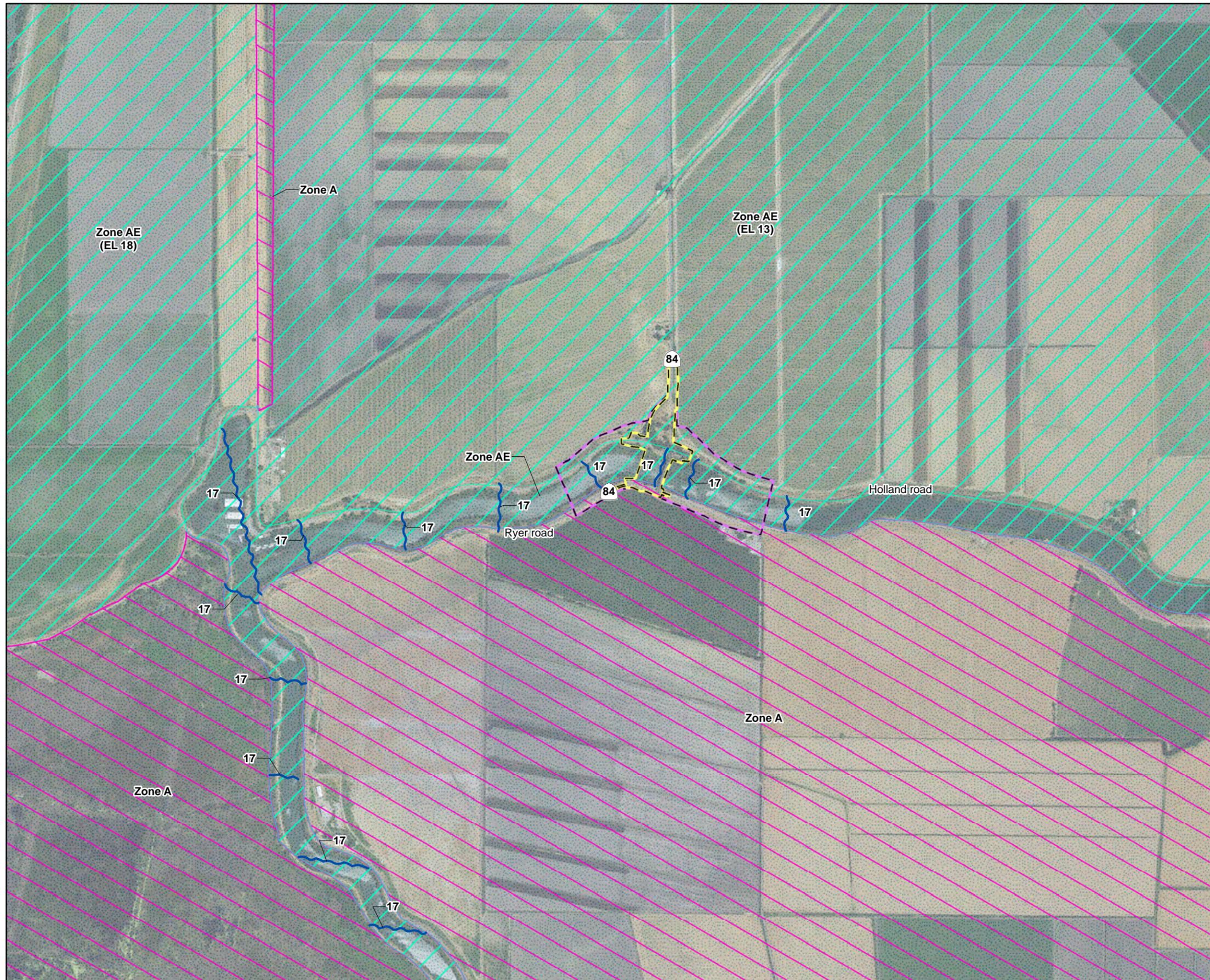
Hydrology and hydraulic information for this section was provided from the *Preliminary Hydraulic Report* (Caltrans 2014a) and *Preliminary Location Hydraulic Study* (Caltrans 2015g) prepared for the proposed project.

Miner Slough is one of three distributaries (i.e., a stream that branches off and flows away from a main stream channel) of the Sacramento River in the tidal area on the eastern portion of Solano County, within the Delta of the Sacramento and San Joaquin Rivers. Miner Slough flows in a southwesterly direction and reconnects with the Sacramento River downstream. The Miner Slough watershed covers a tidally influenced slough approximately 7.8 miles long that begins from Sutter Slough at the upstream end to the intersection of the Sacramento Deep Water Ship Channel and Cache Slough, and ends at the Yolo Bypass. The Delta is a low-lying tidal area that consists mainly of agricultural lands that have been reclaimed by levees. SR 84 from the Rio Vista city limits to the Miner Slough Bridge is located on a levee. In a base flood event, SR 84 north of Miner Slough can be overtopped. Within the project site, the elevation of this levee ranges from approximately 26.9 ft to 26.3 ft (NAVD88). Holland Road is also on a levee; within the project site the elevation of this levee ranges from 22.9 ft to 23.6 ft (NAVD88). The land usage of the surrounding area is primarily agricultural, with very few residences.

The Flood Insurance Rate Map (FIRM) number 06095C0345E, dated May 4, 2009 (Federal Emergency Management Agency [FEMA], 2009), indicates that the base flood inundates the area in the vicinity of the Miner Slough Bridge. Miner Slough is identified as Zone AE with a base flood water surface elevation (WSE) of 17 ft (NAVD88). The area north of Miner Slough is also identified as Zone AE with a base flood WSE of 13 ft (NAVD88). The area south of Miner Slough is identified as Zone A, meaning that no base flood WSE has been determined. The FIRM shows that the proposed project site is located in Zone AE (Figure 2-5).

The *Preliminary Location Hydraulic Study* (Caltrans 2015g) documents effects of the project on floodplain encroachment and identifies risks and potential impacts of the proposed action on the floodplain. The *Summary of Floodplain Encroachment Report* (Caltrans 2015h) summarizes the following:

- The proposed action is not a longitudinal encroachment of the base floodplain.
- The risks associated with the implementation of the proposed action are not significant.



- LEGEND**
-  Project Limits
 -  Project Study Area
 -  Zone A - No base flood elevations determined
 -  Zone AE - Base flood elevations determined
 -  Special flood hazard areas subject to inundation by the 1% Annual chance flood
 -  Base flood elevation line and value, elevation in feet*

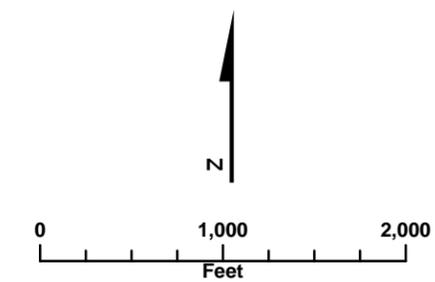


FIGURE 2-5
Federal Emergency Management Agency Flood Insurance Rate Map
 Miner Slough Bridge Replacement Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

- The proposed action does not support probable incompatible floodplain development.
- There are no significant impacts on natural and beneficial floodplain values.
- No special mitigation measures are necessary to minimize impacts or restore and preserve natural and beneficial floodplain values.
- The proposed action does not constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).

2.2.1.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Construction Phase

Under Alternative 1 approximately 150 cubic yards of fill would be placed below the base flood elevation of 17 ft (NAVD 88). Minimal fill would be placed within Zone A on the south side of Ryer Road. Approximately 14,500 cubic yards of fill would be placed for the realigned portion of Route 84 below the base flood elevation of 13 ft (NAVD 88). Approximately 612 ft of the new roadway is below the base flood elevation of 13 ft (NAVD 88) (Caltrans 2015g). Alternative 1 would result in approximately 1.67 ac of impervious surface, of which 0.57 ac would be re-worked (removed and replaced) and 1.10 ac would be new impervious surfaces. In a base flood event, SR 84 north of Miner Slough will be overtopped. Although new roadway would be below the base flood elevation, given the extent of the floodplain in the Delta region the amount of fill proposed would not significantly increase the base flood elevation, nor the flow pattern; therefore no significant impact would occur.

Construction and demolition activities associated with the proposed project would not impede or redirect flows; therefore no adverse effects to the area hydrology or floodplain would occur.

Operation Phase

As a result of deposition of fill material at the southern approach as described above under Construction Phase, placement of fill north of the proposed bridge, and the presence of fewer piers compared to the existing bridge, the proposed project could alter the floodplain under Alternative 1. However, the amount of fill would not significantly increase the base flood elevation, nor alter the flow pattern of Miner Slough; therefore no significant impact would occur.

According to the *Preliminary Hydraulic Report* (Caltrans 2014a), the preliminary hydraulic analysis and scour analysis conducted for the proposed project indicate that the bridge replacement would not cause hydraulic or scour-related issues because it was determined that post-project conditions would remain the same as the pre-project conditions.

Alternative 2 – Bridge Rehabilitation

Construction Phase

Alternative 2 would require approximately 1,880 cubic yards of fill north of Holland Road, below the base flood elevation of 13 ft (NAVD 88). South of Holland Road, there would be approximately 45 cubic yards of fill below the base flood elevation of 17 ft (NAVD 88) (Caltrans 2015g). Alternative 2 would result in approximately 0.62 ac of impervious surface, of which 0.58 ac would be re-worked (removed and replaced) and 0.04 ac are would be new impervious surfaces. In a base flood event, SR 84 north of Miner Slough would continue to be overtopped. Although new roadway would be below the base flood elevation, given the extent of the floodplain in the Delta region the amount of fill proposed would not significantly increase the base flood elevation, nor the flow pattern; therefore no significant impact would occur.

Construction and demolition activities associated with Alternative 2 would not impede or redirect flows; therefore no adverse effects to the area hydrology or floodplain would occur.

Operation Phase

As a result of deposition of fill material at the southern approach and placement of fill north of the existing bridge, the road work associated with the proposed bridge rehabilitation could alter the floodplain. The surrounding area in the vicinity of the project is relatively flat. Given the extent of the floodplain in the Delta region, the amount of fill would not significantly increase the base flood elevation, nor alter the flow pattern of Miner Slough; therefore no significant impact would occur.

Bridge rehabilitation would not cause hydraulic or scour-related issues because conditions would remain the same as the pre-project conditions.

No-Build Alternative

Under the No-Build Alternative no change to hydrology or floodplains would occur.

2.2.1.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

No adverse effects would occur to hydrology or floodplains during construction or operation of either Alternative 1 or 2; therefore, no avoidance, minimization and/or mitigation measures are proposed.

2.2.2 Water Quality and Storm Water Runoff

2.2.2.1 REGULATORY SETTING

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to waters of the U.S. from any point source⁴ 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 CWA 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 (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 United States. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

⁴ A point source is any discrete conveyance such as a pipe or a man-made ditch.

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 Standard permits. There are two types of General permits: Regional permits and Nationwide permits. 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 Nationwide Permit may be permitted under one of the USACE’s Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with the U.S. Environmental Protection Agency’s (USEPA’s) Section 404(b)(1) Guidelines (40 CFR Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the USEPA 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 that would have lesser 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 effluent⁵ 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).

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

⁵ The USEPA defines “effluent” as “wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall.”

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.

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 these 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, 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. RWQCBs 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 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 Caltrans as an owner/operator of an MS4 under federal regulations. Caltrans’ MS4 permit covers all Caltrans rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for 5 years, and permit requirements remain active until a new permit has been adopted.

Caltrans’ MS4 Permit (Order No. 2012-0011-DWQ) was adopted on September 19, 2012 and became effective on July 1, 2013. The permit has three basic requirements:

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

Caltrans’ Construction General Permit (Order No. 2009-009-DWQ), adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of

1 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 1 acre must comply with the provisions of the CGP. Construction activity that results in soil disturbances of less than 1 acre is subject to this CGP 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; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the CGP.

The 2009 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 during construction, as well as aquatic biological assessments during specified seasonal windows before and after construction. For all projects subject to the permit, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). In accordance with Caltrans' Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA of less than 1 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 United States 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 Waste Discharge Requirements 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.

2.2.2.2 AFFECTED ENVIRONMENT

A Water Quality Study (Caltrans 2015i) was prepared to assess the proposed project's potential effects to water quality and storm water management in the area.

The project is located within the Central Valley Regional Water Quality Control Board jurisdiction of Region 5S, which is responsible for implementation and enforcement of state and federal laws and regulations concerning water quality.

The proposed project is located within Hydrologic Sub-Area (HSA) 510.00, specifically the Toe Drain – Cache Slough sub-watershed. From the project site, Miner Slough flows for approximately 6 miles until discharge to the Sacramento River Deep Water Ship Channel (Channel). From there, flows continue along the Channel for approximately 3.8 miles to the confluence with Steamboat Slough, and then an additional 0.5 mile to the confluence with the Sacramento River. Flow within the Sacramento River continues for approximately 14 miles until its confluence with the San Joaquin River at the Delta (see Figure 2-6). Thus, the flowpath from the project site to the Delta is approximately 24 miles. These water bodies are included as part of the CWA Section 303(d) List for Water Quality Limited Segments, though rather than being listed separately, are collectively grouped as “Delta Waterways” (northern portion). This listing includes assigned pollutants/stressors of concern, and associated TMDLs, for the extensive network of water bodies that constitute Delta Waterways (northern portion).

According to the Region 5S Basin Plan (RWQCB 1998), Miner Slough is included with Delta water bodies requiring specific water quality objectives (WQOs) for diazinon and chlorpyrifos, both organophosphate insecticides. Additionally, the Basin Plan lists Miner Slough as part of the Delta Mercury Control Program (Caltrans 2015i).

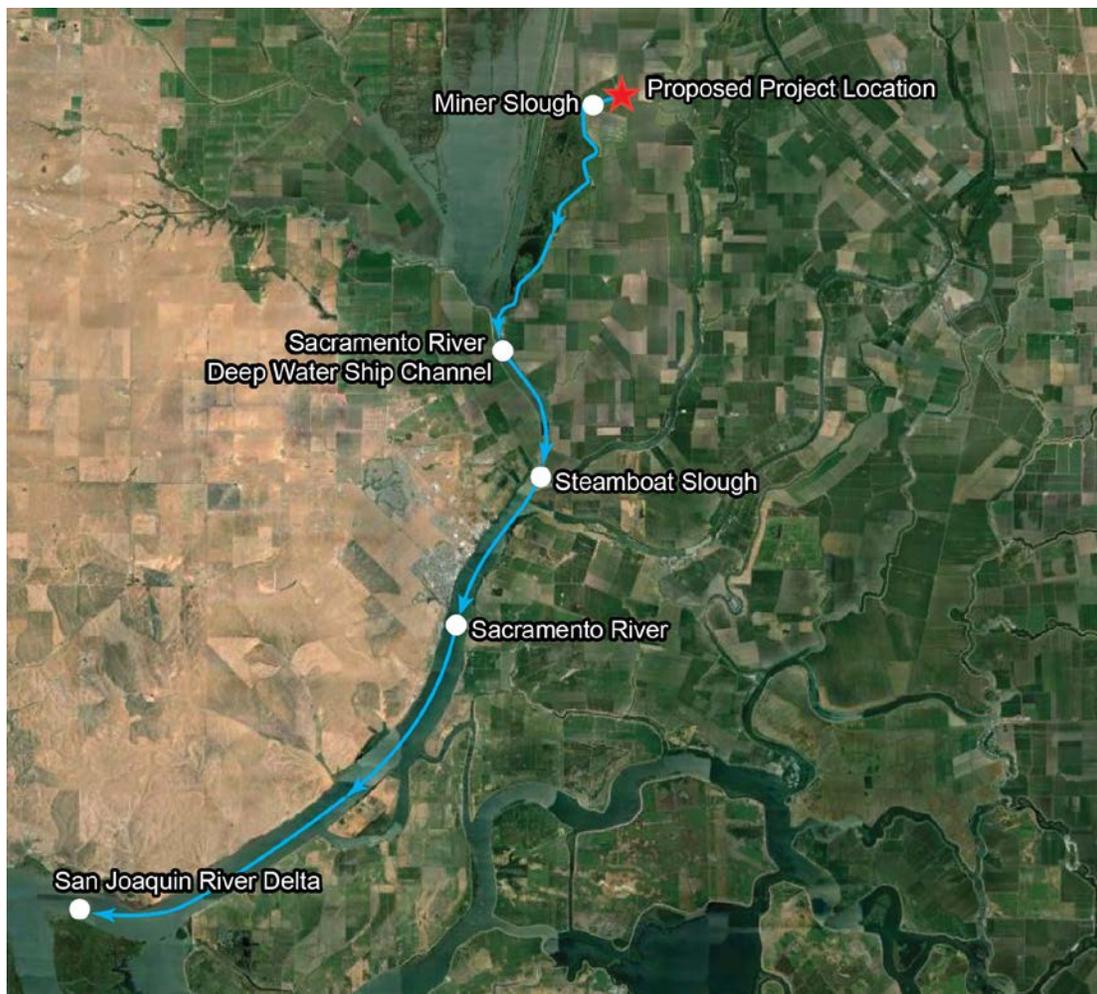
Beneficial Uses

The Basin Plan (RWQCB 1998) establishes beneficial uses for waterways and water bodies within the Delta which include:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Contact/Non-Contact Water Recreation (REC1/REC2)
- Warm Freshwater Habitat (WARM)

- Cold Freshwater Habitat (COLD)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Wildlife Habitat (WILD)
- Navigation (NAV)

Figure 2-6 Flow Path from Miner Slough Bridge to the San Joaquin River at the Delta



In addition, the Basin Plan specifically includes Miner Slough amongst Delta water bodies with Commercial and Sport Fishing (COMM) (recreation) as a beneficial use.

Groundwater

The California Department of Water Resources (DWR) Bulletin 118 has designated the project site as part of the Solano Sub-Basin of the Sacramento Valley Groundwater Basin (Sub-Basin Number 5-21.66) (DWR 2003). The California

Statewide Groundwater Elevation Monitoring (CASGEM) Groundwater Basin Prioritization is a statewide ranking of groundwater basin importance that incorporates groundwater reliance and focuses on basins producing greater than 90 percent of California's annual groundwater. This sub-basin has been ranked as having "Medium" prioritization (DWR 2014).

2.2.2.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Construction Phase

Alternative 1 would result in approximately 3.5 ac of soil disturbance. Construction would include ground disturbance from staging and active construction areas such as grading and earth moving activities; stockpiling of soils; and the loading, unloading, and transport of excavated and fill material. Structural material handling and concrete management would occur over Miner Slough. Heavy metals associated with vehicle tire and brake wear, oil and grease, and exhaust emissions are the primary pollutants associated with transportation corridors. Rainfall could carry loose soils into adjacent waterways, resulting in increased sedimentation and potential effects to water quality, such as an increase in turbidity. To prevent or reduce potential impacts, temporary BMPs would be deployed for general sediment control and material management; these may include, but are not limited to: hydraulic mulch (bonded fiber matrix), cover, fiber roll, limiting construction entrances and exits, concrete wash-out, and street sweeping.

Accidental spills or releases of hazardous materials, such as fuel or water with high pH from concrete work associated with bridge construction, could degrade the quality of storm water runoff that flows into the slough, or flow directly into the slough during dry-weather conditions. This contamination could potentially affect water quality of Miner Slough. With implementation of BMPs and permit requirements, the impact on water quality would be minimal because the potential for accidental spills or releases would be low and, if they did occur, they would be attended to and cleaned up immediately.

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 sediment and receiving water risks. Requirements apply according to the risk level determined. Alternative 1 is a Risk Level 1 (lowest risk) based on the potential sediment risk and the receiving water risk. The requirements for Risk Level 1 projects are presented in Attachment C of the CGP. Alternative 1 is subject to the CGP and is

required to develop and implement an effective SWPPP, because the disturbed soil area is greater than 1 ac.

Alternative 1 would require issuance of a Clean Water Act Section 401 certification from the Central Valley Regional Water Quality Control Board (Region 5S) for discharge into navigable waters; Caltrans would comply with the permanent storm water treatment and hydrograph modification (hereafter, “hydromodification”) mitigation requirements expected to be included as conditions.

With implementation of BMPs and permit requirements, the impact on water quality would be minimal.

Dewatering may be required during removal of the existing structure and abutment construction of the proposed structure. If so, effluent may have to be captured, stored, sampled and, depending on sampling results, hauled off-site. Water stored during dewatering would be stored and released in accordance with the permit requirements, and therefore potential impacts would be minimal. Water removed from the cofferdam would be discharged into Miner Slough.

Effects to Groundwater

The surface water elevation at Miner Slough is considered the groundwater level throughout the project site. If groundwater were encountered during construction, dewatering would protect groundwater quality. Water stored during dewatering would be stored and released in accordance with the permit requirements, and therefore potential impacts would be minimal.

Operation Phase

Surface Water

Alternative 1 would include new roadway surface from the realignment of SR 84, an operator control house, and a paved parking area. As noted previously, this alternative would result in approximately 1.67 ac of impervious surface, of which 0.57 ac would be re-worked (removed and replaced) and 1.10 ac would be new impervious surfaces. Impervious surfaces have the potential to cause a permanent impact due to the deposition and transport of sediment in storm water runoff. To address potential permanent impacts via sediment transport, soil stabilization and sediment control BMPs would be incorporated as part of the project design. A 401 Water Quality Certification from the RWQCB would be required. The stormwater treatment goal is expected to be approximately 1.67 acre. The Treatment BMP type would be either biofiltration or bioretention.

Potential long-term impacts to water quality from Alternative 1 are similar to those of the existing bridge: namely, the deposition and transport of sediment and vehicular-related pollutants. Because treatment BMPs would be implemented, and because long-term impacts to existing water quality would be similar to existing conditions, impacts from operation of the project would be minimal.

Groundwater

The proposed project would increase the impervious area as a result of the new roadway alignment and thus reduce the available unpaved area that previously allowed runoff to infiltrate into the native soils. The reduction of runoff infiltrating through native soils has the potential to result in loss in volume or amount of water that previously recharged localized aquifers and to reduce regional groundwater volumes. However, the increase in impervious area of 1.10 ac would be minimal because it is not expected to result in a measurable change to groundwater recharge.

Alternative 2 – Bridge Rehabilitation

Construction Phase

Alternative 2 would result in approximately 3.25 ac of soil disturbance. Construction of Alternative 2 would require similar ground disturbance activities, structural material handling, and primary pollutants associated with transportation corridors as discussed under Alternative 1. BMPs would be deployed for general sediment control and material management, accidental spills or releases of hazardous materials as discussed above under Alternative 1.

Alternative 2 is a Risk Level 1 (lowest risk) based on the potential sediment risk and the receiving water risk. The requirements for Risk Level 1 projects are presented in Attachment C of the CGP. Alternative 2 is subject to the CGP and is required to develop and implement an effective SWPPP, because the disturbed soil area is greater than 1 ac.

This project would require issuance of a Clean Water Act Section 401 certification from the Central Valley Regional Water Quality Control Board (Region 5S) for discharge into navigable waters; Caltrans would comply with the hydromodification mitigation requirements expected to be included as conditions.

With implementation of BMPs and permit requirements, the impact on water quality would be minimal.

Effects to Groundwater

The surface water elevation at Miner Slough is considered the groundwater level throughout the project site. If groundwater were encountered during construction, dewatering would protect groundwater quality. Water stored during dewatering would be stored and released in accordance with the permit requirements, and therefore potential impacts would be minimal.

Operation Phase

Surface Water

Under Alternative 2, the profile of Holland Road would need to be raised for a length of 500 ft to conform to the bridge access span, and the profile of SR 84 to the north of Holland Road would be raised for a stretch of 240 ft to conform to the newly paved Holland Road. As noted previously, Alternative 2 would result in approximately 0.62 ac of impervious surface, of which 0.58 ac would be re-worked (removed and replaced) and 0.04 ac are would be new impervious surfaces. Impervious surfaces have the potential to cause a permanent impact due to the deposition and transport of sediment in storm water runoff. To address potential permanent impacts via sediment transport, soil stabilization and sediment control BMPs would be incorporated as part of the project design. A 401 Water Quality Certification from the RWQCB would be required. The stormwater treatment goal is expected to be approximately 0.62 ac. The Treatment BMP type would be either biofiltration or bioretention.

Potential long-term impacts to water quality from Alternative 2 are similar to those of the existing bridge: namely, the deposition and transport of sediment and vehicular-related pollutants. Because treatment BMPs would be implemented, and because long-term impacts to existing water quality would be similar to existing conditions, impacts from operation of the project would be minimal.

Groundwater

Alternative 2 would increase the impervious area as a result of the new roadway alignment and thus reduce the available unpaved area that previously allowed runoff to infiltrate into the native soils. The reduction of runoff infiltrating through native soils has the potential to result in a diminished volume of water that previously recharged localized aquifers and thus a reduction in regional groundwater volumes. However, the increase in impervious area of 0.04 ac would be minimal and therefore is not expected to result in a measurable change to groundwater recharge.

No-Build Alternative

Currently there are no existing stormwater management features located at the Miner Slough Bridge. Under the No-Build Alternative existing storm water treatment associated with SR 84 would remain unchanged.

2.2.2.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Under either of the Build Alternatives, the following AMMs would be implemented during project construction and operation to prevent potential water quality effects from occurring.

Construction Phase

- **Measure WATER-1: SWPPP.** A Storm Water Pollution Prevention Plan will be developed and implemented and will comply with the Caltrans SWMP, which includes measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges. Water quality inspector(s) will inspect construction areas to determine if the storm water BMPs are adequate and adjust them, if necessary. Construction activities for the roadway improvements and bridge replacement and demolition will be regulated under the Construction General Permit. The SWPPP will be prepared by the contractor and approved by Caltrans.
- **Measure WATER-2: Stockpile Area.** Stockpile areas for construction materials, equipment, and debris will be placed greater than 150 ft away from Miner Slough, as well as covered to minimize/avoid impacts to Miner Slough.
- **Measure WATER-3: Temporary Construction Site BMPs.** These BMPs will be implemented throughout the duration of construction activities to avoid and minimize pollutant loads in potential storm water/non-storm water discharges. Construction Site BMP strategies applicable to this proposed project may include the following:
 - Soil stabilization: Temporary fence (Environmentally Sensitive Area [ESA] type); move-in/move-out; hydroseeding; geotextiles, mats, plastic covers, and erosion control blankets; hydraulic mulch
 - Sediment Control: Fiber rolls, silt fence, sediment trap, gravel bag berm, check dams, storm drain inlet protection
 - Tracking Control Practices: Temporary construction entrance/exit

- Wind Erosion Controls: Temporary covers
- Non-Storm Water Management: Dewatering operations, material and equipment use over water
- Waste Management and Materials Pollution Control: Concrete waste management, material delivery and storage, material use, stockpile management, spill prevention and control, soil waste management, hazardous waste and/or contaminated soil management, and liquid waste management
- **Measure WATER-4: Waste Management from Bridge Removal.** Waste from removal of the existing bridge will be conducted in accordance with the Standard Specifications, under Section 13-4.03E(6) entitled: “Structure Removal Over or Adjacent to Water.” The contractor will comply with this standard specification during removal of the existing bridge.

Operation Phase

The project design features to address water quality impacts are a condition of Caltrans’ NPDES permit. These BMPs would be developed and incorporated into the final design of the Build Alternative prior to project construction. Design features would include the following AMM:

- **Measure WATER-5: Permanent Treatment BMPs.** Permanent Treatment BMPs are permanent water quality control measures used to remove pollutants from storm water runoff prior to being discharged from Caltrans’ ROW. Permanent storm water treatment will be provided via biofiltration/bioretenion measures (for example, bioretention swale) for the entirety of the new and re-worked impervious surfaces. Hydromodification mitigation is only applicable to the new impervious surface quantity. The permanent storm water treatment and hydromodification obligations could be achieved within the project limits.

2.2.3 Geology/Soils/Seismic/Topography

2.2.3.1 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 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. Caltrans' Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans projects. Structures are designed using Caltrans' Seismic Design Criteria (SDC; Caltrans 2013a). The SDC provide 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 the proposed project an Ordinary Standard bridge would be constructed. For more information, please see Caltrans' Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

2.2.3.2 AFFECTED ENVIRONMENT

A *Preliminary Geotechnical Report* (Caltrans 2015a) was prepared for the proposed project. The following information is derived from this report.

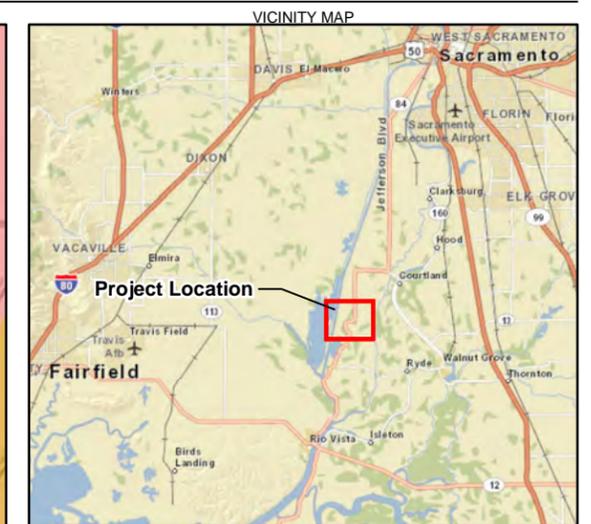
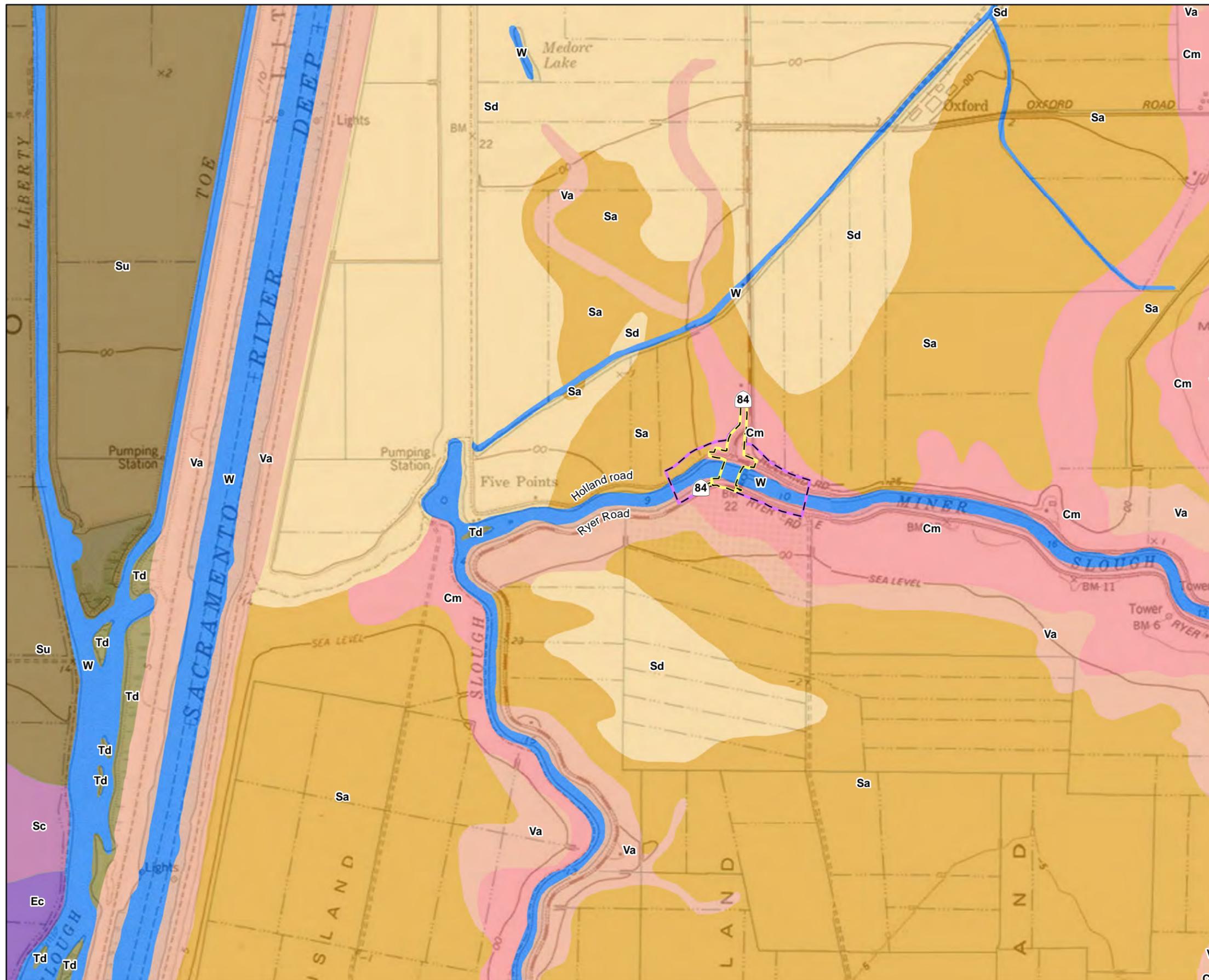
Geologic Setting

The project site is covered by Holocene alluvial fan levee deposits. Many of the islands that form the farmlands in the Delta regions have been protected by the Central Valley Project and the 1937 Rivers and Harbors Act. Many of the islands are ringed by a natural levee topped by a manmade levee.

Soils. The project site is covered by Colombia fine sandy loam. The Colombia fine sandy loam consists of nearly level, somewhat poorly drained soils on flood plains. These soils formed from mixed alluvium. This soil is pale-brown and gray, distinctly mottled, stratified sand, loam, and silty clay loam. Included with this soil are small areas of Valdez silt loam, Egbert silty clay loam, and Ryde clay loam. Permeability is moderately rapid. Surface runoff is slow, erosion is not a hazard. Shrink-swell potential is low, and corrosivity is moderate. Figure 2-7 shows the soils in the project area.

Faults and Seismicity

The dominant geologic structure in the area is the Great Valley fault system which consists primarily of northwest-striking, reverse faults. The closest portions of the Great Valley fault system to the project site are the Midland fault which is 8.9 miles south of the project site, and the Gordon Valley and Pittsburg Kirby Hills portions which are more than 17 miles west of the project site. Fault data are shown in Table 2-3.



- LEGEND**
- Project Limits
 - Project Study Area
- Natural Resource Conservation Service Soils**
- Cm - Columbia fine sandy loam
 - Ec - Egbert silty clay loam, occasionally flooded
 - Sa - Sacramento silty clay loam
 - Sc - Sacramento silty clay loam, occasionally flooded
 - Sd - Sacramento clay
 - Su - Sycamore complex, occasionally flooded
 - Td - Tidal marsh
 - Va - Valdez silt loam drained
 - W - Water

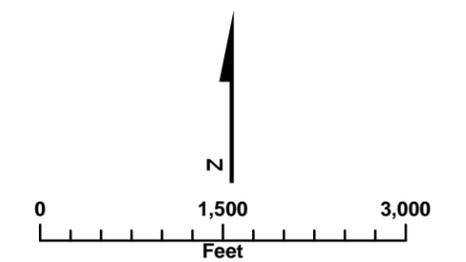


FIGURE 2-7
Natural Resource Conservation Service Soils Map
 Miner Slough Bridge Replacement Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

Table 2-3 Fault Data

Fault Name	Distance from Project Site (miles)	Fault ID	Fault Type	Maximum Magnitude (MMax)
Great Valley 06 Midland	8.9	116	Reverse	6.8
Great Valley 05 Pittsburgh Kirby Hills	17.8	111	Reverse	6.6
Great Valley 04b Gordon Valley	17.3	104	Reverse	6.7

Source: Preliminary Geotechnical Report for Miner Slough Bridge (Caltrans 2015a)

No known active or potentially active faults cross the project site; therefore, the potential for fault ruptures is low.

Liquefaction

Liquefaction is a process whereby strong ground shaking causes loose, saturated, unconsolidated sediments to lose strength and to behave as a fluid. This subsurface process can cause ground deformation at the surface, including lateral spreading and differential compaction or settlement and sand boils. Loss of bearing strength and ground movements associated with liquefaction may result in damage to structures/roadways. Loose, saturated sandy and silty soils are particularly susceptible to liquefaction.

The Preliminary Geotechnical Report (Caltrans 2015a) indicates that a secondary seismic hazard is the susceptibility to liquefaction. Liquefaction susceptibility is very high at the slough banks and moderate approximately 100 ft inland of the project site. In addition, where streams are incised, the Holocene alluvial fan deposits that form the levee and cover the project site could be susceptible to spreading.

Topography. The project site is located in the eastern part of Solano County, which is on the floor of the Sacramento Valley. The valley areas of Solano County are level or gently sloping alluvial plains and marshes. They are near sea level along the eastern and southern borders and rise to an elevation of approximately 100 ft at the foot of the Montezuma Hills. The bridge spans across Miner Slough at the northern tip of Ryer Island. The tops of the levees are approximately 15 ft above the slough. Drainage from the roadway is typically sheet flow into the low-lying areas.

2.2.3.3 ENVIRONMENTAL CONSEQUENCES

According to the Preliminary Geotechnical Report (Caltrans 2015a) there are no hazardous geotechnical conditions, such as erosion, landslides, slope stability, settlement of the levees, or scour, at the project site. However, there are geologic

constraints that may require special considerations in regard to the potential for seismic activity (ground shaking).

Alternative 1 – Bridge Replacement

Construction Phase

Construction impacts could include soil movement due to initial settlement of fill. These potential impacts would be addressed in the construction and design requirements for the proposed project. Implementing construction and design requirements reduces the risk of soil movement during construction to a minimal level. The risk would be elevated if an earthquake were to occur during construction, but the likelihood of a large earthquake during construction is considered low because of the relatively short duration of construction relative to the frequency of large earthquakes.

Operation Phase

Northern California is within the most tectonically active area of the North American Continent. The proposed project lies within the Delta, which is on the western edge of the San Joaquin/Sacramento Valley. The western side of the valley has a complex system of faults. According to the Alquist-Priolo Earthquake Fault Zone Maps, the proposed project is not located within a special studies zone (Caltrans 2015a). However, given the location of the project ground shaking could occur at this location. Under Alternative 1 the project design would incorporate SDC requirements for an Ordinary Standard bridge. With implementation of design features the potential impacts from ground-shaking are minimal. Because the potential for fault ruptures at the project site is low, it is unlikely that the bridge, or roadway, would be damaged by fault ruptures.

Liquefaction could result in lateral spreading, the settlement and failure of land or structures over the liquefiable soil layers. According to the *Preliminary Geotechnical Report* (Caltrans 2015a), liquefaction susceptibility is very high at the stream banks and moderate approximately 100 ft inland, and the project site could be susceptible to lateral spreading. Lateral spreading could impact project structures such as piers and bridge abutments. The project design would incorporate standard engineering features that would not increase the potential for liquefaction at the project site. For example, the piles for the piers would be driven to an appropriate depth (50 ft deep) to support the superstructure, and the abutments would be designed and constructed to address any structural concerns regarding liquefaction.

Alternative 2 – Bridge Rehabilitation

Under Alternative 2 impacts from construction and operation would be the same as discussed above under Alternative 1.

2.2.3.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The following AMM would minimize ground shaking impacts to the proposed project:

- **Measure GEO-1: Engineering Design.** Engineering design of project structures will be carried out in accordance with the latest version of the Caltrans Seismic Design Criteria (Caltrans 2013a). The Caltrans Seismic Design Methodology (Caltrans 2010b) applies to all highway bridges designed in California.
 - *Fault rupture and ground shaking:* Engineering design of the bridge, operator control house, and roadways will be carried out in accordance with Caltrans design standards, which take into account, for example, proximity to a fault. Because of the potential for ground shaking in the project area in the event of a large earthquake, Caltrans will perform a detailed seismic demand analysis and the bridge, embankments, slopes, and roadway will be designed to withstand strong ground shaking. The measures to protect structures from ground shaking may include structural improvements/strengthening, as well as soil improvements.
 - *Liquefaction:* Because of the potential for liquefaction and lateral spreading, there is a potential for the proposed structures to be damaged in a large earthquake. Through the use of appropriate construction and design methods, in accordance with the Caltrans *Highway Design Manual* (Caltrans 2012) and Caltrans Design Information Bulletins, the proposed project would not increase the potential for liquefaction at the project site. Structural concerns regarding liquefaction will be addressed by incorporating appropriate construction and design methods.

2.3 Biological Environment

2.3.1 Natural Communities

2.3.1.1 REGULATORY SETTING

This section discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors 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 (FESA) are discussed in Section 2.3.5, Threatened and Endangered Species. Wetlands and other waters are briefly discussed below and in Section 2.3.2.

2.3.1.2 AFFECTED ENVIRONMENT

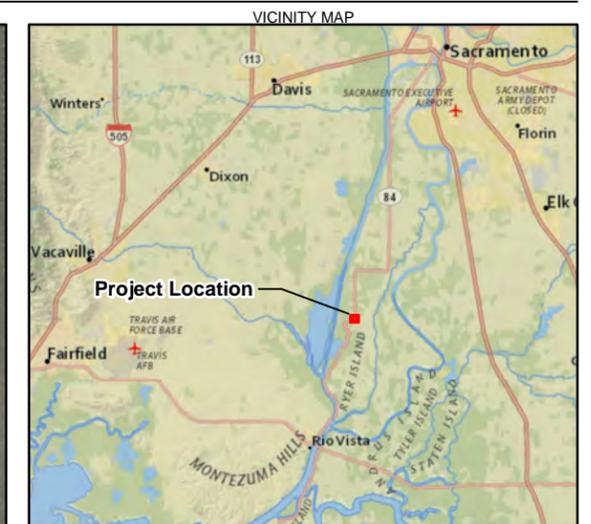
Habitat in the Study Area supports various common and special-status wildlife species. (The Biological Study Area for the proposed project is the same as the Study Area used to evaluate most other types of resources in this IS/EA; this area is referred to throughout the IS/EA as simply “the Study Area” [except on the figures in this Biological Environment section, which refer to the Biological Study Area]. The Study Area includes the limits of project construction plus a 200-ft radius and is shown on Figure 1-2; this same area is shown as the Biological Study Area in the figures in this section. Field studies were conducted within the limits of the Study Area.) The banks of Miner Slough are dominated by riparian vegetation, including open areas with riprap and an access road adjacent to the bridge along the north bank. Below the edge of the banks the slough has been left in a relatively undisturbed state.

The proposed project is in a sparsely populated area where the majority of the vegetation consists of valley foothill riparian, annual grassland, and agriculture. The majority of the vegetation consists of native riparian forest with a mix of native and non-native species in the understory.

Five habitat types/land cover types were found in the approximately 33-ac Study Area and are discussed briefly below in order of abundance. The natural vegetation types are based on *A Manual of California Vegetation* (Sawyer et al. 2009). Figure 2-8 depicts the habitat types and related impacts due to project activities.

Aquatic (Wetlands and Other Waters)

The wetlands within the BSA consist of small patches along the north bank of the slough and on the small island within the slough, totaling approximately 0.36 ac (see Figure 2-9 in Section 2.3.2). Two wetland types can be found bordering the north bank of the slough. One is a palustrine tidal wetland; the dominant vegetation within this wetland is white alder (*Alnus rhombifolia*), red willow (*Salix laevigata*), curly



- LEGEND**
- Biological Study Area (BSA)
 - 1 Foot Elevation Contours
- Habitat Type**
- Agriculture (3.56 acres)
 - Annual Grassland (7.90 acres)
 - Wetlands (0.36 acre)
 - Other Waters (10.30 acres)
 - Urban / Developed (3.59 acres)
 - Valley Foothill Riparian (7.31 acres)

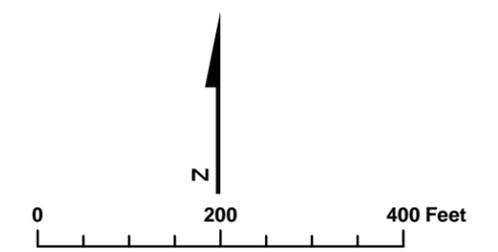


FIGURE 2-8
Habitat Types within the Biological Study Area
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California



dock (*Rumex crispus*), and common rush (*Juncus patens*). The other is a palustrine emergent seasonal wetland; the dominant vegetation within this wetland is white alder, red willow, common rush, and sedge (*Carex* spp.). The National Wetlands Inventory Wetlands Mapper (NWI 2015) classifies the island as shrub scrub wetland.

Other waters consist of Miner Slough and total approximately 10.3 ac within the Study Area. Miner Slough makes up the riverine habitat in the BSA. Miner Slough provides potential habitat for many fish species, including threatened and endangered species, as described in Section 2.3.5.

Annual Grassland

Annual grassland makes up approximately 7.90 ac of the Study Area. Few native plants were observed in this habitat. It is dominated by introduced annual grasses such as wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), wild barley (*Hordeum* spp.), and foxtail fescue (*Festuca myuros*). Due to much of the area being disturbed by the roadway maintenance (mowing etc.) and close proximity to the roadway, it offers low quality habitat for wildlife species as it provides little cover or foraging habitat for small mammals and birds.

Valley Foothill Riparian

Valley foothill riparian habitat makes up approximately 7.31 ac of the Study Area. The valley foothill riparian vegetation type borders both sides of Miner Slough. Two California Native Plant Society (CNPS) rare plants observed in the Study Area, Sanford's arrowhead (*Sagittaria sanfordii*; CNPS List 1B.2) and woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*; CNPS List 1B.2), were found in this habitat type. This habitat provides potential bird nesting habitat and marginal upland dispersal habitat for giant garter snake (*Thamnophis gigas*).

Urban/Developed

These areas are the paved and gravel roads, making up approximately 3.59 ac of the Study Area including portions of SR 84, Ryer Road, and Holland Road.

Agriculture

Agricultural lands make up approximately 3.56 ac of the Study Area and are located along the northern edge of the Study Area. This habitat type consists of cropland/pasture that is actively farmed. Agricultural areas typically provide low-quality foraging habitat for most birds and small mammals, but can provide marginal habitat for some species.

2.3.1.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Construction Phase

Project construction would have permanent and temporary direct impacts to the natural communities listed above in Section 2.3.1.2, Affected Environment. The areas of these effects are shown in Table 2-4.

Table 2-4 Natural Communities Area of Effects – Alternative 1

Habitat	Temporary (ac)	Permanent (ac)	Shade (ac)	Total (ac)
Agriculture	0.032	0.002	0.000	0.034
Annual Grassland	1.110	0.408	0.042	1.560
Aquatic (Wetlands and Other Waters)	0.219	0.020	0.216	0.455
Urban / Developed	0.116	0.101	0.000	0.217
Valley Foothill Riparian	0.847	0.269	0.103	1.219
Total	2.324	0.800	0.361	3.485

Alternative 1 would result in the direct conversion of annual grassland and valley foothill riparian habitat on the north side of Miner Slough due to the new alignment, and would also remove approximately 43 trees with a diameter at breast height greater than 4 inches. These include the following: black walnut (*Juglans nigra*) (approximately 26 trees), acacia (*Acaciaeae sp.*) (7 trees), English walnut (*Juglans regia*) (2 trees), Fremont cottonwood (*Populus fremontii*) (2 trees), olive (*Olea europaea*) (2 trees), fig (*Ficus carica*) (2 trees), sweet bay (*Laurus nobilis*) (1 tree), and sycamore (*Platanus racemosa*) (1 tree). The new alignment would not likely affect wildlife species that require larger contiguous areas of undeveloped lands for their territories, as this area of impact (on the north side of Miner Slough) is approximately 3 acres in size and surrounded by existing roadways and agricultural areas. Construction activities, such as earth-moving or staging, would have direct temporary effects due to temporary loss of ground cover. The area on the north side of Miner Slough would be revegetated. Impacts to terrestrial habitat would result from expansion of Holland Road and compaction at the staging area. The project construction would have minimal effects to the natural communities within the Study Area and would be further minimized by natural community-related AMMs, which are described below in Section 2.3.1.4.

Operation Phase

Maintenance and operation of the new alignment and bridge are not expected to have effects to natural communities greater than those under existing conditions, as such activities would occur within the paved and developed areas.

Alternative 2 – Bridge Rehabilitation

Construction Phase

Under Alternative 2, project construction would have permanent and temporary direct impacts to the natural communities listed above in Section 2.3.1.2, Affected Environment. The areas of these effects are shown in Table 2-5.

Table 2-5 Natural Communities Area of Effects – Alternative 2

Habitat	Temporary (ac)	Permanent (ac)	Shade (ac)	Total (ac)
Agriculture	0.032	0.000	0.000	0.032
Annual Grassland	1.110	0.208	0.000	1.318
Aquatic (Wetlands and Other Waters)	0.219	0.000	0.216	0.455
Urban / Developed	0.116	0.054	0.000	0.170
Valley Foothill Riparian	0.847	0.269	0.000	1.116
Total	2.324	0.531	0.216	3.091

Alternative 2 would result in the direct conversion of annual grassland and valley foothill riparian habitat on the north side of Miner Slough due to the new alignment, and would also remove approximately 30 trees with a diameter at breast height greater than 4 inches. These include the following: black walnut (approximately 16 trees), acacia (8 trees), Fremont cottonwood (1 tree), fig (4 trees), and sweet bay (1 tree). The new alignment would not likely affect wildlife species that require larger contiguous areas of undeveloped lands for their territories, as this area of impact (on the north side of Miner Slough) is approximately 2.3 acres in size and surrounded by existing roadways and agricultural areas. Construction activities, such as earth-moving or staging, would have direct temporary effects due to temporary loss of ground cover. The area on the north side of Miner Slough would be revegetated. Impacts to terrestrial habitat would result from expansion of Holland Road and compaction at the staging area. The project construction would have minimal effects to the natural communities within the Study Area and would be further minimized by natural community-related AMMs, which are described below in Section 2.3.1.4.

Operation Phase

Maintenance and operation of the new alignment and bridge are not expected to have effects to natural communities greater than those under existing conditions, as such activities would occur within the paved and developed areas.

No-Build Alternative

Under the No-Build Alternative, the proposed project would not be implemented. The No-Build Alternative would not contribute to direct, indirect, or cumulative effects to natural terrestrial and aquatic communities in the Study Area.

2.3.1.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The proposed project has been designed to minimize permanent effects to natural communities to the greatest extent feasible.

Under both Build Alternatives all feasible and practical measures would be undertaken to avoid or minimize impacts to natural community habitat types. These include AMMs AIR-1 in Appendix C, and WATER-1 through WATER-4, as described in Section 2.2.2.4, to avoid and/or minimize construction-related impacts. The following AMMs would further minimize the proposed project's effects to natural community habitat:

- **Measure BIO-1: ESA Fencing.** The final construction drawings will show all Environmentally Sensitive Areas (ESAs) (including areas of annual grassland, valley foothill riparian, and areas that may potentially support sensitive species as described in Section 2.3.3 and 2.3.4 below). Prior to the commencement of construction activities, high-visibility fencing will be erected around any and all designated ESAs. The fencing will help to prevent encroachment of construction personnel and equipment into sensitive areas during construction activities and to prevent wildlife from entering the project site. The fencing shall be inspected and maintained by the contractor until completion of the proposed project.
- **Measure BIO-2: Vegetation Control.** The removal of native vegetation will be confined to the minimal area necessary to facilitate construction activities.
- **Measure BIO-3: Seasonal Avoidance.** To the extent practicable, construction will not occur during the wet season. Work within the streambed will be limited to the period between August 1 and November 30.

- **Measure BIO-4: Worker Environmental Awareness Training.** Before the onset of construction activities, a qualified biologist will conduct an education program for all construction personnel. The training will include a description of all listed species with the potential to occur in the BSA as well as migratory birds and their habitats; the occurrence of these species within the project area; an explanation of the status of these species and protection under the federal and California Endangered Species Acts (FESA and CESA); the measures to be implemented to conserve listed species and their habitats as they relate to the work site; and boundaries within which construction may occur. A fact sheet conveying this information will be prepared and distributed to all project personnel entering the project area. Upon completion of the training program, personnel will sign a form stating that they attended the program and understand all the avoidance and minimization measures and implications of FESA and CESA.
- **Measure BIO-5: Avoidance of Entrapment.** To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered at the close of each working day by plywood or similar materials, or will be provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. All replacement pipes, culverts, or similar structures stored within the project area overnight will be inspected before they are subsequently moved, capped, and/or buried.
- **Measure BIO-6: Pre-construction Surveys.** A biologist approved by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) will conduct pre-construction surveys for federally and state-listed species, and the biologist will be present during construction activities including vegetation clearing and grubbing, as required by the resource agencies. If at any point any listed species is discovered within the project limits, the agency-approved biologist, through the Resident Engineer or his/her designee, will halt all work within 50 ft of the animal and contact the corresponding agency (USFWS or CDFW) to determine how to proceed.
- **Measure BIO-7: Handling of Listed Species.** If at any time a listed species is discovered, the Resident Engineer and the agency-approved biologist will be immediately informed. The agency-approved biologist will determine whether

relocating the species is necessary, and will work with the corresponding agency (USFWS or CDFW) prior to handling or relocating unless otherwise authorized.

- **Measure BIO-8: Vegetation Removal.** Vegetation within the project limits may be impacted by construction activities, and some clearing will be needed. Vegetation will be cleared only where necessary and will be cut above soil level except in areas that will be excavated for roadway construction. This will allow plants that reproduce vegetatively to resprout after construction. All clearing and grubbing of woody vegetation will occur by hand tools or using light construction equipment such as backhoes and excavators. A qualified biologist(s) will survey for nesting birds within the area(s) to be disturbed, including a perimeter buffer of 50 ft for passerines and 300 ft for raptors, before clearing activities begin during the nesting season (February 16 through August 31). All nest avoidance requirements of the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFGC) will be observed. All cleared vegetation will be removed from the BSA to prevent attracting animals to the project site. The contractor will be responsible for obtaining all permits, licenses, and environmental clearances for properly disposing of such materials.
- **Mitigation Measure BIO-A: Revegetation and Planting.** Upon completion of project construction, mitigation for the loss of valley foothill riparian habitat will be performed on-site within the Caltrans ROW. Approximately 43 trees will be replanted and disturbed areas will be re-contoured to the natural grade and revegetated with native species appropriate for the site conditions. If planting cannot be accomplished on-site due to a general lack of suitable planting area, offsite mitigation options will be pursued.

2.3.2 Wetlands and Other Waters

2.3.2.1 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 U.S.C. 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 United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. 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 USACE with oversight by the USEPA.

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. 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 Nationwide Permit may be permitted under one of USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with USEPA's Section 404(b)(1) Guidelines (USEPA 40 CFR Part 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the USEPA 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, this executive order states that a federal agency, such as the Federal Highway Administration and/or Caltrans, 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 project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board, the Regional Water Quality Control Boards, and the California Department of Fish and Wildlife. In certain circumstances, the Coastal Commission (or the Bay Conservation and Development Commission or Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the CFGC 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 Regional Water Quality Control Boards 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 (Section 2.2.2) for additional details.

2.3.2.2 AFFECTED ENVIRONMENT

As part of the project development, a wetland delineation was conducted in March 2014 (Caltrans 2014b). All potentially jurisdictional wetlands and Waters of the U.S. were identified and mapped within the Study Area according to the methods outlined in the USACE's *Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Arid West Regional Supplement to the 1987 Manual* (USACE 2006). The jurisdictional determination of these features is pending USACE verification.

A potentially jurisdictional tidal wetland (0.09 acre) is located on the north side of Miner Slough. The dominant vegetation within the wetland is white alder, red willow, curly dock, and common rush. A potentially jurisdictional emergent seasonal wetland (0.016 acre) was found along the north bank of Miner Slough. The dominant vegetation within the wetland is white alder, red willow, common rush, and sedge. Caltrans biologists were unable to survey the island directly east of the existing

bridge for wetlands because it was not easily accessible. The island would not be affected by the proposed project. The NWI Wetlands Mapper (NWI 2014) classifies the island as shrub scrub wetland (0.25 acre). Miner Slough is identified as potentially jurisdictional other waters, and is approximately 10.30 acres within the Study Area.

Please see Figures 2-9 and 2-10 for detailed maps of potentially jurisdictional wetlands and other waters and potential impacts within the project area.

2.3.2.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Construction Phase

Alternative 1 would result in direct temporary and permanent adverse effects to potentially jurisdictional wetlands and other waters. There are no anticipated permanent or temporary impacts to potentially jurisdictional emergent seasonal wetlands. Temporary indirect impacts to potentially jurisdictional tidal wetland include 0.016 ac of shading from the temporary north trestle. Permanent indirect impacts to potentially jurisdictional tidal wetlands on the north shore of the Miner Slough include shading of 0.019 ac beneath the new bridge. Approximately 0.2 ac of direct impacts are expected to potentially jurisdictional open water from having the trestles in place for up to 3 construction seasons (pile driving would be done during the first construction season); although the trestles would be removed following bridge completion, the 3-year duration may result in the effect being defined as a permanent impact to Miner Slough. Permanent direct impacts of approximately 0.02 ac would occur to potentially jurisdictional waters of the U.S. from the new bridge piers.

Temporary adverse effects to potentially jurisdictional wetlands would result from working in areas adjacent to cut-and-fill activities. Work in these areas may result in trampled wetland vegetation or the spread of dust and transported excavated and fill material while constructing the proposed roadway. Installing the proposed cofferdam would have direct temporary effects to Miner Slough. Within Miner Slough, impacts would include disturbance of the bottom substrate through installation of the temporary trestles, which may temporarily increase turbidity from the displacement of sediment. Such indirect impacts could occur during vibration of piles, and potential drift and settlement outside the project site. Caltrans will implement erosion and dust control BMPs to minimize the temporary adverse effects from these construction activities. Refer to Section 2.2.2.4 for a detailed description of the measures that will be taken to protect water quality affected by the Bridge Replacement Alternative.

Alternative 1 would require obtaining a Section 404 permit (it is anticipated that the proposed project would qualify under the Nationwide Permit program), a Section 401 Water Quality Certification (see also Section 2.2.2, Water Quality and Storm Water Runoff), a WDR from the RWQCB, and a Lake and Streambed Alteration Agreement from CDFW. These permits would be applied for during the design phase of the project.

Operation Phase

Maintenance and operation of the new realignment and bridge are not expected to have effects to wetlands and other waters.

Alternative 2 – Bridge Rehabilitation

Construction Phase

Alternative 2 would result in direct temporary and permanent adverse effects to potentially jurisdictional wetlands and other waters. There are no anticipated permanent or temporary impacts to potentially jurisdictional emergent seasonal wetlands. Temporary indirect impacts to potentially jurisdictional tidal wetland include 0.011 ac of shading from the temporary north trestle. Approximately 0.2 ac of direct impacts are expected to potentially jurisdictional open water from having the trestles in place for up to 2 construction seasons (pile driving would be done during the first construction season); although the trestles would be removed following bridge repair, the 1-year duration may result in the effect being defined as a permanent impact to Miner Slough.

Operation Phase

Maintenance and operation of the new realignment are not expected to have effects to wetlands and other waters.

No-Build Alternative

Under the No-Build Alternative the bridge would continue to operate in current conditions.

2.3.2.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The proposed project has been designed to use the fewest number of in-water piers/piles as possible, in an effort to minimize permanent effects to the greatest extent feasible. Several AMMs would protect wetlands and other waters to reduce or offset the direct temporary and permanent adverse effects on these features. The potential for adverse effects to water quality would be reduced by implementing

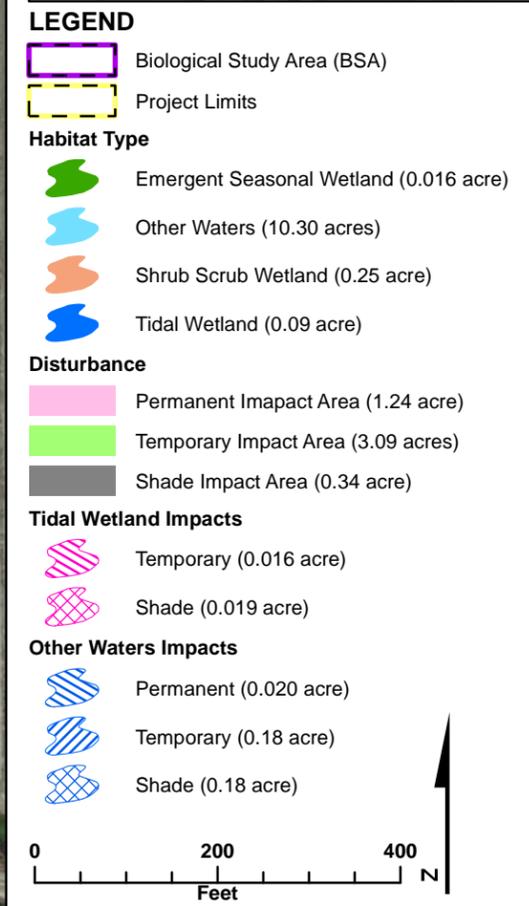
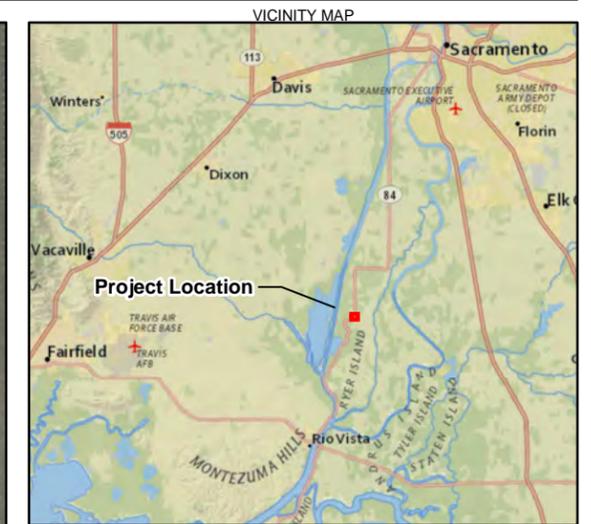
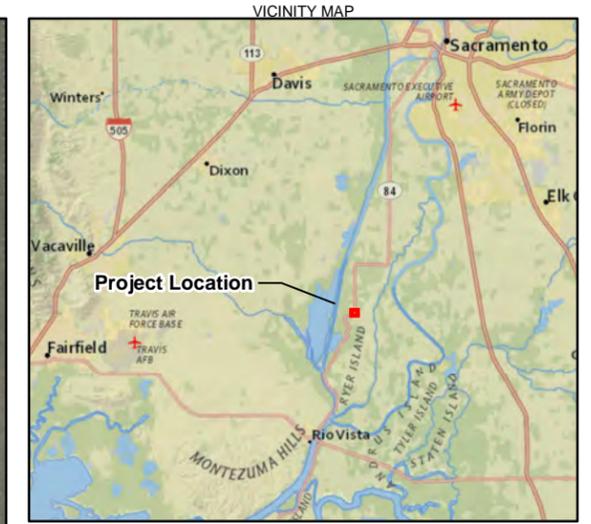


FIGURE 2-9
Impacts to Potential Wetlands and
Other Waters Bridge Replacement
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California



LEGEND

- Biological Study Area (BSA)
- Project Limits

Habitat Type

- Emergent Seasonal Wetland (0.016 acre)
- Other Waters (10.30 acres)
- Shrub Scrub Wetland (0.25 acre)
- Tidal Wetland (0.09 acre)

Disturbance

- Permanent Impact Area (0.50 acre)
- Temporary Impact Area (1.31 acres)

Tidal Wetland Impacts

- Temporary (0.016 acre)
- Shade (0.011 acre)

Other Waters Impacts

- Temporary (0.18 acre)
- Shade (0.017 acre)

N
0 200 400
Feet



FIGURE 2-10
Impacts to Potential Wetlands and
Other Waters Bridge Rehabilitation
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

temporary and permanent BMPs outlined in the SWPPP. Caltrans erosion control BMPs will be implemented to minimize any wind- or water-related erosion. Caltrans will implement the AMMs identified previously in Section 2.3.1, Natural Communities, including Measures BIO-1 and BIO-2, as well as the AMMs WATER-1 through WATER-4 described in Section 2.2.2.4 and compiled in Appendix C. The following AMMs would further minimize the proposed project's effects to wetlands and other waters under the Build Alternative.

- **Measure BIO-9: Wetland Avoidance and Minimization.** Caltrans will avoid or minimize adverse effects to wetlands to the maximum extent practicable. The resident engineer will enforce the staging and access plan. Vegetation removal will be limited to the amount necessary to complete project construction.
- **Mitigation Measure BIO-B: Compensatory Mitigation for Jurisdictional Features.** Caltrans will mitigate for jurisdictional wetlands and other waters of the U.S. to achieve no net loss of the functions and values of jurisdictional features within the Study Area. Caltrans will mitigate on-site at a 1:1 ratio by restoring wetlands and other waters as a result of removing the temporary construction trestles and demolishing the existing bridge. For permanent impacts, and through coordination with the USACE and RWQCB, Caltrans will mitigate at an approved off-site location at a minimum of a 1:1 ratio, with the final mitigation ratio determined through permitting with the USACE and RWQCB. Potential mitigation opportunities include Burke Ranch Conservation Bank and Elsie Gridley Mitigation Bank.

2.3.3 Plant Species

2.3.3.1 REGULATORY SETTING

The U.S. Fish and Wildlife Service and California Department of Fish and Wildlife 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 and/or California Endangered Species Act. Please see the Threatened and Endangered Species section (Section 2.3.5) in this document for detailed information about these species.

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

The regulatory requirements for FESA can be found at 16 U.S.C. 1531 et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at CFGC Sections 2050 et seq. Caltrans projects are also subject to the Native Plant Protection Act, found at CFGC Sections 1900-1913, and CEQA, PRC Sections 21000-21177.

2.3.3.2 AFFECTED ENVIRONMENT

Special-status plant surveys were conducted as part of the project development. Surveys were conducted within the Study Area during the appropriate blooming periods in 2014 (April, June, August, and December) and 2015 (March and April). The special-status plant surveys identified two special-status plants, Sanford’s arrowhead and woolly rose-mallow, in the potentially jurisdictional tidal wetland along the north bank of Miner Slough (Table 2-6; Figures 2-11 and 2-12). A list of the special-status plant species with potential to occur within the Study Area can be found in Table D-1 in Appendix D.

Table 2-6 Plant Species and Habitats of Concern within the Study Area

Scientific Name	Common Name	Status ¹	Specific Habitat Present/Absent ²	Species Presence/Absence ²	Rationale
<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	Woolly rose-mallow	CNPS 1B.2	P	P	Historic occurrences near proposed project in CNDDB. Specimens observed during the 2014 rare plant surveys.
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	CNPS 1B.2	P	P	Observed in project site during 2014 rare plant surveys

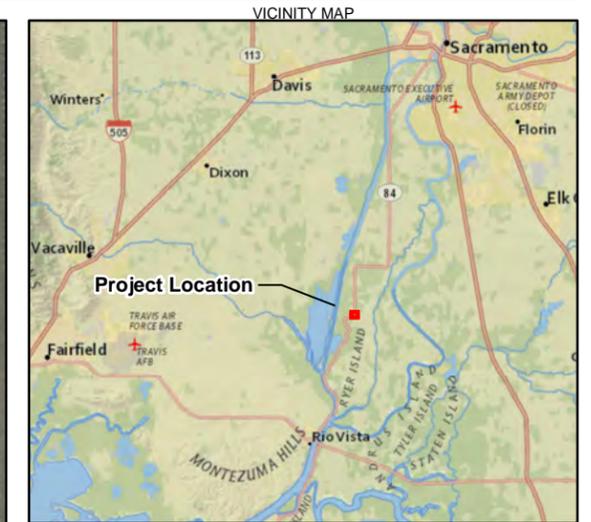
Notes:

¹ CNPS California Native Plant Society

1B = Plants rare, threatened or endangered In California or elsewhere

0.2 = Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

² P Present—Suitable habitat is present



LEGEND

- Woolly Rose Mallow
- Sanford's Arrowhead
- Biological Study Area (BSA)
- Project Limits
- Disturbance**
- Permanent Impact Area (1.24 acre)
- Temporary Impact Area (3.09 acres)
- Shade Impact Area (0.34 acre)
- Temporary Impact (Bridge Removal 0.19 acre)
- Impacts to Rare Plants**
- Temporary (0.004 acre)

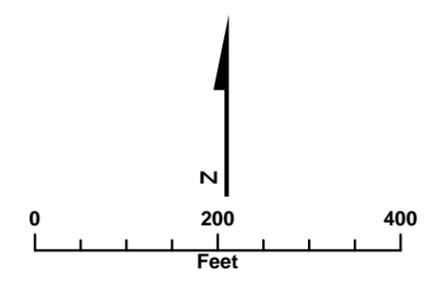
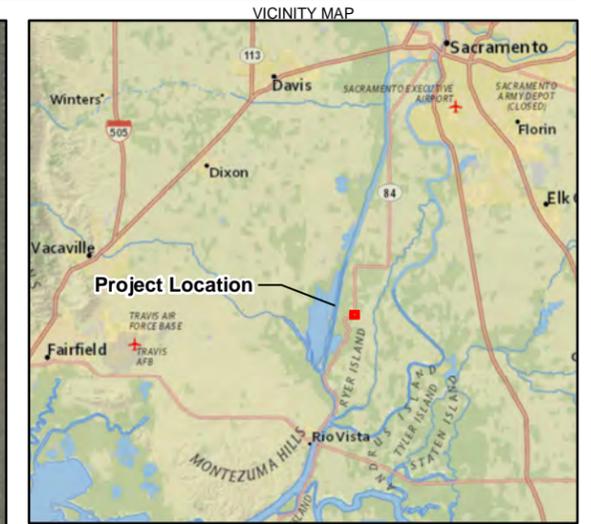


FIGURE 2-11
Impacts to Special-status Plant Species
Bridge Replacement
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California



- LEGEND**
- Woolly Rose Mallow
 - Sanford's Arrowhead
 - Biological Study Area (BSA)
 - Project Limits
- Disturbance**
- Permanent Impact Area (0.50 acre)
 - Temporary Impact Area (1.31 acres)
- Impacts to Rare Plants**
- Permanent (0.008 acre)

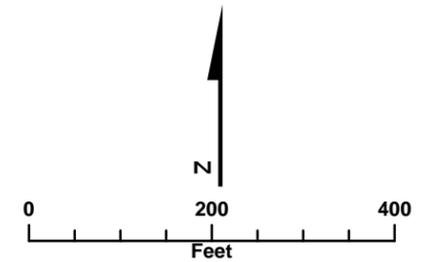


FIGURE 2-12
Impacts to Special-status Plant Species
Bridge Rehabilitation
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

Woolly Rose-mallow

Woolly rose-mallow is a rhizomatous perennial herb in the family Malvaceae. It blooms from June through September. The CNPS rates this species as a List 1B.2 on its inventory of rare and endangered plants. This species is endemic to California and almost always occurs within freshwater marsh and swamp habitats, often in riprap on sides of levees. A population of woolly rose-mallow was found on the north side of Miner Slough on top of a fallen log under the existing bridge. One plant was found in this location and it was in peak bloom. The species occurs in an area that would be spanned by the temporary trestle.

Sanford's Arrowhead

Sanford's arrowhead is a rhizomatous perennial herb in the Alismataceae family. The CNPS rates this species as a List 1B.2 on its inventory of rare and endangered plants. This species is endemic to California and almost always occurs within marshes and swamps in shallow freshwater (CNPS 2015). It blooms from May through November. It is considered extirpated from southern California, and mostly extirpated from the Central Valley. A population of Sanford's arrowhead was located on the north side of Miner Slough, on both sides of the existing bridge. Approximately 100 plants were located along 137 ft of shoreline northwest of the existing bridge and 50 plants were found along 31 ft of shoreline on the northeast side of the bridge. During the June 2014 site visit, 75 percent of the plants were blooming. The occurrence lies in an area that would be spanned by the temporary trestles.

2.3.3.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Construction Phase

Installation of the temporary trestle on the north bank would cause temporary indirect effects due to shading. The anticipated impacts to several individual plant species would directly impact approximately 627 square ft (less than 0.01 ac) of the potentially jurisdictional tidal wetland.

Operation Phase

Maintenance or operation of the new realignment and bridge is not expected to have effects to plant species. The new bridge structure, once built and in operation, would avoid shading of plant species observed, as these populations are outside of the dripline of the new bridge.

Alternative 2 – Bridge Rehabilitation

Construction Phase

Approximately 348 square ft (less than 0.01 acre) of the tidal wetland where plant species are found would be directly impacted by shading caused by installation of the temporary trestle, with an expected impact to several individuals of the species. This impact estimate would be revised prior to construction to a lower figure that would include only the area of individual populations being relocated out of the project area. No indirect impacts would occur to these species.

Operation Phase

Maintenance or operation of the new realignment is not expected to have effects to plant species.

No-Build Alternative

The No-Build Alternative would not result in new direct, indirect, or cumulative effects to special-status plant species.

2.3.3.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Caltrans is also exploring the possibility of relocating these individuals to an area that would not be impacted by project activities, including moving the downed log supporting woolly rose-mallow further east and outside of the construction area. The water quality AMMs described in Section 2.2.2.4 (WATER-1 through WATER-4), as well as the natural communities (BIO-1, BIO-2) and wetland and other waters AMMs in Sections 2.3.1.4 and 2.3.2.4, respectively, would further minimize project effects to plant species.

2.3.4 Animal Species

2.3.4.1 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 (NMFS), 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 Acts. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.5 below. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NMFS 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 1601 – 1603 of the CFCG
- Sections 4150 and 4152 of the CFCG

2.3.4.2 AFFECTED ENVIRONMENT

The following analysis is based on the Natural Environment Study (NES) prepared for the proposed project (Caltrans 2015j) and surveys conducted in support of the proposed project.

Habitats within the Study Area support common species such as the raccoon (*Procyon lotor*), gopher snake (*Pituophis catenifer*), mockingbird (*Mimus polyglottos*), and California ground squirrel (*Spermophilus beecheyi*). The California Natural Diversity Database (CNDDDB) (CDFW 2015) and USFWS (2015) species lists were queried for sensitive wildlife species occurring within the Liberty Island U.S. Geological Survey (USGS) 7.5-minute quadrangle and the surrounding eight quadrangles (see Appendix E). This information is presented as a table of special-status animal species with potential to occur within the Study Area and can be found in Table D-2 in Appendix D.

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a CDFW State Species of Special Concern. This species prefers open, dry grasslands and nests between February 1 and August 31. Nests are typically located in abandoned rodent burrows, particularly California ground squirrel, which they modify each year. Annual grasslands, agricultural fields, and orchard-vineyard habitat within and adjacent to the Study Area could provide potentially suitable foraging and nesting habitat. While the Study Area could provide potential habitat for this species, the amount and quality of the habitat is low and this species was not identified on the CNDDDB records search for the Liberty Island quadrangle.

White-tailed Kite

The federal MBTA also protects the white-tailed kite (*Elanus leucurus*) which has CDFW Fully Protected status. This species is found in rolling foothills and valley margins with scattered oaks, river bottomlands, and marshes next to deciduous woodland. The white-tailed kite requires open grasslands or meadows for foraging close to isolated, dense-topped trees for nesting and perching. They are year-round residents in California but migrate in other parts of the U.S.

Song Sparrow (“Modesto” population)

The song sparrow (“Modesto” population) (*Melospiza melodia*) is protected by the MBTA and is considered a State Species of Concern by CDFW. This species is a resident of brackish-water and freshwater marshes and inhabits cattails (*Typha* sp.), tules and other sedges, and pickleweed (*Salicornia* sp). The species is also known to frequent tangles bordering sloughs.

Western Red Bat

Western red bat (*Lasiurus blossevillii*) is listed as a State Species of Special Concern by CDFW. This species is a typical tree bat, which is closely associated with cottonwoods in riparian areas at elevations below 6,500 ft. Western red bats are also known to roost in orchards, especially in the Sacramento Valley of California. While the Study Area could provide potential habitat for this species north of the bridge, the amount and quality of the habitat is low and this species was not identified on the CNDDDB records search for the Liberty Island quadrangle.

Structure Roosting Bats

The existing bridge within the Study Area provides suitable habitat for structure roosting species bat species, such as the Mexican free tailed bat (*Tadarida brasiliensis*), and little brown bat (*Myotis lucifugus*). The Study Area could provide potential habitat for this species under the existing bridge, although this species was not identified on the CNDDDB records search for the Liberty Island quadrangle.

Migratory Birds

The existing bridge within the Study Area provides suitable habitat for nesting species such as migratory swallows. The cliff swallow (*Petrochelidon pyrrhonota*) is a fairly common migratory bird species that forms large nesting colonies on bridges and other man-made structures. Suitable habitat for cliff swallows is widely available around the project area, and there are numerous nesting colonies in the Delta.

Other migratory birds, including vegetation nesting species such as black phoebe (*Sayornis nigricans*), have the potential to nest in the project area.

Western Pond Turtle

The western pond turtle (*Actinemys marmorata*) is listed as a State Species of Special Concern by CDFW. This species occurs in a variety of permanent and intermittent aquatic habitats, such as ponds, marshes, rivers, streams, sloughs, and ephemeral pools. Pond turtles require suitable basking and haul-out sites, such as emergent rocks or floating logs, which they use to regulate their temperature. In addition to aquatic habitat, western pond turtles require an upland oviposition site in the vicinity of aquatic habitat, often within 500-700 ft. Suitable habitat for western pond turtle is widely available around the project area and vicinity.

Formal surveys have not been conducted for species listed above. None of these species have been observed in the Study Area; however, suitable habitat for each species is found within the Study Area. These species were not identified on the CNDDDB records search for the Liberty Island quadrangle.

2.3.4.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Construction Phase

Construction of Alternative 1 would have direct permanent effects to suitable bird nesting habitat and burrowing owl habitat. The project would result in loss of potential bird nesting habitat due to the conversion of natural habitat to hardscape, converting a total of 0.27 ac of suitable nesting habitat in annual grassland and valley foothill riparian habitat (see Figure 2-8). Alternative 1 would have direct temporary effects to suitable habitat for structure nesting/roosting species (e.g., bats and cliff swallows) and western pond turtle. It would also result in temporary effects as a result of temporary trestles and demolition of the existing structure. These effects are minimal based on the large area of available habitat surrounding the Study Area. Additionally, burrowing owl, white-tailed kite, song sparrow, western red bat, and western pond turtle have not been identified in the Liberty Island quadrangle in CNDDDB, nor have these species been observed during field surveys. Although potentially suitable habitat exists within the Study Area, it is unlikely these species would occur in the Study Area.

Pre-construction nesting surveys would be conducted within the Study Area prior to Alternative 1 implementation and during the breeding season to identify any active nest, burrow, or roost, and establish a construction-free buffer zone until the

nest/roost/burrow is no longer active. As a result, direct effects (e.g., nest/roost/burrow abandonment or destruction, or species mortality) to birds, bats, or pond turtles are not expected during project implementation.

Operation Phase

As Alternative 1 is a replacement of an existing bridge, the operation of the bridge is not expected to affect nesting birds, bats, or western pond turtle as use of the new bridge is not expected to reduce nesting locations or disturb these animals in their habitats.

Alternative 2 – Bridge Rehabilitation

Construction Phase

Construction of Alternative 2 would have direct permanent effects to suitable bird nesting habitat and burrowing owl habitat. This alternative would result in loss of potential bird nesting habitat due to vegetation removal, converting a total of 0.46 ac of suitable nesting habitat in annual grassland and valley foothill riparian habitat (see Figure 2-8). Alternative 2 would have direct temporary effects to suitable habitat for structure nesting/roosting species (e.g., bats and cliff swallows) and western pond turtle. It would also result in temporary effects as a result of temporary trestles. These effects are minimal based on the large area of available habitat surrounding the Study Area. Additionally, burrowing owl, white-tailed kite, song sparrow, western red bat, and western pond turtle have not been identified in the Liberty Island quadrangle in CNDDDB, nor have these species been observed during field surveys. Although potentially suitable habitat exists within the Study Area, it is unlikely these species would occur in the Study Area.

Pre-construction nesting surveys would be conducted within the Study Area prior to project implementation and during the breeding season to identify any active nest, burrow, or roost, and establish a construction-free buffer zone until the nest/roost/burrow is no longer active. As a result, direct effects (e.g., nest/roost/burrow abandonment or destruction, or species mortality) to birds, bats, or pond turtles are not expected during project implementation.

Operation Phase

Under Alternative 2, operation of the bridge is not expected to affect nesting birds, bats, or western pond turtle as continued use of the existing bridge is not expected to reduce nesting locations or disturb these animals in their habitats.

No-Build Alternative

Under the No-Build Alternative, current conditions would continue. The No-Build Alternative would not result in new direct, indirect, or cumulative effects on nesting birds, bats, burrowing owl, or western pond turtle.

2.3.4.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The avoidance and minimization efforts described above in Section 2.3.1.4 would reduce potential effects to migratory bird species, bats, burrowing owl, and western pond turtle. Additionally, the measure included below would further avoid and minimize effects under Alternatives 1 and 2:

- **Measure BIO-10: Pre-construction Surveys for Birds.** Pre-construction surveys for special-status wildlife species will be conducted by a qualified biologist no more than 72 hours prior to the start of any construction activities. If an active nest is found, a qualified biologist in conjunction with the resource agencies will determine the appropriate buffer size and delineate the buffer zone using methods such as ESA fencing, pin flags, yellow caution tape, etc. Construction within the buffer zone will be prohibited until the qualified biologist determines the nest is no longer active. If establishment of the buffer around any nest is not feasible, the appropriate resource agencies will be contacted for further avoidance and minimization guidelines.

2.3.5 Threatened and Endangered Species

2.3.5.1 REGULATORY SETTING

The primary federal law protecting threatened and endangered species is the federal Endangered Species Act (FESA) (16 U.S.C. 1531 et seq.; see also 50 CFR Part 402). This Act and subsequent 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, are required to consult with the U.S. Fish and Wildlife Service and National Marine 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 is a Biological Opinion or an Incidental Take Permit. 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 [CFGC] Sections 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 is the agency responsible for implementing CESA. Section 2081 of the CFGC prohibits “take” of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the CFGC 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 under Section 2081 (b) of the CFGC. For projects requiring a Biological Opinion under Section 7 of the FESA, CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the CFGC.

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 U.S., by exercising (1) 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 (2) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas. The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies such as the FHWA, and Caltrans through NEPA Assignment, to consult with the Secretary of Commerce on any action or proposed action authorized, funded, or undertaken by that agency that may adversely affect essential fish habitat (EFH) as identified under this Act.

2.3.5.2 AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the proposed project (Caltrans 2015j) and surveys conducted for the project. Table D-1 in Appendix D shows the USFWS, CNPS, and CNDDB lists of special-status plant species, including threatened and endangered species that may occur in the USGS Liberty Island 7.5-minute quadrangle and the eight surrounding quadrangles, as well as their status, habitat requirements, and potential to occur in or adjacent to the project area. No federal or state listed plant species or their critical habitat have been documented within a 5-mile radius of the Study Area. Because of the lack of suitable habitat

within the Study Area and nearby source populations, and because none were found during protocol-level rare plant surveys, federal or state listed plant species are not expected to occur in the proposed Study Area.

Table D-2 in Appendix D contains the list of special-status wildlife species with a potential to occur within the Study Area. This list is based on the USFWS list of federally listed wildlife species and critical habitat, and a review of the CNDDDB for the Liberty Island 7.5-minute quadrangle and the eight surrounding quadrangles. This table includes the species status, habitat requirements, and potential to occur in or adjacent to the project area. Swainson's hawk (*Athene cunicularia*) and elderberry shrubs (*Sambucus* spp.) with no exit holes have been confirmed within the Study Area. Delta smelt (*Hypomesus transpacificus*), longfin smelt (*Spirinchus thaleichthys*), Central Valley steelhead (*Oncorhynchus mykiss irideus*), Sacramento River winter-run and Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*), and green sturgeon (*Acipenser medirostris*) are considered present within the Study Area based on habitat present and CNDDDB records. In addition, hydro-acoustic modeling was performed to analyze potential impacts to aquatic species during pile installation for the temporary trestles (Illingworth & Rodkin 2015). Giant garter snake and tricolored blackbird (*Agelaius tricolor*) have a potential to occur in the Study Area. These species are discussed below.

Caltrans will conduct Section 7 consultation with the USFWS for the Delta smelt, longfin smelt and giant garter snake. Caltrans will conduct Section 7 consultation with NMFS for Central Valley steelhead, Sacramento River winter-run and Central Valley spring-run chinook salmon, and green sturgeon. Caltrans will also consult with CDFW for effects to Delta smelt, longfin smelt, Sacramento River winter-run and Central Valley spring-run chinook salmon, giant garter snake, and Swainson's hawk. A Section 2081 Incidental Take Permit will be obtained.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*) is federally listed as a threatened species. The VELB occurs in remnants of riparian and elderberry savanna habitats in the Central Valley and foothill locations. The VELB larvae feed solely on elderberry shrubs. The larvae are woodborers and feed internally in the roots and main stems of elderberry. Elderberry shrubs with stems that are greater than 1.0 inch in diameter at ground level are required for the beetle to complete its life cycle. The field assessment in April 2014 found a cluster of four elderberry shrubs along the north bank of Miner Slough, but no beetles or exit holes

were observed. The closest CNDDDB record of VELB is approximately 13 miles away.

Delta Smelt

The Delta smelt is federally listed as a threatened species and state listed as endangered. The project area is located within designated critical habitat for Delta smelt, and presence of this species in the project area is inferred.

Delta smelt are native (endemic) to the upper Sacramento-San Joaquin River Delta. They occur in the Delta primarily downstream of Isleton on the Sacramento River, downstream of Mossdale on the San Joaquin River, and in Suisun Bay in the Western Delta.

Delta smelt inhabit open, surface waters of the Delta and Suisun Bay, where they school. During all life stages, they are found in greatest abundance in the top 6.7 ft of the water column, and usually not in close association with the shoreline. Delta smelt of all sizes are found in the main channels of the Delta and Suisun Marsh and the open waters of Suisun Bay, where the waters are well oxygenated and temperatures relatively cool, usually less than 59° to 68° F in summer. When not spawning, they tend to be concentrated near the zone where incoming salt water and out-flowing fresh water mix.

In most years, spawning occurs in shallow water habitats in the Delta. Spawning is believed to occur from late January through late June or early July, with a peak in late April and early May (Bennett 2005, Wang 1991). Most Delta smelt die after spawning, but a small contingent of adults survives and can spawn in their second year (Moyle 2002).

Longfin Smelt

Longfin smelt is considered a candidate for listing under FESA and is listed as state threatened. This species is found in a wide range of salinities from fresh water to seawater. They can occupy water as warm as 68°F in summer months, but prefer 59° to 64.4°F waters. The peak breeding season occurs between February and April with larger and older longfin smelt spawning later in the year (Wang 1986, as cited by Moyle et al. 1995). Longfin smelt are rarely found upstream of Rio Vista or Medford Island in the Delta.

No aquatic surveys were conducted for the proposed project. The CDFW Smelt Larva Survey data indicate that longfin smelt adults, juveniles, and larvae are largely absent

from the Study Area between May and January, and may be present December to June.

Chinook Salmon (Sacramento River Winter-Run)

The Sacramento River winter-run Chinook salmon Evolutionary Significant Unit (ESU) is listed as federally endangered and as state endangered. Critical habitat for winter-run Chinook salmon does not exist within the project area. In California, Chinook salmon Essential Fish Habitat (EFH) includes all water bodies currently or historically occupied by Chinook salmon. Chinook salmon EFH also includes the estuarine and marine areas extending from the extreme high tide line in nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone north of Point Conception.

Adults migrate through the Delta during the winter and into late spring (May/June) en route to their spawning grounds in the mainstem Sacramento River downstream of Keswick Dam (USFWS 2001, 2003). This generally occurs from December through July, with a peak occurring in March (Moyle 2002). Adults are believed to primarily use the mainstem Sacramento River for passage through the Delta (NMFS 2009).

Chinook Salmon (Central Valley Spring-Run)

The Central Valley spring-run Chinook salmon ESU is listed as federally threatened and as state threatened. Critical habitat for this ESU includes all river reaches accessible to listed Chinook salmon in the Sacramento River and its tributaries. Also included are adjacent riparian zones, river reaches, and estuarine areas of the Sacramento-San Joaquin River Delta (with the exception of the Sacramento River deep-water ship channel). EFH for Central Valley spring-run Chinook salmon ESU consists of juvenile rearing habitat, juvenile migration corridors, and adult migration corridors within the project area. Spring-run Chinook salmon returning to spawn in the Sacramento River system enter the San Francisco Bay Estuary from the ocean in January to late February, and the Delta and Sacramento River between March and May (Moyle et al. 1995).

Central Valley Steelhead

The Central Valley steelhead Distinct Population Segment (DPS) is listed as federally threatened. Critical habitat is located in Northern California, including Solano County. The Sacramento-San Joaquin River Delta serves as an adult and juvenile migration corridor and as a nursery area for juvenile steelhead (McEwan and Jackson 1996). Based on existing literature and the documented life history characteristics of

Central Valley steelhead, adult Central Valley steelhead would be expected to be migrating upstream from the ocean/estuary into freshwater to spawn, in late summer and early fall. Therefore, Central Valley steelhead are assumed to be present in the project area during in-water work.

Green Sturgeon

The Southern DPS of North American green sturgeon is listed as federally threatened. Critical habitat includes all waterways of the Delta and the proposed project area. Green sturgeon is the most widely distributed member of the sturgeon family in North America (NMFS 2007). They are found in rivers from British Columbia south to the Sacramento River, California (Moyle 2002). NMFS has determined that this species consists of two distinct population segments along the west coast of the U.S. and Canada: the Northern DPS and the Southern DPS. The Northern DPS of green sturgeon includes spawning populations from the Rogue River, Oregon and the Eel and Klamath rivers in California (NMFS 2007). The Southern DPS of green sturgeon consists of a single spawning population found in the Sacramento River. The presence of green sturgeon is inferred in the Study Area.

Giant Garter Snake

The giant garter snake (GGS) is listed as federally and state threatened. GGS occurs in areas with freshwater wetlands, low-gradient streams and sloughs, ponds, waterways, and adjacent uplands. It has also adapted to human-made habitats, such as drainage canals, irrigation ditches, and rice fields. During the active season, GGS generally remain in close proximity to wetland habitats, but can move at least 800 ft into upland areas. Within the Study Area, potential GGS habitat consists of the outer levee banks of Miner Slough.

Swainson's Hawk

Swainson's hawk is a state threatened species that breeds in California and winters in Central and South America. It is a large, broad-winged and broad-tailed hawk with wings that taper noticeably at the tip. Swainson's hawks require large, open grasslands with abundant prey in association with suitable nest trees. Swainson's hawks often nest peripherally to riparian systems of the valley and use lone trees or groves of trees in agricultural fields. During site visits for rare plant surveys in 2014, Caltrans biologists observed an active Swainson's hawk nest near the project area. The nest is located outside of the proposed project construction limits, but within a 0.25-mile radius of the project area.

Tricolored Blackbird

The tricolored blackbird is listed as endangered under CESA as of December 2014. Tricolored blackbirds breed near fresh water, preferably in emergent wetland habitat containing tall, dense cattails or tules; they also breed in thickets of willow, blackberry, wild rose, and tall herbs (Zeiner et al. 1990). Formal surveys have not been conducted for tricolored blackbird and it has not been observed in the Study Area, nor recorded in CNDDDB for the Liberty Island quadrangle. The project area may provide marginal foraging habitat, but does not provide appropriate nesting habitat.

2.3.5.3 ENVIRONMENTAL CONSEQUENCES

As previously discussed in Section 2.3.4, Animal Species, several species listed as endangered or threatened under CESA or FESA have the potential to occur within the Study Area. The potential direct and indirect effects on threatened and endangered species within the Study Area under the project alternatives are discussed below.

Alternative 1 – Bridge Replacement

Construction Phase

Valley elderberry longhorn beetle are unlikely to occur within the project area based on the lack of exit holes observed during the survey in 2014, the lack of other elderberry plants located within the Study Area, and the location of the closest known CNDDDB occurrence being over 10 miles away. The elderberry plants are located within 100 ft of construction activities and would be protected in-place through fencing or flagging; therefore the project may affect, but is not likely to adversely affect, the VELB during construction.

Direct effects to Delta smelt and longfin smelt are not expected as a result of project construction. To minimize the potential for direct and indirect effects, in-water work activities would be conducted during the approved work window for the Central Zone of the Delta (August 1 to November 30) as described in the programmatic consultation on Delta smelt (USFWS 2004). This would avoid any direct effects on Delta and longfin smelt resulting from hydro-acoustic noise levels resulting from pile driving, as that is the time when both species are not typically present in the Study Area. Longfin smelt adults, juveniles, and larvae are not expected to be present within the Study Area during the proposed in-water work window. Because all in-water work activities would be conducted when longfin smelt are absent from the Study Area, no direct effects are expected during construction. Replacing the existing bridge over Miner Slough and constructing temporary trestles would not result in a loss or

shading of shallow water habitat (SWH) for smelt. The programmatic consultation on Delta smelt considers the replacement of the bridge and construction of the temporary trestles to be activities that would not result in the loss or shading of SWH (USFWS 2004). Removing the old bridge would open up 0.12 ac of shaded SWH, and would offset a portion of the 0.2 ac of shaded SWH associated with replacing the bridge. The proposed project would result in a net increase of 0.08 ac of shaded SWH. Effects to critical habitat as a result of construction and subsequent removal of the trestles would be temporary in nature.

Direct effects to Sacramento River winter-run Chinook salmon and Central Valley spring-run Chinook salmon may occur as a result of project construction. Utilization of the in-water work window (August 1 to November 30) would minimize direct and indirect effects to Sacramento River winter-run Chinook salmon, and would avoid the upstream migration of adult Central Valley spring-run Chinook salmon and avoid all but late emigrating juveniles. Given that these emigrating Central Valley spring-run Chinook salmon juveniles would simply be passing downstream through the Study Area during the proposed work window, it is highly unlikely that any individuals would be impacted by the cumulative sound exposure levels over the course of a working day, and mortality would only potentially arise from impacting the piles during proof-testing (final impact from vibratory hammer on the pile). The proposed avoidance and minimization measures would minimize the likelihood of potential mortality. Removing the old bridge would open up 0.12 ac of shaded SWH, and would offset a portion of the 0.2 ac of shaded SWH associated with replacing the bridge. The proposed project would result in a net increase of 0.08 ac of shaded SWH. No impacts to Sacramento River winter-run or Central Valley spring-run Chinook salmon designated critical habitat would occur. No indirect impacts to winter-run or spring-run Chinook salmon are expected.

Direct and indirect effects to Central Valley steelhead may occur as a result of project construction. The August 1 to November 30-in-water work window occurs during the upstream migration of adult Central Valley steelhead. Peak and cumulative sound pressure levels associated with proof-testing the piles has the potential to injure or kill migrating adult and juvenile steelhead, though as stated above this is considered unlikely. Harassment of migrating adult and juvenile steelhead from underwater noise, however, is likely to occur. The peak sound levels from piles being proofed and/or from cumulative sound levels may affect any rearing or migrating Central Valley steelhead juveniles that may be present during pile driving over the course of a working day. The proposed AMMs would minimize the likelihood of potential

adverse effects and mortalities in these cases. Presence of the piles would not appreciably diminish the ability of Central Valley steelhead to migrate upstream or downstream.

Direct and indirect effects to southern DPS of North American green sturgeon may occur as a result of project construction. Data on southern DPS green sturgeon are insufficient to rule out the potential for post-spawning and juvenile/sub-adults to be present in the Study Area during the August 1 to November 30 in-water work window. As such, there is the potential for direct effects associated with sound pressure waves from pile driving. Indirect effects would result from temporary loss of aquatic habitat during the installation and use of temporary trestles. This would be offset through the removal of the temporary trestles and the removal of the existing bridge. Direct effects to critical habitat are temporary and would ultimately result in a net gain of aquatic habitat through the removal of the existing bridge.

Figure 2-13 depicts impact areas to fisheries and aquatic habitat as a result of activities under Alternative 1.

The giant garter snake habitat located within the project area is marginal according to the survey conducted for the proposed project. Direct effects would occur in areas of upland habitat. The majority of these direct effects would result from the laydown and work areas associated with the proposed project on both sides of Miner Slough. These areas would temporarily affect approximately 0.14 ac of potentially suitable upland habitat within the project site. The realignment of SR 84 and widening of other existing roads could permanently affect approximately 0.10 ac of potentially suitable upland habitat. The total area of upland habitat that would be directly impacted by Alternative 1 is approximately 0.24 ac (see Figure 2-14). No indirect impacts to this species are expected.

Figure 2-14 depicts areas of disturbance under Alternative 1, GGS upland habitat, and impact areas to GGS upland habitat as a result of proposed activities under Alternative 1.

Direct and indirect effects to Swainson's hawk are expected as a result of the proposed project. A nest was observed in 2014 and it is within 0.25 mile of the project area. Direct effects to Swainson's hawk, such as nest abandonment or displacement, and the removal and conversion of marginal foraging habitat in the area where SR-84 would be realigned could occur as part of project activities. However,

abundant foraging and nesting habitat is located directly adjacent to the project area. Caltrans will be consulting with CDFW to obtain a 2081 Incidental Take Permit.

Tricolored blackbirds were not observed in the Study Area during field surveys, or listed in CNDDDB records for the Liberty Island quadrangle. There is a small amount of potential foraging habitat for this species, but there is not appropriate breeding habitat. It is unlikely this species would occur or be directly or indirectly affected by the proposed project.

Operation Phase

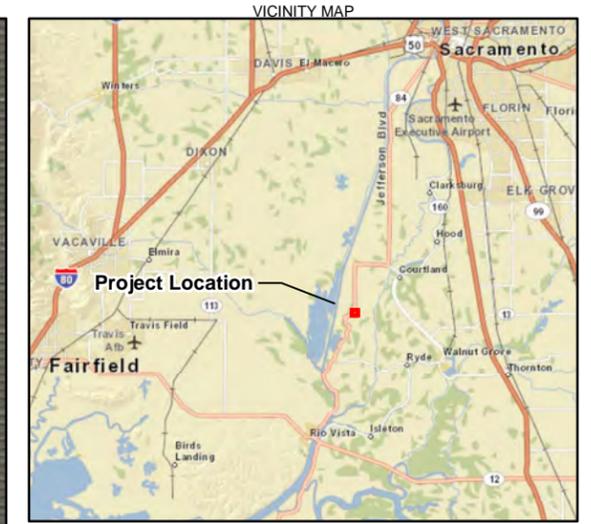
The operation of Alternative 1 is not expected to affect valley elderberry longhorn beetle, Delta smelt, longfin smelt, Central Valley steelhead, Sacramento River winter-run and Central Valley spring-run chinook salmon, green sturgeon, giant garter snake, Swainson's hawk, or tricolored blackbird. The use of the new bridge is not expected to reduce nesting locations or diminish aquatic habitat as it is a replacement of an existing bridge. Alternative 1 would have beneficial effects to aquatic habitat through the net gain in aquatic habitat area through the removal of the existing bridge in-water piles.

Alternative 2 – Bridge Rehabilitation

Construction Phase

Valley elderberry longhorn beetle effects under Alternative 2 would be similar to those of Alternative 1. Construction may affect, but is not likely to adversely affect, the VELB.

Direct effects to Delta smelt and longfin smelt are not expected as a result of Alternative 2 construction. To minimize the potential for direct and indirect effects, in-water work activities would be conducted during the approved work window for the Central Zone of the Delta (August 1 to November 30) as described in the programmatic consultation on Delta smelt (USFWS 2004). This would avoid any direct effects on Delta and longfin smelt resulting from hydro-acoustic noise levels resulting from pile driving, as that is the time when both species are not typically present in the Study Area. Longfin smelt adults, juveniles, and larvae are not expected to be present within the Study Area during the proposed in-water work window. Because all in-water work activities would be conducted when longfin smelt are absent from the Study Area, no direct effects are expected during construction.



- LEGEND**
- Biological Study Area (BSA)
 - Project Limits
- Fisheries Impacts**
- Beneficial Impact Bridge Removal (0.12 acre)
 - Permanent Impact (0.02 acre)
 - Permanent Shade (0.18 acre)
 - Temporary Impact (0.18 acre)

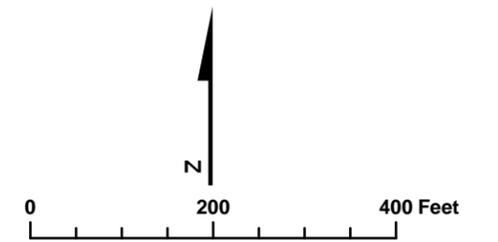


FIGURE 2-13
Fisheries Impacts
Bridge Replacement
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

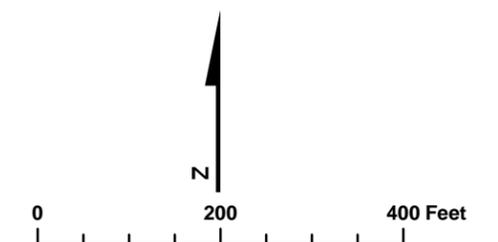
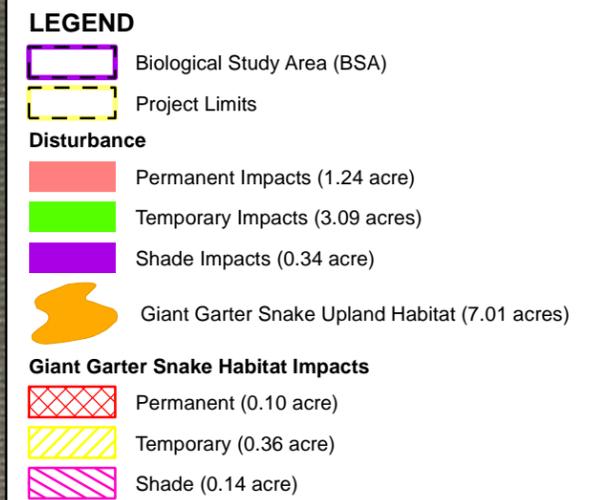


FIGURE 2-14
Giant Garter Snake Habitat
Bridge Replacement
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

Repairing the existing bridge over Miner Slough and constructing temporary trestles would not result in a loss or shading of shallow water habitat (SWH) for smelt. The programmatic consultation on Delta smelt considers the rehabilitation of the bridge and construction of the temporary trestles to be activities that would not result in the loss or shading of SWH (USFWS 2004). Effects to critical habitat as a result of construction and subsequent removal of the trestles would be temporary in nature.

Direct effects to Sacramento River winter-run Chinook salmon and Central Valley spring-run Chinook salmon may occur as a result of construction. Utilization of the in-water work window (August 1 to November 30) would minimize direct and indirect effects to Sacramento River winter-run Chinook salmon, and would avoid the upstream migration of adult Central Valley spring-run Chinook salmon and avoid all but late-emigrating juveniles. Given that these emigrating Central Valley spring-run Chinook salmon juveniles would simply be passing downstream through the Study Area during the proposed work window, it is highly unlikely that any individuals would be impacted by the cumulative sound exposure levels over the course of a working day, and mortality would only potentially arise from impacting the piles during proof-testing (i.e., final impact from vibratory hammer on the pile). The proposed avoidance and minimization measures would minimize the likelihood of potential mortality. No impacts to Sacramento River winter-run or Central Valley spring-run Chinook salmon designated critical habitat would occur. No indirect impacts to winter-run or spring-run Chinook salmon are expected.

Direct and indirect effects to Central Valley steelhead may occur as a result of Alternative 2 construction. The August 1 to November 30 in-water work window occurs during the upstream migration of adult Central Valley steelhead. Peak and cumulative sound pressure levels associated with proof-testing the piles has the potential to injure or kill migrating adult and juvenile steelhead, though as with Chinook salmon this is considered unlikely. Harassment of migrating adult and juvenile steelhead from underwater noise, however, is likely to occur. The peak sound levels from piles being proofed and/or from cumulative sound levels may affect any rearing or migrating Central Valley steelhead juveniles that may be present during pile driving over the course of a working day. The proposed AMMs would minimize the likelihood of potential adverse effects and mortalities in these cases. Presence of the piles would not appreciably diminish the ability of Central Valley steelhead to migrate upstream or downstream.

Direct and indirect effects to southern DPS of North American green sturgeon may occur as a result of project construction. Data on southern DPS green sturgeon are insufficient to rule out the potential for post-spawning and juvenile/sub-adults to be present in the Study Area during the August 1 to November 30 in-water work window. As such, there is the potential for direct effects associated with sound pressure waves from pile driving. Indirect effects would result from temporary loss of aquatic habitat during the installation and use of temporary trestles.

Figure 2-15 depicts a permanent shade impact of 0.017 ac and a temporary impact of 0.18 ac to fisheries and aquatic habitat as a result of the proposed activities under Alternative 2.

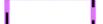
The giant garter snake habitat located within the project area is marginal according to the survey conducted for the proposed project. Direct effects would occur in areas of upland habitat. The majority of these direct effects would result from the laydown and work areas associated with the proposed project on both sides of Miner Slough. These areas would temporarily affect approximately 0.17 ac of potentially suitable upland habitat within the project site. The realignment of SR 84 and widening of other existing roads could permanently affect approximately 0.02 ac of potentially suitable upland habitat. The total area of upland habitat that would be directly impacted by project activities is approximately 0.19 ac (see Figure 2-16). No indirect impacts to this species are expected.

Figure 2-16 depicts areas of disturbance under Alternative 2, GGS upland habitat, and impact areas to GGS upland habitat as a result of proposed activities under Alternative 2.

Direct and indirect effects to Swainson's hawk are expected as a result of the proposed project. A nest was observed in 2014 and it is within 0.25 mile of the project area. Direct effects to Swainson's hawk, such as nest abandonment or displacement, and the removal and conversion of marginal foraging habitat in the area where SR 84 would be realigned could occur as part of project activities. However, abundant foraging and nesting habitat is located directly adjacent to the project area. Caltrans will be consulting with CDFW to obtain a 2081 Incidental Take Permit.



LEGEND

-  Biological Study Area (BSA)
-  Project Limits
- Fisheries Impacts**
-  Permanent Shade (0.017 acre)
-  Temporary Impact (0.18 acre)

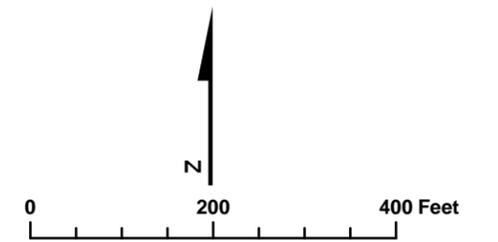
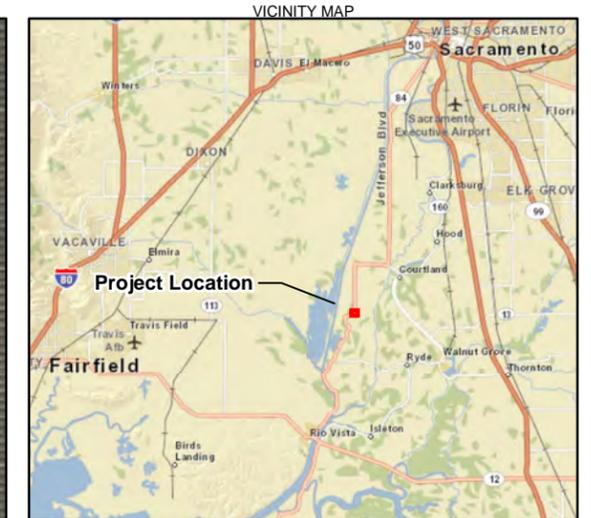


FIGURE 2-15
Fisheries Impacts
Rehabilitation Alternative
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California



- LEGEND**
- Biological Study Area (BSA)
 - Project Limits
- Disturbance**
- Permanent Impacts (0.50 acre)
 - Temporary Impacts (1.31 acres)
 - Giant Garter Snake Upland Habitat (7.01 acres)
- Giant Garter Snake Habitat Impacts**
- Permanent (0.02 acre)
 - Temporary (0.17 acre)

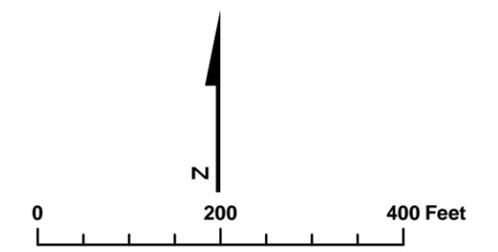


FIGURE 2-16
Giant Garter Snake Habitat
Bridge Rehabilitation
 Miner Slough Bridge Project
 EA 0G660, State Route 84 Post Mile 12.0/12.4
 Solano County, California

Tricolored blackbirds were not observed in the Study Area during field surveys, or listed in CNDDDB records for the Liberty Island quadrangle. There is a small amount of potential foraging habitat for this species, but there is not appropriate breeding habitat. It is unlikely this species would occur or be directly or indirectly affected by the proposed project.

Operation Phase

Operation of Alternative 2 is not expected to affect valley elderberry longhorn beetle, Delta smelt, longfin smelt, Central Valley steelhead, Sacramento River winter-run and Central Valley spring-run chinook salmon, green sturgeon, giant garter snake, Swainson's hawk, or tricolored blackbird. The use of the existing bridge is not expected to reduce nesting locations or diminish aquatic habitat.

No-Build Alternative

Under the No-Build Alternative, current conditions would continue.

2.3.5.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The following avoidance and minimization measures will provide further protection and reduce the amount of adverse effects to special-status and threatened and endangered species:

- **Measure BIO-11 Biological Monitoring.** A USFWS/CDFW-approved, qualified biological monitor shall be assigned to the proposed project. The biological monitor will be onsite to monitor all initial ground-disturbing activities during project construction and restoration activities to ensure that there is no unauthorized take of federally or state listed species or destruction of their habitat. The biologist will perform a clearance survey and mark any active bird nests for avoidance, as feasible. If a giant garter snake is encountered, the biologist shall have the authority through communication with the resident engineer to stop construction in the immediate area until appropriate corrective measures have been completed. Snakes encountered during construction activities shall be allowed to move away from the area on their own. The biologist shall notify the USFWS and CDFW immediately if any listed species are found onsite, and will submit a report, including date(s), location(s), habitat description, and any corrective measures taken to protect the species found. The biologist shall be required to report any take of listed species to the USFWS and CDFW immediately by telephone and by electronic mail or written letter within three working days of the incident.

- **Measure BIO-12: In-Water Work Window.** All in-water work, to include pile driving work in Miner Slough, will be restricted to low-flow periods between August 1 to November 30 when fish species in the Central Zone of the Delta are less likely to be present.
- **Measure BIO-13: Dewatering.** During dewatering of the cofferdam at Pier 3, fish rescue and relocation will be conducted by qualified fisheries biologist(s). The qualified biologist(s) will remain onsite during the entire dewatering process. Relocation will be accomplished by seining, dipnetting, and/or electrofishing. The biologist will minimize handling of fish species, and all captured fish will be held in a container with a lid that contains cool, shaded, adequately aerated water until relocated outside of the cofferdam.
- **Measure BIO-14: Underwater Sound Pressures.** During pile driving activities, the Contractor will be required to ensure sound pressures remain within the authorized range (183 decibels [dB] Sound Exposure Level to 206 dB Peak Exposure Level). Contractor shall use attenuation devices around piles that will be driven in the water with an impact hammer.

Caltrans and its contractors will implement the following measures to avoid and minimize and/or mitigate potential effects to valley elderberry longhorn beetle:

- **Measure BIO-15: Valley Elderberry Longhorn Beetle Fencing and Signage.** Prior to any ground-disturbing activities associated with the proposed project, Caltrans shall install 4-foot-tall temporary, plastic mesh construction ESA fence, where possible, 20 feet from the dripline of elderberry shrubs that are not to be removed. The fencing is intended to prevent encroachment by construction vehicles and personnel. The exact location of fencing will be determined by a qualified biologist. The fencing will be checked and maintained weekly until all construction is completed.

A sign will mark this buffer zone and state the following: “This is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the federal Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines and imprisonment.” The fencing and a note reflecting this condition will be shown on the construction plans. Signs will be legible from a distance of 20 feet and must be maintained for the duration of construction.

Caltrans and its contractors will implement the following measures to avoid and minimize and/or mitigate potential effects to GGS:

- **Measure BIO-16: Giant Garter Snake Habitat Work Window.** All ground-disturbing activity within GGS habitat shall be conducted between May 1 and October 1. Given that all construction activity is confined to upland habitat (over-wintering and movement habitat), the initial grading and disturbance of the laydown and work areas in GGS habitat will occur during the snake's active season. Once the initial grading occurs, no further ground disturbing activity will occur, and mortality to any individuals of the species during hibernation due to construction activities is not anticipated.
- **Measure BIO-17: Aquatic Habitat Dewatering.** Aquatic habitat that will be disturbed or removed will be dewatered 15 days prior to the initiation of construction activities. If complete dewatering is not possible, potential snake prey (i.e., fish and tadpoles) will be removed so that snakes and other wildlife are not attracted to the construction area.
- **Measure BIO-18: Erosion Control Materials.** Tightly woven fiber netting or similar material shall be used for erosion control and other purposes within the project limits to ensure that the GGS does not become trapped or entangled. This limitation shall be communicated to the contractor using special provisions included in the bid solicitation package.
- **Measure BIO-19: Site Restoration.** After construction activities are complete, any temporary fill or construction debris shall be removed and disturbed areas restored to their pre-project conditions. An area subject to "temporary" disturbance includes any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be re-vegetated. All snake habitats subject to temporary ground disturbances, including storage and staging areas, will be restored. These areas shall be re-contoured, if appropriate, and re-vegetated with appropriate locally collected native plant species to promote restoration of the area to pre-project conditions. Appropriate methods and plant species used to re-vegetate such areas will be determined on a site-specific basis. Restoration work may include replanting emergent vegetation. Refer to the *Guidelines for the Restoration and/or Replacement of Giant Garter Snake Habitat* (USFWS 1996b).

Caltrans and its contractors will implement the following measures to avoid and minimize and/or mitigate potential effects to Swainson's hawk:

- **Measure BIO-20: Swainson's Hawk Work Window.** No construction-related activities will occur between March 1 and September 15 within 0.5 mile of a nesting Swainson's hawk, or until August 15 if a Management Authorization or an Incidental Take Permit is obtained from CDFW.
- **Measure BIO-21: Tree Removal.** Removal of trees known to have supported nesting Swainson's hawks within the last five years will be avoided unless a Management Authorization is obtained from CDFW and if the removal is conducted between October 1 and February 1.
- **Measure BIO-22: Swainson's Hawk Surveys.** If construction activities are planned to begin after March 1, a preconstruction breeding survey for Swainson's hawks will be conducted throughout areas of suitable nesting habitat within 0.5 mile of construction. If a Swainson's hawk nest is observed within 0.5 mile of planned construction activities, CDFW will be contacted to determine whether project-related activities are likely to impact the nesting pair and whether additional avoidance and minimization measures can be established to avoid these impacts.

Additionally, the following mitigation measures will be implemented to mitigate project impacts to a less-than-significant level:

- **Mitigation Measure BIO-C: Compensatory Mitigation for Delta Smelt and Longfin Smelt.** Caltrans proposes to compensate for the area of direct impacts to the Delta smelt and longfin smelt habitat at a 3:1 ratio by purchasing credit through a USFWS- and CDFW-approved mitigation location. Consistent with the programmatic consultation for Delta smelt (USFWS 2004), Caltrans proposes to mitigate permanent increases in shaded SWH at a 3:1 ratio.
- **Mitigation Measure BIO-D: Compensatory Mitigation for GGS.** Following the guidelines provided in the programmatic consultation for GGS (USFWS 1997), Caltrans will mitigate the temporary direct effects by onsite restoration and purchasing credit at a minimum 1.5:1 ratio at a USFWS- and CDFW-approved mitigation bank. Prolonged temporary effect of greater than 1 year will be mitigated at a 2:1 ratio. The direct impact due to the permanent impacts within

GGs habitat will be offset at a ratio of 3:1 by purchasing land through a USFWS- and CDFW-approved mitigation bank.

- **Mitigation Measure BIO-E: Compensatory Mitigation for Swainson’s Hawk.** Caltrans will mitigate off-site at a minimum 1:1 ratio for suitable foraging habitat credits from an approved mitigation bank. Credits will be purchased through a CDFW approved mitigation bank.

2.3.6 Invasive Species

2.3.6.1 REGULATORY SETTING

On February 3, 1999, President William J. Clinton signed Executive Order 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 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 analysis for a proposed project.

2.3.6.2 AFFECTED ENVIRONMENT

Moderately invasive species, as ranked by the California Invasive Plant Council, are distributed within the annual grassland areas of the Study Area (e.g., wild oats, Italian thistle, and dogtail grass). Disposal methods that would not promote the spread of these species would be implemented. No invasive invertebrates or other wildlife species were observed during the biological surveys.

2.3.6.3 ENVIRONMENTAL CONSEQUENCES

Alternative 1 – Bridge Replacement

Construction Phase

Construction equipment has the potential to introduce and/or spread new or existing invasive plant species from previous work areas into the Study Area during project implementation. Construction would result in removing natural community habitat and potentially allowing invasive plant species to spread due to the disturbance event. However, in accordance with Caltrans general BMPs, the contractor would be required to use erosion and sediment controls free of invasive species and to restore the temporarily affected areas with non-invasive hydroseed mix that would promote fast-growing vegetation.

The proposed project would comply with EO 13112 and include measures to prevent the introduction of invasive species and provide for their control to minimize the economic, ecological, and human health effects and reduce the spread of invasive, non-native plant species and minimize the potential decrease of palatable vegetation for wildlife species. None of the species on the California list of noxious weeds is currently used by Caltrans for erosion control or landscaping.

Operation Phase

The operation of the proposed project is expected to have a minimal effect on the distribution of invasive species within the Study Area. The area is currently colonized by invasive species of plants, and the proposed bridge replacement is not expected to result in the colonization of additional invasive plant species.

Alternative 2 – Bridge Rehabilitation

Under Alternative 2, construction and operation would have the same impacts as discussed above under Alternative 1.

No-Build Alternative

Under the No-Build Alternative, current conditions would continue.

2.3.6.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The avoidance and minimization measures listed in Section 2.3.1.4 would reduce the potential to introduce or spread invasive species during project construction. In addition, the following measure would further reduce the potential for adverse effects related to the spread of invasive species under the Build Alternatives:

- **Measure BIO-23: Invasive Species.** In compliance with EO 13112 and guidance from FHWA, the landscaping and erosion control included in the proposed project will not use species listed as invasive. The contractor will be required to inspect construction equipment for plant material and seeds prior to construction, remove and dispose of invasive plants at the project site cautiously, and replant the site with fast-growing native species. In areas of particular sensitivity (i.e., near drainages), extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment as well as eradication strategies to be implemented should an invasion occur.

2.4 Cumulative Impacts

2.4.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can be 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 a project, such as changes in community character, traffic patterns, housing availability, and employment.

California Environmental Quality Act 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 can be found in 40 CFR 1508.7 of the Council on Environmental Quality (CEQ) Regulations.

2.4.2 Affected Environment

Table 2-7 lists the environmental resources that are evaluated for cumulative impacts in this IS/EA and the area that corresponds to the cumulative analysis for each specific resource area. For the purpose of the cumulative impacts analysis this is considered the “resource study area.”

Data for this cumulative impacts analysis were obtained from Solano County Transportation Authority, Solano County Resource Management Building and Safety Division, CEQAnet (an online environmental database of the State Clearinghouse), agency websites (to include DWR, USACE, Bureau of Reclamation, USFWS, and CDFW), and from review of environmental documents for local projects archived by Caltrans.

Table 2-7 Cumulative Impacts Analysis by Resource Area

Resource Area	Inclusion in IS/EA Cumulative Analysis	Resource Study Area
Human Environment		
Farmlands/Timberlands	Yes	Study Area
Community Impacts	Yes	Study Area
Traffic and Transportation/ Pedestrian and Bicycle Facilities	Yes	Study Area
Visual/Aesthetics	Yes	Study Area
Cultural Resources	Yes	Study Area
Physical Environment		
Hydrology and Floodplain	Yes	Lower Sacramento watershed within 10 miles of Study Area
Water Quality/Stormwater Runoff	Yes	Lower Sacramento watershed within 10 miles of Study Area
Geology/Soils/Seismic/Topography	Yes	Study Area
Biological Environment	Yes	Miner Slough vicinity including the Study Area and extending downstream to the Sacramento Deep Water Ship Channel

Table 2-8 identifies the various past (within 3 years), present, and reasonably foreseeable private and public development projects that comprise the context by which the proposed project’s cumulative impacts (in all resource areas) are evaluated. The project vicinity is largely rural/agricultural and consequently has few development proposals.

Table 2-8 Cumulative Projects: Past, Present, and Reasonably Foreseeable Projects in the State Route 84 Vicinity

Project Name	Location	Characteristics	Status
Private Projects			
Electrical work on an agricultural pump	4868 State Hwy 84, Walnut Grove, CA 95690	Not applicable	Project permitted through Solano County. Work completed in 2014.
Public Projects			
Miner Slough Levee Repair	SR 84 and Holland Road, located on the west side of Ryer Island	Repair sections of Miner Slough levee by placing rock slope protection and soil mix.	IS/MND completed February 2014. Addendum to the IS/MND completed January 2015. Work anticipated to begin summer/fall 2015. Agency consultation ongoing.
Prospect Island Tidal Habitat Restoration Project	Prospect Island located between Sacramento Deep Water Ship Canal and Miner Slough	Restore property to freshwater tidal wetland and open water habitats.	Public draft EIR scheduled for release in 2015. Section 404 and Section 401 pending.
SR 12 / Rio Vista Bridge	Existing Sacramento River crossing at Rio Vista	Investigating routes across Sacramento River and replacement of existing lift bridge.	Final Preliminary Bridge Study Report completed in 2010.
Antioch Bridge Seismic Retrofit	Route 160 connecting City of Antioch in Contra Costa County to Sherman Island in Sacramento County	Seismic retrofit completed on a two mile bridge crossing	CEQA and NEPA documents and permits approved for the project. Work completed in 2012.
Delta Region Ferries	Solano County, Ryer Island Ferries Real McCoy II and J-Mack	Maintenance activities and intermittent closures of SR 84 at ferry crossings	Ongoing, intermittent

Sources:

California Department of Water Resources and California Department of Fish and Wildlife, Fish Restoration Program Annual Report at <http://www.water.ca.gov/environmentalservices/frpa.cfm>
 Caltrans District 4 Antioch Bridge Project at <http://www.dot.ca.gov/dist4/antioch/>
 Caltrans District 4 Bay Area Projects at http://www.dot.ca.gov/dist4/projects_list.htm#solano
 Solano County Resource Management, Building and Safety Division
 Solano Transportation Authority Countywide Plans & Studies at http://www.sta.ca.gov/Content/10055/Countywide_Plans_Studies.html#highwayroad

2.4.3 Issues with No Cumulative Effect

If a project would not result in a direct or indirect adverse effect on a resource, then it would not contribute to a cumulative impact on that resource and does not need to be further evaluated. The proposed project was determined not to have any potential for effects on the following resources, which therefore would not have any cumulative impact from the project:

- Existing and future land use
- Coastal zone
- Wild and Scenic Rivers
- Parks and recreational facilities
- Growth
- Community character and cohesion
- Environmental justice
- Utilities/emergency service systems
- Paleontology
- Hazards and hazardous materials
- Air quality
- Noise

The following resources with the potential for project effects were evaluated in their respective subsections in this chapter. The analysis determined that, with the implementation of the avoidance, minimization, and/or mitigation measures summarized in Appendix C, the proposed project would have no adverse effect and therefore no cumulative impact on these resources:

- Farmlands/timberlands
- Relocations and real property acquisition
- Traffic and transportation/pedestrian and bicycle facilities
- Visual/aesthetics
- Cultural resources
- Hydrology and floodplains
- Water quality/storm water

Certain resources are not susceptible to incremental/cumulative effects. One example is geologic/seismic hazards. Geological/seismic hazards are site-specific and relate to the type of building or structure proposed as well as soil composition and slope on the site. There is no additive effect of the geologic/seismic hazards associated with other

approved or foreseeable development together with the proposed project; therefore, no further cumulative analysis of this resource is warranted.

2.4.4 Issues with the Potential to Contribute to Cumulative Effects

2.4.4.1 BIOLOGICAL RESOURCES

For the cumulative impact analysis, the resource study area for biological resources includes the Miner Slough vicinity from the Study Area and extending downstream to the Sacramento Deep Water Ship Channel.

2.4.4.2 NATURAL COMMUNITIES, WETLANDS AND OTHER WATERS, PLANTS, AND ANIMAL SPECIES

Of the past, present, and reasonably foreseeable future projects identified in the resource study area, only the Miner Slough Bridge Project has the potential to impact natural communities, wetlands and other waters, plants, and animal species. When viewed in connection with the effects of past, current, and reasonably foreseeable future projects, the potential incremental effects to natural communities, plants, and animals species would not be cumulatively considerable.

Incremental effects to wetlands and other waters by the proposed project, when viewed in connection with effects of past, current, and probable future projects, would not be cumulatively considerable with mitigation incorporated.

2.4.4.3 THREATENED AND ENDANGERED SPECIES

Project effects to threatened and endangered species are expected to be minimal, and reduced with mitigation incorporated. Projects identified as potentially contributing to cumulative project effects are listed in Table 2-8 above. These projects could affect biological resources, but the net effect would be minor given the limited area affected. Furthermore, each project would be subject to formal Section 7 consultation requirements with the appropriate agencies (USFWS, NMFS, etc.), consultation with CDFW, and required to obtain permits from the appropriate resource agencies (e.g., CDFW, NMFS, RWQCB, USACE, USFWS, etc.) to avoid, minimize, and/or mitigate effects to biological resources. For these reasons, effects to biological resources are not cumulatively considerable.

2.4.4.4 INVASIVE SPECIES

Development in the vicinity of the proposed project may threaten the landscape with invasive species. However, the projects listed in Table 2-8 are expected to undergo environmental review and/or project permitting that will result in requirements to fully mitigate these effects. Therefore, with the appropriate avoidance and prevention

measures the proposed project is expected to have minimal contributions to cumulative effects from invasive species.

2.5 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 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 (CO₂), methane (CH₄), nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF₆), 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. In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) make up the largest source of GHG-emitting sources. The dominant GHG emitted is CO₂, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation." Greenhouse Gas Mitigation is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. Adaptation refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels) (AASHTO 2015).

There are four primary strategies for reducing GHG emissions from transportation sources: 1) improving the transportation system and operational efficiencies, 2) reducing travel activity, 3) transitioning to lower GHG-emitting fuels, and 4) improving vehicle technologies/efficiency. To be most effective, all four strategies should be pursued cooperatively (FHWA 2014).

2.5.1.1 REGULATORY SETTING

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

State

With the passage of several pieces of legislation including State Senate Bills (SBs) and Assembly Bills (ABs) and Executive Orders (EOs), California launched an innovative and proactive approach to dealing with 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 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 the year 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.
- **Assembly Bill 32, Núñez and Pavley, The Global Warming Solutions Act of 2006:** AB 32 sets the same overall 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."
- **Executive Order S-20-06 (October 18, 2006):** This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency (Cal/EPA) and state agencies with regard to climate change.
- **Executive Order S-01-07 (January 18, 2007):** This order set forth the low carbon fuel standard for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.
- **Senate Bill 97, Chapter 185, Greenhouse Gas Emissions (2007):** This bill required the Governor's Office of Planning and Research to develop recommended amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

- **Senate Bill 375, Chapter 728, Sustainable Communities and Climate Protection (2008):** This bill requires the ARB to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a “Sustainable Communities Strategy” that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region.
- **Senate Bill 391, Chapter 585, California Transportation Plan (2009):** This bill requires the state’s long-range transportation plan to meet California’s climate change goals under AB 32.

Federal

Although climate change and GHG reduction are a concern at the federal level, currently no regulations or legislation have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the U.S. Environmental Protection Agency nor the Federal Highway Administration has issued explicit guidance or methods to conduct project-level GHG analysis. ⁶ FHWA supports the approach that climate change considerations should be integrated throughout the transportation decision-making process from planning through project development and delivery. Addressing climate change mitigation and adaptation 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. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies outlined by FHWA to lessen climate change impacts correlate with efforts that the state is undertaking to deal with transportation and climate change; these strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the National Clean Car Program and EO 13514:

⁶ To date, no national standards have been established regarding mobile source GHGs, nor has USEPA established any ambient standards, criteria or thresholds for GHGs resulting from mobile sources.

- **Executive Order 13514, Federal Leadership in Environmental, Energy and Economic Performance (October 5, 2009):** This order is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

USEPA'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, USEPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and USEPA's assessment of the scientific evidence that form the basis for USEPA's regulatory actions. USEPA 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 (Center for Climate and Energy Solutions [C2ES] 2015).

The USEPA and NHTSA are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations.

The final combined standards that made up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards implemented by this program are expected to reduce GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On August 28, 2012, USEPA and NHTSA issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards this program is projected to save approximately four billion barrels of oil and two billion metric tons of GHG emissions.

The complementary USEPA and NHTSA standards that make up the Heavy-Duty National Program apply to combination tractors (semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks). Together, these standards will cut greenhouse gas emissions and domestic oil use significantly. This program responds to President Barack Obama's 2010 request to jointly establish greenhouse gas emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce CO₂ emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model year 2014 to 2018 heavy duty vehicles.

2.5.1.2 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 GHGs.⁷ 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.

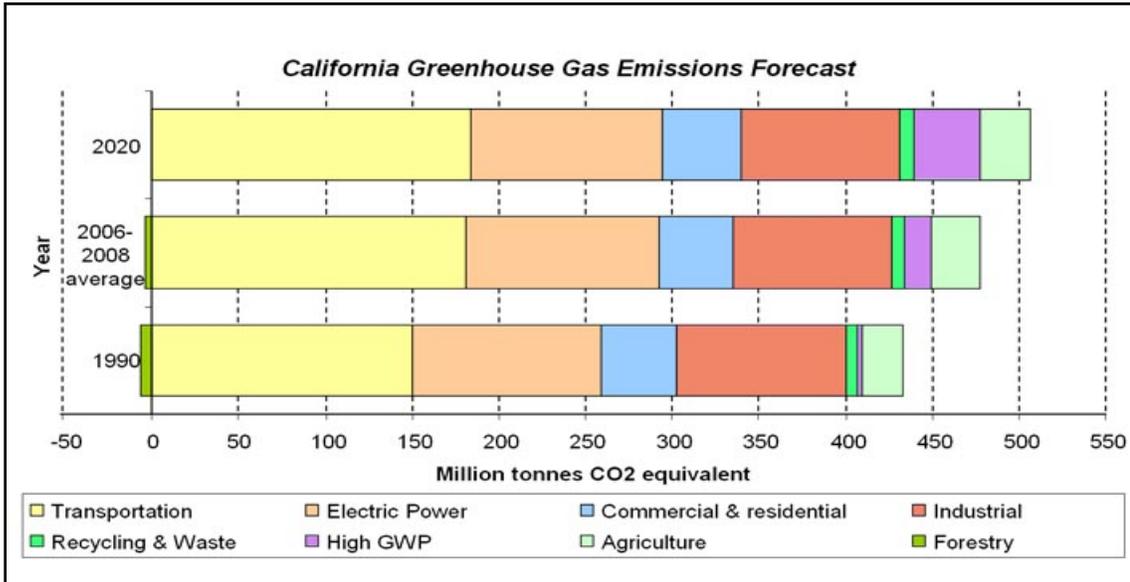
The AB 32 Scoping Plan mandated by AB 32 includes the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the draft Scoping Plan, the ARB released the GHG inventory for California (forecast last updated: October 28, 2010) (see Figure 2-17). The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

Caltrans and its parent agency, the Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that

⁷ This approach is supported by the Association of Environmental Professionals: *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 U.S. Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

98 percent of California’s GHG emissions are from the burning of fossil fuels and 40 percent of all human-made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans (Caltrans 2006) that was published in December 2006.

Figure 2-17 California Greenhouse Gas Forecast



Source: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

Construction Emissions

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by on-site construction equipment, and emissions arising from 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 longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

Greenhouse Gas Reduction Strategies

Caltrans continues to be involved on the Governor’s Climate Action Team as the ARB works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from then-Governor Arnold Schwarzenegger’s Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in GHG emissions, while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain CO₂ reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in Figure 2-18: The Mobility Pyramid.

Figure 2-18 Mobility Pyramid



Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans works closely with local jurisdictions on planning activities, but does not have local land use planning authority. Caltrans assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars and light- and heavy-duty trucks; Caltrans is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by

participating on the Climate Action Team. It is important to note, however, that control of fuel economy standards is held by the USEPA and ARB.

Caltrans is also working towards enhancing the State's transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under SB 375 (Steinberg 2008), SB 391(Liu 2009) requires the state's long-range transportation plan to meet California's climate change goals under AB 32.

The California Transportation Plan 2040 (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.

The purpose of the CTP is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs.

Table 2-9 summarizes the efforts that Caltrans and other California agencies are implementing to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (Caltrans 2006).

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

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

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

1. Landscaping reduces surface warming and, through photosynthesis, decreases CO₂. The proposed project proposes planting in the intersection slopes, drainage channels, and seeding in areas next to frontage roads as well as planting a variety

of different-sized plant material and approximately 43 trees. These trees will help offset any potential CO₂ emissions increase.

2. According to Caltrans' Standard Specifications, the contractor must comply with all local Air Pollution Control District's rules, ordinances, and regulations for air quality restrictions.

Table 2-9 Climate Change/CO₂ Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO ₂ Savings Million Metric Tons (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Transportation System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.07	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, Cal/EPA, ARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.045 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries	2.5 % limestone cement mix	1.2	4.2	
			25% fly ash cement mix	0.36	3.6	
			> 50% fly ash/slag mix			
Goods Movement	Office of Goods Movement	Cal/EPA, ARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.18

2.5.1.3 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. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and 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. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

At the federal level, the Interagency Climate Change Adaptation Task Force, co-chaired by the White House Council on Environmental Quality, the Office of Science and Technology Policy, and the National Oceanic and Atmospheric Administration, released its interagency task force progress report on October 28, 2011 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 provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as fresh water, and providing accessible climate information and tools to help decision-makers manage climate risks.

Climate change adaptation must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

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.

In addition to addressing projected sea level rise, the California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state and federal public and private entities to develop the 2009 California Climate Adaptation Strategy, which summarizes the best-known science on climate change impacts to

California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08 that specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the Cal/EPA; Business, Transportation and Housing (BT&H); Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include Public Health, Biodiversity and Habitat, Ocean and Coastal Resources, Water Management, Agriculture, Forestry, and Transportation and Energy Infrastructure (California Natural Resources Agency 2009). As data continue to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

The National Academy of Sciences was directed to prepare a Sea Level Rise Assessment Report to recommend how California should plan for future sea level rise. The report, titled *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (National Research Council [NRC] 2012), includes:

- Relative sea level rise projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates.
- The range of uncertainty in selected sea level rise projections.
- 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.
- A discussion of future research needs regarding sea level rise.

In 2010, interim guidance was released by The Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans as a method to initiate action and discussion of potential risks to the state's infrastructure due to projected sea level rise. Subsequently, CO-CAT updated the Sea Level Rise guidance to include information presented in the NRC (2012) study.

All state agencies that are planning to construct projects in areas vulnerable to future sea level rise are directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to 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, storm surge, and storm wave data.

All projects that have filed a Notice of Preparation as of the date of EO S-13-08, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines.

Executive Order S-13-08 also directed BT&H to prepare a report to assess vulnerability of transportation systems to sea level rise affecting safety, maintenance and operational improvements of the system, and economy of the state. Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change effects, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, Caltrans will be able review its current design standards to determine what changes, if any, may be needed to protect the transportation system from sea level rise.

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 an active participant in the efforts being conducted in response to EO S-13-08 and is mobilizing to be able to respond to the NRC's (2012) Sea Level Rise Assessment Report.

2.5.1.4 SEA LEVEL RISE IMPACT ASSESSMENT

The project site is located in an area vulnerable to sea level rise (SLR). Information for this section was provided from the Sea Level Rise Impact Assessment (assessment) (CH2M HILL 2015) prepared for the project.

In agreement with Caltrans' SLR guidance (Caltrans 2011), SLR projections developed by the National Research Council (NRC 2012) were used in the assessment. A design life of 20 years was assumed for the existing and rehabilitated bridges (end of bridge life by 2030) and 75 years (e.g., end of bridge life by 2090) for the new bridge. The peak stage at the Miner Slough Bridge of 19.24 feet NAVD88 was used in this assessment and referred to herein as the USACE (1957) design peak stage for the current sea level.

Results from California Department of Water Resources' DSM2 hydraulic model of the Delta indicated that the design peak stages at Miner Slough Bridge, as a result of SLR, would be between 0.1 and 0.9 ft higher than present in 2035, and between 0.9 and 3.9 ft higher in 2090.

The SLR Impact Assessment (CH2M HILL 2015) included a vulnerability assessment, a risk assessment, and an adaptation assessment, results of which are summarized below.

Vulnerability Assessment

The vulnerability assessment evaluated the effect of SLR on river stage at the Miner Slough Bridge. Water levels (river stage) and currents were considered to be the main drivers of processes, which, depending on their severity, could be hazardous to the Miner Slough Bridge. Processes (generally referred to as hazards) driven by water levels and currents that were identified included flooding, inundation, vertical bridge clearance, bank erosion, and pier scour.

The vulnerability assessment indicated that flooding, inundation, bank erosion and pier scour are not hazards for consideration in the SLR impact assessment. The bridges would not be impacted by these hazards as a consequence of SLR. However, flooding is a hazard for the north levee and adjacent landward areas.

Title 23 of the California Code of Regulations (CCR) states, in Section 128, that the soffit elevation of the bridge must be 3 ft above the floodplain (design peak stage). Bridge clearance would be a hazard for both of the bridge alternatives because the clearance required by the CCR would not be satisfied in any of the NRC (2012) SLR scenarios.

Risk Assessment

The risk assessment consisted of assessing the likelihood of an event occurring in the future and assessing the magnitude of the consequences if the event were to occur.

The qualitative assessment indicated that for all bridge alternatives the risk of not meeting the CCR's bridge clearance requirements was high, and that flooding was a hazard of medium risk for the north levee adjacent landward areas.

Adaptation Assessment

Using the results of the risk assessment, the capacity of the Miner Slough Bridge alternatives and north levee adjacent landward areas to adapt to SLR and associated hazards were assessed, and preliminary adaptation measures identified. The assessment considered that a bridge is a large monolithic structure at a fixed elevation with essentially no adaptation capacity.

For the existing bridge, the risk associated with not complying with the CCR's 3-foot clearance was assessed as high, and because the bridge is already built its adaptation capacity was assessed as low. For the rehabilitated and new bridges, their soffit elevations would not comply with the CCR requirement in the NRC (2012) SLR scenarios in 2035 and 2090, respectively. Their soffit elevations could simply be revised to comply with the CCR requirement, and this would imply a high adaptation capacity. However, because constructability, cost, site characteristics, and environmental implications of raising the soffit elevations are unknown at this time, their adaptation capacity was assessed as medium.

For the north levee adjacent landward areas, the risk associated with the flooding hazard was assessed as medium. The adaptation capacity of these areas is tied to the adaptation capacity of the levee. Because in 2090 the USACE (1957) design peak stage in the high NRC (2012) SLR scenario is estimated at 23.1 ft NAVD88, only 0.2 foot higher than the levee elevation (22.9 ft NAVD88), the adaptation capacity of the levee, and consequently of the adjacent landward areas, could be assessed as high given the relative ease of increasing the elevation of the levee that small amount. However, given the uncertainties in long-term SLR projections and the unknown length of the stretch of the levee that would require a higher elevation, its adaptation capacity was assessed as medium.

The following adaptation measures are suggested, prioritizing the structures with low adaptation capacity and hazards with high risk:

1. Compliance with the CCR's 3-foot bridge clearance appears to be the most significant issue for the existing bridge (No-Build) alternative. The possibility of relaxing the CCR bridge clearance requirement should be investigated given that its construction date likely precedes the date of the CCR requirement.

2. Similarly, compliance with the CCR's 3-ft bridge clearance appears to be the most significant issue for the rehabilitated and new bridges. The possibility of increasing their soffit elevations should be evaluated, in addition to exploring the possibility of relaxing the CCR bridge clearance requirement to 2 ft (applicable to minor streams at sites where significant amounts of stream debris are unlikely).
3. SLR monitoring is recommended to determine whether climate change and corresponding SLR projections materialize, resulting in the need to increase the north levee elevation.
4. While not derived from the SLR impact assessment presented herein, it is recommended to provide bank and pier scour protection, or monitor these and provide remedial action when needed.

Adaptation Assessment

Under Alternative 1 the soffit elevation of the replacement bridge would not comply with the required 3-ft clearance for the 100-year peak stage for the current sea level, nor for all expected future NRC (2012) SLR scenarios in 2090. Under Alternative 2 the soffit elevation of the rehabilitated bridge would not comply with the required 3-ft clearance for the 100-year peak stage for the current sea level, nor for all expected future NRC (2012) SLR scenarios in 2035.

Chapter 3 Comments and Coordination

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 consultation and public participation for this proposed project have been accomplished through a variety of formal and informal methods, including Project Development Team (PDT) meetings, and agency coordination meetings.

During the preparation of this document, the following agencies were consulted:

Federal

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- Natural Resources Conservation Service
- National Marine Fisheries Service
- U.S. Coast Guard

State

- California Department of Fish and Wildlife
- California Department of Water Resources
- State Historic Preservation Officer
- California Department of Conservation, Division of Land Resource Protection

A list of meetings and correspondence conducted with agency personnel, as well as the dates, is provided in Table 3-1.

A Public Notice of Availability of the Initial Study/Environmental Assessment with a 30-day comment period from November 5, 2015 to December 4, 2015 will be advertised in the *Rio Vista Beacon*, and the *Sacramento Bee*.

Table 3-1 Agency Coordination Meetings and Correspondence

Organization/Individual	Date	Topic
U.S. Army Corps of Engineers, California Department of Water Resources	August 13, 2014	Meeting to discuss general design, geotechnical, and hydraulic considerations for the proposed project.
U.S. Coast Guard	August 18-19, 2014	E-mail correspondence between Caltrans and USCG requesting consultation for the proposed project.
State Historic Preservation Officer	February 23, 2015	Caltrans initiated consultation with SHPO.
State Historic Preservation Officer	April 14, 2015	SHPO concurred with Caltrans findings and determinations of eligibility.
Natural Resources Conservation Service	April 20, 2015	Caltrans sent correspondence to NRCS regarding acquisition of farmland and requested assistance with Form AD-1006.
California Department of Conservation	April 20, 2015	Caltrans sent correspondence to the Department of Conservation notifying them of public acquisition of Williamson Act land.
California Department of Conservation	September 28, 2015	Caltrans sent additional correspondence to the Department of Conservation notifying them of public acquisition of farmland land for both Build Alternatives.

A public meeting will be held on November 18, 2015 from 5:30 p.m. to 7:30 p.m. at the Rio Vista Fire Department Conference Room, 350 Main Street, Rio Vista, CA 94571. Should you wish to submit comments on the IS/EA, please do so no later than 5:00 p.m., December 4, 2015. All comments will be part of the public record. Caltrans will respond to the comments received in the final IS. Please submit comments at the address below. Comments can also be sent by e-mail to: zachary.gifford@dot.ca.gov.

Zachary Gifford, Associate Environmental Planner
 Office of Environmental Analysis/Mail Station 8B
 111 Grand Avenue
 Oakland, CA 94612

Copies of the IS/EA are available for review at the following locations and on the Caltrans website at: <http://www.dot.ca.gov/dist4/envdocs.htm>.

Caltrans District 4
 Office of Environmental Analysis
 111 Grand Avenue
 Oakland, CA 94612
 (510) 286-5610

Rio Vista Library
 44 South Second St.
 Rio Vista CA 94571

Suisun City Library
33 Sunset, Suite 280 (2nd Floor)
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Courtland Library
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Rio Vista Library
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Appendix A CEQA Checklist

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<p>II. 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:</p>				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

VII. GREENHOUSE GAS EMISSIONS: Would the project:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included this good faith effort in order to provide the public and decision-makers as much information as possible about the Project, 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 and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the Project. These measures are outlined in the body of the environmental document.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
X. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XII. NOISE: Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIV. 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:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XV. RECREATION:				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Appendix B Title VI Policy Statement

DEPARTMENT OF TRANSPORTATION

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March 2013

**NON-DISCRIMINATION
POLICY STATEMENT**

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

For information or guidance on how to file a complaint based on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, please visit the following web page: http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

Additionally, if you need this information in an alternate format, such as in Braille or in a language other than English, please contact the California Department of Transportation, Office of Business and Economic Opportunity, 1823 14th Street, MS-79, Sacramento, CA 95811. Telephone: (916) 324-0449, TTY: 711, or via Fax: (916) 324-1949.

A handwritten signature in blue ink, appearing to read "Malcolm Dougherty".

MALCOLM DOUGHERTY
Director

Appendix C Avoidance, Minimization, and/or Mitigation Summary

Table C-1 Avoidance, Minimization, and/or Mitigation Summary

Air Quality
AIR-1: Construction Period Best Management Practices. Short term air quality effects during the proposed project's construction period will be addressed by Caltrans Special Provision and Standard Specification 14-9.02. Trucks and construction equipment emit hydrocarbons, oxides of nitrogen, carbon monoxide and particulates. Most project-related pollution during construction would consist of wind-blown dust generated by excavation, grading, hauling and various other activities. The effects from these activities would vary from day to day as construction progresses. The Special Provisions and Standard Specifications includes requirements to minimize or eliminate dust during construction through the application of water or dust palliatives.
Cultural Resources
CUL-1: Unanticipated Discovery of Cultural Resources. In the event of an unanticipated cultural resource discovery during construction, all ground disturbances within 60 feet of the discovery will be halted or redirected to other areas until the discovery has been documented by a qualified archaeologist and its potential significance evaluated in terms of applicable criteria.
CUL-2: Discovery of Human Remains. If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code (PRC) Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the District 4 Office of Cultural Resource Studies Chief 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.
Water Quality and Stormwater Runoff
WATER-1: SWPPP. A Storm Water Pollution Prevention Plan (SWPPP) will be developed and implemented and will comply with the Caltrans Storm Water Management Plan, which includes measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges. Water quality inspector(s) will inspect construction areas to determine if the storm water BMPs are adequate and adjust them, if necessary. Construction activities for the roadway improvements and bridge replacement and demolition will be regulated under the Construction General Permit. The SWPPP will be prepared by the contractor and approved by Caltrans.
WATER-2: Stockpile Area. Stockpile areas for construction materials, equipment, and debris will be placed greater than 150 ft away from Miner Slough, as well as covered to minimize/avoid impacts to Miner Slough.
WATER-3: Temporary Construction Site Best Management Practices (BMPs). These BMPs will be implemented throughout the duration of construction activities to avoid and minimize pollutant loads in potential stormwater/non-stormwater discharges. Construction Site BMPs strategies applicable to this project may include the following: <ul style="list-style-type: none"> • Soil Stabilization: Temporary Fence (Type ESA); Move-In/Move-Out; Hydroseeding; Geotextiles, Mats, Plastic Covers, and Erosion Control Blankets; Hydraulic Mulch • Sediment Control: Fiber Rolls, Silt Fence, Sediment Trap, Gravel Bag Berm, Check Dams, Storm Drain Inlet Protection • Tracking Control Practices: Temporary Construction Entrance/Exit • Wind Erosion Controls: Temporary covers • Non-Stormwater Management: Dewatering Operations; Material and Equipment Use Over Water • Waste Management and Materials Pollution Control: Concrete Waste Management, Material Delivery and Storage, Material Use, Stockpile Management, Spill Prevention and Control, Soil Waste Management, Hazardous Waste and/or Contaminated Soil Management, and Liquid Waste Management
WATER-4: Waste Management from Bridge Removal. Waste from removal of the existing bridge will be conducted in accordance with the Standard Specifications, under Section 13-4.03E(6) entitled: "Structure Removal Over or Adjacent to Water." The contractor will comply with this standard specification during removal of the existing bridge.
WATER-5: Permanent Treatment BMPs. Permanent Treatment BMPs are permanent water quality control measures used to remove pollutants from stormwater runoff prior to being discharged from Caltrans' right-of-way (ROW). Permanent stormwater treatment will be provided via biofiltration/bioretention measures (e.g., bioretention swale) for the entirety of the new and re-worked impervious surfaces, or 1.52 acres. Hydromodification mitigation is only applicable to the new impervious surface area, or 1.13 acres. The permanent stormwater treatment and hydromodification obligations could be achieved within the project limits.

Table C-1 Avoidance, Minimization, and/or Mitigation Summary

Geology/Soils/Seismic/Topography
<p>GEO-1: Engineering design of project structures will be carried out in accordance with the latest version of the Caltrans Standard Design Criteria (SDC). The Caltrans seismic design methodology applies to all highway bridges designed in California.</p> <ul style="list-style-type: none"> • <i>Fault rupture and ground shaking:</i> Engineering design of the new bridge, operator control house, and roadways will be carried out in accordance with Caltrans design standards, which take into account, for example, proximity to a fault. Because of the potential for ground shaking in the project area in the event of a large earthquake, Caltrans will perform a detailed seismic demand analysis and the bridge, embankments, slopes, and roadway will be designed to withstand strong ground shaking. The measures to protect structures from ground shaking may include structural improvements/strengthening, as well as soil improvements. • <i>Liquefaction:</i> Because of the potential for liquefaction and lateral spreading, there is a potential for the proposed structures to be damaged. Through the use of appropriate construction and design methods, in accordance with the Caltrans Highway Design Manual and Caltrans Design Information Bulletins, the proposed project will not increase the potential for liquefaction at the proposed project site. Structural concerns regarding liquefaction will be addressed by incorporating appropriate construction and design methods.
Biological Resources
<p>BIO-1: ESA Fencing. The final construction drawings will show all Environmentally Sensitive Areas (ESAs) (including areas of annual grassland, valley foothill riparian, and areas that may potentially support sensitive species as described in Section 2.3.3 and 2.3.4 below). Prior to the commencement of construction activities, high-visibility fencing will be erected around any and all designated ESAs. The fencing will help to prevent encroachment of construction personnel and equipment into sensitive areas during construction activities and to prevent wildlife from entering the project site. The fencing shall be inspected and maintained by the contractor until completion of the proposed project.</p>
<p>BIO-2: Vegetation Control. The removal of native vegetation will be confined to the minimal area necessary to facilitate construction activities.</p>
<p>BIO-3: Wetland Avoidance and Minimization. To the extent practicable, construction will not occur during the wet season. Work within the streambed will be limited to the period between August 1 and November 30.</p>
<p>BIO-4: Worker Environmental Awareness Training. Before the onset of construction activities, a qualified biologist will conduct an education program for all construction personnel. The training will include a description of all listed species with the potential to occur in the BSA as well as migratory birds and their habitats; the occurrence of these species within the project area; an explanation of the status of these species and protection under the federal and California Endangered Species Acts (FESA and CESA); the measures to be implemented to conserve listed species and their habitats as they relate to the work site; and boundaries within which construction may occur. A fact sheet conveying this information will be prepared and distributed to all project personnel entering the project area. Upon completion of the training program, personnel will sign a form stating that they attended the program and understand all the avoidance and minimization measures and implications of FESA and CESA.</p>
<p>BIO-5: Avoidance of Entrapment. To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered at the close of each working day by plywood or similar materials, or will be provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. All replacement pipes, culverts, or similar structures stored within the project area overnight will be inspected before they are subsequently moved, capped, and/or buried.</p>
<p>BIO-6: Pre-construction Surveys. A biologist approved by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) will conduct pre-construction surveys for federally and state-listed species, and the biologist will be present during construction activities including vegetation clearing and grubbing, as required by the resource agencies. If at any point any listed species is discovered within the project limits, the agency-approved biologist, through the Resident Engineer or his/her designee, will halt all work within 50 ft of the animal and contact the corresponding agency (USFWS or CDFW) to determine how to proceed.</p>
<p>BIO-7: Handling of Listed Species. If at any time a listed species is discovered, the Resident Engineer and the agency-approved biologist will be immediately informed. The agency-approved biologist will determine whether relocating the species is necessary, and will work with the corresponding agency (USFWS or CDFW) prior to handling or relocating unless otherwise authorized.</p>

Table C-1 Avoidance, Minimization, and/or Mitigation Summary

<p>BIO-8: Vegetation Removal. Vegetation within the project limits may be impacted by construction activities, and some clearing will be needed. Vegetation will be cleared only where necessary and will be cut above soil level except in areas that will be excavated for roadway construction. This will allow plants that reproduce vegetatively to resprout after construction. All clearing and grubbing of woody vegetation will occur by hand tools or using light construction equipment such as backhoes and excavators. A qualified biologist(s) will survey for nesting birds within the area(s) to be disturbed, including a perimeter buffer of 50 ft for passerines and 300 ft for raptors, before clearing activities begin during the nesting season (February 16 through August 31). All nest avoidance requirements of the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFGF) will be observed. All cleared vegetation will be removed from the BSA to prevent attracting animals to the project site. The contractor will be responsible for obtaining all permits, licenses, and environmental clearances for properly disposing of such materials.</p>
<p>BIO-9: Wetland Avoidance and Minimization. Caltrans will avoid or minimize adverse effects to wetlands to the maximum extent practicable. The resident engineer will enforce the staging and access plan. Vegetation removal will be limited to the amount necessary to complete project construction.</p>
<p>BIO-10: Pre-construction Surveys for Birds. Pre-construction surveys for special-status wildlife species will be conducted by a qualified biologist no more than 72 hours prior to the start of any construction activities. If an active nest is found, a qualified biologist in conjunction with the resource agencies will determine the appropriate buffer size and delineate the buffer zone using methods such as ESA fencing, pin flags, yellow caution tape, etc. Construction within the buffer zone will be prohibited until the qualified biologist determines the nest is no longer active. If establishment of the buffer around any nest is not feasible, the appropriate resource agencies will be contacted for further avoidance and minimization guidelines.</p>
<p>BIO-11: Biological Monitoring. A USFWS/CDFW-approved, qualified biological monitor shall be assigned to the proposed project. The biological monitor will be onsite to monitor all initial ground-disturbing activities during project construction and restoration activities to ensure that there is no unauthorized take of federally or state listed species or destruction of their habitat. The biologist will perform a clearance survey and mark any active bird nests for avoidance, as feasible. If a giant garter snake is encountered, the biologist shall have the authority through communication with the resident engineer to stop construction in the immediate area until appropriate corrective measures have been completed. Snakes encountered during construction activities shall be allowed to move away from the area on their own. The biologist shall notify the USFWS and CDFW immediately if any listed species are found onsite, and will submit a report, including date(s), location(s), habitat description, and any corrective measures taken to protect the species found. The biologist shall be required to report any take of listed species to the USFWS and CDFW immediately by telephone and by electronic mail or written letter within three working days of the incident.</p>
<p>BIO-12: In-Water Work Window. All in-water work, to include pile driving work in Miner Slough, will be restricted to low-flow periods between August 1 to November 30 when fish species in the Central Zone of the Delta are less likely to be present.</p>
<p>BIO-13: Dewatering. During dewatering of the cofferdam at Pier 3, fish rescue and relocation will be conducted by qualified fisheries biologist(s). The qualified biologist(s) will remain onsite during the entire dewatering process. Relocation will be accomplished by seining, dipnetting, and/or electrofishing. The biologist will minimize handling of fish species, and all captured fish will be held in a container with a lid that contains cool, shaded, adequately aerated water until relocated outside of the cofferdam.</p>
<p>BIO-14: Underwater Sound Pressures. During pile driving activities, the Contractor will be required to ensure sound pressures remain within the authorized range (183 decibels [dB] Sound Exposure Level to 206 dB Peak Exposure Level). Contractor shall use attenuation devices around piles that will be driven in the water with an impact hammer.</p>
<p>BIO-15: Valley Elderberry Longhorn Beetle Fencing and Signage. Prior to any ground-disturbing activities associated with the proposed project, Caltrans shall install 4-foot-tall temporary, plastic mesh construction ESA fence, where possible, 20 feet from the dripline of elderberry shrubs that are not to be removed. The fencing is intended to prevent encroachment by construction vehicles and personnel. The exact location of fencing will be determined by a qualified biologist. The fencing will be checked and maintained weekly until all construction is completed.</p> <p>A sign will mark this buffer zone and state the following: "This is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the federal Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines and imprisonment." The fencing and a note reflecting this condition will be shown on the construction plans. Signs will be legible from a distance of 20 feet and must be maintained for the duration of construction.</p>

Table C-1 Avoidance, Minimization, and/or Mitigation Summary

<p>BIO-16: Giant Garter Snake (GGS) Habitat Work Window. All ground-disturbing activity within GGS habitat shall be conducted between May 1 and October 1. Given that all construction activity is confined to upland habitat (over-wintering and movement habitat), the initial grading and disturbance of the laydown and work areas in GGS habitat will occur during the snake’s active season. Once the initial grading occurs, no further ground disturbing activity will occur, and mortality to any individuals of the species during hibernation due to construction activities is not anticipated.</p>
<p>BIO-17: Aquatic Habitat Dewatering. Aquatic habitat that will be disturbed or removed will be dewatered 15 days prior to the initiation of construction activities. If complete dewatering is not possible, potential snake prey (i.e., fish and tadpoles) will be removed so that snakes and other wildlife are not attracted to the construction area.</p>
<p>BIO-18: Erosion Control Materials. Tightly woven fiber netting or similar material shall be used for erosion control and other purposes within the project limits to ensure that the GGS does not become trapped or entangled. This limitation shall be communicated to the contractor using special provisions included in the bid solicitation package.</p>
<p>BIO-19: Site Restoration. After construction activities are complete, any temporary fill or construction debris shall be removed and disturbed areas restored to their pre-project conditions. An area subject to “temporary” disturbance includes any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be re-vegetated. All snake habitats subject to temporary ground disturbances, including storage and staging areas, will be restored. These areas shall be re-contoured, if appropriate, and re-vegetated with appropriate locally collected native plant species to promote restoration of the area to pre-project conditions. Appropriate methods and plant species used to re-vegetate such areas will be determined on a site-specific basis. Restoration work may include replanting emergent vegetation. Refer to the <i>Guidelines for the Restoration and/or Replacement of Giant Garter Snake Habitat</i> (USFWS 1996b).</p>
<p>BIO-20: Swainson’s Hawk Work Window. No construction-related activities will occur between March 1 and September 15 within 0.5 mile of a nesting Swainson’s hawk, or until August 15 if a Management Authorization or an Incidental Take Permit is obtained from CDFW.</p>
<p>BIO-21: Tree Removal. Removal of trees known to have supported nesting Swainson’s hawks within the last five years will be avoided unless a Management Authorization is obtained from CDFW and if the removal is conducted between October 1 and February 1.</p>
<p>BIO-22: Swainson’s Hawk Surveys. If construction activities are planned to begin after March 1, a preconstruction breeding survey for Swainson’s hawks will be conducted throughout areas of suitable nesting habitat within 0.5 mile of construction. If a Swainson’s hawk nest is observed within 0.5 mile of planned construction activities, CDFW will be contacted to determine whether project-related activities are likely to impact the nesting pair and whether additional avoidance and minimization measures can be established to avoid these impacts.</p>
<p>BIO-23: Invasive Species. In compliance with Executive Order 13112 and guidance from the Federal Highway Administration, the landscaping and erosion control included in the proposed project will not use species listed as invasive. The contractor will be required to inspect construction equipment for plant material and seeds prior to construction, remove and dispose of invasive plants at the project site cautiously, and replant the site with fast-growing native species. In areas of particular sensitivity (i.e., near drainages), extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment as well as eradication strategies to be implemented should an invasion occur.</p>
<p>Mitigation Measure BIO-A: Revegetation and Planting. Upon completion of project construction, mitigation for the loss of valley foothill riparian habitat will be performed on-site within the Caltrans ROW. Approximately 43 trees will be replanted and disturbed areas will be re-contoured to the natural grade and revegetated with native species appropriate for the site conditions. If planting cannot be accomplished on-site due to a general lack of suitable planting area, offsite mitigation options will be pursued.</p>
<p>Mitigation Measure BIO-B: Compensatory Mitigation for Jurisdictional Features. Caltrans will mitigate for jurisdictional wetlands and other waters of the U.S. to achieve no net loss of the functions and values of jurisdictional features within the Study Area. Caltrans will mitigate on-site at a 1:1 ratio by restoring wetlands and other waters as a result of removing the temporary construction trestles and demolishing the existing bridge. For permanent impacts, and through coordination with the U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB), Caltrans will mitigate at an approved off-site location at a minimum of a 1:1 ratio, with the final mitigation ratio determined through permitting with the USACE and RWQCB. Potential mitigation opportunities include Burke Ranch Conservation Bank and Elsie Gridley Mitigation Bank.</p>

Table C-1 Avoidance, Minimization, and/or Mitigation Summary

<p>Mitigation Measure BIO-C: Compensatory Mitigation for Delta Smelt and Longfin Smelt. Caltrans proposes to compensate for the area of direct impacts to the Delta smelt and longfin smelt habitat at a 3:1 ratio by purchasing credit either through a USFWS and CDFW approved mitigation location. Consistent with the programmatic consultation for Delta smelt (USFWS 2004), Caltrans proposes to mitigate permanent increases in shaded Shallow Water Habitat at a 3:1 ratio.</p>
<p>Mitigation Measure BIO-D: Compensatory Mitigation for GGS. Following the guidelines provided in the programmatic consultation for GGS (USFWS 1997), Caltrans will mitigate the temporary direct effects by onsite restoration and purchasing credit at a minimum 1.5:1 ratio at a USFWS- and CDFW-approved mitigation bank. Prolonged temporary effect of greater than 1 year will be mitigated at a 2:1 ratio. The direct impact due to the permanent impacts within GGS habitat will be offset at a ratio of 3:1 by purchasing land through a USFWS-and CDFW-approved mitigation bank.</p>
<p>Mitigation Measure BIO-E: Compensatory Mitigation for Swainson’s Hawk. Caltrans will mitigate off-site at a minimum 1:1 ratio for suitable foraging habitat credits from an approved mitigation bank. Credits will be purchased through a CDFW approved mitigation bank.</p>

Appendix D Special-status Plant and Animal Species

Table D-1 Potential Special-status Plants in the Nine-Quadrangle Area Surrounding Miner Slough

Scientific Name	Common Name	Status (Fed/State/CNPS ^a)	Habitat	Subhabitat	Flowering Period	Potential to Occur within Project Area
<i>Astragalus tener</i> var. <i>ferrisiae</i>	Ferris' milk-vetch	None/None/1B.1	Meadows, and valley and foothill grassland. Subalkaline flats on overflow land in the Central Valley; usually seen in dry, adobe soil. 5-75 m.	Elevations up to 200 ft. Vernal moist meadows and subalkaline flats in valley grasslands.	Apr.-May	Moderate. Minimal grassland found in Study Area. Closest CNDDDB occurrence is 8 miles away.
<i>Astragalus tener</i> var. <i>tener</i>	Alkali milk-vetch	None/None/1B.2	Alkali playa, valley and foothill grassland, and vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 1-170 m.	--	Mar.-Jun.	Moderate. Minimal grassland found in Study Area. Closest CNDDDB occurrence is 8 miles away.
<i>Atriplex cordulata</i> var. <i>cordulata</i>	heartscale	None/None/1B.2	Chenopod scrub, valley and foothill grassland, and meadows. Alkaline flats and scalds in the Central Valley, sandy soils. 0-560 m.	Elevations up to 500 ft. Saline or alkaline soils in alkali meadows, saltbrush scrub, and alkali sink communities.	Apr.-Oct.	Moderate. Minimal grassland found in Study Area. Closest CNDDDB occurrence is 8 miles away.
<i>Brasenia schreberi</i>	watershield	None/None/2B.3	Freshwater marshes and swamps. Aquatic from water bodies both natural and artificial in California.	--	Jun.-Sep.	Moderate. Closest CNDDDB occurrence is 7 miles away and is from 1976.
<i>Carex comosa</i>	bristly sedge	None/None/2B.1	Marshes and swamps. Lake margins, wet places; site below sea level is on a Delta island. -5-1,005 m.	--	May-Sep.	Moderate. Closest CNDDDB occurrence is 6 miles away.
<i>Cicuta maculata</i> var. <i>bolanderi</i>	Bolander's water-hemlock	None/None/2B.1	Marshes, fresh or brackish water. 0-200 m.	--	Jul.-Sep.	Moderate. Closest CNDDDB occurrence is 6 miles away.
<i>Fritillaria liliacea</i>	fragrant fritillary	None/None/1B.2	Coastal scrub, valley and foothill grassland, and coastal prairie. Often on serpentine; various soils reported though usually clay, in grassland. 3-410 m.	--	Feb.-Apr.	Moderate. Minimal grassland found in Study Area. Closest CNDDDB occurrence is 9 miles away.
<i>Gratiola heterosepala</i>	Boggs Lake hedge-hyssop	None/Endangered/1B.2	Marshes and swamps (freshwater), and vernal pools. Clay soils; usually in vernal pools, sometimes on lake margins. 10-2,375 m.	Elevations of 50-5,000 ft. Vernal pools, reservoir edges, similar mudflats; wet clay soil.	Apr.-Aug.	Moderate. Closest CNDDDB occurrence is 8 miles away.

Table D-1 Potential Special-status Plants in the Nine-Quadrangle Area Surrounding Miner Slough

Scientific Name	Common Name	Status (Fed/State/CNPS ^a)	Habitat	Subhabitat	Flowering Period	Potential to Occur within Project Area
<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	woolly rose-mallow	None/None/1B.2	Scattered small locations in central California from Butte County to San Joaquin County.	Freshwater marsh.	Aug.-Sep.	Detected. Observed within the Study Area in 2014.
<i>Isocoma arguta</i>	Carquinez goldenbush	None/None/1B.1	Valley and foothill grassland. Alkaline soils, flats, and lower hills. On low benches near drainages and on tops and sides of mounds in swale habitat. 1-20 m.	--	Aug.-Dec.	Moderate. Minimal grassland found in Study Area. Closest CNDDDB occurrence is 9 miles away.
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	None/None/1B.2	Freshwater and brackish marshes. Often found with Typha, Aster lentus, Rosa calif., Juncus spp., Scirpus, etc. Usually on marsh and slough edges.	--	May-Sep.	High. Closest CNDDDB occurrence is 2 miles away. Found in neighboring Lindsay Slough.
<i>Lepidium latipes</i> var. <i>heckardii</i>	Heckard's pepper-grass	None/None/1B.2	Valley and foothill grassland. Grassland and sometimes vernal pool edges. Alkaline soils. 2-200 m.	--	Mar.-May	Moderate. Minimal grassland in Study Area. Closest CNDDDB occurrence is 4 miles away.
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	None/None/1B.1	Freshwater and brackish marshes, and riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. 0-10 m.	--	Apr.-Nov.	High. CNDDDB occurrences within 1.5 miles of Study Area. Found in neighboring Lindsay Slough
<i>Limosella australis</i>	Delta mudwort	None/None/2B.1	Riparian scrub, freshwater marsh, and brackish marsh. Probably the rarest of the suite of Delta rare plants. Usually on mud banks of the Delta in marshy or scrubby riparian associations; often with Lilaeopsis masonii. 0-3 m.	--	May-Aug.	High. Closest CNDDDB occurrence is 4 miles away.
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	None/None/1B.2	Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. 0-650 m.	Elevations from 10-2,000 ft. Shallow, standing fresh water and sluggish waterways associated with marshes, swamps, ponds, vernal pools, lakes, reservoirs, sloughs, ditches, canals, streams, and rivers.	May-Oct.	Detected. Observed within the Study Area in 2002.

Table D-1 Potential Special-status Plants in the Nine-Quadrangle Area Surrounding Miner Slough

Scientific Name	Common Name	Status (Fed/State/CNPS ^a)	Habitat	Subhabitat	Flowering Period	Potential to Occur within Project Area
<i>Scutellaria lateriflora</i>	side-flowering skullcap	None/None/2B.2	Meadows and seeps, and marshes and swamps. Wet meadows and marshes. In the Delta, often found on logs. -3-500 m.	--	Jul.-Sep.	Moderate. Closest CNDDDB occurrence is 7 miles away.
<i>Symphotrichum lentum</i>	Suisun Marsh aster	None/None/1B.2	Marshes and swamps (brackish and freshwater). Most often seen along sloughs with Phragmites, Scirpus, blackberry, Typha, etc. 0-3 m.	--	May-Nov.	High. Closest CNDDDB occurrence is within 1.3 miles. Found in neighboring Lindsay Slough
<i>Trifolium hydrophilum</i>	saline clover	None/None/1B.2	Marshes and swamps, valley and foothill grassland, and vernal pools. Mesic, alkaline sites. 0-300 m.	--	Apr.-Jun.	Moderate. Closest CNDDDB occurrence is 7 miles away.

Notes:

^a CNPS Status definitions are as follows:

- 1B = Plants rare, threatened or endangered In California or elsewhere
- 2B = Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
- 0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- 0.2 = Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
- 0.3 = Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Source: Reprinted from the *Miner Slough Bridge Replacement Project Special-Status Plant Survey* (Caltrans 2015; Appendix C).

Table D-2 Special-status Animal Species with a Potential to Occur within the Miner Slough Bridge Project Study Area

Common Name (<i>Scientific Name</i>)	Federal Status^a	State Status^b	Habitat Requirements	Habitat Present/ Absent	Potential to Occur within the Project Study Area	Effect Finding for Federally Listed Species
Birds						
Tricolored blackbird (<i>Agelaius tricolor</i>)	--	SE	Nests colonially in large, dense stands of freshwater marsh, riparian scrub, and other shrubs and herbs; forages in grasslands and agricultural fields.	Present	Low. Species is not known to occur near the project area; habitat within project area is of poor quality.	N/A
Western burrowing owl (<i>Athene cunicularia hypugea</i>)	--	SSC	Nests and forages in open, dry grasslands, deserts, and agricultural fields characterized by low growing vegetation and suitable burrows.	Present	Low. Species is not known to occur near the project area; habitat within project area is of poor quality.	N/A
Swainson's hawk (<i>Buteo swainsonii</i>)	--	ST	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent on burrowing mammals.	Present	Detected. Active nest observed in 2014 within Study Area. Ground squirrels or their burrow complexes have not been observed in the Study Area.	N/A
white-tailed kite (<i>Elanus leucurus</i>)	--	FP	Open grasslands or meadows for foraging close to isolated, dense-topped trees for nesting and perching.	Present	Moderate. Marginally suitable nesting habitat is present within the Study Area. One CNDDDB occurrence records is located within 5 miles of the Study Area, approximately 4 mi northeast of the project.	N/A
song sparrow ("Modesto" population) (<i>Melospiza melodia maxillaris</i>)	--	SSC	Brackish-water, freshwater marshes, and tangles bordering sloughs.	Present	Moderate. Marginally suitable nesting habitat is present within the Study Area. Three CNDDDB occurrence records are located within 5 miles of the Study Area.	N/A

Table D-2 Special-status Animal Species with a Potential to Occur within the Miner Slough Bridge Project Study Area

Common Name (<i>Scientific Name</i>)	Federal Status ^a	State Status ^b	Habitat Requirements	Habitat Present/ Absent	Potential to Occur within the Project Study Area	Effect Finding for Federally Listed Species
Fish						
Chinook salmon (<i>Oncorhynchus tshawytscha</i>) Central Valley spring-run	FT, CH	ST	Adults spawn in the Sacramento River below Keswick Dam, but not in tributary streams. Requires clean, cold water over gravel beds for spawning.	Present	Moderate. Spawning and rearing of adults only occurs upstream of the Study Area in the upper reaches of the Sacramento River watershed. Presence in the Study Area can only be inferred during the upstream migration of adults and the downstream migration of juveniles). The Study Area is located within designated critical habitat for Central Valley spring-run Chinook salmon Evolutionary Significant Unit (ESU).	May affect, but is not likely to adversely affect the Central Valley spring-run Chinook salmon ESU or its habitat. Will not adversely modify or destroy designated critical habitat for this ESU.
Chinook salmon (<i>Oncorhynchus tshawytscha</i>) Sacramento River winter-run	FE, CH	SE	Adults spawn in the Sacramento River below Keswick Dam, but not in tributary streams. Requires clean, cold water over gravel beds for spawning.	Present	Moderate. Spawning of adults and rearing of juveniles only occurs upstream of the Study Area in the upper reaches of the Sacramento River watershed. Presence in the Study Area can only be inferred during the upstream migration of adults and the downstream migration of juveniles. The Study Area is not located within designated critical habitat for Sacramento River winter-run Chinook salmon ESU.	May affect, but is not likely to adversely affect the Sacramento River winter-run Chinook salmon ESU or its habitat. Will have no effect to designated critical habitat for this ESU.

Table D-2 Special-status Animal Species with a Potential to Occur within the Miner Slough Bridge Project Study Area

Common Name (<i>Scientific Name</i>)	Federal Status ^a	State Status ^b	Habitat Requirements	Habitat Present/ Absent	Potential to Occur within the Project Study Area	Effect Finding for Federally Listed Species
North American green sturgeon (<i>Acipenser medirostris</i>) Southern Distinct Population Segment (DPS)	FT, CH	None	Spawn in deep pools or “holes” in large turbulent freshwater river mainstems. Eggs likely are broadcast over large cobble substrates, but range from clean sand to bedrock substrates as well. Adults live in oceanic waters, bays, and estuaries when not spawning.	Present	Moderate. Post-spawning adults are known to remain in the Sacramento River through the fall, and juvenile/subadult green sturgeon remain in the Delta region for 2 to 3 years before entering the estuary or ocean. Post-spawning adults and rearing juveniles/subadults may be present in the Study Area due to its proximity to the Sacramento River.	Likely to adversely affect but not jeopardize the Southern DPS of green sturgeon. Will not adversely modify or destroy designated critical habitat.
longfin smelt (<i>Spirinchus thaleichthys</i>)	C	SSC	Euryhaline, nektonic, and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 parts per thousand (ppt) but can be found in completely freshwater to almost pure seawater.	Absent	Very Low. Estuarine habitat is not present within the Study Area. Nearest CNDDDB documented occurrence is 3.7 miles.	May affect, but is not likely to adversely affect.
Delta smelt (<i>Hypomesus transpacificus</i>)	FT, CH	None	Sacramento-San Joaquin River Delta. Seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay. Seldom found at salinities greater than 10 ppt. Most often at salinities less than 2 ppt.	Present	High. Species known to seasonally occur in the vicinity of Miner Slough between December and July. Critical habitat includes Miner Slough within Study Area.	May affect, but is not likely to adversely affect. Will not adversely modify or destroy designated critical habitat.

Table D-2 Special-status Animal Species with a Potential to Occur within the Miner Slough Bridge Project Study Area

Common Name (<i>Scientific Name</i>)	Federal Status ^a	State Status ^b	Habitat Requirements	Habitat Present/ Absent	Potential to Occur within the Project Study Area	Effect Finding for Federally Listed Species
steelhead - Central California coast DPS (<i>Oncorhynchus mykiss irideus</i>)	FT; CH	None	Occurs from Russian River south to Soquel Creek near Santa Cruz and to, but not including, the Pajaro River near Watsonville, California. Also occurs in San Francisco Bay and San Pablo Bay.	Present	Moderate. Spawning of adults and rearing of juveniles only occurs upstream of the Study Area in the Sacramento River watershed and in the San Joaquin River watershed. Presence in the Study Area can only be inferred during the upstream migration of adults and the downstream migration of juveniles. Designated critical habitat within the Study Area in Miner Slough.	Likely to adversely affect but not jeopardize Central Valley steelhead. The proposed project will not adversely modify or destroy designated critical habitat for the Central Valley steelhead DPS.
Invertebrates						
valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>)	FE	None	Restricted to the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>) with stems that are 1-inch-diameter or greater at ground level.	Present	Low. Elderberry shrubs found within the Study Area; however, no sign of VELB was observed. The closest VELB record noted in the CNDDDB is approximately 13 miles away from the project along the Cosumnes River in Sacramento County.	No effect – The elderberry shrubs are located more outside the project impact area and will have a fenced buffer around them to prevent direct effects.
Reptiles						
giant garter snake (<i>Thamnophis gigas</i>)	FT	ST	Permanent or seasonal water, mud bottoms, and vegetated dirt banks. Sufficient water to supply cover and food such as small fish and amphibians. Emergent, herbaceous wetland vegetation, accompanied by vegetated banks to provide basking and foraging habitat and escape cover; high ground or upland habitat above the annual high-water mark to provide cover and refuge from flood.	Present	Moderate. Marginally suitable habitat is present within the Study Area. Although no CNDDDB occurrence records are located within 5 miles of the Study Area, the project is within the historic and currently recognized range of the species.	May affect, but is not likely to adversely affect

Table D-2 Special-status Animal Species with a Potential to Occur within the Miner Slough Bridge Project Study Area

Common Name (<i>Scientific Name</i>)	Federal Status ^a	State Status ^b	Habitat Requirements	Habitat Present/ Absent	Potential to Occur within the Project Study Area	Effect Finding for Federally Listed Species
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Notes:

^aUSFWS designations are as follows:

- C = Candidate species
- CH = Critical Habitat (area essential to the conservation of a species)
- FE = Endangered (any species in danger of extinction throughout all or a significant portion of its range)
- FT = Threatened (any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range)

^bCDFW designations are as follows:

- FP = Fully Protected species
- SE = Endangered (any species at risk of becoming extinct in all or a significant portion of its range)
- SSC = Species of Special Concern
- ST = Threatened (any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range)

Except for the species with effects determination made in Table D-2, all other species included in the list below and in Appendix E, the proposed project will have no effect: California clapper rail, California least tern, Northern spotted owl, Western snowy plover, Yellow-billed cuckoo, California freshwater shrimp, Conservancy fairy shrimp, Vernal pool fairy shrimp, Vernal pool tadpole shrimp, Tidewater goby, Antioch Dunes evening-primrose, Colusa grass, Contra Costa goldfields, Contra Costa wallflower, Keck’s checker-mallow, San Joaquin orcutt grass, Santa Cruz tarplant, Sebastopol meadowfoam, Showy Indian clover, Soft bird’s-beak, Solano grass, Sonoma sunshine, Suisun thistle, Tiburon paintbrush, Callippe silverspot butterfly, Delta green ground beetle, Lange’s metalmark butterfly, Myrtle’s silverspot butterfly, San Bruno elfin butterfly, Salt marsh harvest mouse, San Joaquin kit fox, Alameda whipsnake, Coho salmon – central California coast, Central Valley steelhead.

Appendix E CNDDDB, USFWS, and NMFS Species Lists



Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Taxonomic Group is (Fish or Amphibians or Reptiles or Birds or Mammals or Mollusks or Arachnids or Crustaceans or Insects or Ferns or Gymnosperms or Monocots or Dicots or Lichens or Bryophytes) and (Federal Listing Status is (Endangered or Threatened) or State Listing Status is (Endangered or Threatened)) and Quad is (Birds Landing (3812127) or Clarksburg (3812145) or Courtland (3812135) or Dixon (3812147) or Dozier (3812137) or Isleton (3812125) or Liberty Island (3812136) or Rio Vista (3812126) or Saxon (3812146))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Agelaius tricolor</i> tricolored blackbird	G2G3 S1S2	None Endangered	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	5 5	431 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Ambystoma californiense</i> California tiger salamander	G2G3 S2S3	Threatened Threatened	CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	20 197	1127 S:10	4	0	0	0	1	5	2	8	9	0	1
<i>Branchinecta conservatio</i> Conservancy fairy shrimp	G1 S1	Endangered None	IUCN_EN-Endangered	10 35	42 S:8	6	0	0	0	0	2	0	8	8	0	0
<i>Branchinecta lynchi</i> vernal pool fairy shrimp	G3 S2S3	Threatened None	IUCN_VU-Vulnerable	5 65	752 S:22	1	6	6	1	0	8	3	19	22	0	0
<i>Buteo swainsoni</i> Swainson's hawk	G5 S3	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	-10 130	2394 S:243	44	76	28	6	4	85	16	227	239	1	3
<i>Coccyzus americanus occidentalis</i> western yellow-billed cuckoo	G5T3Q S1	Threatened Endangered	BLM_S-Sensitive NABCI_RWL-Red Watch List USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	5 5	126 S:1	0	0	0	0	1	0	1	0	0	0	1
<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	G3T2 S2	Threatened None		55 55	271 S:1	0	0	0	1	0	0	1	0	1	0	0
<i>Elaphrus viridis</i> Delta green ground beetle	G1 S1	Threatened None	IUCN_CR-Critically Endangered	15 30	7 S:3	1	1	0	0	1	0	1	2	2	0	1
<i>Gratiola heterosepala</i> Boggs Lake hedge-hyssop	G2 S2	None Endangered	Rare Plant Rank - 1B.2 BLM_S-Sensitive	15 30	94 S:6	0	4	0	1	0	1	4	2	6	0	0



Summary Table Report
California Department of Fish and Wildlife
California Natural Diversity Database



Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Hypomesus transpacificus</i> Delta smelt	G1 S1	Threatened Endangered	AFS_TH-Threatened IUCN_EN-Endangered	0 5	27 S:5	0	0	1	0	0	4	0	5	5	0	0
<i>Lepidurus packardii</i> vernal pool tadpole shrimp	G3 S2S3	Endangered None	IUCN_EN-Endangered	10 35	273 S:18	4	4	2	0	0	8	0	18	18	0	0
<i>Neostapfia colusana</i> Colusa grass	G2 S2	Threatened Endangered	Rare Plant Rank - 1B.1	18 35	62 S:7	0	4	1	2	0	0	1	6	7	0	0
<i>Oncorhynchus mykiss irideus</i> steelhead - Central Valley DPS	G5T2Q S2	Threatened None	AFS_TH-Threatened		31 S:2	0	0	0	0	0	2	0	2	2	0	0
<i>Sidalcea keckii</i> Keck's checkerbloom	G1 S1	Endangered None	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden		16 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Spirinchus thaleichthys</i> longfin smelt	G5 S1	Candidate Threatened	CDFW_SSC-Species of Special Concern	0 20	45 S:7	0	0	0	0	0	7	0	7	7	0	0
<i>Thamnophis gigas</i> giant garter snake	G2 S2	Threatened Threatened	IUCN_VU-Vulnerable	5 15	345 S:9	2	2	0	0	2	3	5	4	7	2	0
<i>Tuctoria mucronata</i> Crampton's tuctoria or Solano grass	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	15 35	4 S:4	0	1	2	0	1	0	1	3	3	0	1

My project

IPaC Trust Resource Report

Generated June 22, 2015 02:24 PM MDT



US Fish & Wildlife Service

IPaC Trust Resource Report



Project Description

NAME

My project

PROJECT CODE

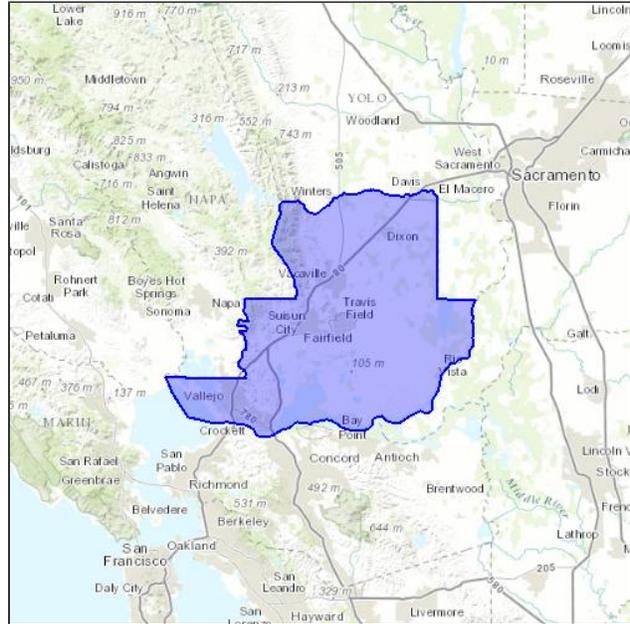
AV4B5-7PKMR-AAXF7-PNCC4-I4XORY

LOCATION

Solano County, California

DESCRIPTION

No description provided



U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

San Francisco Bay-delta Fish And Wildlife

650 Capitol Mall

SUITE 8-300

Sacramento, CA 95814

(916) 930-5603

Sacramento Fish And Wildlife Office

Federal Building

2800 COTTAGE WAY, ROOM W-2605

Sacramento, CA 95825-1846

(916) 414-6600

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the [Endangered Species Program](#) and should be considered as part of an effect analysis for this project.

Amphibians

California Red-legged Frog *Rana draytonii*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D02D>

California Tiger Salamander *Ambystoma californiense*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D01T>

Birds

California Clapper Rail *Rallus longirostris obsoletus*

Endangered

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B04A>

California Least Tern *Sterna antillarum browni*

Endangered

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B03X>

Northern Spotted Owl *Strix occidentalis caurina*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08B>

Western Snowy Plover *Charadrius alexandrinus nivosus*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B07C>

Yellow-billed Cuckoo *Coccyzus americanus*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **proposed** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06R>

Crustaceans

California Freshwater Shrimp *Syncaris pacifica*

Endangered

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No **critical habitat** has been designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K01W>

Conservancy Fairy Shrimp *Branchinecta conservatio*

Endangered

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K03D>

Vernal Pool Fairy Shrimp *Branchinecta lynchi*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K03G>

Vernal Pool Tadpole Shrimp *Lepidurus packardii*

Endangered

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K048>

Fishes

Delta Smelt *Hypomesus transpacificus*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E070>

Steelhead *Oncorhynchus (=Salmo) mykiss*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D>

Tidewater Goby *Eucyclogobius newberryi*

Endangered

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E071>

Flowering Plants

Antioch Dunes Evening-primrose *Oenothera deltoides* ssp. *howellii* **Endangered**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1ZN>

Colusa Grass *Neostapfia colusana* **Threatened**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q19I>

Contra Costa Goldfields *Lasthenia conjugens* **Endangered**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q122>

Contra Costa Wallflower *Erysimum capitatum* var. *angustatum* **Endangered**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1WA>

Keck's Checker-mallow *Sidalcea keckii* **Endangered**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1OS>

San Joaquin Orcutt Grass *Orcuttia inaequalis* **Threatened**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1ZP>

Santa Cruz Tarplant <i>Holocarpha macradenia</i>	Threatened
MANAGED BY Sacramento Fish And Wildlife Office	
CRITICAL HABITAT There is final critical habitat designated for this species.	
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q0ZL	
Sebastopol Meadowfoam <i>Limnanthes vincularis</i>	Endangered
MANAGED BY Sacramento Fish And Wildlife Office	
CRITICAL HABITAT No critical habitat has been designated for this species.	
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1Y1	
Showy Indian Clover <i>Trifolium amoenum</i>	Endangered
MANAGED BY Sacramento Fish And Wildlife Office	
CRITICAL HABITAT No critical habitat has been designated for this species.	
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q238	
Soft Bird's-beak <i>Cordylanthus mollis</i> ssp. <i>mollis</i>	Endangered
MANAGED BY Sacramento Fish And Wildlife Office	
CRITICAL HABITAT There is final critical habitat designated for this species.	
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q0GT	
Solano Grass <i>Tuctoria mucronata</i>	Endangered
MANAGED BY Sacramento Fish And Wildlife Office	
CRITICAL HABITAT There is final critical habitat designated for this species.	
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q23L	
Sonoma Sunshine <i>Blennosperma bakeri</i>	Endangered
MANAGED BY Sacramento Fish And Wildlife Office	
CRITICAL HABITAT No critical habitat has been designated for this species.	
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1TO	
Suisun Thistle <i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	Endangered
MANAGED BY Sacramento Fish And Wildlife Office	
CRITICAL HABITAT There is final critical habitat designated for this species.	
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q0FC	

Tiburon Paintbrush *Castilleja affinis* ssp. *neglecta*

Endangered

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=Q26R>

Insects

Callippe Silverspot Butterfly *Speyeria callippe callippe* **Endangered**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I019>

Delta Green Ground Beetle *Elaphrus viridis* **Threatened**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I01G>

Lange's Metalmark Butterfly *Apodemia mormo langei* **Endangered**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I00H>

Myrtle's Silverspot Butterfly *Speyeria zerene myrtleae* **Endangered**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I00N>

San Bruno Elfin Butterfly *Callophrys mossii bayensis* **Endangered**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I00Q>

Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* **Threatened**

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I01L>

Mammals

Salt Marsh Harvest Mouse *Reithrodontomys raviventris*

Endangered

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A03Y>

San Joaquin Kit Fox *Vulpes macrotis mutica*

Endangered

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A006>

Reptiles

Alameda Whipsnake (=striped Racer) *Masticophis lateralis euryxanthus*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C04A>

Giant Garter Snake *Thamnophis gigas*

Threatened

MANAGED BY

Sacramento Fish And Wildlife Office

CRITICAL HABITAT

No critical habitat has been designated for this species.<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C057>

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

California Red-legged Frog Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D02D#crithab>

California Tiger Salamander Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D01T#crithab>

Chinook Salmon Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E06D#crithab>

Conservancy Fairy Shrimp Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K03D#crithab>

Contra Costa Goldfields Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q122#crithab>

Delta Green Ground Beetle Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I01G#crithab>

Delta Smelt Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E070#crithab>

Soft Bird's-beak Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q0GT#crithab>

Steelhead Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D#crithab>

Steelhead Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D#crithab>

Suisun Thistle Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q0FC#crithab>

Vernal Pool Fairy Shrimp Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K03G#crithab>

Vernal Pool Tadpole Shrimp Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K048#crithab>

Migratory Birds

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You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

<p>Allen's Hummingbird <i>Selasphorus sasin</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0LI</p>	Bird of conservation concern
<p>Bald Eagle <i>Haliaeetus leucocephalus</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008</p>	Bird of conservation concern
<p>Bell's Sparrow <i>Amphispiza belli</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HE</p>	Bird of conservation concern
<p>Black Oystercatcher <i>Haematopus bachmani</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0KJ</p>	Bird of conservation concern
<p>Black Rail <i>Laterallus jamaicensis</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09A</p>	Bird of conservation concern
<p>Black-chinned Sparrow <i>Spizella atrogularis</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0IR</p>	Bird of conservation concern
<p>Black-vented Shearwater <i>Puffinus opisthomelas</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0LF</p>	Bird of conservation concern
<p>Burrowing Owl <i>Athene cunicularia</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0NC</p>	Bird of conservation concern
<p>Common Yellowthroat <i>Geothlypis trichas sinuosa</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B080</p>	Bird of conservation concern
<p>Costa's Hummingbird <i>Calypte costae</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JE</p>	Bird of conservation concern

Fox Sparrow <i>Passerella iliaca</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0NE	Bird of conservation concern
Lawrence's Goldfinch <i>Carduelis lawrencei</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0J8	Bird of conservation concern
Least Bittern <i>Ixobrychus exilis</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JW	Bird of conservation concern
Lesser Yellowlegs <i>Tringa flavipes</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0MD	Bird of conservation concern
Lewis's Woodpecker <i>Melanerpes lewis</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HQ	Bird of conservation concern
Loggerhead Shrike <i>Lanius ludovicianus</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY	Bird of conservation concern
Long-billed Curlew <i>Numenius americanus</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06S	Bird of conservation concern
Marbled Godwit <i>Limosa fedoa</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JL	Bird of conservation concern
Mountain Plover <i>Charadrius montanus</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B078	Bird of conservation concern
Nuttall's Woodpecker <i>Picoides nuttallii</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HT	Bird of conservation concern
Oak Titmouse <i>Baeolophus inornatus</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0MJ	Bird of conservation concern
Olive-sided Flycatcher <i>Contopus cooperi</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0AN	Bird of conservation concern
Peregrine Falcon <i>Falco peregrinus</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU	Bird of conservation concern
Pink-footed Shearwater <i>Puffinus creatopus</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0KZ	Bird of conservation concern

Short-billed Dowitcher <i>Limnodromus griseus</i>	Bird of conservation concern
Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JK	
Short-eared Owl <i>Asio flammeus</i>	Bird of conservation concern
Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD	
Song Sparrow <i>Melospiza melodia samuelis</i>	Bird of conservation concern
Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08Q	
Song Sparrow <i>Melospiza melodia maxillaris</i>	Bird of conservation concern
Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08R	
Swainson's Hawk <i>Buteo swainsoni</i>	Bird of conservation concern
Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B070	
Tricolored Blackbird <i>Agelaius tricolor</i>	Bird of conservation concern
Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06P	
Whimbrel <i>Numenius phaeopus</i>	Bird of conservation concern
Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JN	
Yellow Rail <i>Coturnicops noveboracensis</i>	Bird of conservation concern
Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JG	
Yellow-billed Magpie <i>Pica nuttalli</i>	Bird of conservation concern
Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0N8	
Red Knot <i>Calidris canutus ssp. roselaari</i>	Bird of conservation concern
Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0G6	

Refuges

Any activity proposed on [National Wildlife Refuge](#) lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

San Pablo Bay National Wildlife Refuge

13,386.65 acres

PHONE (707) 769-4200

ADDRESS

2100 Highway 37

Petaluma, CA 94954

<http://www.fws.gov/refuges/profiles/index.cfm?id=81644>

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate [U.S. Army Corps of Engineers District](#).

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Wetland data is unavailable at this time.

My project

IPaC Trust Resource Report

Generated June 22, 2015 04:13 PM MDT



US Fish & Wildlife Service

IPaC Trust Resource Report



Project Description

NAME

My project

PROJECT CODE

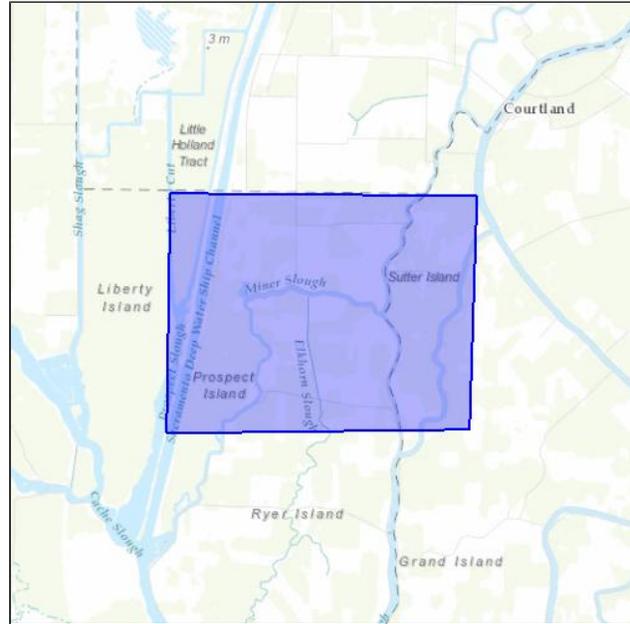
36CV7-UXS6N-BVJGQ-CTDAW-E4RLTU

LOCATION

Sacramento and Solano counties,
California

DESCRIPTION

No description provided



U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

San Francisco Bay-delta Fish And Wildlife

650 Capitol Mall

SUITE 8-300

Sacramento, CA 95814

(916) 930-5603

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the [Endangered Species Program](#) and should be considered as part of an effect analysis for this project.

There are no endangered species identified for this project area

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

Chinook Salmon Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E06D#crithab>

Delta Smelt Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E070#crithab>

Steelhead Critical Habitat Final designated

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D#crithab>

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<p>Bald Eagle <i>Haliaeetus leucocephalus</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008</p>	Bird of conservation concern
<p>Black Rail <i>Laterallus jamaicensis</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09A</p>	Bird of conservation concern
<p>Burrowing Owl <i>Athene cunicularia</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0NC</p>	Bird of conservation concern
<p>Costa's Hummingbird <i>Calypte costae</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JE</p>	Bird of conservation concern
<p>Fox Sparrow <i>Passerella iliaca</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0NE</p>	Bird of conservation concern
<p>Least Bittern <i>Ixobrychus exilis</i> Season: Breeding https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JW</p>	Bird of conservation concern
<p>Lesser Yellowlegs <i>Tringa flavipes</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0MD</p>	Bird of conservation concern
<p>Lewis's Woodpecker <i>Melanerpes lewis</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HQ</p>	Bird of conservation concern
<p>Loggerhead Shrike <i>Lanius ludovicianus</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY</p>	Bird of conservation concern
<p>Long-billed Curlew <i>Numenius americanus</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06S</p>	Bird of conservation concern

Marbled Godwit <i>Limosa fedoa</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JL	Bird of conservation concern
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Short-eared Owl <i>Asio flammeus</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD	Bird of conservation concern
Swainson's Hawk <i>Buteo swainsoni</i> Season: Wintering https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B070	Bird of conservation concern
Tricolored Blackbird <i>Agelaius tricolor</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06P	Bird of conservation concern
Williamson's Sapsucker <i>Sphyrapicus thyroideus</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FX	Bird of conservation concern
Yellow-billed Magpie <i>Pica nuttalli</i> Year-round https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0N8	Bird of conservation concern

Refuges

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There are no refuges within this project area

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Freshwater Emergent Wetland

PEMT	34.9 acres
PEMV	16.9 acres
PEMN	5.12 acres
PEMCh	0.715 acre
PEMFx	0.607 acre

Freshwater Forested/shrub Wetland

PSSR	32.6 acres
PFOR	28.7 acres

Freshwater Pond

PUBHx	2.54 acres
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Lake

L2UBV	1,120 acres
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Other

PF	49,000 acres
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Riverine

R1UBV	30,000 acres
R1UBVx	2,470 acres
R2UBHx	29.2 acres
R2UBH	15.4 acres

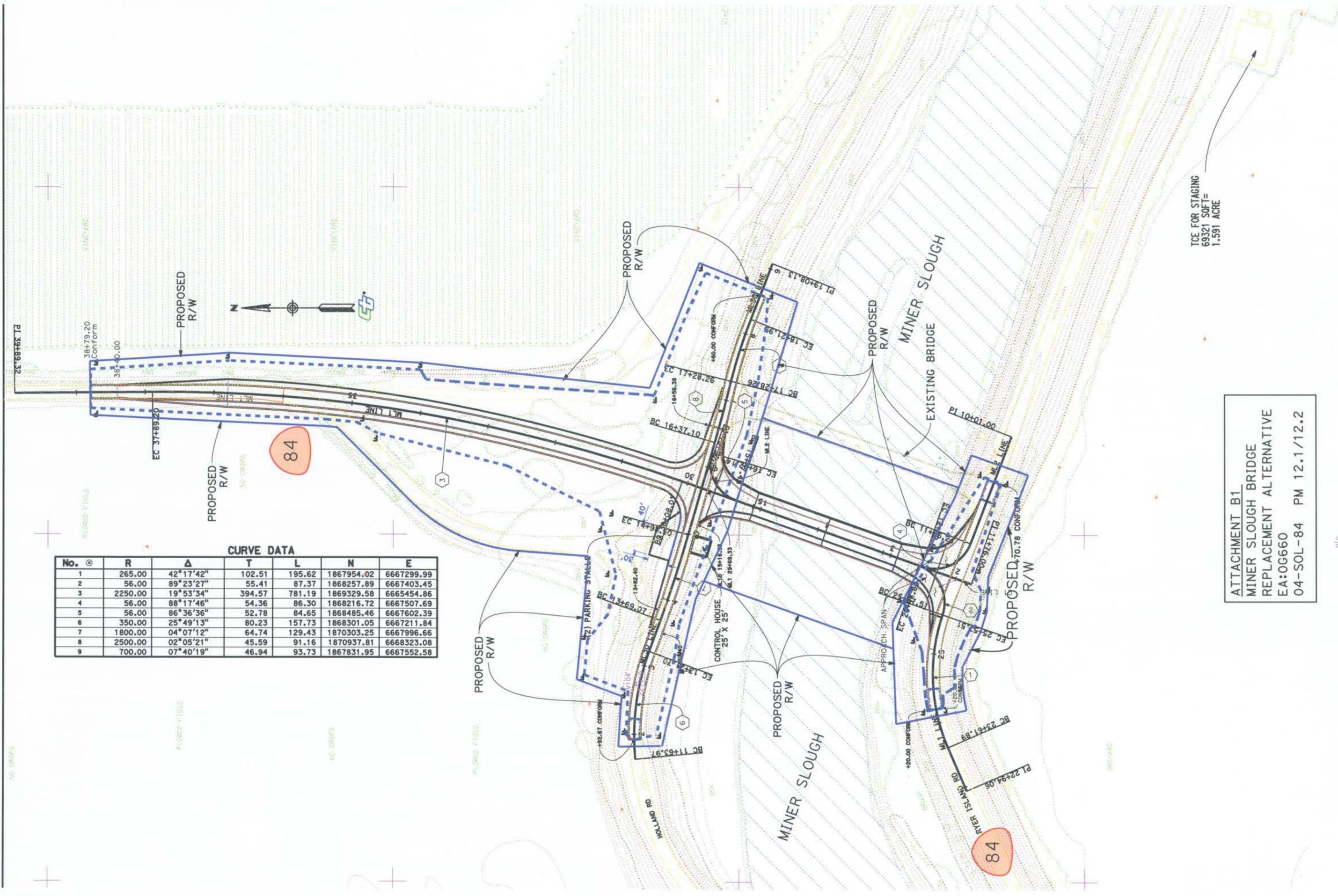
Appendix F List of Technical Studies

- Hydraulic Report (Caltrans; September 2014, revised September 2015)
- 4(f) Analysis (Caltrans; March 2015)
- Air Quality Assessment (Caltrans; March 2015)
- Energy Analysis (Caltrans; March 2015)
- Geotechnical Report (Caltrans; March 2015)
- Location Hydraulic Study (Caltrans; March 2015, revised September 2015)
- Scenic Resource Evaluation and Visual Impact Assessment (Caltrans; March 2015)
- Water Quality Study (Caltrans; March 2015, revised September 2015)
- Cultural Findings Memo (Caltrans; April 2015; Addendum August 2015)
- Traffic Report (Caltrans; April 2015, revised September 2015)
- Natural Environment Study (CH2M HILL; April 2015, Final September 2015)
- Analysis of Potential Underwater Construction Noise (Illingworth & Rodkin; April 2015)
- Sea Level Rise Impact Assessment (CH2M HILL; August 2015)
- Summary Floodplain Encroachment Report (Caltrans; September 2015)

Appendix G Layout Plans

CURVE DATA

No.	⊙	R	Δ	T	L	N	E
1		265.00	42°17'42"	102.51	195.62	1867954.02	6667299.99
2		56.00	89°23'27"	55.41	87.37	1868257.89	6667403.45
3		2250.00	19°53'34"	394.57	781.19	1869329.58	6665454.86
4		56.00	88°17'46"	54.36	86.30	1868216.72	6667507.69
5		56.00	86°36'36"	52.78	84.65	1868485.46	6667602.39
6		350.00	25°49'13"	80.23	157.73	1868301.05	6667211.84
7		1800.00	04°07'12"	64.74	129.43	1870303.25	6667996.66
8		2500.00	02°05'21"	45.59	91.16	1870937.81	6668323.08
9		700.00	07°40'19"	46.94	93.73	1867831.95	6667552.58



TCE FOR STAGING
69321 SOFT=
1.591 ACRE

ATTACHMENT B1
MINER SLOUGH BRIDGE
REPLACEMENT ALTERNATIVE
EA:06660
04-SOL-84 PM 12.1/12.2

PARCEL BOUNDARY LINE



SUMMARY OF THIS SHEET:

- 1) Required Acquisition from APN 0042-200-200
70496 SQFT = 1.618 AC
- 2) Required Acquisition from APN 0042-200-140
140225 SQFT = 3.219 AC
- 3) Required Acquisition from APN 0042-220-020
38267 SQFT = 0.879 AC
- 4) ICE for Staging 69321 Sqft
= 1.591 AC

Additional R/W Required
- 70496 SQFT -
1.618 AC

PROPOSED R/W

PROPOSED R/W

PARCEL BOUNDARY LINE

APN 0042-200-200

PROPOSED R/W

PARCEL BOUNDARY LINE

PROPOSED R/W

APN 0042-200-140
Gasto Co.
6/13/97
199700036340

2927 SQFT -
0.067 AC

PROPOSED R/W

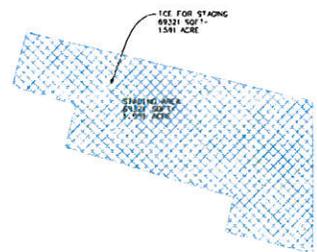
PROPOSED R/W

PROPOSED R/W

APN 0042-220-020
Islands Inc.

Additional R/W Required
- 38267 SQFT -
0.879 AC

MINER SLOUGH BRIDGE REPLACEMENT ALTERNATIVE
RIGHT OF WAY REQUIREMENT
EA:0G660



84

TCE FOR STAGING
= 18345 SQFT
= 0.421 AC

+40.00 CONFORM

PROPOSED R/W

PROPOSED R/W

+80.00 CONFORM

PROPOSED R/W

+80.00 CONFORM

PROPOSED R/W

MINER SLOUGH

MINER SLOUGH

ALTERNATIVE II
RETROFIT EXISTING
BRIDGE

CONFORM

84

TCE FOR STAGING
69321 SQFT=
1.591 ACRE

ATTACHMENT B2
MINER SLOUGH BRIDGE
RETROFIT ALTERNATIVE
EA:0G660
04-SOL-84 PM 12.1/12.2

SUMMARY OF THIS SHEET:

- 1) Required Acquisition from APN 0042-200-200
26687 SQFT = 0.613 AC
- 2) Required Acquisition from APN 0042-200-140
58389 SQFT = 1.340 AC
- 3) Required TCE from APN 0042-200-140
18345 SQFT = 0.421 AC
- 4) TCE LEASE on the House southeast of the Bridge
69321 SQFT = 1.591 ACRE



PARCEL BOUNDARY LINE

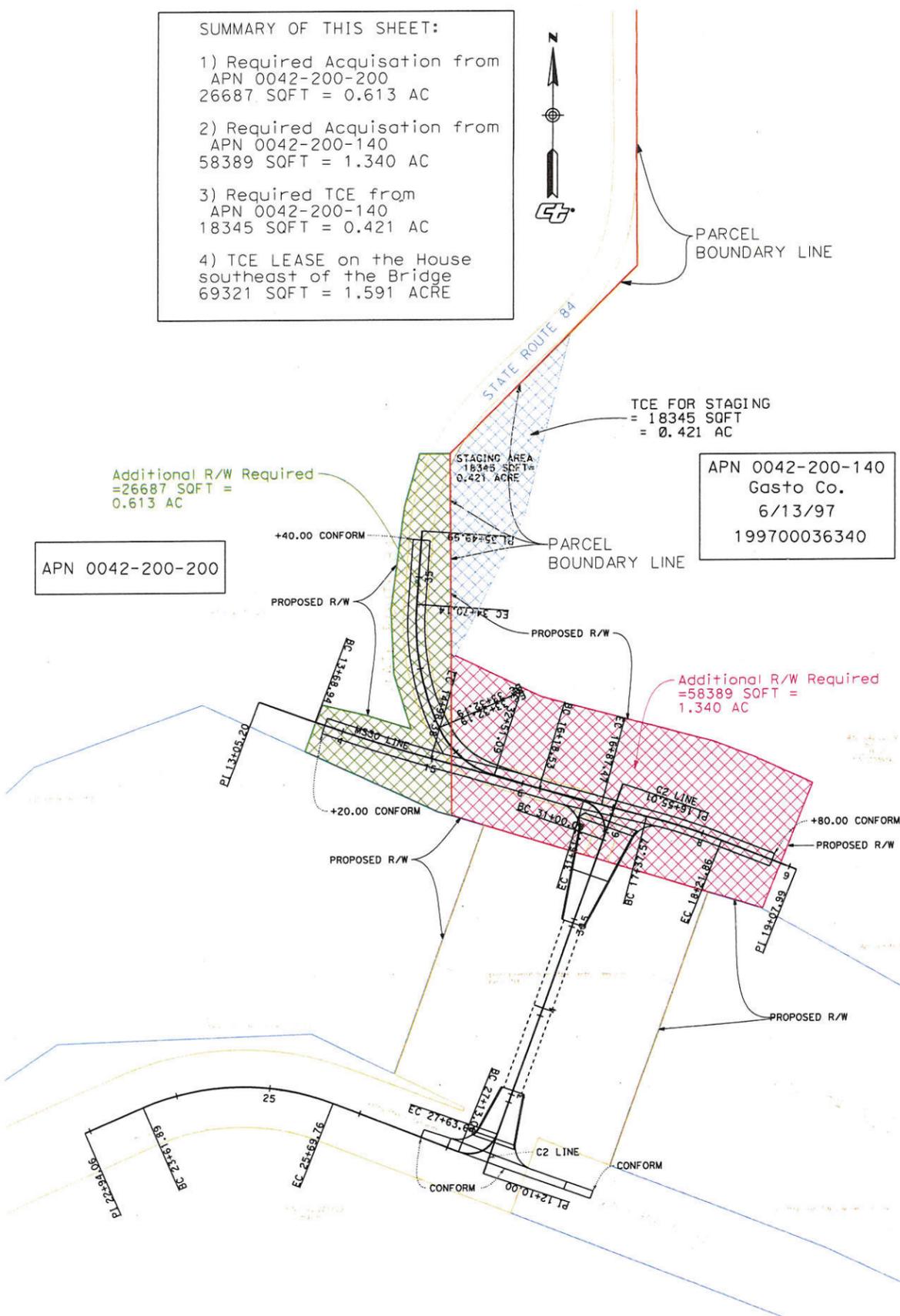
TCE FOR STAGING
= 18345 SQFT
= 0.421 AC

APN 0042-200-140
Gasto Co.
6/13/97
199700036340

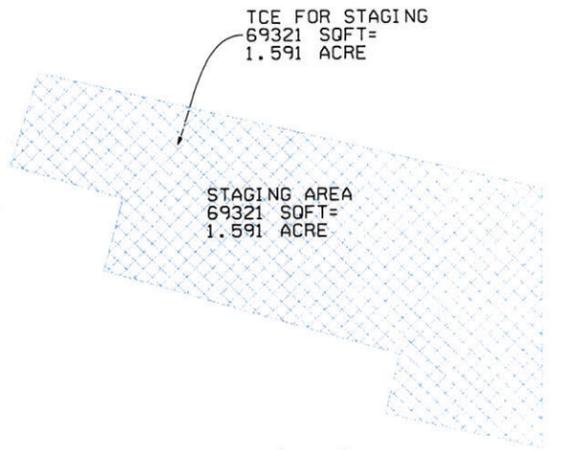
Additional R/W Required
=26687 SQFT =
0.613 AC

APN 0042-200-200

Additional R/W Required
=58389 SQFT =
1.340 AC



MINER SLOUGH BRIDGE RETROFIT ALTERNATIVE
RIGHT OF WAY REQUIREMENT
EA:0G660



APN
0042-220-020