

State Route 12 Roadway Resurfacing, Restoration and Rehabilitation Project

(From Currie Road to Sacramento County Line in Solano County)

SOLANO COUNTY, CALIFORNIA
DISTRICT 4 – SOL – 12 (PM 20.57/26.41)
0J630/0414000020

Initial Study with Proposed Mitigated Negative Declaration/ Environmental Assessment



**Prepared by the
State of California, Department of Transportation**

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



June 2019

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 project located in Solano County, California. Caltrans is the lead agency under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The document tells you why the project is being proposed, what alternatives we have considered for the project, how the existing environment could be affected by the 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.
- Additional copies of this document and the related technical studies are available for review at the following locations: California Department of Transportation, District 4, 111 Grand Avenue, Oakland, CA 94612; Rio Vista City Hall, 1 Main Street, Rio Vista, CA 94571; and Rio Vista Library, 44 South Second Street, Rio Vista, CA 94571. This document may be downloaded at the following website: <http://www.dot.ca.gov/d4/envdocs.htm>.
- We'd like to hear what you think. If you have any comments about the proposed project, please attend the public meeting at **Veterans Memorial Building**, 610 St. Francis Way, Rio Vista on Tuesday July 9th from 6:00pm to 8:00pm and/or send your written comments to Caltrans by the deadline. The comment period is from June 24 to July 24, 2019.
- Send comments via postal mail to:
Cindy Fong, Associate Environmental Planner
California Department of Transportation, District 4
PO Box 23660, MS 8B, Oakland, CA 94623
- Send comments via email to: cindy.fong@dot.ca.gov
- Be sure to send comments by the deadline: Friday July 24, 2019

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 project.

ALTERNATIVE FORMATS:

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 the Department of Transportation, District 4, Attn: Cindy Fong, PO Box 23660, MS 8B, Oakland, CA 94623; (510) 286-5935 (Voice) or use the California Relay Service 1 (800) 735-2929 (TTY), 1 (800) 735-2929 (Voice) or 711.

Perform roadway resurfacing, restoration and rehabilitation in three segments along State Route 12
from Currie Road to the Sacramento County Line in Solano County

**INITIAL STUDY WITH PROPOSED MITIGATED NEGATIVE DECLARATION /
ENVIRONMENTAL ASSESSMENT**

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

THE STATE OF CALIFORNIA
Department of Transportation

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

6/14/19

Date

Tony Tavares

Tony Tavares
District Director
California Department of Transportation
CEQA/NEPA Lead Agency

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

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PROPOSED MITIGATED NEGATIVE DECLARATION

Pursuant to: Division 13, Public Resources Code

PROJECT DESCRIPTION

Caltrans proposes to rehabilitate State Route (SR) 12 in three segments from PM 20.57 to 26.41 in Solano County to repair roadway pavement cracking and upgrade existing non-standard shoulders, non-standard travel lanes, non-standard vertical sight distances, non-standard cross slopes, and drainage systems. The project also proposes to address existing flooding problems, upgrades to American with Disabilities Act (ADA) facilities, and to undertake complete street elements in downtown City of Rio Vista, CA.

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 existing and future land use; consistency with state, regional, and local plans and programs; community impacts; traffic and transportation/pedestrian and bicycle facilities; cultural resources; tribal resources; wild and scenic rivers; farmlands/timberlands; plant species; mineral resources; paleontology; geology, soil, and seismicity; and wildfire.

In addition, the project would have less than significant effects to utilities; visual/aesthetics; natural communities; animal species; air quality; Greenhouse Gases; hazardous waste; hydrology/water quality; and noise.

With the following mitigation measures incorporated, the proposed project would have less than significant effects to wetlands; and threatened and endangered species:

- Large branchiopod vernal pool mitigation acreage requirements may be satisfied through purchase of credits, if necessary, at an approved mitigation bank (mitigation for large branchiopods is proposed at a ratio of 10:1, the final value will be determined in the next project phase), or through off-site mitigation. Approximately 0.05 acre of vernal pools will be affected and 0.3 of seasonal wetlands are being affected. Mitigation will be finalized in coordination with resource agencies.
- Threatened and Endangered Species – California Tiger Salamander mitigation requires Caltrans to compensate for the project's effects to individual California Tiger Salamander utilizing the project area with the purchase of approximately 0.6 acres or a ratio of 3:1 of California Tiger Salamander upland habitat credits at the U.S. Fish and Wildlife Service approved conservation bank.

 Tony Tavares
 District Director
 District 4
 California Department of Transportation

 Date

Table of Contents

GENERAL INFORMATION ABOUT THIS DOCUMENT	iii
PROPOSED MITIGATED NEGATIVE DECLARATION	vii
LIST OF APPENDICES	iii
LIST OF FIGURES & TABLES	iv
LIST OF ACRONYMS	v
1.0 Chapter 1 – Proposed Project	1
1.1 INTRODUCTION	1
1.2 PURPOSE AND NEED	4
1.3 PROJECT DESCRIPTION	5
1.3.1 PROJECT ALTERNATIVES	5
Build Alternative	5
No-Build Alternative	15
<i>Alternatives Considered but Eliminated from Further Discussion</i>	15
Permits and Approvals Needed	1
Right of way (ROW)	2
Transportation System Management and Transportation Demand Management Alternatives	4
2.0 CHAPTER 2 – AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES	6
2.1 HUMAN ENVIRONMENT	7
2.1.1 Land Use	7
2.1.2 Utilities	8
2.1.3 GROWTH	9
2.1.4 Community Impacts	10
2.1.5 Environmental Justice	11
2.1.6 Visual/Aesthetics	12
2.1.7 CULTURAL RESOURCES	23
2.2 PHYSICAL ENVIRONMENT	25
2.2.1 Hydrology and Floodplain	25
2.2.2 WATER QUALITY AND STORM WATER RUNOFF	36
2.2.3 GEOLOGY/SOILS/SEISMIC/TOPOGRAPHY	42
2.2.4 PALEONTOLOGY	43

2.2.5 HAZARDOUS WASTE/MATERIALS	44
2.2.6 AIR QUALITY	46
2.2.7 NOISE.....	51
2.3 BIOLOGICAL ENVIRONMENT	56
2.3.1 NATURAL COMMUNITIES	56
2.3.2 WETLANDS AND OTHER WATERS	65
2.3.3 PLANT SPECIES	69
2.3.4 ANIMAL SPECIES.....	76
2.3.5 THREATENED AND ENDANGERED SPECIES.....	80
2.3.6 INVASIVE SPECIES	94
2.4 CUMULATIVE IMPACTS	101
Determining Significance under CEQA	106
CEQA Environmental Checklist	107
CLIMATE CHANGE	126
Chapter 4 – List of Preparers	143
Chapter 5 – Distribution List	145

LIST OF APPENDICES

Appendix A	Section 4(f)
Appendix B	Title VI Policy Statement
Appendix C	Project Footprint Maps L-1 to L-23
Appendix D	Avoidance, Minimization, and/or Mitigation Summary
Appendix E	List of technical Studies
Appendix F	Biological Figures
Appendix G	Species Lists
Appendix H	ROW Figures
Appendix I	Class of Action Determination Form and Email
Appendix J	Cross Sections

LIST OF FIGURES & TABLES

- Figure 1: Location Map
Figure 2: Maps of each parcel location of ROW acquisition
Figure 3: Key View Map
Figure 4: KV 1 Existing conditions site photo
Figure 5: Key View #1
Figure 6: Key view #1: Vertical curve correction with slope construction
Figure 7: Key View #2
Figure 8: KV 2 Existing conditions site photo
Figure 9: KV 2 Simulation of proposed resurfacing, multimodal improvements, and streetscape enhancements
Figure 10: Flood Insurance Rate Map 1 (Segment 1)
Figure 11: Flood Insurance Rate Map 3 (Segment 1 and Segment 2)
Figure 12: Flood Insurance Rate Map 3 (Segment 2)
Figure 13: Flood Insurance Rate Map 3 (Segment 2 and Segment 3)
Figure 14: Noise Levels of Common Activities
Figure 15: 2020 BAU Emissions Projection 2014 edition
Figure 16: The Governor's Climate Change pillars: 2030 Greenhouse Gas Reduction Goals
Figure 17: Map of the BSA within the project vicinity
Figure 18: Map of the Location of Parry's Rough Tarplant
Figure 19: Map of the Location of Suisun Marsh Aster
Figure 20: California 2016 Greenhouse Gas Emissions
Figure 21: Change in California GDP, Population and GHG Emissions Since 2000
- Table 1: Segment 1 RCP Replacements
Table 2: Dimensions of the existing facility and the new proposed facility
Table 3: Culvert type, location and size
Table 4: Permit or approval document and approving agency
Table 5: Right of Way Take
Table 6: Permits to Enter and Construct
Table 7: Temporary Construction Easements
Table 8: Permanent Road Easements
Table 9: Permanent Drainage Easements
Table 10: Receptors and hypothetical locations exceeding 86 dBA
Table 11: Regional Special Status Species with the Potential to Occur in the Study A
Table 12: Summary of Construction-related GHG Emissions

LIST OF ACRONYMS

AB	Assembly Bill
ACHP	Advisory Council on Historic Places
AC	Asphalt Concrete
ADA	Americans with Disabilities Act
ADL	Aerially Deposited Led
APE	Area of Potential Effects
APN	Assessor's Parcel Number
ARB	California Air Resource Board
ASR	Archaeological Survey Report
BC	Black Carbon
BMPs	Best Management Practices
BSA	Biological Study Area
CCAA	California Clean Air Act
CCRD	Caltrans' Cultural Resources Database
CDFW	California Department of Fish and Wildlife
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH ₄	Methane
CHRIS	California Historical Resources Information Systems
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CRHR	California Register of Historical Resources
CSP	Corrugated Steel Pipe
CTS	California Tiger Salamander
CWA	Clean Water Act
DDT	Dichlorodiphenyltrichloroethane
DSA	Disturbed Soil Area
EB	Eastbound
EO	Executive Order
ESA	Environmentally Sensitive Area
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIRM	Flood Insurance Rate Maps
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FSTIP	Federal Statewide Transportation Improvement Program
FTA	Federal Transportation Administration
FTIPs	Federal Transportation Improvement Programs
Ft ²	Feet Squared
GHG	Greenhouse Gases

H	High
HCP	Habitat Conservation Plan
HDM	Highway Design Manual
HFCs	Hydrofluorocarbons
H ₂ S	Hydrogen Sulfide
H&SC	California Health and Safety Code
HPSR	Historic Property Survey Report
ITP	Incidental Take Permit
KV	Key View
LEDPA	Least Environmentally Damaging Practicable Alternative
M	Moderate
MBTA	Migratory Bird Treaty Act
MGS	Midwest Guardrail System
MH	Moderate-High
MIS	Major Investment Study
MLD	Most Likely Descendent
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MRP	Municipal Regional Permit
MS4s	Municipal Separate Storm Sewer Systems
MTC	Metropolitan Transportation Commission
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NHPA	National Historic Preservation Act
N ₂ O	Nitrous Oxide
NO _x	Nitrogen Oxides
NO ₂	Nitrogen Dioxide
NOAA	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
O ₃	Ozone
OCRS	Office of Cultural Resource Studies
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Act
PA	Programmatic Agreement
PB	Lead
PM	Particulate Matter
PM ₁₀	Particulate Matter of 10 micrometers or smaller
PM _{2.5}	Particulate Matter of 2.5 micrometers or smaller
PM	Post Mile
PDE	Permanent Drainage Easements
PDT	Project Development Team
PRC	California Public Resources Code
PRE	Permanent Road Easement

PS&E	Plans, Specifications, & Estimates
PTE&C	Permits to Enter and Construct
RCB	Reinforced Concrete Box
RCEM	Road Construction Emissions Model
RCNM	Roadway Construction Noise Model
RCRA	Resource Conservation and Recovery Act
RCP	Reinforced Concrete Pipes
RE	Resident Engineer
RFFBs	Rectangular Rapid Flashing Beacons
ROW	Right of Way
RTPs	Regional Transportation Plans
RWQCBs	Regional Water Quality Control Boards
SCAQMD	Yolo-Solano Air Quality Management District
SDC	Seismic Design Criteria
SHOPP	State Highway Operations and Protection Program
SHPO	California State Historic Preservation Officer
SO ₂	Sulfur Dioxide
SR	State Route
STA	Solano Transportation Authority
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plans
SWRCB	State Water Resources Control board
TCE	Temporary Construction Easement
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TMDLs	Total Maximum Daily Loads
TMP	Transportation Management Plan
TSCA	Toxic Substance Control Act
TSM	Transportation Systems Management
U. S.	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USDOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compounds
WB	Westbound
WDR	Water Discharge Requirements
WPCP	Water Pollution Control Program

1.0 Chapter 1 – Proposed Project

1.1 INTRODUCTION

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

The California Department of Transportation (Caltrans), as assigned by the FHWA, is the lead agency under NEPA. Caltrans is the lead agency under the California Environmental Quality Act. Caltrans proposes to rehabilitate State Route (SR) 12 in three segments from post mile (PM) 20.57 to 26.41 in Solano County to repair pavement cracking and upgrade existing non-standard shoulders, non-standard travel lanes, non-standard vertical sight distances, non-standard cross slopes, and drainage systems. The project also proposes to address existing flooding problems, upgrades to American with Disabilities Act (ADA) facilities, and to undertake complete street elements in downtown City of Rio Vista, CA.

Figure 1 shows the three segments, project vicinity and location.

Within the project limits, SR 12 is an undivided two-lane conventional highway composed of two travel lanes, with one lane in each direction. The highway has a two-foot wide median with a rumble strip and delineators. The proposed build alternative is approximately 12 lane miles in length and the existing roadway consists of asphalt concrete (AC) pavement.

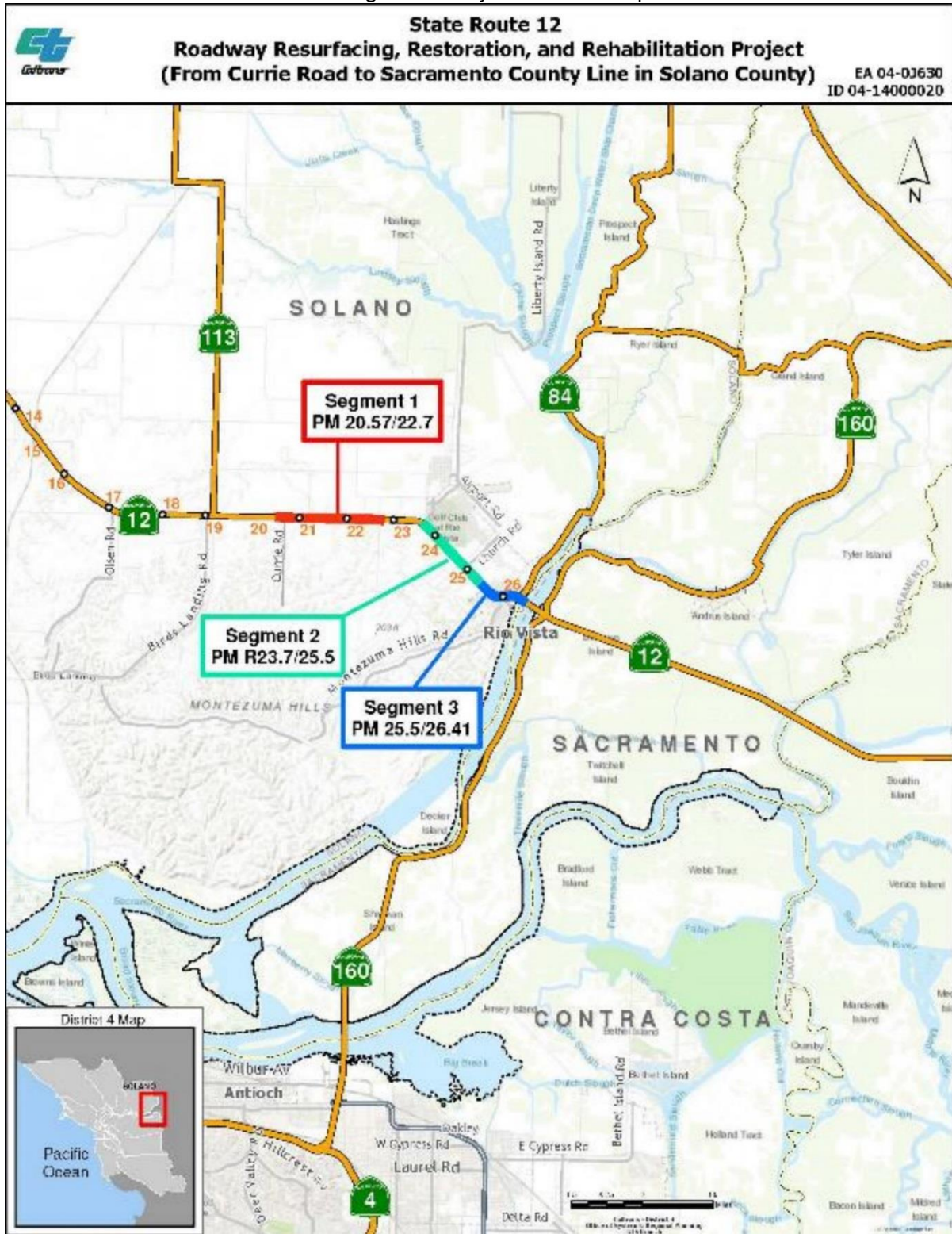
The project corridor traces the northern edge of the Montezuma Hills into the City of Rio Vista and ends at the eastern edge of the City of Rio Vista at the approach to the Rio Vista Bridge which spans the Sacramento River. The land use within the project corridor is rural/agricultural to the west with some residential development, including the Trilogy senior community at Summerset Road, with commercial development along the highway within the urban core of the City of Rio Vista.

The project setting is at the eastern edge of the San Francisco Bay Area in the San Joaquin Delta, at the confluence of the Sacramento and San Joaquin Rivers. The semi-rural landscape west of the City of Rio Vista is characterized by open views of the rolling Montezuma Hills and the turbines of the Shiloh Wind Farm that dot them to the south, and agricultural fields spanning gentler hills to the north along with some newer developments.

Project Funding and Programming

Funding for this project will be from the 2018 State Highway Operations and Protection Program (SHOPP) Roadway Rehabilitation 3R Program (Program Code 201.120). The proposed project is included in the 2021 Federal Statewide Transportation Improvement Program (FSTIP). The project is included in the cost-constrained 2019 Metropolitan Transportation Commission's Transportation Improvement Program (TIP) SHOPP Roadway Preservation Program (TIP ID-VAR170006). The total programmed cost of the project for support and capital, including construction cost, is approximately \$7.62 million.

Figure 1 – Project Location Map



Please see detailed project footprint maps L-1 to L-23 in **Appendix C**.

1.2 PURPOSE AND NEED

The purpose of the proposed project is to rehabilitate SR 12 in three segments from PM 20.57 to 26.41 to enhance highway safety and ride quality for users; improve drainage efficiency; satisfy ADA compliance requirements in downtown of the City of Rio Vista; and incorporate complete streets design elements in downtown of the City of Rio Vista. Caltrans will update all non-standard shoulders, non-standard travel lanes, non-standard vertical sight distances, and non-standard cross slopes to meet updated standards to increase highway safety.

The project is needed because segments of existing pavement of SR 12 within the project limits has alligator pavement cracking and non-standard shoulders, non-standard travel lanes, non-standard vertical sight distances, and non-standard cross slopes. Additionally, downtown of the City of Rio Vista experiences periodic flooding and lacks ADA compliant facilities.

INDEPENDENT UTILITY AND LOGICAL TERMINI

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

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

Logical termini for project development are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. The environmental impact review frequently covers a broader geographic area than the strict limits of the transportation improvements.

The proposed project has independent utility, which means the proposed improvements can be implemented within the project limits and completion of other projects would not be required to gain the operational benefits of the proposed improvements.

The proposed project has logical starting and ending points, or termini. The end points were selected to contain the length of the existing roadway and drainage deficiencies. All of the proposed roadway and drainage improvements under the Build Alternative are included within the project limits.

1.3 PROJECT DESCRIPTION

This section describes the proposed action and the project alternatives developed to meet the purpose and need of the project, while avoiding or minimizing environmental impacts. The alternatives are the “Build Alternative” and “No-Build Alternative.”

The project is located in Solano County on SR 12 from PM 20.57 to 26.41. Within the limits of the proposed project, SR 12 is an undivided two-lane conventional highway composed of two travel lanes, with one lane in each direction. The highway has a two feet wide median with a rumble strip and delineators. The proposed project is approximately 12 lane miles long and the existing roadway consists of AC pavement.

1.3.1 PROJECT ALTERNATIVES

Build Alternative

For this project, the “Build Alternative” proposes to rehabilitate SR 12 in three segments within the project limits for the benefit of studying, describing, and constructing this project. This proposed build alternative has been divided into 3 segments because each segment is located in different areas within the project footprint and the scope of work for each segment is different. The project footprint map consists of the area of direct, indirect, temporary and permanent project impacts. Please see project footprint maps for more details on what type of work will be completed at each segment in **Appendix C** and **Appendix J** for project cross sections. Also see **Figure 1** on page 3, for a map of the three segments’ project vicinity. Segment 1 work starts from Curry Road to Azevedo Road at PM 20.57 to 22.7, segment 2 starts from Summerset Road to Drouin Drive at PM 23.7 to 25.5, and segment 3 begins at Drouin Drive and ends at the approach of the City of Rio Vista Bridge at PM 25.5 to 26.41. Work for each segment is as follows:

SEGMENT 1 - Curry Road to Azevedo Road (PM 20.57 to 22.7)

For segment 1 please see detailed project footprint maps L-1 to L-13 located in **Appendix C**.

Pavement Work

The proposed work for Segment 1 would be from Curry Road to Azevedo Road (PM 20.57 to 22.7). At this segment, the existing road would be rehabilitated due to cracking in the pavement, potholes, and rutting. Rutting is the linear grooves worn into the surface of the road resulting from the continuous friction of wheels from traveling vehicles. Work at this location includes pavement grinding using methods such as cold planing or pavement milling, an AC overlay, pavement widening, and the repair of potholes by using dig-outs up to a depth of six inches. Dig-outs involve removing the AC layer and part of the base layer in a square shape surrounding the pot hole and filling it back in with appropriate material.

Safety upgrades in this segment would include tapering the edge of the AC pavement, adding a shoulder embankment or backing on both the eastbound (EB) and westbound (WB) lanes, upgrading the nonstandard guardrail to Midwest Guardrail System (MGS) with vegetation control, and restoring the hinge point up to three feet wide from the edge of pavement. A hinge point is an unpaved area beyond the edge of pavement that allows motorists who have pulled over the road to maneuver and gain

enough speed to safely merge back into traffic. Per an MOU dated January 12, 1993 with the California Department of Fish and Wildlife (CDFW), this segment will reuse flexible pavement grindings and pavement chunks or pieces for shoulder embankments or backing when the materials are placed where they will not enter the waters of the State.

Drainage Work

Water runoff from SR 12 within this segment flows off the pavement. Four reinforced concrete pipes (RCP), would be replaced that were lined with plastic in 2007 on another project, EA 3S6904. The plastic lining reduced the diameter of the culverts, thereby reducing their carrying capacity. **Table 1** outlines the diameter of the four existing RCP’s, their locations, and the new proposed RCP’s. The existing RCP’s would be removed and replaced with larger diameter RCP’s in the same location to restore the original carrying capacity. Additionally, the existing ditches along the drainage systems and the ditches parallel to the roadway may be regraded.

Table 1: Segment 1 RCP Replacements

Post Mile	Diameter of Existing RCP	Diameter of Replacement RCP
21.38	18” RCP, with 15” plastic liner	18” RCP, no plastic liner
21.60	36” RCP, with 30” plastic liner	36” RCP, no plastic liner
21.72	18” RCP, with 15” plastic liner	18” RCP, no plastic liner
22.10	18” RCP, with 15” plastic liner	18” RCP, no plastic liner

Project Features: Segment 1

1. Some of the existing ditches may be converted to bioswales to conform with storm water quality requirements. Converting ditches to bioswales will be determined in design phase.
2. The area at the intersection of McClosky Road and SR 12 has been designated as an environmentally sensitive area (ESA). This ESA area starts 600 feet west and ends 600 feet east of the intersection. Construction access will be restricted in both directions and no construction staging areas will be allowed.
3. Segment 1 construction work is proposed to end near the intersection of Azevedo Road and SR 12. This area has been designated as an ESA and starts about 1,000 feet west of the Azevedo Road and SR 12 intersection and ends at the intersection itself. Construction access will be restricted in both directions and no construction staging areas will be allowed within the ESA. Coordination with Caltrans Office of Biological Sciences and Permits will be required.

Construction Staging: Segment 1

Stage 1: Replace RCP's, clearing and grubbing, dig-outs, regrading of ditches, and construction of bioswales

Stage 2: Pavement grinding and cold planing or pavement milling of roadway

Stage 3: Pavement of roadway and place pavement edge during pavement operations. After paving is completed, place shoulder backing and restore the hinge point, upgrade guardrail systems, and place vegetation control

Stage 4: Stripe the roadway to final configuration

SEGMENT 2 - Summerset Road to Drouin Drive (PM 23.7 to 25.5)

For segment 2 please see detailed project footprint maps L-13 to L-20 located in **Appendix C**.

Rehabilitation Work

The proposed work for segment 2 would be from Summerset Road to Drouin Drive (PM 23.7 to 25.5). At this segment, travel lanes and shoulders would be brought up to Caltrans standard dimensions. **Table 2** outlines the dimensions of the existing facility and the dimensions of the new proposed facility. Per an MOU dated January 12, 1993 with CDFW, this segment will reuse flexible pavement grindings and pavement chunks or pieces for shoulder embankments or backing when the materials are placed where they will not enter the waters of the State.

Table 2: Dimensions of the existing facility and the new proposed facility

Existing Facility	Proposed Facility (Caltrans Standard)
10.5 feet wide travel lanes	12 feet wide travel lanes
1 to 4 feet wide shoulders	8 feet wide shoulders
2 feet wide median with rumble strips and channelizers	2 feet wide median with rumble strips and channelizers (no change from existing)

Bicycle Lane

A class II bicycle lane would be included within the span of the new 8 feet wide shoulder and would be marked using both roadway pavement markings and road signs.

Pavement Widening and Profile Corrections

Due to the undulating nature of SR 12 in segment 2, improvements to the vertical sight distance, or the distance ahead that a motorist can see when cresting a slope, would be made by correcting the roadway

grade profile. The roadway grade profile would either be raised or lowered, depending on location. Pavement widening would occur on both the EB and WB sides of SR 12. Pavement widening, and profile corrections would require the following:

1. Clearing and grubbing: Remove existing vegetation such as trees, stumps, roots of trees, grass, and weeds. The depth will vary depending on the roots of trees and weeds.
2. Earthwork: Depending on the topography of the location, either excavation or backfill will occur.
3. Pavement widening: Once activities for earthwork, and side slopes have been completed, the structural section is placed in several steps. First, the ground is compacted. Second, an aggregate base is placed on top of the original ground and compacted. Finally, the AC pavement is placed on top of the aggregate base and compacted. The AC pavement undergoes a final lift which will include work on the pavement edge.

Retaining Walls

Due to the undulating nature of SR 12 in Segment 2, improvements to the vertical site distance, or the distance ahead that a motorist can see when cresting a slope, would be made by correcting the roadway grade profile. The roadway grade profile would either be raised or lowered, depending on location. Pavement widening would occur on both the EB and WB sides of SR 12. Pavement widening, and profile corrections would require one or more of the following:

1. Clearing and grubbing: Remove existing vegetation such as trees, stumps, roots of trees, grass, and weeds. The depth will vary depending on the roots of trees and weeds.
2. Earthwork: Depending on the topography of the location, either excavation or backfill will occur.
3. Side slopes/retaining walls: Construction of the side slopes of the roadway will happen concurrently with earthwork activities. Retaining walls would be constructed when the construction of slide slopes cannot be contained within Caltrans Right of Way (R/W) or if warranted per geotechnical conditions of the earth.
 - a. The placement of retaining walls typically requires excavation of the existing ground. The four retaining walls will be placed near the ephemeral drainage at PM 25.26 in Segment 2. For cut retaining walls, excavation goes as deep as the height of the retaining wall, plus an additional six feet for construction of the footing and base underneath the footing. For fill retaining walls, excavation would be six feet for the construction of the footing and base.
 - b. Height of the retaining walls would vary from 0-16.5 feet above road level and a concrete barrier would then place on top of the retaining walls in fill.

Further details on retaining walls will be determined during the design phase of the project.

Drainage Work

Work would be performed on five existing cross culverts in segment 2. The following table outlines the details of these culverts. Please see Maps L4, L5, L7, L13 - 15, L18 and L19 in **Appendix C. Project Footprint Maps L-1 to L-23** to where the culvert work will occur.

Table 3: Culvert type, location and size

	Culvert Type	Location (in Post Miles on SR 12)	Size of Culvert
1	Reinforced Concrete Box (RCB)	23.9	12' x 6'
2	RCB	24.2	4' x 2'
3	RCB	24.38	6' x 4'
4	Corrugated Steel Pipe (CSP)	25.1	24" diameter
5	CSP	25.3	48" diameter

First, the existing RCBs will be lengthened to accommodate the additional width of the proposed highway widening. Temporary pipe will be placed to lengthen the RCB to accommodate the additional width of the temporary detour road. This pipe will be removed when the temporary detour road is removed. The existing CSP culverts are beyond their service life and would be replaced. The 24" CSP would be replaced with a 30" reinforced concrete pipe (RCP), and the 48" CSP would be replaced with a 4' x 4' RCB.

In addition to the proposed work on the cross culverts, new drainage systems are proposed for the section of SR 12 east of Church Road, at approximately PM 24.3. The new drainage system would consist of drainage inlets, which collect water from paved surfaces, and an 18" pipe that would connect to the proposed 30" RCP would be placed on both sides of SR 12 to drain the area east of Church Road up to the first hill at approximately PM 25.2. From this hill to the border of the City of Rio Vista, drainage inlets would be placed along the new roadway configuration to drain roadway runoff to the base of the roadway embankment. Dikes will be placed to channel roadway runoff into the proposed drainage inlets.

Proposed roadway work in segment 2 would be broken down into sub segments to accommodate different types of roadway work:

For segment 2 subsegments please see detailed project footprint maps L-13 to L-20 in **Appendix C**.

PM 23.7 to 24.5

Caltrans proposes to construct standard twelve feet wide lanes, eight feet wide shoulders, and two feet wide median. Widening of SR 12 would occur on both the EB and WB sides at approximately 10.5 feet along each direction from the existing edge of pavement. In addition to the widening, profile correction

work would occur as needed. Side slopes along each direction of travel will be constructed at a 2:1 slope or flatter. List of work in the section would include clearing and grubbing, earthwork, side slopes, profile correction, and pavement widening.

The existing 12' x 6' RCB, 4' x 2' RCB, and 6' x 4' RCB will be lengthened to accommodate the widening of SR 12. The drainage system connected to the 12' x 6' RCB at PM 23.9 would be affected by the proposed widening. This inlet would be adjusted to match the final grade of the road.

PM 24.5 to 25.0

Construct standard twelve feet wide lanes, eight feet wide shoulders, and two feet wide median. Widening would occur on the EB direction of SR 12 at approximately 21 feet from the existing edge of pavement. Side slopes would be constructed at a 2:1 slope or flatter. Work in this section would include clearing and grubbing, earthwork, side slopes, profile correction, and pavement widening.

PM 25.0 to 25.1

Construct standard twelve feet wide lanes, eight feet wide shoulders, and two feet wide median. Widening would occur on the EB direction of SR 12 at approximately 21 feet from the existing edge of pavement. Side slopes would be constructed at a 2:1 slope or flatter. To assist with pavement widening activities, a 30 feet wide temporary road would be constructed on a temporary construction easement (TCE) for motorist use during construction. The temporary road would be built from PM 24.8 to 25.6. List of work in this section include clearing and grubbing, earthwork, side slopes, profile correction, and pavement widening.

The existing 24" CSP would be replaced with a 30" RCP.

PM 25.1 to 25.4

Construct standard twelve feet wide lanes, eight to ten feet wide shoulders, and two feet wide median. Widening would occur on the EB direction of SR 12 at approximately 35 feet from the existing edge of pavement. A bio swale would be placed on the edge of the shoulder with a three feet hinge point. List of work in this section include clearing and grubbing, earthwork, construct concrete barriers and new pavement.

Existing flood plains on the WB side of SR 12 would be partially filled in at a maximum of 0.12 acre for construction activities.

The existing 48" RCP would be replaced with a 4' x 4' RCB.

PM 25.4 to 25.6

Construct standard twelve feet wide lanes, eight feet wide shoulders, and two feet wide median. Widening would occur along the EB direction of SR 12 so that the existing cemetery along the WB direction remains untouched. Widening would occur along the EB direction of SR 12 at approximately 21 feet from the existing edge of pavement, and side slopes would be constructed at a 2:1 slope or flatter.

List of work in this section includes clearing and grubbing, earthwork, side slopes, and pavement widening

Project Features: Segment 2

1. Stormwater treatment device (i.e. bio-swale) will be placed on the edge of the shoulder to treat stormwater run-off from Caltrans ROW. Since this is to meet requirements for project specific CWA section 401, the treatment device will be designed per the requirements in SF Bay Municipal Regional Permit (MRP).
2. Erosion control measures will be implemented on the newly constructed side slopes. Treatment of disturbed slopes and soil will consist of a combination of netting, hydroseeding, and/or hydro mulch. Fiber rolls may also be used.

Construction Staging: Segment 2

Stage 1-A: Widen the existing road to provide 24 feet for two travel lanes to be used during construction in Stage 2.

Stage 1-B: Construct a 24 feet wide temporary road to serve as a detour in the area where the most significant cut/fill constructions activity is to occur.

Stage 2: Shift traffic to the roads constructed in Stage 1-A or 1-B. Construction work to occur for the proposed roadway realignment, roadway widening, and profile correction.

Stage 3: Stripe the constructed road to the final configuration and shift traffic back.

SEGMENT 3 - Drouin Drive to the approach of Rio Vista Bridge (PM 25.5 to 26.41)

For segment 3 please see detailed project footprint maps L-20 to L-23 located in **Appendix C**.

The proposed work for segment 3 would be from Drouin Drive to the approach of the Rio Vista Bridge (PM 25.5 to 26.41). At this segment, the project would improve the existing drainage systems to eliminate existing flooding problems, upgrade MBGR to MGS and place vegetation control underneath, repair potholes by using dig-outs, upgrade roadside signs, upgrade traffic signals, and incorporate ADA and complete streets elements in downtown of the City of Rio Vista. The purpose of complete streets is to provide safe mobility for all users, including bicyclists and pedestrians, on Caltrans facilities. In addition, roadway cross slope correction may be included in segment 3. Please see footprint maps L-20 to L-23 in **Appendix C**. This is where the cross slope of SR 12 would be levelled out and brought to Caltrans standard to increase drainage efficiency and reduce instances of flooding or ponding.

Existing Drainage Facilities:

Starting at Post-Mile (PM) 25.58 there is a drainage system that starts at an inlet on the west side of the intersection of Drouin Drive and SR 12. This drainage system consists of 18" pipe and four inlets. It runs in a south-easterly direction along eastbound (EB) SR 12 and ends at an inlet located PM 25.67, just

north of St. Joseph Cemetery. This drainage system is a 'bubble-up' system, runoff that flows into this drainage system builds up until it overtops the last inlet and flows down Main Street. 'Bubble-up' systems are an issue because sediment and trash can get carried into the drainage system and will be trapped within the system causing the system to get clogged quickly resulting in roadway flooding.

There is another 'bubble-up' system across SR 12 from the system mentioned above, beginning outside the Rio Vista Ford, near PM 25.65. It consists of 12" pipe with inlets located at various points along the system. The drainage system runs along westbound (WB) SR 12 to an inlet on the west side of the intersection of Hillside Terrace and SR 12, where a City drainage system joins with this drainage system. The State drainage system then crosses Hillside Terrace and continues along westbound SR 12 where it ends at an inlet at PM 25.85. Both 'bubble-up' systems have an average depth of 4'.

The main drainage system through downtown of the City of Rio Vista begins outside of the State Right of Way, at a drainage inlet at the intersection of Yosemite Drive and Sierra Avenue. This 18" pipe drainage system runs down Sierra Avenue, crosses Main Street and the parking lot of the Lira's Supermarket, and joins with a manhole located within the State Right of Way at approximately PM 25.86. From here, the drainage system runs parallel to EB SR 12 until PM 25.93 where it makes a turn towards the north and connects into the south wall of a 5'x4' reinforced concrete box (RCB) junction structure.

An 18" pipe draining the intersection of Gardiner Way and SR 12 connects to this junction structure from the north. A 27" pipe runs from this junction structure to a manhole located at the intersection of North 5th Street and SR 12, near PM 26.01. A 12" City drainage system that runs from the intersection of Gardiner Way and Saint Francis Way, through the back of the Caltrans Rio Vista Maintenance Yard and the Car Wash located at PM 26.0 connects to the State drainage system at this manhole.

From this manhole, a 27" pipe runs along EB SR 12 to a manhole located at PM 26.15. A 24" City drainage system along Virginia Drive connects to the State drainage system at this point. From here, a 33" pipe runs along EB SR 12 until PM 26.18, where the pipe changes to a southerly direction and runs out of the State Right of Way, under the Rio Sands Lodge and private property to Crescent Drive. From Crescent Drive, the 33" pipe changes to an easterly direction and outfalls to the Sacramento River. The depth of this drainage system ranges from approximately 5' at the junction box located at PM 25.93 to 10' at the manhole located at PM 26.15. Please see **Appendix C** for footprints of drainage work.

Proposed Drainage Activities:

Starting on eastbound (EB) SR 12 at Post-Mile (PM) 25.58, the existing drainage system just north of St. Joseph Cemetery, will be upgraded to an 18" pipe system. The existing 'bubble-up' situation at the inlet at PM 25.67 will be eliminated by connecting this inlet to the 5'x4' RCB junction structure at PM 25.93 with 18" pipe and manholes at junction points. The existing cross-culverts at PM 25.93, 26.01 and 26.15 that drain runoff from the north side of SR 12 to the existing system will be removed/abandoned. The rest of the existing drainage system will remain in place.

A new drainage system will be constructed under the westbound (WB) shoulder of SR 12 to drain runoff from the north side of SR 12. This new drainage system will replace all existing drainage systems along the WB shoulder of SR 12.

The new system will begin with upgrading the existing drainage system along WB SR 12 with 24" pipe and adding an inlet at PM 26.0. 18" pipe will be placed from this inlet to the upgrade existing drainage system. The existing bubble-up situation will be eliminated by connecting the existing manhole at the intersection of Hillside Terrace and SR 12 (PM 25.78) with 30" pipe to the existing manhole at the intersection of Gardiner Way and SR 12. 36" pipe will be placed from here to a proposed inlet located outside the Caltrans Maintenance Yard at PM 26.5.

A drainage inlet will be placed at the north end of the yard to alleviate flooding issues and will connect to the proposed inlet at PM 26.5 via a 30" pipe. From the Caltrans Maintenance Yard, 48" pipe will be placed to the existing manhole at the intersection of Virginia Road and SR 12 (PM 26.14). The proposed drainage system will continue along WB SR 12 until approximately PM 26.3 where it will turn northwards and continue to the base of the roadway embankment. From here, the system will run along SR 84, parallel to SR 12, and outfall to the Sacramento River at PM 26.32 through a 48" pipe. All existing manholes will be replaced with Caltrans Standard G2 manholes with all existing tie-ins from the City being maintained.

ADA and Complete Streets

Existing pedestrian facilities near or at downtown of the City of Rio Vista, such as sidewalks, driveways, and curb ramps would be upgraded to both Caltrans and ADA compliance standards. In close coordination with the City of Rio Vista and the Solano Transportation Authority (STA), a combination of the following ADA and complete streets elements is proposed:

1. Upgrade existing sidewalks to nine feet by five feet wide to meet Caltrans standards, not including the curb and gutter, and upgrade the existing curb ramps. Some sidewalks will have two and a half feet to three feet wide planting buffer; buffer location will be placed either at the front or back of sidewalks. The plant buffer size will depend on the location of existing utilities.
 - a. Placement of planting buffer will depend on whether Caltrans is able to incorporate decomposed granite to prevent any maintenance work.
2. Plant street trees on sidewalks. This includes a tree well three feet in width on a six feet wide sidewalk.
3. At driveways, build 4.6' wide ramps and five feet wide sidewalks.
4. All roadways will have standard shoulders.
5. Textured pavement is proposed on the existing raised median island between Virginia Drive and the bridge (see L-22 in **Appendix C**).
6. Construct a one-way Class IV separated bikeway in each direction of travel along SR 12 with a painted stripe buffer at roadway level and a standard flexible post barrier or inflexible physical barrier.
7. Construct new sidewalks at locations that do not currently have sidewalks or curb ramps.

8. Construct a floating bus stop in the EB direction of SR 12 at or near the driveway entrance to Lira's Supermarket. A bikeway would separate the floating bus stop from the pedestrian sidewalk.
9. Construct a pedestrian hybrid beacon at the existing pedestrian crosswalk at the intersection of Gardiner Way and SR 12.
10. Construct a striped crosswalk and pedestrian hybrid beacon at the intersection of Virginia Way and SR 12.

Further details on ADA and complete streets elements will be completed during the design phase of the project.

Project Features: Segment 3

1. The proposed new outfall into the Sacramento River is below the high tide line. Construction work on the riverbank side of the culvert would require the use of temporary shoring and temporary construction Best Management Practices (BMPs). The project proposes to install a cofferdam and undertake dewatering to separate construction activities from the river.

Construction Staging: Segment 3

Stage 1: Place one row of K-rail to allow for two 12' travel lanes separated by a soft median no narrower than two feet wide on one side of the road, creating a protected work area. Then construct hydraulics improvements on one side of SR 12.

Stage 2: Work on sidewalk and curb ramp improvements while providing a protected temporary pedestrian detour behind the K-rail.

Stage 3: Reverse Stage 1 work to the other side of SR 12.

Stage 4: Begin cross slope corrections and pavement construction work. Upgrade the guardrail and place vegetation control underneath.

Stage 5: Stripe SR 12 to the final configuration and shift traffic back.

Please see **Figure 9** in section 2.1.6 for graphic representation of implementation of complete street.

Equipment

AC paving would be conducted with pavers and rollers. Pavement grinding would be conducted with a grinder and a street sweeper would be used to collect leftover grindings and debris. Clearing and grubbing would be done by hand, chainsaws, excavators, and/or loaders. Earthwork would be done by excavators, bulldozers, and graders. Equipment used to construct the side slopes would be excavators, bulldozers, graders, rollers, and cement pouring equipment. Equipment used for cross slope correction would be pavement grinders and/or an AC paver for the pavement overlay. Equipment used for the removal of old curb ramps, sidewalks, and driveways would be jackhammers, concrete saw cutters,

excavators, and hand tools. Other equipment includes forklifts, front end loaders, a hydroseeding truck, and various trucks and trailers.

Tree Removal

Approximately 74 non-riparian trees, east of summerset road to Drouin drive, are proposed to be removed to make room for roadway improvements. Since the 74 trees are non-riparian and non-native, no replanting or mitigation is required.

Utilities

Approximately 20-25 PG&E utility poles on the WB side along SR 12 within segment 2 are proposed to be relocated. The details of the relocations will be determined at the design phase of the project, but it is anticipated they would be relocated to the EB side along SR 12 in segment 2 within the newly acquired portions of Caltrans ROW.

No-Build Alternative

The No-Build Alternative compares project conditions if the proposed improvements are not constructed and existing roadway conditions remain unchanged. Existing travel lanes, shoulders, medians, vertical sight distances and cross slopes would remain non-standard and could result in safety impacts to motorists. Drainage systems would not be improved, and the project area would continue to experience flooding and ponding issues. Furthermore, ADA facilities and complete streets elements in downtown of the City of Rio Vista would not be improved, resulting in impaired ADA and bicycle and pedestrian access.

Comparison of Alternatives

After the public circulation period, all comments will be considered, and Caltrans will select a preferred alternative and make the final determination of the project's effect on the environment. Under CEQA, Caltrans will prepare an ND or MND if no unmitigable significant impacts are identified. Similarly, if Caltrans as assigned by FHWA, determines the action does not adversely affect the environment, Caltrans will issue a Finding of no Significant Impact (FONSI) in accordance with NEPA.

Alternatives Considered but Eliminated from Further Discussion

The Project Initiation Report was prepared and approved in 2015 that discussed other viable alternatives for the project that the project development team analyzed and evaluated. However, none of the following alternatives were viable.

- **Alternative A: Retaining Wall at the Cemetery at Segment 2** would build a context-sensitive retaining wall to improve the corner sight distance.

The existing driveways at the cemetery (as described in the build alternative section above) and at the adjacent church located in the westbound direction of Route 12 just after the intersection from Drouin Drive (where the posted speed limits 40MPH), appear not to meet corner sight distance requirements. Providing the full standard 8-foot shoulder would further separate the

road from the driveways, improving corner sight distance. However, this would require cutting into the natural slope on the perimeter of the cemetery adjacent to the edge of the road. The proposed project took into consideration the preservation of the integrity of the cemetery. The cemetery is a potential historic resource and Caltrans decided to avoid it altogether. Building a context-sensitive retaining wall to achieve that cut at this location was considered but rejected because there is a burial site on the slope. This Alternative was rejected because the construction of the retaining wall would impact cultural resources.

- **Alternative B: Staging Area at Segment 2.** Extending staging area was proposed to avoid impacts of floodplains and wetlands. This alternative explored a larger footprint from Currie Road to McClosky road to include construction staging and storage area. However, biological study showed that the larger footprint would encroach on sensitive habitats such as vernal pools. Caltrans project development team worked with the design engineers to reduce the proposed staging area to avoid impacts on biological resources. The larger footprint was rejected to also avoid impacts on floodplains and wetlands.
- **Alternative C: Utility Conflict in Segment 2.** Caltrans developed another alternative alignment that was mostly on the Northern side of the existing roadway in segment 2 at Summerset Road to Drouin Drive (PM 23.7 to 25.5). There is an existing PG&E utility pole and other known utility on the north side of the WB side. Utilities on the northern side of the roadway that would create conflict during construction due to utility conflict. Caltrans project development team rejected the northern alignment however the project still having to relocate five PG&E utility poles on the WB side along SR 12 within segment 2. (See 2.1.2 Utilities section)

The only two viable alternatives are the build and no-build alternative discussed in section 1.3.1.

Permits and Approvals Needed

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

Permit or Approval Document	Approving Agency
1600 – Lake and Streambed Alteration Agreement	California Department of Fish and Wildlife
*2081 – Incidental Take Permit (ITP) California Tiger Salamander and Swainson’s Hawk	California Department of Fish and Wildlife
Section 404 Nationwide Permit	U.S. Army Corps of Engineers
Section 401 Water Quality Certification	Regional Water Quality Control Board
**Section 408 Permit	U.S. Army Corps of Engineers
Biological Opinion (BO)	U.S. Fish and Wildlife Service
Biological Opinion (BO)	National Marine Fisheries Service

Table 4: Permit or approval document and approving agency

*An Incidental Take Permit (ITP) will be required for this project for the Swainson’s hawk and the California Tiger Salamander, they are both State listed threatened species. An ITP is a permit issued by CDFW for state listed species that allows agencies to complete projects that might result in the take of an endangered or threatened species. The Swainson’s hawk has been observed within close proximity of proposed construction work. The presence of the Swainson’s hawk is inferred due to recent observations of the species along SR 12. These observations occurred within 0.5 miles of the project area. There are no records of the California Tiger Salamander within six miles of this Project, but suitable upland habitat exists in near the project vicinity. Because the project is located within the current and historic range of this species it is reasonable to conclude that this species may be present. Consultation with CDFW will be required.

**A 408 Permit will be required for this project because the project will install a new drainage pipe through the Sacramento River levee. A 408 Permit is triggered when a public work project is altered or modified. Public work projects include both natural and physically built environments such as levees, dams, sea walls, dikes, wharfs, piers, water reservoirs, bridges, railways, and sewer systems. The alteration must not be detrimental to the public interest and will not impair the usefulness of the work. This SR Roadway, Resurfacing, Restoration, & Rehabilitation project will meet current U.S. Army Corps of Engineers (USACE) design and construction standards of Section 408.

RIGHT OF WAY (ROW)

The project will not result in the displacement of residents or businesses. However, ROW is anticipated to be acquired during the ROW phase of the project in the form of easements. Please see **Appendix H** for ROW Figures.

SEGMENT 1

All construction related work will occur within Caltrans ROW.

SEGMENT 2

TCEs are needed for construction of the temporary road to be used during roadway widening activities and for proposed staging areas.

Permanent Drainage Easements (PDEs) are needed for the proposed culvert work.

ROW take would be required from several properties for the proposed widening of SR 12, one of which contains a house. This property is located at PM 24.83 at the intersection of Amerada Road and SR 12. Proposed ROW take from this property would be a 10' wide strip past the existing ROW fence. ROW take before and after the house then varies from 35' to 45'.

See Table 5 on following page for more information on ROW acquisition.

See Table 7 in **Appendix H.** for more information on TCEs.

See Table 9 in **Appendix H.** for more information on PDEs

See Figure 2 in **Appendix H.** for all the ROW maps that show each parcel location of ROW acquisition

SEGMENT 3

TCEs are needed for work on city streets, private driveways, and at curb ramps.

Some drainage work in segment 3 is proposed outside of Caltrans ROW, where the drainage system outfalls into the Sacramento River. This would require permission from the USACE through a 408 permit.

See Table 5 for more information on TCEs.

Table 5: ROW acquisition

Assessor's Parcel Number (APN)	ROW Acquisition (ft ²)
City of Rio Vista (APN unavailable)	35,984.33
0048-120-580	135,632.42
0049-310-020	23,975.53
0049-310-010	10,793.89
0049-310-300	170,839.53
0049-132-010	1,792.13
0176-010-620	19,849.30
0178-101-070	95,021.80

Table 5 above outlines the ROW acquisition necessary for the proposed project.

The following maps and tables can be found in **Appendix H: ROW Figures**

Figure 2 displays all the maps that depicts each parcel location of ROW acquisition

Table 6 outlines the Permits to Enter and Construct (PTE&C) necessary for the proposed project

Table 7 outlines the Temporary Construction Easements (TCE) necessary for the proposed build alternative

Table 8 outlines the Permanent Road Easements (PRE) necessary for the proposed project.

Table 9 outlines the Permanente Drainage Easements (PDE) necessary for the proposed project.

Transportation System Management and Transportation Demand Management Alternatives

Transportation Systems Management (TSM) strategies increase the efficiency of existing facilities; they are actions that increase the number of vehicles trips a facility can carry without increasing the number of through lanes. Examples of TSM strategies include: ramp metering, auxiliary lanes, turning lanes, reversible lanes, and traffic signal coordination. TSM also promotes automobile, public and private transit, ridesharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system. Modal alternatives integrate multiple forms of transportation modes, such as pedestrian, bicycle, automobile, rail, and mass transit.

The project proposes to include TSM strategies in segment 3 by incorporating ADA and complete streets elements in downtown of the City of Rio Vista. Work includes upgrades to existing sidewalks, construct new sidewalks at locations where there are none to provide continuity to pedestrian access, a new floating bus stop, a striped crosswalk, pedestrian hybrid beacons, and a Class IV separated bikeway along each direction of SR 12.

Transportation Demand Management (TDM) focuses on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. It facilitates higher vehicle occupancy or reduces traffic congestion by expanding the traveler's transportation options in terms of travel method, travel time, travel route, travel costs, and the quality and convenience of the travel experience. A typical activity would provide funds to regional agencies that actively promote ridesharing, maintain rideshare databases, and provide limited rideshare services to employers and individuals.

Following consideration of the setting as well as the purpose and need of the proposed project, Caltrans has identified no other viable TSM and TDM alternatives.

Transportation Management Plan

A Transportation Management Plan (TMP) would be prepared and implemented during the design phase of the project to minimize or prevent delays and inconveniences to the traveling public and to address traffic impacts from stage construction and specific handling concerns during construction.

The TMP may include press releases to notify and inform multi modal travelers, businesses, community groups, local entities, emergency services, and local officials of upcoming closures or detours.

One-way traffic control with flagging in both directions will be utilized throughout construction in segments 1, 2 and 3 and will include temporary construction area signs (ground mounted and/or embedded) to direct traffic during operation. The project would construct a temporary road from PM 24.8 to 25.6 for motorist use during construction activities.

The need for nighttime and/or weekend lane closures will be identified during the design phase.

Construction activities would take place during both daytime and nighttime hours. The anticipated construction duration is approximately nine months for segment 1, two to three years for segment 2, and one to two years for segment 3.

Traffic Management Project Features

PF TRAFFIC-1: Placement traffic signage for construction and detours will be determined in the design phase of the project, there will be about 10-20 traffic signs placed through out all segments.

PF TRAFFIC-2: One flashing crosswalk beacon will be placed at Virginia Drive in segment 3.

2.0 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 build alternative. Potential environmental impacts of the proposed build alternative and recommended avoidance, minimization, and/or mitigation measures are discussed. Chapter 2 also addresses issues of concern pursuant to CEQA and NEPA. Please see chapter 3 for the CEQA Checklist.

As part of the scoping and environmental analysis carried out for the 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 State Route 12 Roadway Resurfacing, Restoration, and Rehabilitation Project would not conflict with or change existing or planned land uses or zoning codes.

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

Consistency with Federal, State, Regional and Local Plans and Programs – The proposed project, under its purpose and need, is consistent with state, regional and local plans and programs, as well as transportation plans and programs including the Metropolitan Transportation Commission Plan Bay Area 2040 and Rio Vista’s 2013 General Plan.

Wild and Scenic Rivers – There are no wild and scenic rivers that traverse the project area.

Growth – The proposed build alternative would not affect growth within Solano County. The project is located in a semi-rural area in 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.

Community Character and Cohesion – The project would continue to serve the region in the same manner as the existing roadways; therefore, no impact to community character and cohesion would occur.

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

Environmental Justice – No minority or low-income populations that would be adversely affected by the proposed build alternative have been identified as determined above. Therefore, this project is not subject to the provisions of Executive Order 12898.

Farmlands/Timberlands – The proposed build alternative will not convert farmland in the project area to a non-agriculture use, or otherwise affect farmland, timberland or land under Williamson Act Contracts.

2.1 HUMAN ENVIRONMENT

2.1.1 LAND USE

Existing and Future Land Use

Solano County is a fast-growing region within the northern reaches of the San Francisco Bay Area. Regionally, SR 12 is a major east-west route to destinations such as Sacramento, San Francisco and the greater Bay Area, and provides a link to major freeways such as I-80 and I-5. SR 12 is a two-lane highway facility set in a rural landscape that is flat grassland to the west and rolling hilly terrain to the east. There are residential or commercial structures in or around the project area. Agricultural land about the ROW along both sides of the alignment. The agricultural use is primarily grazing of livestock. The land uses along SR 12 are zoned and projected to remain rural, agricultural, and unchanged.

This highway is strategically located as the only east-west route connecting Solano County to the Sacramento and Stockton areas, and as such, handles a significant amount of interregional traffic. SR 12 is a major road to various tourist attractions in the Sacramento Delta, the Sierra Nevada Mountains, and the Lake Tahoe area. Within the project limits, SR 12 carries significant numbers of trucks and conveys traffic between Suisun City to the west and the City of Rio Vista to the east. Both urban areas are experiencing high rates of growth. Accident levels are lower for SR 12 than the average for similar roads, but the nature of the accidents has been severe.

The long-range (20-year) concept for the highway, which is the Caltrans strategy for future improvements, is for a 4-lane expressway facility divided with limited access such as driveways or minor streets from Suisun City to the City of Rio Vista. However, there are no capacity-increasing planned improvements to the SR 12 corridor within a 25-year planning horizon.

Consistency with Plans:

The proposed build alternative, under its purpose and need, is consistent with state, regional and local plans and programs, as well as transportation plans and programs including the Metropolitan Transportation Commission's 2040 Plan Bay Area, the Rio Vista 2001 General Plan, and the Solano County 2008 General Plan. The project is included in the Metropolitan Transportation Commission's cost-constrained 2019 TIP SHOPP Roadway Preservation Program (TIP ID-VAR170006).

State Planning

The 1985 Route Concept Report identified the widening of Route 12 to four lanes from Suisun City to the Solano County/Sacramento County line.

A Major Investment Study (MIS) was completed in October 2001, for the portion of SR 12 extending from Route 80 to the Sacramento River. The MIS identified potential existing and future transportation deficiencies and proposed appropriate phased remedies in the Study corridor. As part of the MIS, both short-term and long-term recommendations (Year 2025) were proposed. This project is consistent with the MIS recommendations to provide Safety Improvements along this section of the highway.

Regional Plans

Delta protection commission land use and resource management plan for the primary zone of the delta

The project is consistent Delta Protection Commission Land Use and Resource Management Plan for the Primary Zone of the Delta. The proposed project has reviewed and considered the policies and recommendations of the management plan including Environment, Utilities, Land Use, Recreation & Access, and Infrastructure.

General and Community Plans:

Solano County General Plan

The proposed build alternative would not change any existing land uses. The project is consistent with the Solano County General Plan.

Coastal Zone and Wild and Scenic Rivers

The entire project area is outside of coastal zones. There are no wild and scenic rivers that traverse the project area.

Parks and Recreation

There are no publicly-owned parks, recreation areas, or wildlife or waterfowl refuges that border or are near the project area. No historic sites exist within the project area.

Avoidance, Minimization, and/or Mitigation Measures

The Build Alternative is consistent with state, regional, and local planning goals and policies, no mitigation for farmland is proposed for the project at this time.

2.1.2 UTILITIES

Affected Environment

There are five Pacific Gas & Electric (PG&E) utility poles on the WB side along SR 12 within segment 2 are proposed to be relocated

Environmental Consequences

The relocations have not been determined but it is anticipated they will be relocated to the EB side along SR 12 in segment 2 within the newly acquired portions of Caltrans ROW. All of the affected utilities are anticipated to be relocated prior to the beginning of construction.

Avoidance, Minimization, and/or Mitigation Measures

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

2.1.3 GROWTH

Regulatory Setting

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

Affected Environment

This portion of the corridor connects recreational and commercial areas, and rural, agricultural communities to urban areas for distribution of agricultural products. The SR 12 corridor provides an important linkage to SR 113, I-80, and I-5; further to the west, it provides access to US-101.

This project does not increase the traffic capacity of the highway facility, but instead enhances its safety and efficiency. For the proposed build alternative Caltrans will be expanding the roadway, however we will not be adding any additional lanes. Therefore, it would not have any impact on the growth of the area or the community.

Employment Projections and Jobs/Housing Balance

In 2005, there were 148,640 jobs and 194,900 employed residents in Solano County for a jobs deficit of 46,260 jobs. Job growth forecasts for Solano County predict increases of 47% to the Solano County employment base from 2005-2030. A projected 38% increase in employed residents ensures no significant improvements to the present imbalance between continuing jobs/housing. The jobs deficit is projected to increase to 51,890 by 2030. Growth in jobs is projected to be 47% with a 38% growth in employed residents. See **table 2** on the following page.

To summarize, the rate of growth in Solano county jobs is expected to be slightly greater than the growth among county residents, but the improvement in the jobs/housing imbalance is negligible compared with the existing jobs deficit. For the foreseeable future, numerous Solano County residents will be required to commute to jobs elsewhere in the Bay Area. As another indicator of this jobs/housing imbalance, Solano County today contains the greatest proportion of long-distance commuters (more than 45 minutes each way) among the nine Bay Area counties.

These predicted employment increases may mitigate the housing growth within each county, but all projections emphasize continued demand for travel to local and regional jobs and for regional shopping needs. A significant number of in-county jobs in each of these outlying Bay Area counties are low-wage positions in the retail and service industries that require residents to travel out-of-county for employment.

Impact

There will be no adverse impacts as a result of the proposed project.

2.1.4 COMMUNITY IMPACTS

Regulatory Setting

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

Affected Environment

This stretch of SR 12 links northbound SR 113 and is an important east-west link for motorists traveling between the Fairfield/Suisun City area and the City of Rio Vista. These towns are destinations as well as transportation hubs for commuters using mass transit. SR 12 serves as an interregional, recreational, commercial, agricultural, and commuter route. It provides an important link to interstate truck routes including US-101, I-80 and I-5. The highway serves as a route for long-distance recreational bicycle travel.

Impact

The proposed build alternative would not divide any established communities or require any relocations. The following section will address Environmental Justice concerns. This proposed project would not adversely result in adverse impacts on population growth/sprawl, local economy, municipal or community services, utility services, community character, or existing and proposed land uses.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are necessary because the project alternatives will have no effect on community cohesion.

2.1.5 ENVIRONMENTAL JUSTICE

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed by President Clinton on February 11, 1994. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For year 2007, this was \$20,650 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. Caltrans' commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director, which can be found in **Appendix B** of this document.

Impacts

The proposed build alternative would not require any residential or business relocations. The widened road would be within an existing, highway corridor. Although the new median barrier would create a minor impact to traffic circulation, the project would not constitute any new physical or psychological barriers that would divide, disrupt or isolate neighborhoods in the corridor. The proposed improvements would require both temporary and permanent sliver acquisitions affecting private property. Existing parking would not be affected. Private driveways that are affected due to the roadway widening will be realigned where needed.

Based on the above discussion and analysis, the build alternative will not cause disproportionately high and adverse effects on any minority or low-income populations as per E.O. 12898 regarding environmental justice.

2.1.6 VISUAL/AESTHETICS

Regulatory Setting

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

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

The Caltrans’ Scenic Highway Program is intended to protect and enhance the natural scenic beauty of California’s highways and adjacent corridors, through special conservation treatment. The program protects against encroachment of incompatible land uses, mitigates and minimizes development activities along the corridor, prohibits billboards, regulates grading activity, and other activities causing visual degradation.

Affected Environment

A Visual Impact Assessment (Caltrans April 12, 2019) was prepared to assess the project’s potential effects to visual resources in the area.

Visual Setting

The proposed project is located on State Route 12 from PM 20.57, just west of Currie Road to PM 22.7 at Acevedo Road, and from PM 23.7, at Summerset Road, through the City of Rio Vista in Solano County, California. The project setting is at the eastern edge of the San Francisco Bay Area, in the San Joaquin Delta, the confluence of the Sacramento and San Joaquin Rivers. The project corridor traces the northern edge of the Montezuma Hills into the urbanizing City of Rio Vista and ending at the eastern edge of the City of Rio Vista, at the approach to the Rio Vista Bridge that spans the Sacramento River.

The semi-rural landscape west of the City of Rio Vista is characterized by open views of the rolling Montezuma Hills and the massive turbines of the Shiloh Wind Farm that dot them to the south, and agricultural fields spanning gentler hills to the north along with some newer developments. East of Drouin Drive, the highway passes through continuous development in the City of Rio Vista. The land use within the project corridor is rural/agricultural to the west, with some residential development, including the Trilogy senior community at Summerset Road, with commercial development along the highway within the urban core of the City of Rio Vista. The project corridor is defined as the area of land that is visible from, adjacent to, and outside the highway right-of-way, and is determined by topography, vegetation, and viewing distance.

State Route 12 is not a designated or eligible State Scenic Highway within the project limits but is a county scenic road. The project corridor offers scenic views to the surrounding agricultural fields in segments 1 and 2 before entering into the City of Rio Vista in segment 3.

Visual resources of the project setting are defined and identified below in the Environmental Consequences section, by assessing the *visual character* and *visual quality* in the project corridor.

Because it is not feasible to analyze all the views in which the proposed build alternative would be seen, it is necessary to select a number of Key Views that would clearly demonstrate the change in the project’s visual resources. Key views also represent the viewer groups that have the highest potential to be affected by the project considering exposure and sensitivity.

Two Key Views(KV) have been identified within the project limits

- KV 1: Looking east at Post Mile 25.1, highway travelers see the near side of a hill as the roadway follows the existing topography
- KV 2: Looking southwest across the Gardiner Way intersection, pedestrians see the crossing in the foreground and Lira’s Market in the background

Because the project will result in negligible visual change within segment 1, there is no Key View for this segment. The map below locates the Key Views within segment 2 and segment 3.



Figure 3: KV MAP—This map locates the Key Views within the project corridor and depicts viewer orientation.

Figure 4: KV #1 – Looking east with a wide view of agricultural fields and the wind farm to the south.

KV- #1 Existing Condition

The semi-rural character of the existing conditions is evident at this view. The straight line of the freeway is echoed by the line of overhead utilities and the line of channelizer posts along the median. In the existing condition, the roadway more or less follows the rolling topography, and stretches of roadway are lined with trees.



Figure 4: KV #1 – Looking east with a wide view of agricultural fields and the wind farm to the south.



Figure 4: Existing Conditions site photo.

Viewer Response

Segment 2 is located between downtown of the City of Rio Vista and the Trilogy Senior Community to the west. Many of the viewers traveling along this segment are traveling between the two, with high exposure and moderate-high sensitivity. Viewers at this location also include regional commuters with daily exposure and an anticipated moderate-low sensitivity to visual change, and truckers, with recurring exposure, anticipated to have low sensitivity. Additionally, there are recreational travelers with less

frequent exposure to this stretch of highway, who are also anticipated to have low sensitivity to visual change along this segment. Highway neighbors along this segment include residents of Trilogy who are anticipated to have Moderate-Low Viewer Response. Overall Viewer Response is anticipated to be Moderate.

Figure 5: KV #2 – Looking west across SR 12 toward Lira’s Market in the urban core of the City of Rio Vista.

KV- #2 Existing Condition

The urban character of this segment of highway is evident through the continuous development, but the wide roadway, large parking lots, and lack of consistency of urban amenities serve to diminish the distinctness of the City of Rio Vista from its rural surroundings as the highway passes through town. This Key View is from the perspective of a pedestrian crossing Gardiner Way and approaching the SR 12 crossing.



Existing Conditions – This image is a composite of two site photos.

Viewer Response

Segment 3 is located within the City of Rio Vista. Viewers are a mix of local residents, business owners, and local and regional commuters, including truckers. Viewer exposure and sensitivity vary from Low to High, with business owners and local residents anticipated to have the highest sensitivity to visual

change. Overall viewer response is anticipated to be High, with a predominantly positive response to visual changes.

Environmental Consequences

Visual Resources and Resource Change

Resource change is assessed by evaluating the visual character and the visual quality of the visual resources that comprise the project corridor before and after the construction of the proposed build alternative.

The visual character of the proposed build alternative will be somewhat compatible with the existing visual character of the corridor. Proposed changes will not obscure the dominant rural character of the highway. The visual quality of the existing corridor will be altered by the proposed build alternative. The intactness of the rural highway following the rolling topography will be diminished by the vertical curve correction.

Segment 1 will include roadway resurfacing and replacement and upgrades to existing project elements, such as drainage culverts and metal beam guardrail, resulting in negligible visual change.

Segment 2 follows rolling topography in existing conditions, with views of surrounding farmland, including agricultural fields to the north and the Montezuma Hills and Shiloh Wind Farm to the south, interrupted by an irregular pattern of roadside trees. Visual quality will be diminished by the vegetation removal required for roadway widening and the retaining walls and regrading required for vertical curve correction. The most noticeable visual changes will occur where roadway widening will require the removal of up to 74 trees and vertical curve correction will require hillside cuts, side slope construction, and below roadway retaining walls. The roadside trees are somewhat sparse, and many are in poor health, but they are numerous enough to establish a tree-lined character to the roadway that contrasts with the uninterrupted open views along Segment 1. While tree removal will be minimized to the extent feasible, it will result in noticeable visual change. The construction of retaining walls and road edge barriers will introduce engineered visual elements to reshape the topography of the roadway, which currently follows the natural topography.

A Temporary Detour Road may be constructed to accommodate traffic during roadway widening and vertical curve correction, which would require vegetation removal, grading, and paving. While this would be restored to the extent feasible after construction, some degree of permanent visual change is likely to occur. A Detour Route on existing roads would not result in visual change.

Noticeable visual change will also occur in segment 3. In existing conditions, highway crossings along this segment are wide, sidewalks along the highway are discontinuous, there are no dedicated bike facilities, and street trees are only planted at the eastern end of the city. Through a cost-sharing agreement with the City of Rio Vista and Solano Transportation Authority, and a Maintenance Agreement with the City of Rio Vista, Caltrans will implement several streetscape improvements along with Complete Streets features. The project will more clearly define the multi-modal uses of the urban highway segment by installing a contrasting paving treatment in the center turn lane, creating separated bicycle lanes, closing sidewalk gaps, installing pedestrian-actuated Rectangular Rapid Flashing Beacons at (RFFBs, pending further analysis) at the Gardiner Way and Virginia Street intersections, planting street trees at additional

locations, and installing benches in select locations. These visual changes will be compatible with the existing urban-rural character, and visual quality will be improved as this segment of the project corridor becomes visually more organized and the legibility of this multi-modal segment along the highway is strengthened.

Viewers and Viewer Response

Neighbors (people with views *to* the road) and *highway users* (people with views *from* the road) will be affected by the proposed build alternative. It is anticipated that the average response of all viewer groups will be moderate.

Highway users include area residents that use the highway to get around locally and regionally, and regional commuters. Segment 1 highway users are predominantly traveling regionally, while segment 2 includes highway users who travel between the Trilogy development west of the urban core of the City of Rio Vista and segment 3 includes highway users traveling within the City. Local residents are anticipated to have a Moderate-High response to visual change, while regional commuters are anticipated to have a Low response, resulting in an average Moderate viewer response for highway users.

Highway neighbors include the residents and businesses along the highway. There are few highway neighbors along segment 1, and there is an intermediate tree row along the one residence that fronts the highway. Several residences within the Trilogy community along segment 2 have views toward the highway. Most have a partially obstructed view of the highway due to intermediate walls and vegetation. Where the highway is visible from residences, it is not a prominent visual feature. Highway neighbors along segments 1 and 2 are anticipated to have a Low viewer response. Segment 3 has immediately adjacent businesses and nearby residences. These highway neighbors are anticipated to be sensitive to visual change, and Viewer Response is anticipated to be High along segment 3, with business owners expected to be particularly concerned about whether changes will affect visibility of businesses and access points.

Visual Impact

Visual impacts are determined by assessing changes to visual resources and predicting viewer response to those changes. These impacts can be beneficial or detrimental. Cumulative impacts and temporary impacts due to the contractor's operations are also considered.

This VIA also considers the potential impacts of a No-Build Alternative. In a no-build alternative, no new retaining walls would be built, and no trees would be removed in Segment 2 and no trees would be planted in Segment 3. The existing rough pavement surface would persist throughout the project corridor, and the nonstandard travel lane and shoulder widths and nonstandard vertical curves in Segment 2 would remain unchanged. Multimodal access and legibility of the City of Rio Vista would not be improved in Segment 3.

The following section describes and illustrates visual impacts at key views, compares existing conditions to the proposed build alternative, and includes the predicted viewer response.

Figure 6: KV #1 – Vertical curve correction with side slope construction.



Simulation of proposed built condition.

Resource Change:

Segment 2 work includes roadway widening and vertical curve correction, requiring construction of cut and fill side slopes, with a 200-foot segment of below-roadway retaining walls to maintain a waterway. The largest of the hillside cut and side slope constructions is visible in the foreground of this simulation, and the below roadway retaining walls and above-roadway barriers are visible in the distance. Side slopes and retaining walls will be constructed on both sides of the highway to support the new roadway profile along these segments. The above simulation demonstrates that noticeable change would occur. The roadside trees would be permanently removed and the road edge barriers along fill slope retaining walls would add a more engineered element to the landscape. Measures to minimize these impacts would include use of an open type barrier along the below-roadway retaining walls to maintain the view of the surrounding landscape and slope rounding techniques and/or hydroseeding with native grasses to aid in blending the constructed side slopes with the surrounding landscape.

Visual Impact:

The Build Alternative at Key View 2 is anticipated to have a Moderate-Low level of viewer response and a Moderate-Low visual resource change, resulting in a Moderate-Low level of Visual Impact.

Figure 9: KV #2 – Simulation of proposed resurfacing, multimodal improvements, and streetscape enhancements.



Simulation of proposed built condition.

Resource Change:

A Complete Streets approach will be implemented in Segment 3, with continuous sidewalks, separated bike lanes, and a new bus stop in front of Lira’s Market. Please see Segment 3 Complete Streets & Additional Improvements graphic on **page 21**. A Rectangular Rapid Flashing Beacon (RFFB) is proposed at this location, as well as at Virginia Avenue to the east (behind this view, pending review), to increase pedestrian safety. In addition to these multi-modal improvements, the center turn lane will have a contrasting paving treatment and sidewalk street trees will be planted along both sides of the roadway where opportunities occur. Visual change will include a noticeable shift to a more organized landscape than in existing conditions, with space for different travel modes clearly defined.

Visual Impact:

The Build Alternative at Key View 3 is anticipated to have a High level of viewer response and a Moderate level of visual resource change, resulting in a Moderate-High level of Visual Impact, anticipated to be welcomed by local residents and business owners.

Project Features

Project Features include design elements of the project and standardized measures that are applied to all or most Caltrans projects, including Best Management Practices, Caltrans Standards and Specifications, and standard special provisions. The features are considered an integral part of the project and have been

considered prior to any significance determinations for CEQA. The following project features are included in the Build Alternative:

PF VIS-1: Preserve Existing Vegetation. Beginning with preliminary design and continuing through final design and construction, save and protect as many existing trees in the study area as feasible.

PF VIS-2: Preserve Existing Vegetation. Survey exact locations for trees to remain and include in plan set.

PF VIS-3: Landscape Plantings. Use drought-tolerant plants, including California native species, as part of the planting palette where regionally appropriate. Planting must be maintainable, low maintenance, durable, and site appropriate.

PF VIS-4: Landscape Plantings. Plantings within the State right-of-way will follow the 1997 Caltrans Plant Setback and Spacing Guide.

Avoidance, Minimization, and/or Mitigation Measures

Avoidance or minimization measures have been identified and can lessen visual impacts caused by the project. Also, the inclusion of aesthetic features in the project design previously discussed can help generate public acceptance of a project. This section describes additional avoidance and/or minimization measures to address specific visual impacts. These will be designed and implemented with concurrence of the District Landscape Architect.

The following measures to avoid or minimize visual impacts will be incorporated into the project:

AMM VIS-1: The project development team (PDT) will solicit input from local stakeholders for context-sensitive design of streetscape elements in segment 3.

AMM VIS-2: Tree and vegetation removal will be minimized to the extent feasible.

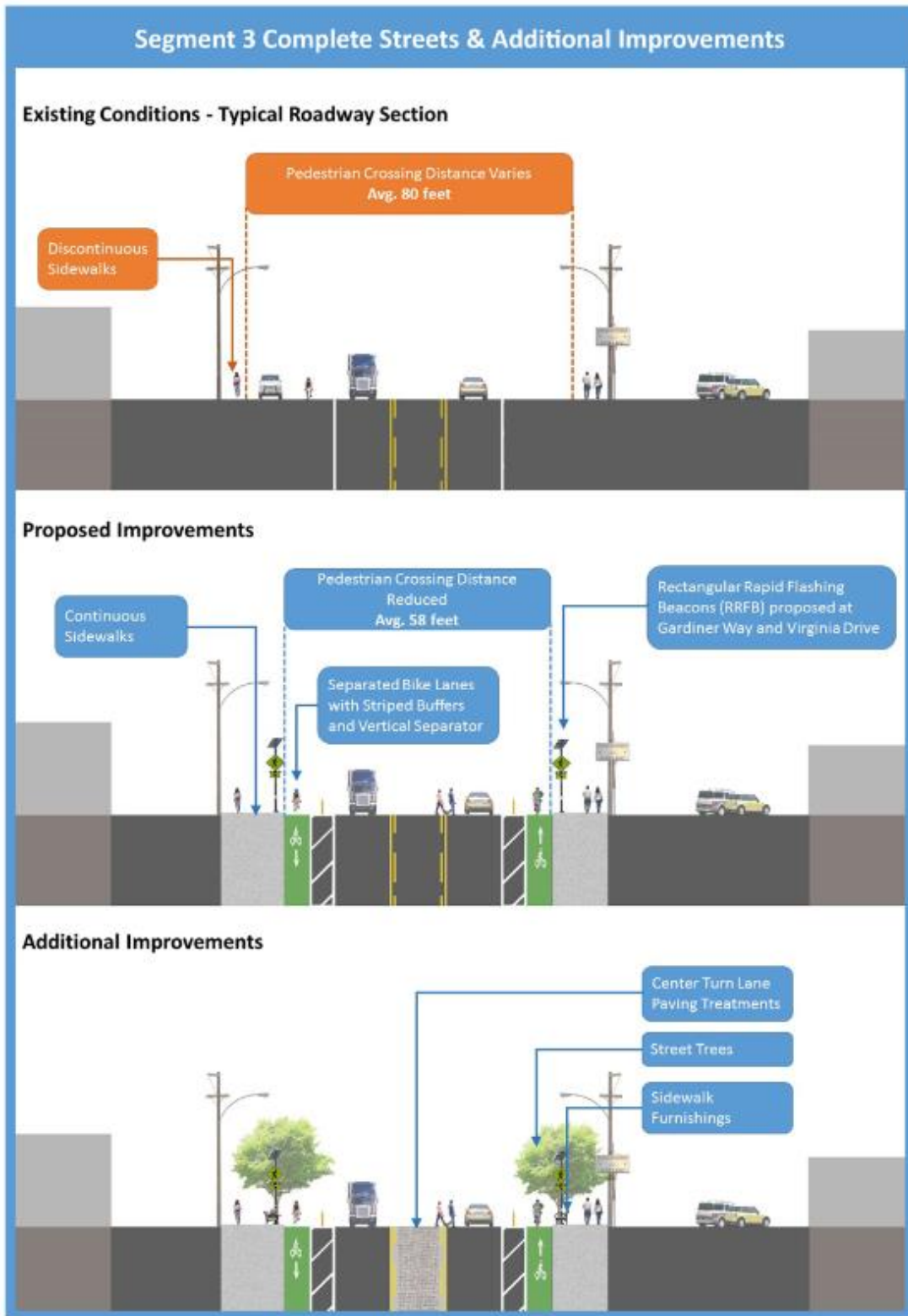
AMM-VIS-3: Trees and vegetation outside of clearing and grubbing limits shall be protected from the contractor's operations, equipment, and materials storage.

AMM VIS-4: Newly constructed below-roadway fill walls shall include aesthetic treatments. Wall texture and color treatments shall be context-sensitive.

AMM VIS-5: The barrier portion at the base of below-roadway fill walls shall incorporate aesthetic treatments to minimize contrast with below-roadway fill walls.

AMM VIS-6: Cut slopes shall use slope rounding and/or vegetation to blend with the surrounding environment.

AMM VIS-7: Construction activities shall limit all construction lighting to within the area of work and avoid light trespass in residential areas through directional lighting, shielding, and other measures as needed.



2.1.7 CULTURAL RESOURCES

Regulatory Setting

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

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

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

Affected Environment

The studies for this undertaking were carried out in a manner consistent with Caltrans' regulatory responsibilities under Section 106 of the National Historic Preservation Act (36 CFR Part 800) and pursuant to the January 2014 First Amended Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding compliance with Section 106 of the National Historic Preservation Act, as it pertains to the Administration of the Federal Aid Highway Program in California.

Cultural studies have been undertaken by the Office of Cultural Resource Studies (OCRS) for the State Route 12 Roadway Rehabilitation Project in Solano County, California. OCRS has completed and approved the required Historic Property Survey Report (HPSR) and Archaeological Survey Report (ASR) on August 29th, 2018 and has determined that a Finding of No Historic Properties Affected is appropriate for the undertaking.

A cultural resources records search was conducted on August 9, 2017 of Caltrans' Cultural Resources Database (CCRD) and data from the California Historical Resources Information System (CHRIS). The Native American Heritage Commission was contacted by email on August 9, 2017. They responded on August 31, 2017. Their letter states no sacred sites were identified and included three interested individuals or tribes on the Native American Contact list. Formal notification under Section 106 and AB 52 began with a letter sent to Marshall Mckay of the Yoche Dehe Wintun Nation, identified by the SB 18 list, on August 15, 2017.

The Area of Potential Effects (APE) for the project was established in consultation with Lindsay Hartman, PQS Principal Investigator, Prehistoric Archaeology, Michael Meloy, PQS Principal, Architectural History and Jason Mac, Project Manager, on August 1, 2018. The APE was surveyed on September 6, 2017 and February 8, 2018 by Caltrans Office of Cultural Resource archaeologists. No archaeological resources were identified during the survey.

While six cultural resources have been previously recorded within the APE, four are exemptible under the Section 106 PA Stipulation VIII.C. I Attachment 4 and PRC 5024 MOU Stipulation VIII.C. I and Attachment 4. The final two resources are built resources: Bridge 23-0022 and P-48-000803. Bridge 23-0022 is Category 5 and not eligible for the National Register of Historic Places and P-48-000803 is a single-family property built in 1951 and previously determined not eligible on April 4, 2016. No historic properties or 4(f) resources are present within the APE.

Environmental Consequences

There will be no Historical Properties Affected on this project.

This project is not located on any tribal lands per Caltrans consultation with SHPO.

There are no 4(f) resources within the vicinity of this project.

Avoidance, Minimization, and/or Mitigation Measures

AMM CULT-1: 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.

AMM CULT-2: If Caltrans professionally qualified staff determines that cultural materials includes human remains, 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. Caltrans Cultural Resources Studies Office will contact the Solano County Coroner. Pursuant to CA PRC Section 5097.98, if the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission, which will then notify the Most

Likely Descendent. Caltrans, District 4, Cultural Resources Studies Office will work with the Most Likely Descendent 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

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 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

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

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

Affected Environment

A Floodplain Encroachment Review (Caltrans May 1, 2018) and Floodplain Encroachment Review Addendum (November 15, 2018) was prepared to assess the project’s potential effects to the floodplains in the area. The Floodplain Encroachment Review and Floodplain Encroachment Review Addendum incorporates information from the Federal Emergency Management Agency (FEMA), Flood Insurance Rate Maps (FIRM) for Solano County.

Floodplains

According to FIRM map numbers 06095C0525E and 06095C0540E, there are no base floodplains present within segment 1.

Floodplain information for segment 2 is shown on FIRM map numbers 06095C5037E and 06095C0540E. FIRM map number 06095C0540E shows a Zone A floodplain at the 12'x6' RCB. Zone A denotes a base floodplain where the base flood elevation was not determined. An analysis of the 12'x6' RCB indicates that the base floodplain does not overtop the roadway at this location. The same FIRM also shows a Zone AO floodplain downstream of the 48" CSP. The Zone AO shows that the base floodplain at this location has a flood depth of 2'. Please see **Figures 10 -13** for floodplains in and near this project.

Segment 3 is included in FIRM number 06095C5037E. No base floodplains are shown within segment 3.

Figure 10: Flood Insurance Rate Map 1 (Segment 1)

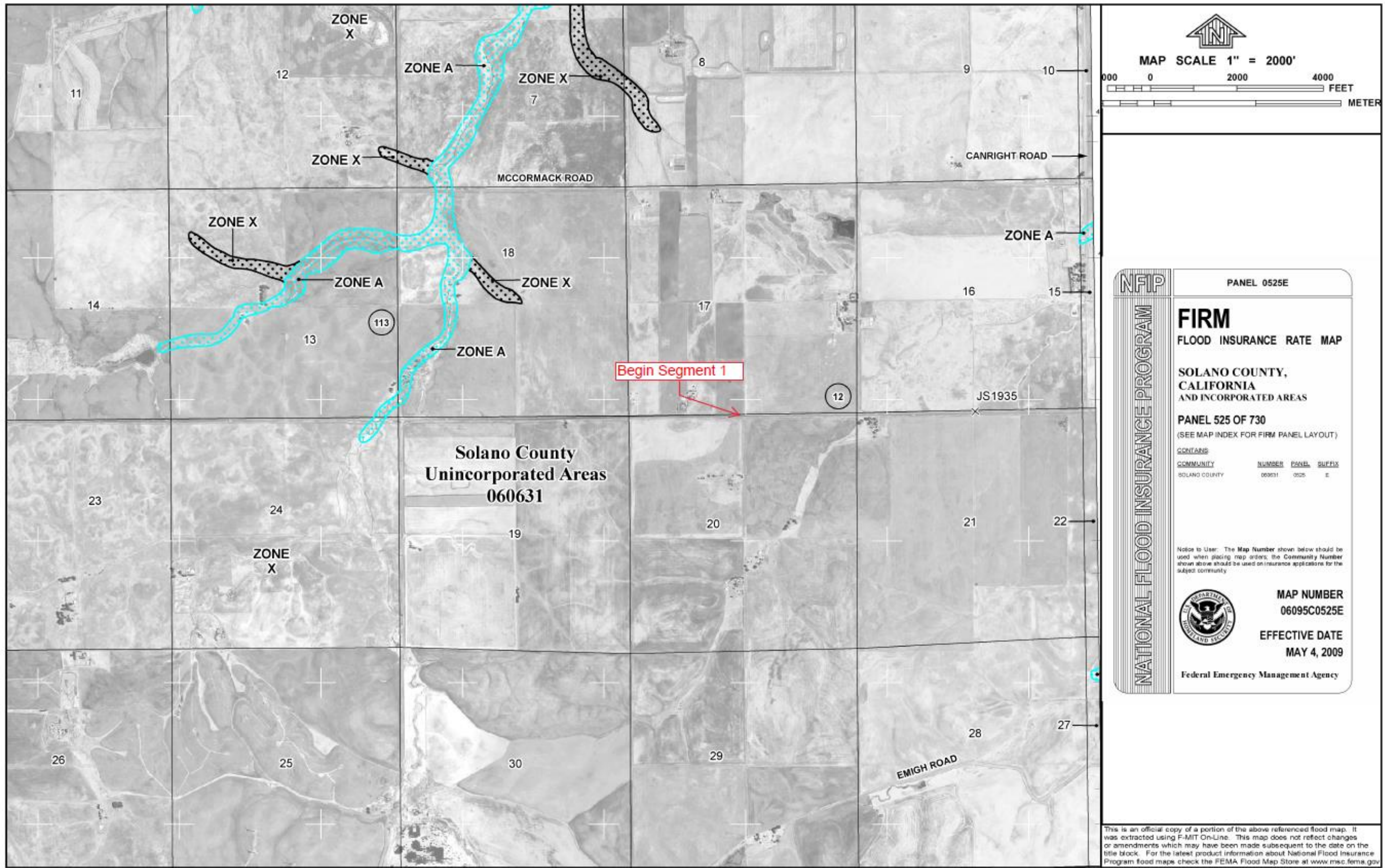


Figure 11: Flood Insurance Rate Map 3 (Segment 1 and Segment 2)

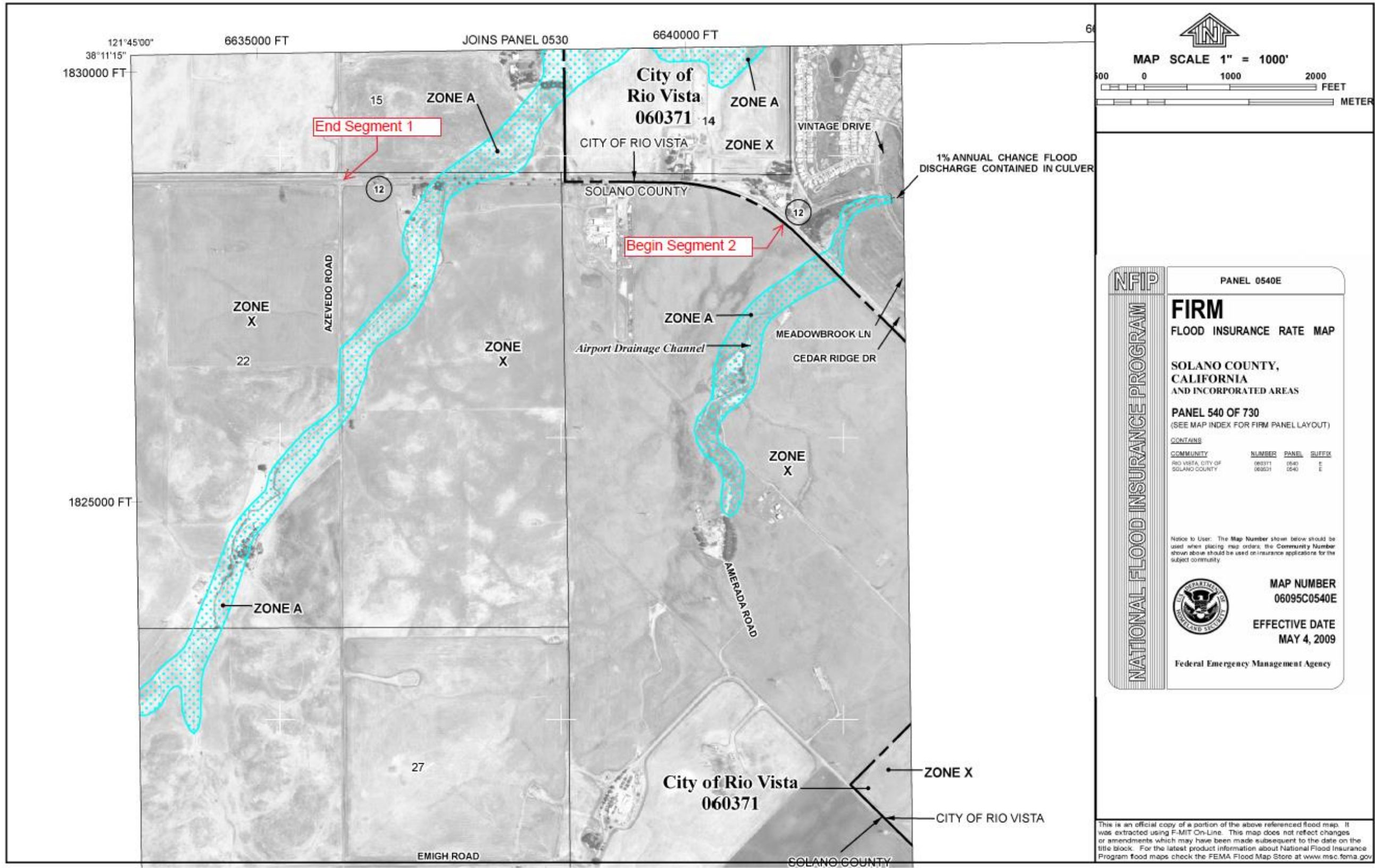


Figure 12: Flood Insurance Rate Map 3 (Segment 2)

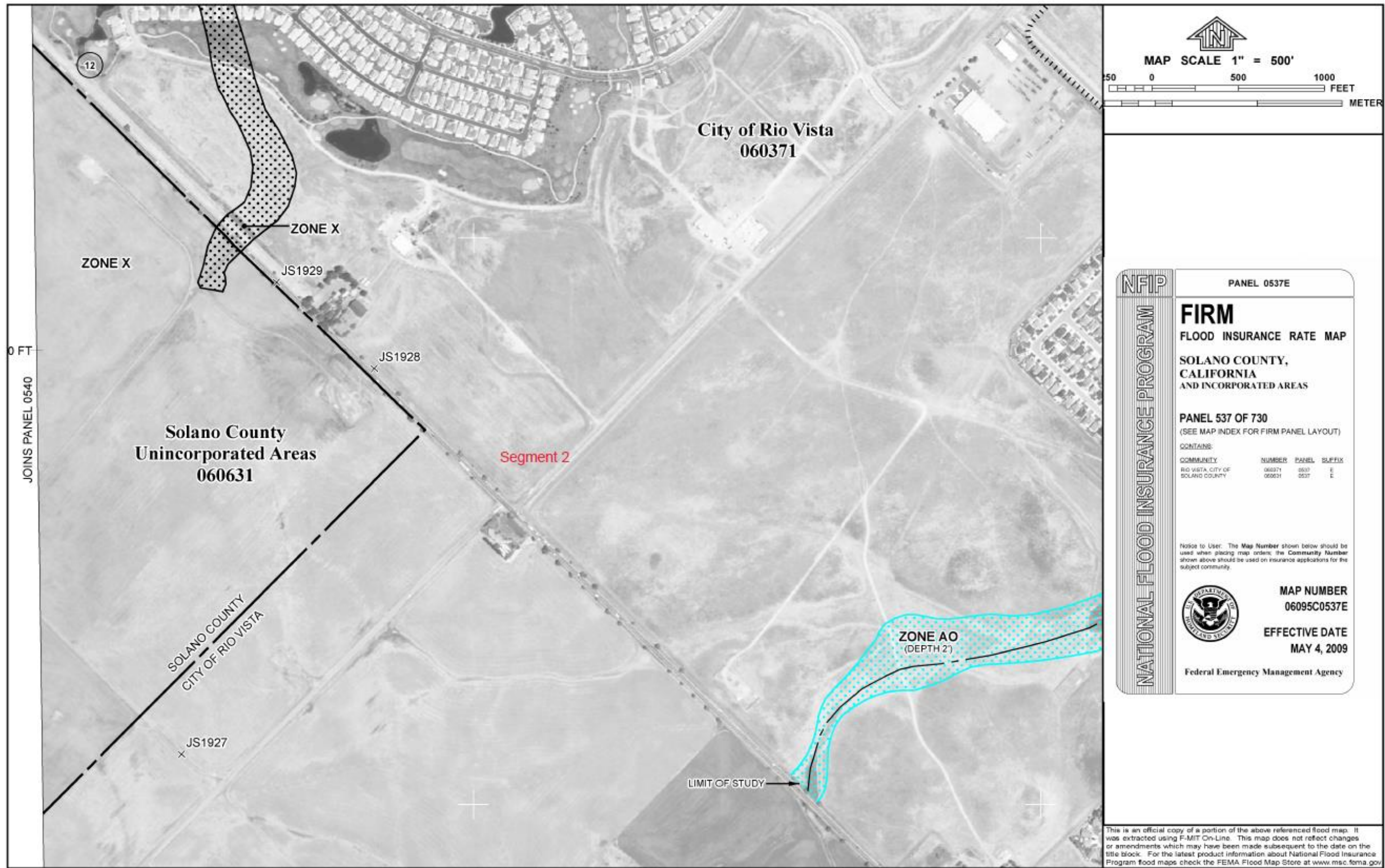
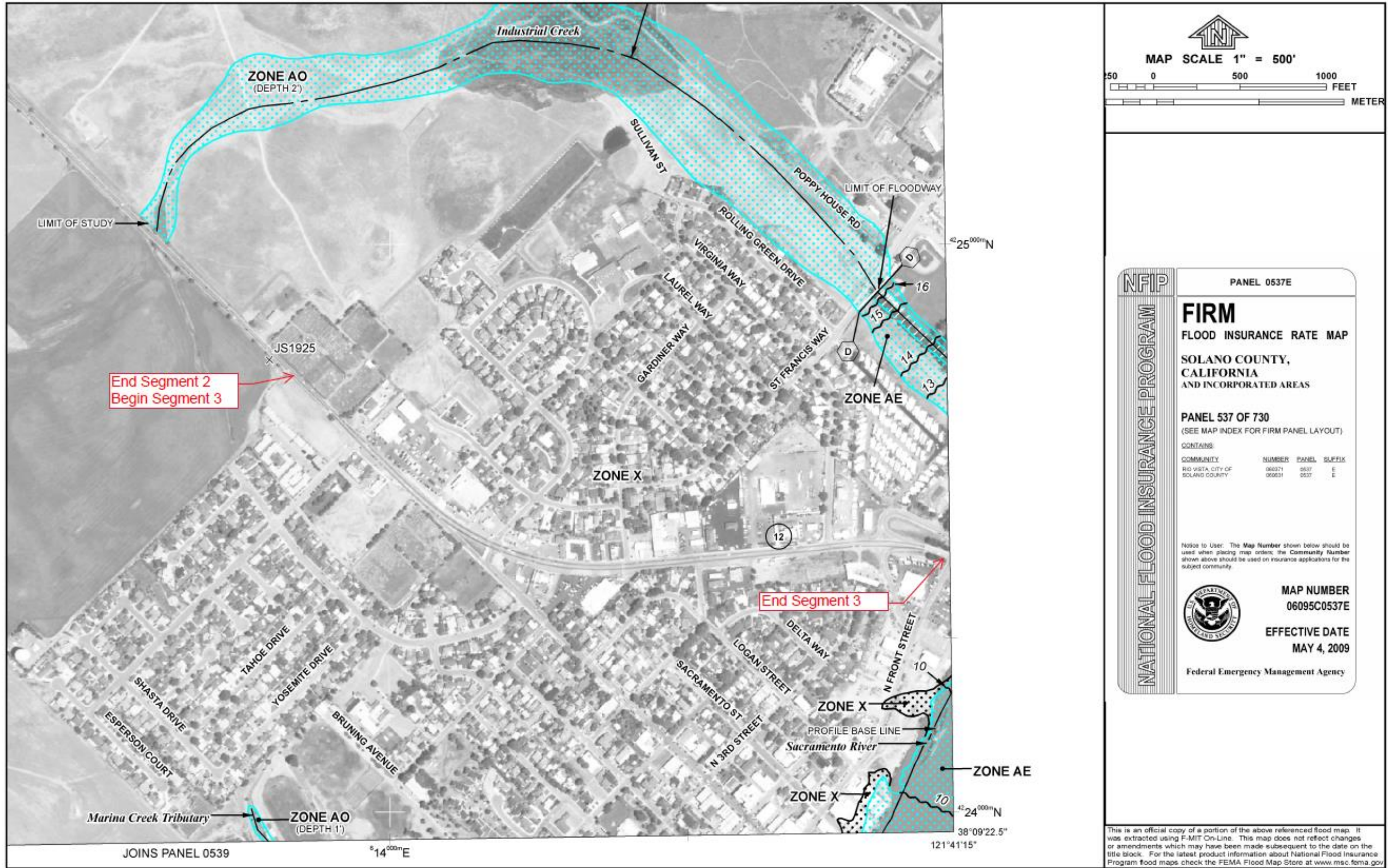


Figure 13: Flood Insurance Rate Map 3 (Segment 2 and Segment 3)



Environmental Consequences

The embankment fill being placed at the 12'x6' RCB will be above the base flood elevation, as a result, no impact to the Zone A floodplain at this location is expected.

Without the previously proposed below-roadway fill walls, fill will be placed within the Zone AO floodplain at the existing 48" CSP to correct the roadway profile at this location.

For segment 1 and 3, the proposed work is not located within any base floodplain.

Avoidance, Minimalization, and/or Mitigation Measures

AMM HYDRO-1: To mitigate the placement of fill within the floodplain, an equal volume of material should be removed from the floodplain. This mitigation should be considered when determining the required ROW.

2.2.2 WATER QUALITY AND STORM WATER RUNOFF

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source¹ unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCBs) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the USACE.

The goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

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

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

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

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 effluent² standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause “significant degradation” to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

State Requirements: Porter-Cologne Water Quality Control Act

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

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

State Water Resources Control Board and Regional Water Quality Control Boards

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

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

National Pollutant Discharge Elimination System (NPDES) Program

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as “any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water.” The SWRCB has identified Caltrans as an owner/operator of an MS4 under federal regulations. Caltrans’ MS4 permit covers all Department rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

Caltrans’ MS4 Permit, Order No. 2012-0011-DWQ (adopted on September 19, 2012 and effective on July 1, 2013), as amended by Order No. 2014-0006-EXEC (effective January 17, 2014), Order No. 2014-0077-DWQ (effective May 20, 2014) and Order No. 2015-0036-EXEC (conformed and effective April 7, 2015) has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (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

Construction General Permit, Order No. 2009-0009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective on July 17, 2012). The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of

at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop Storm Water Pollution Prevention Plans (SWPPPs); to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

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

Section 401 Permitting

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

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

Affected Environment

A Water Quality Study (Caltrans May 14, 2018) was prepared to assess the project's potential effects to water quality and storm water management in the area.

This project is located within the Central Valley Regional Water Quality Control Board jurisdiction of Region 5, which is responsible for implementation of State and Federal laws and regulation for water quality protection.

Segment 1 is in the Valley Putah-Cache-Elmira Hydrologic Area, HSA #511.10. The watershed boundary dataset is Cache Slough, with Watson Hollow as its subwatershed. Segments 2 and 3, are also in the same Calwater watershed as segment 1; however, at postmile 24.6, the watershed boundary dataset changes to Sherman Lake-Sacramento River with the Three-mile Slough as the subwatershed.

Runoff from the project site eventually drains to the Delta Waterways. The northern portion of the Delta Waterways at the Rio Vista Bridge is on the 2014-2016 303(d) and TMDLs List for chlordane, chlorpyrifos,

DDT (Dichlorodiphenyltrichloroethane), diazinon, dieldrin, group A pesticides, invasive species, mercury, PCBs (Polychlorinated biphenyls), and unknown toxicity. The western portion (south of the bridge) is impaired for chlorpyrifos, DDT (Dichlorodiphenyltrichloroethane), diazinon, electrical conductivity, group A pesticides, invasive species, mercury, and unknown toxicity.

Along the project area, it is primarily rural and farmland with residential and business development towards the eastern portion of the project, in the City of Rio Vista, near the Sacramento Bridge. The topography is relatively flat.

Climate

The project is in a region characterized by warm summers and mild wet winters and a rainy season between October 15 and April 15 (Department *Construction Site Best Management Practices (BMPs) Manual*, March 2003). Average annual precipitation is about 17 inches in the project area.

Environmental Consequences

The following activities are of particular water quality concern: installation of best management practices treatment, hauling and storage of material and equipment, general equipment movement and access within and to/from the site, drainage work, profile and grade correction requiring grading and contouring, pavement widening, and concrete work associated with the ADA ramps and drainage facilities.

Installation of best management practices is a concern because this project will involve digging which will disrupt soil and create sediment that can reach water. Hauling and storage of material and equipment, general equipment movement and access, drainage work, profile and grade correction requiring grading and contouring will all occur on non-paved areas. When the road or path is unpaved this could create sediment. Leaking oil from hauling, storage, equipment, and drainage work activity will potentially seep into waterways.

At segment 1, there is 10 acres of disturbed Soil Area, 0.13 acres of new impervious, and 0 acres of replaced impervious. Segment 2 has 16.6 acres of disturbed soil area, 2.2 acres of impervious, and 3.7 acres of replaced impervious. And segment 3 has 0.5 acres of disturbed soil area, 0.16 acres of new impervious, and 0 acres of replaced impervious.

Construction impacts to receiving waterbodies that should be addressed by Caltrans include turbidity and pH. These could result from the discharge of sediment and cement beyond the site perimeter. Dewatering and multiple water diversions are anticipated. Post-construction impacts need to be addressed, since the project has an estimated 6.2 acres of new and replaced impervious surfaces and a 401 permit will be needed.

The project area is not considered a water quality high risk area for sediment.

The project located is in an area that does not require trash capture.

Avoidance, Minimalization, and/or Mitigation Measures

Caltrans will implement the following avoidance and minimization measures below:

AMM WATER- 1: Temporary Impacts:

- To prevent or reduce impacts, temporary Construction Site BMPs will be deployed for sediment control and material management. These include cover, check dam, drainage inlet protection, fiber roll, silt fence, hydraulic mulch, concrete washout, and street sweeping.

AMM WATER- 2: Temporary Impacts:

- Construction entrances, temporary construction roadway, dewatering, and water diversions will also be required in addition to stormwater sampling and analysis, required under a SWPPP for risk levels 2 and 3, water quality monitoring will be required for in-water work during construction of the drainage systems.

AMM WATER-3: Permanent Impacts:

- The project will need to install permanent Water Quality Treatment BMPs. Due to the flat and undeveloped terrain, biofiltration strips and swales and/or infiltration trenches will be considered.

AMM WATER-4: Permanent Impacts:

- Permanent erosion control will be proposed for disturbed areas and new side slopes and will consist of hydroseeding, hydromulch and/or netting.

AMM WATER-5: Storm Water Pollution Prevention Plan (SWPPP):

- Prior to commencement of construction activities, a SWPPP will be prepared by the Contractor and approved by Caltrans. The SWPPP addresses potential temporary impacts via implementation of appropriate BMPs, such as those mentioned above, to the Maximum Extent practicable.

2.2.3 GEOLOGY/SOILS/SEISMIC/TOPOGRAPHY

Regulatory Setting

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

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

Affected Environment

A Geological and Paleontological Impact Memo was issued on November 2, 2017.

Most of the project lies in agricultural land underlain by the Pleistocene Montezuma Formation (Graymer and Brabb, 2002). The Montezuma Formation consists of sand, silt, and gravel and can contain fossils.

Environmental Consequences

Segments 1 and 3 will not impact soils, geology, or paleontology. The segment 2 retaining walls are fill walls and will not impact soils, geology, or paleontology. Minor regrading is proposed for segment 2 and could include cuts up to 3-5 feet deep on the side slopes.

There are no geologic or seismic impacts from this project. There will be no increase in risk of seismic activity to the traveling public as a result of any part of this project.

Avoidance, Minimization, and/or Mitigation Measures

To address the potential for disturbing significant fossils, a Paleontological Mitigation Plan and/or a Paleontological Evaluation Report will need to be prepared when the limits and depth of excavation are known. The PER should address whether the proposed excavation has the potential to reach into the potentially fossiliferous Montezuma Formation.

2.2.4 PALEONTOLOGY

Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils.

A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects.

16 United States Code (USC) 461-467 established the National Natural Landmarks (NNL) program. Under this program property owners agree to protect biological and geological resources such as paleontological features. Federal agencies and their agents must consider the existence and location of designated NNLs, and of areas found to meet the criteria for national significance, in assessing the effects of their activities on the environment under NEPA.

23 USC 1.9(a) requires that the use of Federal-aid funds must be in conformity with all federal and state laws.

23 USC 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

Under California law, paleontological resources are protected by the CEQA.

Affected Environment

A Geological and Paleontological Impact Memo was issued on November 2, 2017.

Most of the project lies in agricultural land underlain by the Pleistocene Montezuma Formation (Graymer and Brabb, 2002). The Montezuma Formation consists of sand, silt, and gravel and can contain fossils.

Environmental Consequences

Segments 1 and 3 will not impact soils, geology, or paleontology. The segment 2 retaining walls are fill walls and will not impact soils, geology, or paleontology. Minor regrading is proposed for segment 2 and could include cuts up to 3-5 feet deep on the side slopes.

There are no geologic or seismic impacts from this project. Potential paleontological impacts will be assessed in the PER when the limits of excavation are known.

Avoidance, Minimization, and/or Mitigation Measures

To address the potential for disturbing significant fossils, a Paleontological Mitigation Plan and/or a Paleontological Evaluation Report will need to be prepared when the limits and depth of excavation are known. The PER should address whether the proposed excavation has the potential to reach into the potentially fossiliferous Montezuma Formation.

2.2.5 HAZARDOUS WASTE/MATERIALS

Affected Environment

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

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

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

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

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

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

Affected Environment

In the project's general vicinity, there is minor lead contamination in shallow soils. However, soil sampling work has not occurred along the Solano-12 corridor close to the City of Rio Vista, where the project is proposed. The project anticipates using almost exclusively imported soil for widening work. In the locations where excavations are planned, Caltrans will collect data to know if the soil is contaminated. Any soil sampling work will be completed in the design phase.

The project proposes plans to acquire additional ROW from adjacent property owners. These locations have a likely history of agriculture use. Therefore, it will be necessary to do soil and groundwater testing on these properties to rule out pesticide contamination factors.

In sum, the project would not result in any increased hazards or hazardous materials 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.

Environmental Consequences

Aerially deposited lead (ADL) from the historical use of leaded gasoline, exists along roadways throughout California. There is the likely presence of soils with elevated concentrations of lead as a result of ADL on the state highway system ROW within the limits of the project alternatives. Soil determined to contain lead concentrations exceeding stipulated thresholds must be managed under the July 1, 2016, ADL Agreement between Caltrans and the California Department of Toxic Substances Control. This ADL Agreement allows such soils to be safely reused within the project limits as long as all requirements of the ADL Agreement are met.

Avoidance, Minimization, and or Mitigation Measures

AMM HAZ-1: Private property owners are legally responsible to cleanup-regulated contamination on their properties. A soil investigation would be conducted during the project's design phase to characterize the soil to be excavated. Based upon the soil testing results, specifications for proper soil handling and management will be developed and incorporated into the construction contract documents.

AMM HAZ-2: During construction, measures will need to be taken to protect against the accidental spillage of gasoline and other contaminants.

2.2.6 AIR QUALITY

Regulatory Setting

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act (CCAA) is its companion state law. These laws, and related regulations by the U.S. EPA and the California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM)—which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM₁₀) and particles of 2.5 micrometers and smaller (PM_{2.5})—and sulfur dioxide (SO₂). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H₂S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the NEPA. In addition to this environmental analysis, a parallel “Conformity” requirement under the FCAA also applies.

Conformity

The conformity requirement is based on FCAA Section 176(c), which prohibits the USDOT and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The proposed build alternative must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 Code of Federal Regulations (CFR) 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), and in some areas (although not in California), sulfur dioxide (SO₂). California has nonattainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO₂, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to

determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), FHWA, and Federal Transit Administration (FTA) make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed build alternative meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and scope³ that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and EPA-approved emissions models; and in PM areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts.

Affected Environment

This proposed build alternative does not increase traffic capacity. Thus, it is not anticipated to affect air quality. This project is exempt from project level (40 CFR 93.126) conformity requirements. Separate listing of the project in the Regional Transportation Plan and Transportation Improvement Program, and their regional conformity analyses, is not necessary. The project will not interfere with timely implementation of Transportation Control Measures identified in the applicable SIP and regional conformity analysis. The Transportation Improvement Plan ID for this project is VAR 170010, and the CTIPS ID 20600006107. Effects to air quality could result during the project’s construction phase but would be temporary. Measures to reduce the temporary effects has been incorporated into the project and is listed in **Appendix E**.

Construction Impacts:

Environmental Consequences

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other construction-related activities¹. Emissions from construction equipment also are expected and would include carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOCs), directly-emitted particulate matter (PM₁₀ and PM_{2.5}), and toxic air contaminants such as diesel exhaust particulate matter. Ozone is a regional pollutant that is derived from NOx and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction typically involves clearing, cut-and-fill activities, grading, removing or improving existing roadways, building bridges, and paving roadway surfaces. Construction-

³ "Design concept" means the type of facility that is proposed, such as a freeway or arterial highway. "Design scope" refers to those aspects of the project that would clearly affect capacity and thus any regional emissions analysis, such as the number of lanes and the length of the project.

related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. These activities could temporarily generate enough PM₁₀, PM_{2.5}, and small amounts of CO, SO₂, NO_x, and VOCs to be of concern. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site could deposit mud on local streets, which could be an added source of airborne dust after it dries. PM₁₀ emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM₁₀ emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the United States Environmental Protection Agency (U.S. EPA) to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. Caltrans' Standard Specifications (Section 14) on dust minimization require use of water or dust palliative compounds and will reduce potential fugitive dust emissions during construction.

In addition to dust-related PM₁₀ emissions, heavy-duty trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO₂, NO_x, VOCs and some soot particulate (PM₁₀ and PM_{2.5}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO₂ is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel (not more than 15 ppm sulfur), so SO₂-related issues due to diesel exhaust will be minimal.

Some phases of construction, particularly asphalt paving, may result in short-term odors in the immediate area of each paving site(s). Such odors would quickly disperse to below detectable levels as distance from the site(s) increases.

Most of the construction impacts to air quality are short-term in duration and, therefore, will not result in long-term adverse conditions. Implementation of the following standardized measures, some of which may also be required for other purposes such as storm water pollution control, will reduce any air quality impacts resulting from construction activities:

- Caltrans will follow these standard project features:
 - Specifically require compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
 - Directly controlling dust. If dust palliative materials other than water are to be used.

- Water or dust palliative will be applied to the site and equipment as often as necessary to control fugitive dust emissions. Fugitive emissions generally must meet a “no visible dust” criterion either at the point of emissions or at the right-of-way line, depending on local regulations.
- Soil binder will be spread on any unpaved roads used for construction purposes, and on all project construction parking areas.
- Trucks will be washed as they leave the right-of-way as necessary to control fugitive dust emissions.
- Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by California Code of Regulations Title 17, Section 93114.
- A dust control plan will be developed documenting sprinkling, temporary paving, speed limits, and timely revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.
- Equipment and materials storage sites will be located as far away from residential and park uses as practicable. Construction areas will be kept clean and orderly.
- ESA-like areas or their equivalent will be established near sensitive air receptors. Within these areas, construction activities involving the extended idling of diesel equipment or vehicles will be prohibited, to the extent feasible.
- Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, will be used.
- All transported loads of soils and wet materials will be covered before transport, or adequate freeboard (space from the top of the material to the top of the truck) will be provided to minimize emission of dust (particulate matter) during transportation.
- Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to decrease particulate matter.
- To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.
- Mulch will be installed or vegetation planted as soon as practical after grading to reduce windblown particulate in the area.

Construction Conformity

Construction activities will not last for more than 5 years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123(c)(5)).

In addition to construction impacts on air-quality, the proposed build alternative was analyzed for potential GHG emissions caused by construction of the proposed build alternative. The analysis is provided in the Climate Change section of Chapter 3, following the CEQA checklist.

Climate Change

Neither the U.S. EPA nor the FHWA has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and executive orders on climate change, the issue is addressed in the CEQA chapter of this document. The CEQA analysis may be used to inform the NEPA determination for the project.

Avoidance, Minimization, and or Mitigation Measures

AMM AIR-1: Equip all internal combustion engine driven equipment with manufacturer recommended intake and exhaust mufflers that are in good condition and appropriate for the equipment.

AMM AIR-2: Use energy and fuel-efficient vehicles and equipment

AMM AIR-3: Use alternative (non-petroleum based) fuels

AMM AIR-4: Construction activities are short-term, however, implementation of Caltrans Standard Specifications, such as complying with air-pollution-control rules, regulations, ordinances, and statutes that apply to work performed under the Contract and the use of construction best management practices, e.g. (1) Regular vehicle and equipment maintenance (2) Limiting idling of vehicle and equipment onsite.

AMM AIR-5: In addition, with innovations such as longer pavement lives, improvement in traffic management and changes in materials, construction-related GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

AMM AIR-6: Solid waste will be reduced, recycled, and reused to the maximum extent feasible.

AMM AIR-7: Improve fuel efficiency from construction equipment by minimizing idling time and maintaining construction equipment in proper working condition.

2.2.7 NOISE

Regulatory Setting

NEPA of 1969 and the CEQA provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed build alternative will have a noise impact. If a proposed build alternative is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The rest of this section will focus on the NEPA/23 Code of Federal Regulations Part 772 (23 CFR 772) noise analysis; please see Chapter 3 of this document for further information on noise analysis under CEQA.

National Environmental Policy Act and 23 CFR 772

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

Figure 14: Noise Levels of Common Activities

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
Quiet Rural Nighttime	30	Bedroom at Night, Concert Hall (Background)
	20	Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

According to Caltrans' Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, August 2006, or if the project is using the 2011 Noise Protocol Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

Affected Environment

For reasons described below, a noise study comparing the completed project with current noise quality was not required. However, a Construction Noise Analysis Study was completed on January 10, 2019. This study analyzed the construction impacts alone. The findings of that study are detailed below. In order to complete that study, 33 receptors were identified.

Environmental Consequences

The project is not a Type I per 23 CFR 772. Generally, a Type I project is a project to build new highway in a new location, to add capacity or a travel lane to an existing highway, or to add a new or substantially alter a weigh station, rest stop, ride-share lot or toll plaza. The proposed project does not qualify as any of the categories described in 23 CFR 772. Therefore, a traffic noise study is not required. However, because of receptors in close proximity (shown in **Table 1**) along with the likelihood that portions of the project will take place at night, construction noise was evaluated. The analysis method used to determine whether adverse construction noise impacts in the project area would arise was the FHWA Roadway Construction Noise Model (RCNM).

Table 10 below followed by Figures 1 - 8 show the 33 receptor locations chosen for this study. Residential areas are the most sensitive to construction noise especially during nighttime and therefore a greater proportion were chosen for this analysis. Of the 33 receptor locations chosen, 27 are residential while the remaining six consist of commercial, and institutional (churches). Additionally, hypothetical non-specific locations were modelled at common whole number distances of 50 feet, 100 feet, 200 feet and 500 feet from the project boundary to provide a perspective on noise levels at these general project offsets.

Summary Noise Level Results

Table 10: Receptors and hypothetical locations exceeding 86 dBA:

Map Label	Segment	Address	Type	Receptor Distance (ft)	Place & remove K-rail along with striping operations		Excavating and Grading		Asphalt		Demolishing existing structures (curb, sidewalk, driveway)		Install Drainage system	
					Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
None	1	Segment 1 - Hypothetical location at 50 ft	-	50	89.5	86.6	89.6	88.6	85	86.1	-	-	89.6	87.8
None	2	Segment 2 - Hypothetical location at 50 ft	-	50	89.5	86.6	89.6	88.6	85	86.1	-	-	89.6	89
K	2	141 Alpine Dr. Rio Vista CA 94572	Residential	49	89.7	86.8	89.8	88.8	85.2	86.3	-	-	89.8	89.2
N	2	163 Alpine Drive Rio Vista, CA 94571	Residential	54	88.8	86	88.9	87.9	84.3	85.5	-	-	88.9	88.3
S	2	672 Sandpiper Pl, Rio Vista, CA 94571	Residential	72	86.3	83.5	86.4	85.4	81.8	83	-	-	86.4	85.8
W	2	no street number CA-12, Rio Vista, CA 94571	Residential	52	89.2	86.3	89.2	88.3	84.7	85.8	-	-	89.2	88.6
None	3	Segment 3 - Hypothetical location at 50 ft	-	50	89.5	86.6	89.6	88.6	85	86.1	89.6	86.3	89.6	87.8
DD	3	120 N 6th St, Rio Vista, CA 94571	Residential	49	89.7	86.8	89.8	88.8	85.2	86.3	70.8	67.5	89.8	88
FF	3	Trendsetters 210 CA-12 Rio Vista, CA 94571	Commercial	20	97.5	94.6	97.5	96.6	93	94.1	89.8	86.4	97.5	95.8

* Per a 2/6/19 site visit, receptor W is no longer considered as it appeared to be boarded up.

Table 3 above shows receptors and hypothetical location lines where construction noise levels will exceed 86dBA. This table bears out the following:

Segment 1

No construction noise impacts. Although the hypothetical location line at 50 ft indicates receptors within this project distance would experience noise levels greater than 86 dBA, no receptors are present within this distance.

Segment 2

Construction noise impacts are indicated per the hypothetical location line at 50 ft for segment 2 and by receptors K, N and S. Widening within this section consists of adding 10.5 ft of pavement to either side of SR 12. To note, a portion of the approximately 3,000 household Trilogy retirement community borders SR 12. Eighteen homes on the south side of Alpine Drive as represented by receptors K, N and S are approximately 50 feet from the SR 12 project limit. Backing and running the length of these 18 homes along SR 12 is an approximately 8ft-high wall. Although the barrier provides some mitigation, further mitigation measures for these 18 homes should be addressed. Further, receptor W is a residence off of SR 12 for which no street number was found. It is located 52 feet from the project. The property appears to be occupied but it is not clear. Update - per a site visit of 2/6/19, receptor W appeared to be boarded up. It is therefore no longer considered as a receptor of concern.

Segment 3

Receptor DD lies within a group of 5 residences at the intersection of North 6th Street and Logan Drive, the back sides of which are approximately 50 feet from the project limits. Receptor FF is identified as the Trendsetters hair salon. It is among approximately 6 businesses on the north side of SR 12 which experience high noise level readings owing to their very close proximity to the project of less than 30 feet.

Project Features:

PF NOISE-1: If feasible, schedule construction activities during the day, between 6:00 a.m. to 9:00 p.m.

PF NOISE-2: Combine noisy operations to occur within the same time period. The total noise level will not be significantly greater than the level produced if operations are performed separately.

PF NOISE-3: Construct noise barriers (temporary enclosures or stockpiles of excavated material) between noisy activities and noise sensitive receptors or around activities with high noise levels or group of noisy equipment (e.g. shields can be used around pile drivers).

PF NOISE-4: Stage equipment at grade (same elevation or lower than residences) and if possible, away from sensitive receptors.

PF NOISE-5: Avoid unnecessary nighttime idling of internal combustion engines within 100 feet of sensitive receptors.

PF NOISE-6: Locate all stationary noise-generating construction equipment as far as practical from noise-sensitive receptors or provide baffled housing or sound aprons to equipment when sensitive receptors adjoin or are near a construction project area.

PF NOISE-7: Equip all internal combustion engine driven equipment with manufacturer recommended intake and exhaust mufflers that are in good condition and appropriate for the equipment.

PF NOISE-8: Utilize “quiet” air compressors and other “quiet” equipment where such technology exists.

PF NOISE-9: Maintain all internal combustion engines properly to minimize noise generation.

2.3 BIOLOGICAL ENVIRONMENT

The following analysis is based on the Natural Environment Study (NES) prepared for the Solano Highway 12, 3R, Roadway Rehabilitation Project 04-OJ630 (Caltrans 2019) and various other surveys completed for this project. These surveys include, habitat and community characterizations and assessments, Large Branchiopod Habitat Assessment, California Tiger Salamander Habitat Assessment, Giant Garter Snake Habitat Assessment, Tree Survey Report, Rare Plant Survey Report, Wetland Delineation Report, Soils Report, Essential Fish Habitat Assessment.

2.3.1 NATURAL COMMUNITIES

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. 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 are discussed below in the Threatened and Endangered Species section 2.3.5. Wetlands and other waters are also discussed below in section 2.3.2.

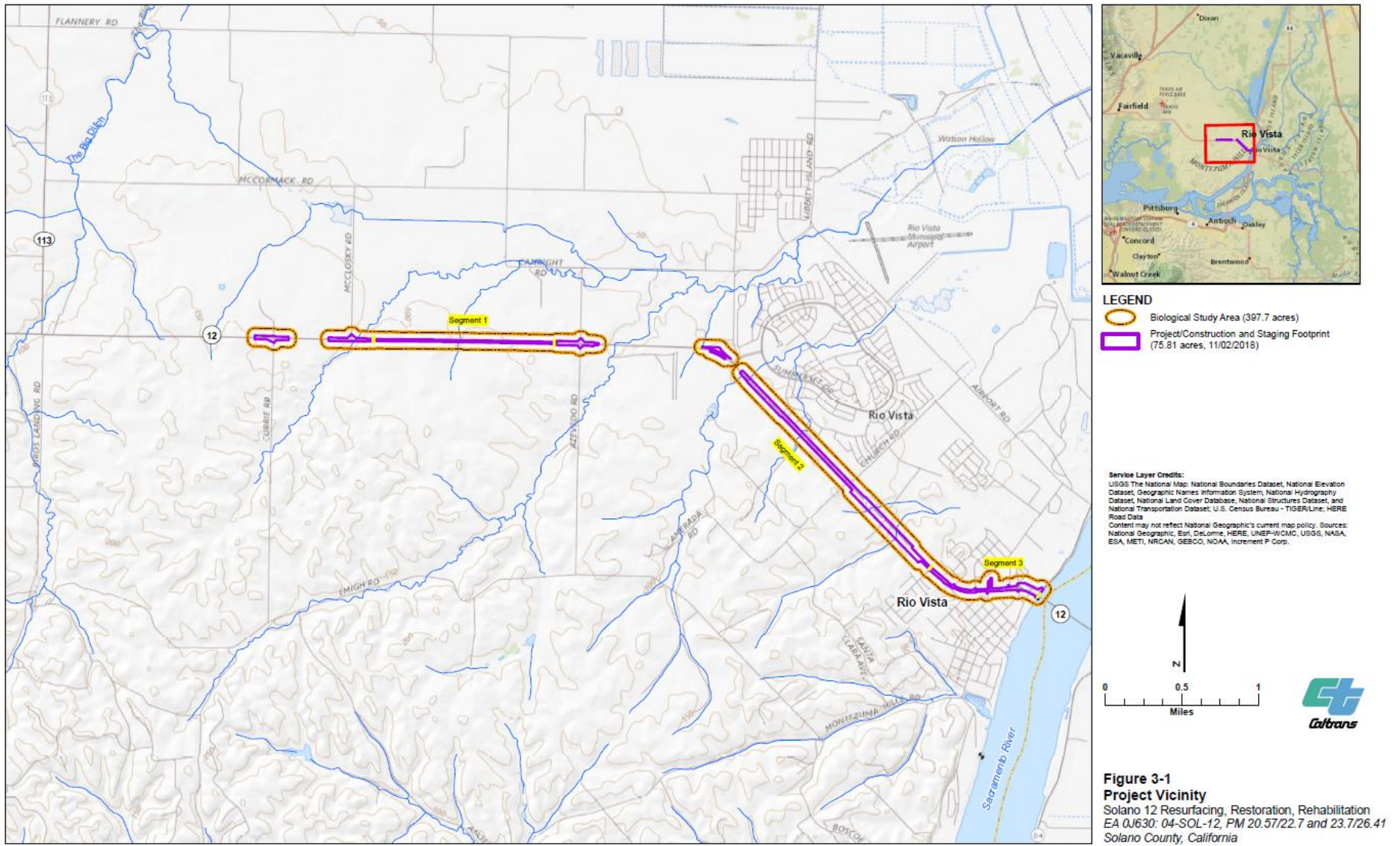
Affected Environment

Caltrans' Office of Biological Sciences and Permits prepared a Natural Environment Study (NES) in March of 2019. This study documented the potential effects of the proposed alternatives on nearby biological resources. A biological study area (BSA) was surveyed that includes all areas that could potentially be impacted by the project. The BSA for the proposed project is located along SR 12, between the intersection of west of Currie Road to the Rio Vista Bridge and N. Front Street in the City of Rio Vista. This includes the project footprint, Caltrans' ROW, and additional areas beyond the ROW that would reasonably be either direct or indirectly impacted by the proposed project.

This portion of SR 12 is located within the Montezuma Hills and is characterized by rolling hills and mostly bordered to the east by alluvial plains of the Great Valley and by the Suisun Bay to the south. The area in the vicinity of the Project is part of the Valley Putah-Cache Creek Watershed, which drains 305 square miles of the Lower Sacramento River and is characterized by a series of gently rolling east-trending hills and low swales with elevations ranging from approximately 50 to 205 feet above sea level. The Sacramento River is directly adjacent to segment 3 of the project. Wildlife species that occupy the project area include invertebrates, fish, amphibians, reptiles, birds, and small mammals.

The vegetation types identified within the BSA support a variety of wildlife species, including mammals, birds, amphibians, reptiles, and fishes. Please see **Figure 17** for the map of the BSA within the project vicinity. Marsh habitats can provide habitat for fish nurseries, amphibians, aquatic reptiles, wading birds, waterfowl, and songbirds. Riparian woodland can provide foraging, roosting, and nesting habitat for a variety of birds and provide cover and refuge sites for small mammals, amphibians, and reptiles. Detailed descriptions of each habitat and vegetation mapping are described in greater detail in the NES.

Figure 17: Map of the BSA of each segment within the project vicinity.



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The Solano Plain represents one of the last areas in California where remnant Valley Needlegrass Prairie associations exist. It is also one of the more important regions where claypan and hardpan vernal pools and hog wallows exist in a landscape spotted with mima mound formations. The Jepson Prairie Preserve, located approximately 10 miles north of the BSA, is one of the most important centers of native grassland and vernal pool diversity in the State. Most of the original prairie and vernal pool lands of the Solano Plain in the vicinity of the Project area have been converted to farmland, leaving only scattered isolated areas where the original landscape features and unique prairie and vernal pool habitat remain. These natural communities have previously been both directly and indirectly impacted by human activities due to their close proximity SR-12. These include but are not limited to constantly being disturbed (ruderal) by mowing, herbicides, vehicular traffic, and disking.

The NES identified ten general habitat types within the BSA: developed, agricultural, annual grassland, vernal pool, seasonal wetland, seasonal swale, ephemeral drainage, ditch, emergent marsh, and open water aquatic riverine within the project footprint. Wetlands compared to the various habitats present within the BSA, are considered sensitive habitat types. Impacts to aquatic and wetland habitats are discussed in **Section 2.3.2, Wetlands and Other Waters**, which discusses jurisdictional wetlands and other waters within the BSA. The other general habitat types are discussed below.

- **Developed.** Developed areas consist of anthropogenic features including buildings, roads, sidewalks, golf courses, farm operations and associated horticultural vegetation (landscaping). Vegetation includes eucalyptus species (*Eucalyptus sideroxylon*, *E. polyanthemos*, *E. pulverulenta*, and *E. globulus*), oleander (*Nerium oleander*), coast redwood (*Sequoia sempervirens*), maples (*Acer* sp.), fruitless mulberry (*Morus* sp.), Deodar cedar (*Cedrus deodara*), scarlet firethorn (*Pyracantha* sp.), iceplant (*Carpobrotus edulis*), rose (*Rosa* spp.), rhododendron (*Rhododendron* spp.), and herbs including lawn grasses (e.g. Fescue [*Festuca* spp.], blue grass [*Poa* spp]), and perennial and annual flowers (e.g., iris [*Iris* spp.], violets [*Viola* spp.]). Developed habitats, agricultural, and annual grasslands habitats (described below) are the three most abundant types in the action area.

- **Agricultural.** This habitat type consists mostly of fallow and cultivated lands that are planted with wheat or other grains that can grow from the winter rains. This habitat was separated from the more natural annual grassland habitat (described below) based on disking patterns observed in the field or on the aerial photos. This habitat also includes individual non-native trees that occur along the edge of SR 12 within the eastern half of the action area. The majority of the agricultural lands in the action area occurred on the southern side of SR 12.

- **Annual Grassland.** Annual grassland habitat in the action area occupies the valleys as well as the surrounding foothills. Non-native annual grassland composed primarily of weedy non-native grasses and forbs is the predominant habitat type within the existing Caltrans ROW, with small-unvegetated gravel areas adjacent to rural residential sites and other unvegetated patches of ground. Typical non-native grasses in this area include wild oat (*Avena barbata*), rip-gut brome (*Bromus diandrus*), Italian ryegrass (*Lolium multiflorum*), and Mediterranean barley (*Hordeum marinum*). Common non-native forbs include fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), burclover (*Medicago polymorpha*), vetch (*Vicia sativa*), filaree (*Erodium botrys*), bristly ox-tongue (*Picris echioides*), summer mustard (*Hirschfeldia incana*), black mustard (*Brassica nigra*), yellow star-thistle (*Centaurea solstitialis*), and cut-leaf geranium (*Geranium dissectum*). The 1B.2 rare Pappose tarplant (*Centromadia parryi*) was observed

onsite. Agricultural land is the most common land use adjacent to the ROW and includes pasturelands and areas cultivated for dry-land grains such as wheat and barley. Like agricultural habitat (described above), the annual grassland habitat includes individual non-native trees that occur singularly along the edge of SR 12 within the eastern half of the action area.

- **Vernal Pool.** Vernal pools are seasonally flooded depressions where water ponds because of limitations to surface or subsurface drainage due to an aquitard or other compact layer. Surface drainage is prevented by a depressed or concave topography. Soil layers impervious to the downward infiltration of water inhibit subsurface drainage resulting in swallow ponding during the wet-season. Vernal pools support distinct native vegetation adapted to periodic or continuous inundation during the wet season, and the absence of either ponded water or wet soil during the dry season. Typical vernal pools occurring in the Sacramento Valley are dominated by popcorn flower (*Plagiobothrys stipitatus*), Fremont's goldfield (*Lasthenia fremontii*), common blennosperma (*Blennosperma nanum*), silver hairgrass (*Deschampsia danthonioides*), water pygmy-weed (*Crassula aquatica*), common spike rush (*Eleocharis macrostachya*), hedge-hyssop (*Gratiola ebracteata*), and American pillwort (*Pilularia americana*).

- **Seasonal Wetland.** Seasonal wetlands are shallow to deep topographic depressions underlain by soils with slow water permeability that promote ponding or soil saturation during the wet season. In the action area, seasonal wetlands occur predominantly at the terminus of swales or in low depressions within the disked fringes of agricultural fields or annual grasslands. One seasonal wetland was observed in the City of Rio Vista south of SR 12 near milepost (PM) 26.1. Seasonal wetlands support a number of plant species adapted to periodic inundation during the growing season. Typical seasonal wetland plant species include Italian ryegrass, rabbit's foot grass (*Polypogon monspeliensis*), Bermuda grass (*Cynodon dactylon*), curly dock (*Rumex crispus*), Mediterranean barley, toad rush (*Juncus bufonius*), and umbrella sedge (*Cyperus eragrostis*). A small seasonal wetland, near PM 26.1, supported saltgrass (*Distichlis spicata*), mugwort (*Artemisia douglasiana*) and curly dock.

- **Seasonal Swale.** Seasonal swales are broad, shallow, seasonally wet areas that primarily convey water during and shortly after rain events. Surface runoff collects in swales, wetting and saturating the soil for short periods. Swales are typically vegetated and have somewhat defined channels but lack an eroded bed and bank characterizing ephemeral drainages described below. Seasonal swale vegetation is a transitional community that is wetter than the surrounding annual grassland and agricultural lands but typically drier than the vernal pools or seasonal wetlands. This community varies from supporting a prevalence of wetland vegetation (hydrophytic - "water loving" plants) to supporting a mixture of upland (non-hydrophytic) and wetland vegetation. Typical seasonal swale plant species in the action area include Mediterranean barley, Italian ryegrass, curly dock, spiny cocklebur (*Xanthium spinosum*), nut sedge, and rabbits foot grass. A few of the seasonal swales in the action area integrate with ephemeral drainages habitats described below.

- **Ephemeral Drainage.** Ephemeral drainages are sparse to moderately vegetated (10 to 30 percent total cover) watercourses with well-defined beds and banks derived from erosional forces of flowing water (lotic). The ephemeral drainages within the action area are moderately sloped and convey surface runoff during and shortly after rainfall events, and except for the occasional deep pool are dry for the remainder of the year. Although varying in size, slope, and degree of incision, most ephemeral drainages in the study area are 0.3 to 1 meter in width and 0.3 to 1.6 meters deep. The ephemeral drainages

support a sparse assemblage of plant species associated with seasonal swales and seasonal wetlands described above.

- **Ditch.** Ditch habitat in the action area consists of small (0.3 to 0.6 meter wide and less than 0.5 meter deep) human excavated habitats. The majority of the ditches in the action area occur along the edges of roads and SR 12. These ditches were constructed for road drainage and the vegetation composition varies depending on soils, slope, and contributing hydrology (watershed). At dry sites (xeric), vegetation is similar to annual grasslands. In contrast, moist sites (mesic) support species that occur in the seasonal wetlands. One ditch habitat within the action area (located between PM 24.1 and PM 24.2) receives irrigation runoff from the adjacent golf course.

- **Emergent Marsh.** Emergent marsh is characterized by a dominance of perennial monocots that grow in permanently or semi-permanently flooded/saturated soil conditions that emerge from fresh water. They generally differ from seasonal wetlands in their vegetative composition (mostly lacking forbs as dominants) and duration of ponding and soil saturation (usually greater than 4 months). Emergent marsh habitat was observed in two locations within the action area. The first location consists of a small patch of tule (*Schoenoplectus acutus*) located at the extreme western limit of the action area growing along the edge of the Sacramento River (see Open Water Aquatic Riverine below). The second location consisted of a few small patches of cattails (*Typha* sp.) growing in the ephemeral drainage south of SR 12 between PM 25.3 and PM 25.4.

- **Open Water Aquatic Riverine.** As its name implies, this habitat consists of open water aquatic habitat associated with the Sacramento River. In general, the turbid, moderately fast flowing water precludes vegetation establishment except along its edges. There is 0.2 acres of open water habitat in the action area.

Habitats and Natural Communities of Special Concern-Critical Habitat

Segment 3 of the project includes 0.2 acres of Sacramento River winter run chinook salmon, fall/late fall run chinook salmon, Central Valley spring-run chinook salmon (70 FR 52488), Central Valley steelhead, delta smelt, longfin smelt, and southern green sturgeon critical habitat. In determining what areas are critical habitat, the federal agencies consider both physical and biological features that are essential to the conservation of a given species and that may require special management considerations or protection. Such primary constituent elements (PCEs) include, but are not limited to, the following: (1) Space for individual and population growth, and for normal behavior; (2) Food, water, air, light, minerals, or other nutritional or physiological requirements; (3) Cover or shelter; (4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally; (5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species (NMFS 2009).

Environmental Consequences

The NES identified potential impacts to the natural communities and habitats previously mentioned. These impacts are the result of construction work, access, and staging for the Project.

The project area contains migratory habitat for all fish species addressed in this document, that has temporary and insignificant affects from minimal sedimentation during the dewatering process. Insignificant impacts from increased sedimentation could degrade physical and biological features of the migratory corridors, estuarine areas, and critical habitat.

Removal of potential nesting trees along SR 12, loss of potential foraging habitat and disturbance from construction activities are impacts are anticipated with this Project. The removal of 74 trees adjacent to State Route 12 is potential roosting and nesting trees for migratory birds including Swainson's hawk.

Loss of suitable vernal pool habitat from construction activities are anticipated with this project. Changes in hydrology, and possible degradation of water quality is anticipated. CTS impacts include loss of dispersal habitat, and potential mortality from individuals in the project area during active construction.

Adverse effects related to wetlands and other waters of the U.S., are discussed in **Section 2.3.2, Wetlands and Other Waters.**

Construction activities, such as earth-moving or staging, would result in the temporary loss of ground cover. All temporarily disturbed areas would be revegetated. Overall, project construction would have minimal effects on the natural communities within the study area and would be further minimized by implementing several natural community-related AMMs, which are described in **Appendix D Avoidance, Minimization and/or Measures.**

Adverse effects related to special-status plant and animal species associated with the remaining habitat types of the BSA are discussed in **Sections 2.3.3, Plant Species; 2.3.4, Animal Species; and 2.3.7, Threatened and Endangered Species.**

Trees

A total of 109 trees were inventoried consisting of 63 California ash (*Fraxinus dipetala*); 38 *Eucalyptus* including red ironbark (*Eucalyptus sideroxylon*) located on the eastern end of the Project footprint and blue gum (*Eucalyptus globulus*) located throughout the Project footprint; 2 black locus (*Robinia pseudoacacia*) located on the bank of the Sacramento River; 2 interior live oak (*Quercus wislizeni*) in front of an abandoned house; 2 London planetree (*Platanus x acerifolia*); and 2 Northern California Black Walnut (*Juglans hindsii*).

The trees in the Project footprint are located in upland habitat and are not considered riparian vegetation. Approximately 74 trees non-riparian trees, east of Summerset Road to Drouin Drive, are set to be removed to make room for roadway improvements. The project footprint maps in **Appendix C** contains the locations of the proposed tree removal.

The following project features will reduce the above:

ESA Fencing. The final construction plans will show all ESAs (including areas that may potentially support sensitive species as described in Section 2.3.3 and 2.3.4 below). Caltrans will delineate all environmentally sensitive areas on the final construction plans. The USFWS-approved Biological Monitor

will be onsite to direct the installation of this fencing. Fencing will then be installed on an as-needed basis such as when bird nests are established.

Vegetation Control. The removal of native vegetation will be confined to the minimal area necessary to facilitate construction activities. Temporarily affected areas where vegetation is to be removed, will be re-vegetated (e.g., hydro-seeding and installation of woody plants) with locally appropriate native plant species. Narrow leaved milkweed (*Asclepias fascicularis*) and/or showy milkweed (*A. speciosa*) will be added to the seed mix to enhance habitat for the monarch butterfly.

Seasonal Avoidance. To the extent practicable, construction will not occur during the wet season. All in-water work (including cofferdam installation, sheet pile driving, and geotechnical investigation) will be conducted between July 1 to October 15 only. To the extent practicable, nighttime construction will be minimized. In-water work will be conducted during daylight hours only to provide fish in the action area with an extended quiet period during nighttime hours for feeding and unobstructed passage.

- For CTS, work in the vicinity of water crossings will be scheduled to occur between May 15th and October 15th.
- For seasonal avoidance of the delta smelt, construction will not occur outside of the cofferdam from October 15 through July 31 to the maximum extent practicable.
- To the extent practicable, Caltrans and its contractors will initiate all work in or within 250 feet of potential habitat for vernal pool crustaceans between May 1 and November 1. When construction activities must take place after November 1 and before May 1, daily biological monitoring will occur for the vernal pool crustaceans.

Worker Environmental Awareness Training. Construction personnel will attend a mandatory environmental education program delivered by the USFWS-approved Biological Monitor(s) prior to any ground disturbance, vegetation clearing, or construction activities. The program will focus on the conservation measures that are relevant to an employee's personal responsibilities and will include an explanation as how to best avoid take of special status species. At a minimum, the training will include a description of the special status species and how they may be encountered within the action area; their status and protection; and the relevant Conservation Measures and Terms and Conditions of the BO. A fact sheet conveying this information will be prepared and distributed to all construction and project personnel.

Trash Management. All food-related trash items, such as wrappers, cans, bottles, and food scraps, will be disposed of in closed containers and removed from the entire project site at the end of each workday.

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.

Pre-construction Surveys. A biologist approved by USFWS and 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 when special-status species have the highest likelihood of being harmed or harassed. If at any point any listed species is discovered within the project limits, a 50-foot work restriction buffer will be applied until the animal moves out of the area or once it is relocated out of harm's way. USFWS and CDFW will be contacted on how best to proceed.

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.

Vegetation Removal. Vegetation within the project limits will 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 feet for passerines and 300 feet for raptors, before clearing activities begin during the nesting season (February 1 through August 31). All cleared vegetation will be removed from the study area 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.

Vegetation Removal. Vegetation and tree removal would be minimized as much as practicable to construct the project. This would minimize impacts to the availability of habitat for wildlife species. Areas where vegetation removal has occurred will be replanted as soon as those areas are no longer needed for construction activities along. Replanting is done with native species of both woody vegetation and grasses that are appropriate for the habitat of the area where the removal has occurred.

Staging: Staging, storage, and parking areas will be located on paved or graveled surfaces outside of any designated ESAs, as specified by the project biologist. This will avoid construction impacts to natural communities.

Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and/or mitigation measures specific to wetlands and other waters of the U.S., including aquatic and wetland habitat, are discussed in **Section 2.3.2, Wetlands and Other Waters**. Measures specific to adverse effects to special-status plant and animal species associated with the natural communities of the BSA are discussed in **Sections 2.3.3, Plant Species; 2.3.4, Animal Species; and 2.3.5, Threatened and Endangered Species and 2.3.7 Avoidance and Minimization Measures and Project Mitigation Measures**.

2.3.2 WETLANDS AND OTHER WATERS

Regulatory Setting

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

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

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

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

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency, such as FHWA and/or 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 proposed build alternative includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

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

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

Affected Environment

Caltrans' Office of Biological Sciences and Permits' Natural Environment Study (March 2019) also assessed potential impacts to wetlands and other waters. A field delineation was performed on January 22, 2019 to identify potentially jurisdictional wetlands and waters of the U.S. that would be subject to regulation under Section 401 and Section 404 of the Clean Water Act.

A delineation of wetlands and waters of the U.S. in or near the Project site was conducted in November 2018. to preliminarily delineate jurisdictional wetlands and other waters of the U.S., which are regulated by the USACE, and other federal waters of the State regulated by the RWQCB and CDFW. The delineations were conducted in accordance with USACE guidance.

A 76.1-acre project study area in accordance with the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987), the Arid West Regional Supplement (USACE2008), and the A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States (Lichvar and McColley 2008). The study area contains 0.295 acre of potential wetlands and 0.452 acre of potential non-wetland waters of the United States.

The jurisdictions of individual features as discussed in this section have not yet been officially verified by the USACE. A wetland verification site visit will be attended by USACE and Caltrans during the next project phase (PS&E) for official verification. If the delineated wetlands are determined to be USACE-jurisdictional, impacts to these wetlands due to project-related activities are likely to require a Section 404 permit issued by the USACE (a Regional or Nationwide General Permit if possible; an Individual Permit only if a General is not possible). However, wetlands determined to be isolated wetlands, and not USACE-jurisdictional, remain potentially State jurisdictional since isolated waters are considered waters of the State.

Sections 1601 through 1606 of the California Fish and Game Code require that a Streambed Alteration Application be submitted to CDFW for “any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake.” CDFW will review the proposed action and, if necessary, provide Caltrans with a proposal for measures to protect State-listed fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and Caltrans is the Streambed Alteration Agreement. Often, projects that require a Streambed Alteration Agreement also require a permit from the USACE under Section 404 of the Clean Water Act.

Environmental Consequences

The Build Alternative is the only action alternative moving forward for the proposed project. Other alternatives were considered but eliminated as none were deemed viable because of physical constraints and feasibility, or because they did not meet the project’s purpose and need. See **Section 1.3.1, Project Alternatives**.

Direct Impacts

The proposed project will result in unavoidable impacts to potentially jurisdictional Waters of the U.S., including up to 0.706 acre of ephemeral waters and 0.295 acre of seasonal wetlands. A total of 0.197 acre of perennial waters was delineated at the Sacramento River. Perennial waters are terrestrial waters such as lakes and ponds. The area of impact in the Sacramento River is not known at this time but is expected to be less than 0.1 acre. Maps of potential wetlands and waters of the U.S. can be found in **Appendix F. Biological Figures** but have yet to be confirmed by the USACE.

Indirect Impacts

The proposed build alternative will result in temporary impacts to 0.2 acres of open water critical habitat in the Sacramento River. Jurisdiction of the river is currently the responsibility of both the USACE and Central Valley Flood Protection Board and permission will have to be approved for any construction work on the riverbanks.

Permitting

A Section 404 permit is necessary when a project will result in fill to waters under USACE jurisdiction. A preliminary jurisdictional delineation of these resources will be completed and submitted to USACE for verification. The Build Alternative would result in permanent and temporary effects to wetland and water features within the Caltrans right-of-way. A Section 404 permit would be required for the Build Alternative.

A Section 401 Water Quality Certification is necessary when a project requires a Section 404 permit from the USACE, and under other special circumstances. Because the Build Alternative would require a 404 permit, a 401 Water Quality Certification from RWQCB would also be required.

A Section 1602 Lake or Streambed Alteration Agreement with CDFW is necessary when a project will alter the flow, bed, channel, or bank of a stream or lake. For the work being performed within

ephemeral drainages, wetlands and waters of the state a Section 1602 permit would be required. Delineations of wetlands can be found in **Appendix F. Biological Figures**.

Executive Order 11988 directs all federal agencies to avoid the long-and short-term adverse impacts associated with the modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative and to restore and preserve the natural and beneficial values served by floodplains. The project would not result in the substantial or adverse modification of any floodplain. Similarly, the project does not directly or indirectly support further development within a floodplain.

No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to I-80 corridor within the BSA. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of jurisdictional waters as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USACE, RWQCB, and CDFW requirements regarding protected Waters of the U.S., should those features be identified within areas that would be directly or indirectly affected. The potential presence of jurisdictional waters in areas outside of the BSA would be determined under separate environmental review.

Avoidance, Minimization, and/or Mitigation Measures

Construction activities and operation of the roadway improvements would be regulated under the applicable Caltrans' NPDES permit and SWMP, which regulate storm water discharge from activities on roadways. The potential for adverse effects to water quality will be avoided by implementing the temporary and permanent BMPs outlined in the SWPPP. Caltrans erosion control BMPs will be used to minimize any wind or water-related erosion. The project would not violate any water quality standards, deplete groundwater supplies, alter drainage patterns, or create capacity exceeding runoff. See **Section 2.2.1, Hydrology and Floodplain**, and **Section 2.2.2, Water Quality and Storm Water Runoff** for a more detailed analysis of the avoidance measures that would be implemented to protect water quality. These avoidance measures would also protect the natural functions of the affected wetlands and waters and any associated habitat.

Implementation of these measures (**Measures WATER-1-5, BIO-1, and BIO-2**) would provide the avoidance and minimization measures required to minimize the indirect impacts to wetlands and other water features located within the BSA.

Caltrans anticipates onsite mitigation for potential direct impacts to wetlands and waters of the U.S. and will continue to coordinate with USACE in the approval and implementation of onsite mitigation. Onsite mitigation for wetlands and other waters will be determined in the design phase. See **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures, Measure WET-1**.

2.3.3 PLANT SPECIES

Regulatory Setting

The USFWS and CDFW have regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species section 2.3.5 in this document for detailed information about these species.

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

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

Affected Environment

The following analysis is based on the NES prepared for the project (Caltrans, 2019).

Special-status plant species with potential to occur in the region was based on a search of the USFWS Species List Database and the CNPS Inventory of Rare and Endangered Plants. Forty-seven special status plant species were initially reviewed for potential to occur within the study area. Of these, two special status plants were found to occur within the BSA. Please see **Figure 17** above to see the BSA for each segment within the project vicinity.

Two special-status plants, Parry’s rough tarplant (*Centromadia parryi ssp. Rudis*) and Suisun Marsh aster (*Symphyotrichum lentum*), were identified during the protocol-level surveys on January 30, April 18, April 30, June 26, August 30 and September 21, 2018. Both of these plant species are considered California rare, with a ranking of 4.2 for the Parry’s tarplant, and 1B.2 for the Suisun marsh aster. The location of these plants can be found in **Figures 18** and **Figure 19**.

Figure 18: Map of the Location of Parry's Rough Tarplant

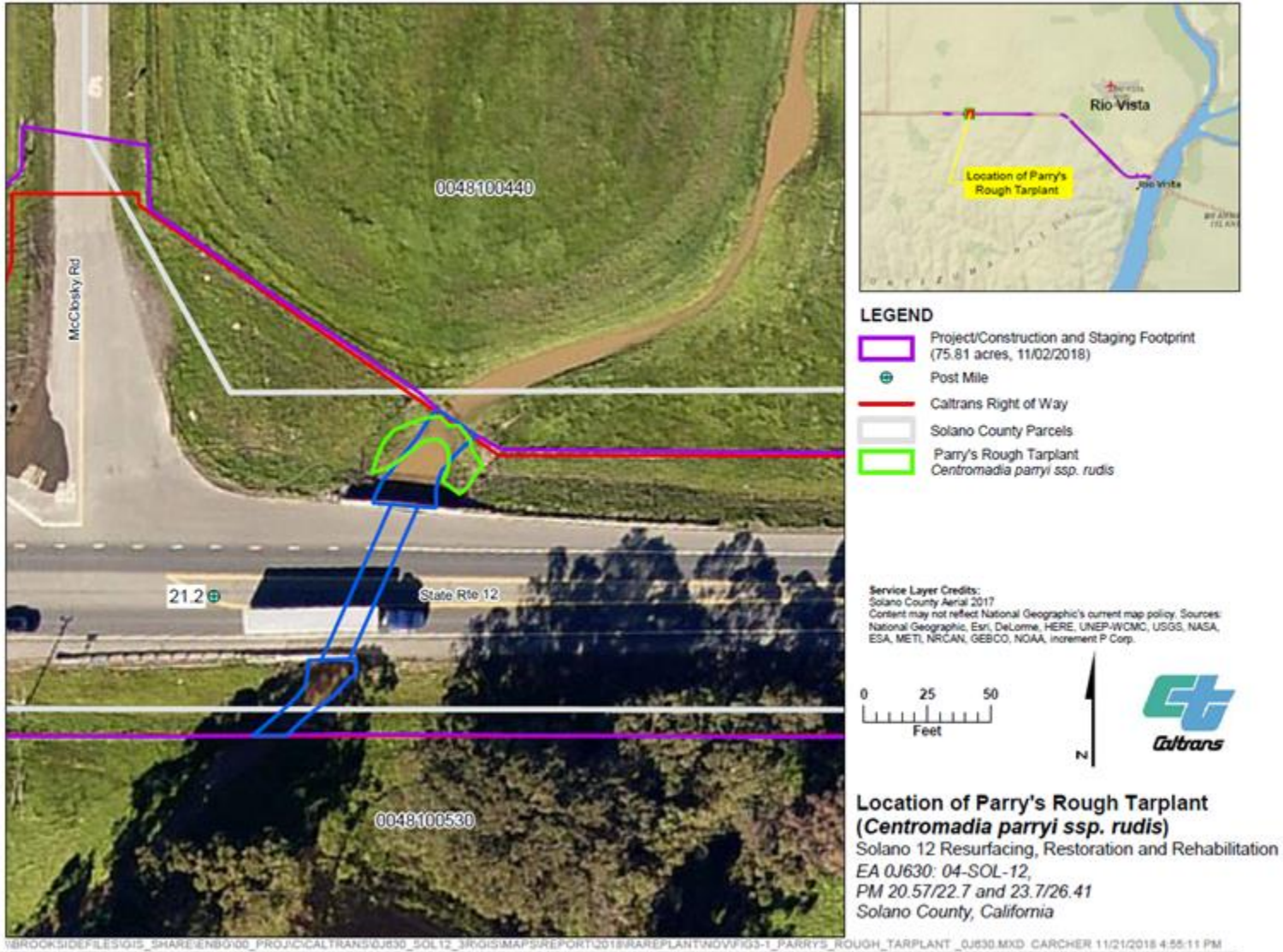
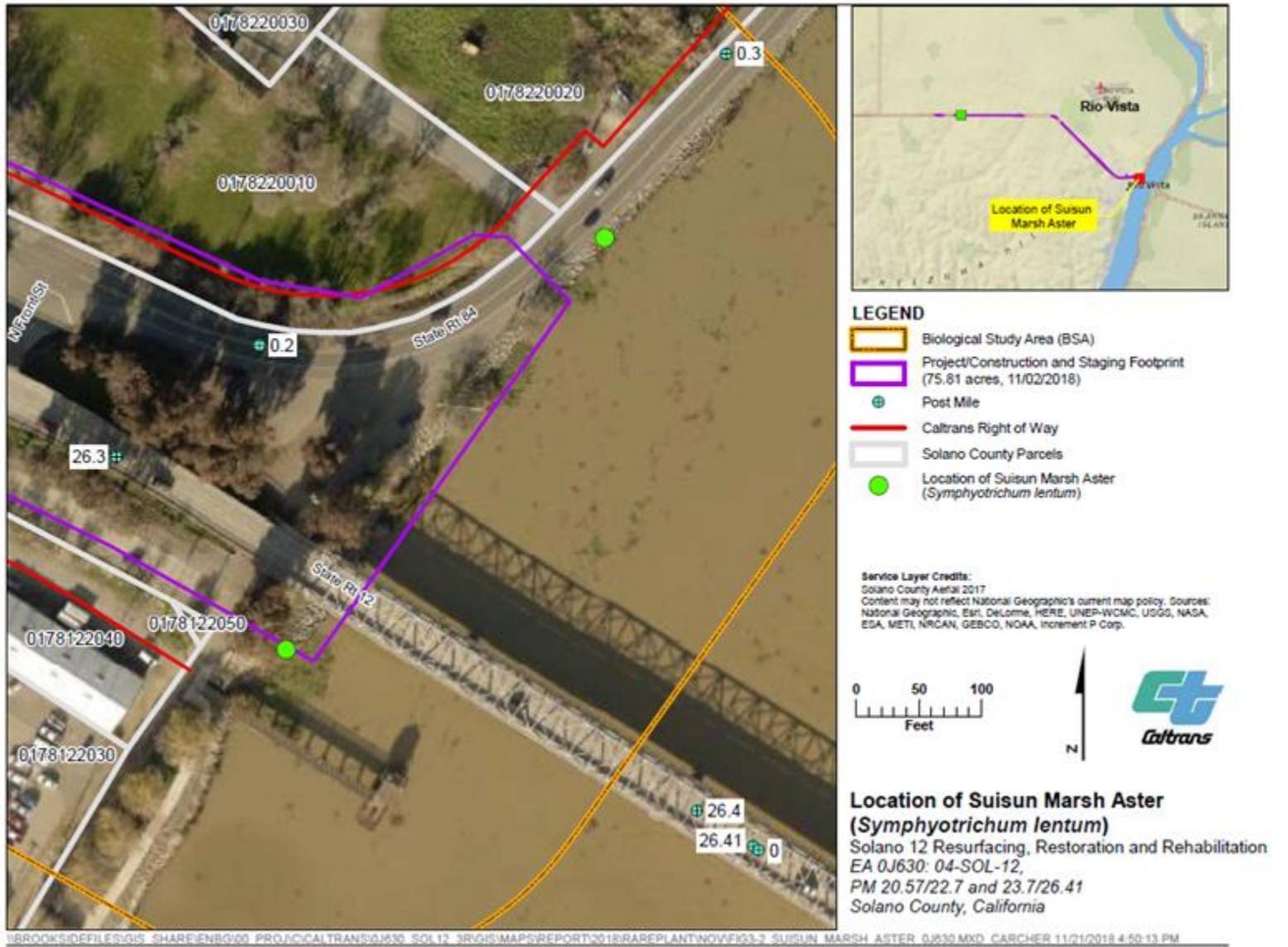


Figure 19: Map of the Location of Suisun Marsh Aster



Parry's rough tarplant

Parry's rough tarplant is an annual that is limited to California. Its limited distribution has it considered fairly threatened in California (CNPS 2018). It is found in grasslands at the edges of vernal pools or wetlands and in disturbed sites.

Approximately ten Parry's rough tarplant individuals were observed on August 30, 2018. The Parry's rough tarplant were found in a disturbed depressional feature with seasonal wetland vegetation in Caltans ROW, please see Figure 18. The Parry's rough tarplant individuals and the surrounding grassland vegetation were severely burned due to a recent grassland fire but were still in identifiable condition.

Suisun Marsh aster

Suisun marsh aster is "rare, threatened, or endangered in California and elsewhere; seriously threatened in California" (CNPS 2018). Two Suisun marsh asters were found on April 30, 2018 during the protocol-level surveys. One plant was observed in the Project BSA about 325 feet north of the Rio Vista Bridge, along River Road, a second Suisun marsh aster plant was noted in the Project BSA between the Rio Vista Bridge and the pier about 50 feet southwest of the Rio Vista Bridge, please see Figure 19.

Environmental Consequences

There will be no anticipated project impacts to Parry's rough tarplant or Suisun marsh aster because the area that the plant was previously observed has been designated as an ESA. ESA fencing will be placed around the habitat suitable for the tarplant.

Avoidance, Minimization, and/or Mitigation Measures

Project activities are not expected to have a substantial adverse effect on Parry's rough tarplant or Suisun marsh aster populations or their habitats. To avoid and minimize effects to sensitive species and their habitats within the BSA, Caltrans would install ESA fencing will surround the location where the tarplant was observed during floristic surveys as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures in Measure BIO 33**. The measures would be included as part of the special provisions of the construction bid package as measures that would implemented during construction.

Exclusion fencing is preferred, wildlife exclusion fencing will be installed to identify ESAs within the BSA that are to be avoided by project activities. A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans. Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated, maintained throughout the construction period, and be removed after completion of construction.

2.3.4 ANIMAL SPECIES

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service), and the CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in the Threatened and Endangered Species Section 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 NOAA Fisheries Service candidate species.

Federal laws and regulations relevant to wildlife include the following:

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

State laws and regulations relevant to wildlife include the following:

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

Affected Environment

The following analysis is based on the NES prepared for the project (Caltrans, 2019).

The identification of special-status animal species with potential to occur in the region was based on a search of the USFWS Species List Database, the CNDDDB for the USGS quadrangles surrounding the BSA, and reports previously prepared for the project. **Appendix G. Species List** each of these species and describes whether or not the species could occur in the BSA.

Species with a lack of suitable habitat or because the BSA is outside the known range of the species will not be discussed further. The following species that have the potential to occur within the BSA are federally and/or state threatened species and are described in **Section 2.3.5, Threatened and Endangered Species**:

California Tiger Salamander
Vernal Pool Tadpole Shrimp
Vernal Pool Fairy Shrimp
Conservancy Fairy Shrimp
Central Valley Steelhead
Sacramento River winter-run Chinook Salmon
Central Valley spring-run Chinook Salmon
Central Valley fall/late fall run Chinook Salmon
Southern Green Sturgeon

Swainson's hawk
Delta smelt
Longfin smelt

The remaining special-status species: Central Valley Fall-Run Chinook Salmon, Migratory Birds, Burrowing Owl, and Bat Species are discussed below.

Central Valley Fall-Run Chinook Salmon

The Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*) is an anadromous California species of special concern that represents a population of Chinook salmon that migrate from the ocean to spawning streams in late fall and begin spawning in beds of coarse river gravels between October and December. Chinook salmon spawn and rear in the mainstem Sacramento River and suitable perennial tributaries.

Migratory Birds

Several special-status bird species have at least some potential to nest or forage within the BSA, including:

Swainson's hawk (*Buteo swainsoni*), State threatened species

Tri-colored blackbird (*Agelaius tricolor*), California species of special concern at its nesting colonies.

Loggerhead shrike (*Lanius ludovicianus*), California species of special concern when nesting.

The Swainson's hawk is discussed in **Section 2.3.5, Threatened and Endangered Species**. The northern harrier nests in marshes and moist fields, and forages over open areas. Grasslands and agricultural fields in and adjacent to the BSA provide suitable nesting and foraging habitat. Northern harriers have been observed in the vicinity of the BSA although none were observed within the BSA during surveys conducted by the biologists. The grasslands and marsh habitat within the BSA provide suitable foraging habitat for this species; however, harriers typically nest and forage in the interiors of large expanses of open habitat, not very close to high volume roadways. Thus, although individuals may occasionally forage in the BSA, they are not expected to nest there.

Tri-colored blackbird nesting colonies are usually located near fresh water in dense emergent vegetation. The species is highly colonial when nesting, forming dense breeding colonies that, in some areas, may consist of up to tens of thousands of pairs. Suitable nesting and foraging habitat is present in the BSA. Potential foraging habitat (e.g., perennial marsh, seasonal marsh, and grasslands) for the tricolored blackbird is present within and immediately adjacent to the BSA. However, the tricolored blackbird has not been recorded breeding in the BSA, the nearest record of its occurrence is located approximately 11 miles to the east near Jepson Prairie Preserve, and the species is not expected to breed within the BSA due to the high levels of disturbance associated with the freeway. Thus, although individuals may occasionally forage in the BSA, they are not expected to nest there.

The loggerhead shrike can be found in grasslands, scrub habitats, riparian areas, other open woodlands, ruderal habitats, and developed areas including golf courses and agricultural fields. Ideal breeding

habitat for loggerhead shrikes is open, with short grassy vegetation punctuated by many perches, shrubs, or trees for nesting, and sharp branches or barbed wire fences for impaling prey. They nest in tall shrubs and dense trees and forage in grasslands marshes, and ruderal habitats. The breeding season may begin as early as late February and lasts through July. Suitable breeding and foraging habitat is present in the BSA and the species was observed during surveys of the BSA. However, because of the BSA's proximity to I-80, particularly given that high quality nesting and foraging habitat (e.g., open agricultural fields and pastures) more removed from the high levels of disturbance caused by the I-80 are abundant in the project region, the number of pairs of loggerhead shrikes that may nest in the BSA is expected to be very low.

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a California species of special concern. This species favors flat, open grassland or gentle slopes and sparse shrubland ecosystems for breeding, though they will also readily colonize agricultural fields and other developed areas. Ideal habitat for burrowing owls is comprised of annual and perennial grasslands with low vegetation height, sparse or nonexistent tree or shrub cover, and an abundance of mammal burrows. The nesting season as recognized by the CDFW (1995) runs from February 1 through August 31. After nesting is completed, adult owls may remain in their nesting burrows or in nearby burrows or may migrate; young birds disperse across the landscape. No suitable ground burrows were observed during Phase II survey of the ROW and accessible areas of the BSA. No suitable habitat was observed in the BSA.

Bat Species

One state special-status bat species have potential to occur within the BSA based on range, habitat, and recorded occurrences in the region:

- Western red bat (*Lasiurus blossevillii*), a California species of special concern.

The western red bat does not breed in the project area but roosts in the foliage of trees in Solano County during winter or migration. Western red bats are strongly associated with intact cottonwood/sycamore valley riparian habitats in low elevations and the loss of such habitat throughout its range threatens the persistence of the species. Roosting habitat not present in the BSA, No bats were detected during surveys, suggesting that the species does not regularly use the BSA.

Environmental Consequences

Build Alternative

Central Valley Fall-Run Chinook Salmon

The project would result in less than 0.2 acres of open water, critical habitat, will be exposed to increased sedimentation and turbidity. The intensity of this direct stressor will be minimal and last during installation of cofferdam and dewatering process. Significant physical and biological features of habitat will be exposed to this stress but will not sustain permanent impacts from the proposed construction activity.

Dewatering activities could cause direct take from harassment as fish are handled and stored temporarily. Although the project proposes to use a vibratory hammer to install sheet piles for cofferdam, dewater the area and work within isolated section of the river, the modifications would not result in the addition of new barriers or exacerbation of any existing impediments to salmonid movement. No hydroacoustic effects from the vibratory hammer, just the potential for minute sedimentation. The vibratory hammer will not exceed the 150dB threshold for ambient sound, therefore no barotrauma is anticipated to salmonid.

Bat Species

The Build Alternative would not result in temporary or permanent impacts on western red bats through the alteration of foraging patterns as suitable Roosting habitat was not present in the BSA.

Burrowing Owl

The Build Alternative is not expected to result in impacts on burrowing owl breeding habitat due to the lack of evidence of owl use in the project limits. No suitable ground burrows were observed during Phase II survey of the ROW and accessible areas of the BSA. No suitable habitat was observed in the BSA.

Giant Garter Snake

The Build Alternative is not expected to result in impacts on Giant Garter Snake because the project area lacks suitable habitat.

Migratory Birds

Although project activities would occur along the margins of suitable habitat for the Swainson's hawk, tri-colored blackbird, and loggerhead shrike. The potential for such activities to disturb a nest to the point of abandonment would be very low because none of these species are expected to nest near the high volume roadway where project activities would be concentrated. Vegetation removal for the Build Alternative could reduce nesting habitat for a number of bird species protected under the Migratory Bird Species Act, disturbance of foraging habitat would unlikely have a substantial effect on local and regional populations of these species because of the low number of breeding birds relative to the extent of suitable foraging habitat and abundance of prey. Therefore, the project is not expected to substantially reduce these species' populations or nesting habitats and any project impacts would be minimal.

Avoidance, Minimization, and/or Mitigation Measures

Build Alternative

Central Valley Fall-Run Chinook Salmon

Water quality during construction and project operation would be protected by BMPs that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality; Measures HYDR-1** and

WQ-2 and **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below), for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA are maintained for the special-status species that could be present in these aquatic habitats. Additionally, **Measure BIO-3, BIO-4, BIO-5, BIO-6, and BIO-7** as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**, below include provisions on worker environmental training, construction to avoid take, disturbances or injury of the Chinook salmon, habitat protection, and biological monitoring.

Bat Species

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for effects to roosting bats during project construction. Although no impacts are expected.

Burrowing Owl

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures** would reduce the potential for effects to burrowing owls during project construction. Although no suitable habitat was observed during Phase II survey of the ROW and accessible areas of the BSA.

Migratory Birds

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures, (Measures BIO 23-32)** below would reduce the potential for adverse effects to migratory bird species. These measures include a work window for vegetation removal and preconstruction surveys, deterrence of nesting birds and nest-start removal, and non-disturbance buffers for nesting birds.

2.3.5 THREATENED AND ENDANGERED SPECIES

Regulatory Setting

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

California has enacted a similar law at the state level, the CESA, California Fish and Game Code Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The CDFW is the agency responsible for implementing CESA. Section 2080 of the California Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

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

Affected Environment

This section addresses species listed or eligible for listing as threatened or endangered. The list of special status species with the potential to occur within the BSA is provided in **Appendix G**, and in **Table 11**. Several listed species were identified as having a potential to occur within the study area. These species include the following:

- Swainson's hawk (*Buteo swainsoni*) – state threatened
- Delta smelt (*Hypomesus transpacificus*) – state endangered, federally endangered; Species presence in the study area is inferred.
- Longfin smelt (*Spirinchus thaleichthys*) – state threatened, federal candidate; Species presence in the study area is inferred.
- Central Valley steelhead (*Oncorhynchus mykiss*)– no state status, federally threatened; Species is considered present in the study area.
- Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*) – state threatened, federally threatened; Ephemeral streams in the BSA are not suitable for anadromous fish.
- Sacramento River winter run Chinook salmon (*Oncorhynchus tshawytscha*)
- Green Sturgeon; Southern (*Acipenser medirostris*) – no state status, federally threatened; Species could occur within the study area.
- California Tiger Salamander (*Ambystoma californiense*)- state species of concern, federally threatened; BSA contains suitable dispersal and aestivation habitat.

- Vernal Pool Tadpole Shrimp (*Lepidurus packardii*) federally endangered; Species presence in the study area is inferred.
- Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) federally threatened; Species presence in the study area is inferred
- Conservancy Fairy Shrimp (*Branchinecta conservation*) federally endangered; Species presence in the study area is inferred.

Central Valley steelhead

The Central Valley steelhead (*Oncorhynchus mykiss*) is a Federally threatened species. The steelhead is an anadromous form of rainbow trout that migrates upstream from the ocean to spawn in late fall or early winter, when flows are sufficient to allow it to reach suitable habitat in far upstream areas. They are known to utilize the delta region primarily as a migration corridor for spawning adults migrating. Most California steelhead spawn from December through April. Steelhead spawn in small streams and tributaries where cool, well oxygenated water is available year-round (CDFW 2019). Based on existing literature and the documented life history characteristics of steelhead, adult steelhead would be expected to be migrating upstream from the ocean/estuary into freshwater to spawn, in late summer and early fall. Therefore, both the Central Valley steelhead and the *Central California Coastal steelhead* are assumed to be present in the BSA. Central valley steelhead is shown as threatened in the *Fish* section in **Table 11** and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the National Marine Fisheries Service (NMFS) and will be included in the forthcoming Biological Opinion.

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. The Green sturgeon is shown as threatened in the *Fish* section in **Table 11**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

California Tiger Salamander

California tiger salamander is a Federal endangered species and was listed in August of 2004. A habitat assessment for the California tiger salamander was conducted in November 2018. Although there are no records of this species within six miles of this Project, suitable upland habitat exists in near the Project vicinity. Because the Project is located within the current and historic range of this species it is

reasonable to conclude that this species may be present. Caltrans is using this logic as the basis for inferring presence of this species within the Project's limits and action area. The California tiger salamander is shown as threatened in the *Amphibians* section in **Table 11**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

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 Caltrans has inferred presence of this species within the study area. Delta smelt are native to the upper Sacramento-San Joaquin River Delta (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 the 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 feet 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). The Delta smelt is shown as federally threatened species and state listed as endangered in the *Fish* list in **Table 11**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

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 the City of Rio Vista or Medford Island in the Delta. No aquatic surveys were conducted in support of the proposed project. CDFW larval smelt 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. The Longfin smelt is considered a candidate for listing under FESA and is listed as state threatened in the *Fish* list in **Table 11**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will not be included in the forthcoming Biological Opinion because it is a candidate species.

Central Valley spring-run Chinook Salmon

The Central Valley spring-run Chinook Salmon is listed as federally threatened and as state threatened. CV spring-run chinook are thought to use the delta region as a migration corridor. Allen and Hassler (1986) showed that in estuaries, as juvenile Chinook salmon increase in length, they tend to school in the surface waters of the main and secondary channels and sloughs, following the tides into shallow water habitats to feed. Within the delta, juvenile chinook salmon forage in shallow areas with protective cover, such as intertidal and subtidal mudflats, marshes, channels, and sloughs (McDonald 1960). Adults also use the delta as a migratory corridor, swimming upstream to spawn. Spring-run Chinook Salmon enter the Sacramento River from late March through September. Adults hold in cool water habitats through the summer, then spawn in the fall from mid-August through early October. Spring run juveniles migrate soon after emergence as young-of-the-year or remain in freshwater and migrate as yearlings. The Central Valley spring-run Chinook Salmon is listed as federally threatened and as state threatened in the *Fish* list in **Table 11**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

Sacramento River winter run Chinook salmon

The Sacramento River winter-run Chinook salmon is listed as federally endangered and as state endangered. Sacramento River winter-run use the north delta primarily as a migration corridor. Relative abundance is inferred through monitor data, CDFW rotary screw trap sampling, and USFWs Delta Juvenile Fish Monitoring Program data. Chinook salmon have two basic life history types: stream-type and ocean-type. Stream-type adults run up streams before they have reached full maturity, in spring or summer, and juveniles usually spend more than one year in fresh water. Ocean-type adults spawn soon after entering freshwater, in summer and fall, and juveniles spend 3 months to a year rearing in fresh water. The fall/late fall-run chinook exhibit the ocean-type life history, the spring run primarily exhibit the stream-type life history, and the winter run exhibit a hybrid of the two approaches, with adults that move upstream before maturity, and juveniles that spend more than one year rearing in freshwater and estuarine areas (Moyle 2002). As they grow larger and mature into adults, fish become a dominant part of their diet. Adult chinook salmon spend 1 to 5 years in the ocean before returning to their natal stream to spawn. Once they reach their natal stream, chinook salmon select large, deep pools (usually greater than 2 meters) with bedrock bottoms and moderate velocities for holding. Spawning occurs in areas with a substrate mixture of gravel and small cobbles with low silt content and adequate subsurface flow (Moyle 2002). The Sacramento River winter-run Chinook salmon is listed as federally endangered and as state endangered in the *Fish* list in **Table 11**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp (*Lepidurus packardii*) is a federally listed as endangered small crustacean in the Triopsidae family. Vernal pool tadpole shrimp breed in a variety of habitats ranging from clear to highly turbid seasonal wetlands, vernal pools, and swales; cysts are attached to vegetative matter, sediment particles, and other objects on the bottom. Cysts hatch based on water temperature, between 50 and 59°F, throughout the rainy season and vernal pool tadpole shrimp mature after approximately 54 days. Vernal pool tadpole shrimp tend to inhabit vernal pool complexes rather than

individual pools. Within Solano County, vernal pool tadpole shrimp are primarily found in Jepson Prairie, north of the Potero Hills, and south of SR 12. They occur in abundance, but are susceptible to predation by wildfowl, which can rapidly reduce population levels (LSA 2012c). The vernal pool tadpole shrimp is listed as a federally endangered species in the invertebrates list **Table 11**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp (*Branchinecta lynchi*) is a federally listed as threatened small crustacean in the Branchinectidae family. Vernal pool fairy shrimp breed in a variety of vernal pool habitats ranging from small clear rocky pools to turbid and alkaline grassland pools and cysts are dropped to the bottom of these pools. Cysts hatch primarily between December and May and vernal pool fairy shrimp can take as few as 18 days to reach maturity. Pools containing vernal pool fairy shrimp tend to be smaller pools. Within Solano County, vernal pool fairy shrimp are found in most of the remaining vernal pool complexes, distributed widely, but occurring in relatively low population levels (LSA 2012b). The vernal pool fairy shrimp is listed as a federally threatened species in the invertebrates list in **Table 11** and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

Conservancy Fairy Shrimp

The conservancy fairy shrimp (*Branchinecta conservatio*) is a federally listed as endangered small crustacean in the Branchinectidae family. Conservancy fairy shrimp breed in somewhat turbid ephemeral or temporary pools (i.e., vernal pools, swales, and seasonal wetlands) and eggs (referred to as cysts) are dropped to the bottom of these pools. As the pools refill with rainwater, the cysts hatch, primarily between November and April, and take approximately 49 days to reach maturity. Adults range from 0.6 to 1.1 inches in length. Pools containing conservancy fairy shrimp tend to be large playa pools on deep alluvial soils. Within Solano County, conservancy fairy shrimp primarily occur within the Jepson Prairie, northwest of the study area, and populations levels are unknown and difficult to quantify because they occur in large populations in suitable pools (LSA 2012a). The conservancy fairy shrimp is listed as an endangered federally species in the invertebrates list in **Table 11**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

Swainson's hawk

The Swainson's hawk is a California state threatened species. Little is known about the breeding home range and foraging habitat requirements of the Swainson's hawk in the Sacramento Valley. Previous studies suggest that home-range sizes can vary significantly in response to agriculture, changes in prey availability, and various farming practices (Babcock 1995). Swainson's hawks have been observed in eucalyptus trees along SR 12, but it's difficult to assess the environmental baseline of the species in the area when little is known about breeding home range and foraging habitat requirements. 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. A protocol-level was not conducted for Swainson's hawk, however, presence is inferred due to recent observations of the species along SR 12. These occurrences occurred within 0.5 miles of the Project area near a eucalyptus stand. Consultation with CDFW will be required as well as an Incidental Take Permit (ITP) for this species.

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. Proposed mitigation for impacts to each protected species is provided in the *Avoidance, Minimization, and Mitigation Measures* section presented further below. Final approved avoidance, minimization, and mitigation measures will be determined in consultation with the appropriate permitting agencies.

Protected fish Species and Habitat; Delta smelt Longfin smelt, Central Valley steelhead, Central Valley spring-run chinook salmon, Central Valley fall/late fall chinook salmon, Sacramento River winter run Chinook salmon, Southern Green Sturgeon

This project has the potential to result in direct and indirect effects on listed fish that occur in the Delta. The delta and longfin smelts, steelhead, Chinook salmon, green sturgeon, and other fish species could be present during in-water work during the planned in-water work window July 1-December 1. Installation of a culvert outfall, cofferdam installation, and sheet piles installation activities may have indirect and direct implications from the proposed project actions that include, increase in turbidity, dewatering and potential handling, barotrauma, introduction of contaminations/pollutants and temporary/minimal increase in sedimentation.

Excavation of culverts from the roadway will increase sedimentation and will increase the localized turbidity in the Sacramento River. Any fishes in the vicinity of this may experience elevated levels of sediment that could cause temporary adverse reactions. This will have indirect impacts temporarily affecting the quality of aquatic resources. Less than 0.2 acres of open water, critical habitat, will be exposed to increased sedimentation and turbidity. The intensity of this direct stressor will be minimal and last during active construction. Significant physical and biological features of the critical habitat will be exposed to this stress but will not sustain permanent impacts from the proposed construction activity.

Dewatering activities could cause direct take from harassment as fish are handled and stored temporarily. Sedimentation and increases in turbidity may occur as a result of activities associated with construction of the cofferdam, dewatering, and replacement of culvert outfall. This could cause temporary changes in behavior, increased predation, and decreased habitat quality. Potential exists for contaminant incursion into the river, which could result in acute toxicity to listed fish species occupying the action area at the time of construction or may result in contamination of sediment that could be re-suspended at a later time. Proposed avoidance and minimization measures will reduce the effects of sedimentation, turbidity and contaminants of insignificant levels.

Installation of the cofferdam will involve installation of sheet piles, within near the bank of the Sacramento River. cofferdam installation will be done with sheet pile and a vibratory hammer. This

method will not consist of any pipe driving and will have no hydroacoustic effects for the special status species that may be in the Project footprint during this construction activity. No hydroacoustic impacts are anticipated from the installation of the cofferdam because the impacts from the vibratory hammer will be minimal and insignificant. The potential for take comes from the potential for the fish relocation from an authorized biologist. Direct and indirect impacts may be associated with the installation of this structure. Insignificant amounts of turbidity may result from the installation of the piles, but impacts would be temporary and minimal. Direct effects would include possible entrapment of individuals in the cofferdam and translocating those species by an approved biologist. These fish species may be temporarily affected by changes in modal behavior, and possible stress of individuals being handled.

Due to the potential for direct impacts to these listed species, Caltrans has determined that the proposed construction activities for Solano 12, 3R, Roadway Rehabilitation Project may affect, likely to adversely affect the CV steelhead, winter run chinook, fall/late chinook, Southern Green Sturgeon, spring run chinook, and Delta and Longfin Smelt. Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below will minimize impacts on individuals and their habitat during construction.

California Tiger Salamander (CTS)

Because the project is located within the current and historic range of this species it is reasonable to conclude that this species may be present. Caltrans is using this logic as the basis for inferring presence of this species within the project's limits and action area. The project will have direct and indirect impacts to this species.

All CTS individuals located within the project action area will be exposed to both direct and indirect impacts. Adult CTS, of both sexes will be affected. Habitat fragmentation, and loss of suitable habitat are stressors associated with the exposure of the proposed project. The potential for genetic bottlenecking comes as a result of habitat fragmentation. The exposures for CTS are both direct and indirect and will be minimized with the implementation of AMMs. The exposure will last for the (complete) duration of the project. The anticipated response may include changes in behavior, and increased mortality.

The proposed project will have permanent impacts to approximately 0.58 acres of upland, threatened California tiger salamander, dispersal habitat.

Large branchiopods; Vernal Pool Tadpole Shrimp, Vernal Pool Fairy Shrimp, Conservancy Fairy Shrimp

The project will have permanent impacts to approximately 0.046 acres of large branchiopod vernal pool habitat. Permanent take and direct impacts from proposed construction activities will occur EB/WB from PM 23.75 to PM 26.18 These vernal pools exhibit suitable characteristics for the branchiopod habitat. Presence of these large branchiopod species has been inferred.

Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below will minimize and mitigate impacts on individuals and their habitat during construction.

Swainson's hawk

The proposed build alternative activities will have indirect effects on Swainson's hawk caused by the potential loss of nesting trees, foraging habitat, and noise disturbance from construction activities. Consultation with CDFW will be required as well as an ITP for this species. A protocol-level was not conducted for Swainson's hawk, however, presence is inferred due to recent observations of the species along SR 12. These occurrences occurred within 0.5 miles of the project area near a eucalyptus stand.

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:

Protected fish Species and Habitat; Delta smelt Longfin smelt, Central Valley steelhead, Central Valley spring-run chinook salmon, Sacramento River winter run Chinook salmon, Southern Green Sturgeon

Water quality during construction and project operation would be protected by BMPs that would be developed and approved prior to construction (see Section 2.2.2, Water Quality; Measures WATER-1-5 (BMP AMM's Stormwater Prevention Plan, Stormwater BMPs) and Section 2.3.7 Avoidance and Minimization Measures and Project Mitigation Measures, below), for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA are maintained for the special-status species that could be present in these aquatic habitats. Additionally, Measures BIO 1-5, as detailed in Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures will be implemented to minimize impacts to the listed aquatic species.

Compensatory mitigation for aquatic critical habitat is not anticipated because proposed construction activities will not destroy or modify critical habitat or affect the PCEs or physical or biological features required for each listed species.

California Tiger Salamander

Measure BIO 6-16, as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** will be implemented to minimize impacts to CTS. The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for adverse effects to CTS during project construction. These measures include monitors, work windows, and work site measures. **Mitigation Measure BIO-A** outlines compensatory mitigation to minimize adverse effects to CTS to a negligible level. Caltrans will purchase 0.58 acres (at a ratio of 3:1) at an approved mitigation bank.

Large branchiopods; Vernal Pool Tadpole Shrimp, Vernal Pool Fairy Shrimp, Conservancy Fairy Shrimp

Measure BIO-19, as detailed in **Section 2.3.7, Avoidance and Minimization Measures and project Mitigation Measures** will be implemented to minimize impacts to large branchiopods. The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for adverse effects to Large branchiopods during project construction.

Compensatory mitigation

Compensatory mitigation for large branchiopods has not been decided at this time. Coordination with USFWS will continue into the Design Phase.

Swainson's hawk

Measure BIO-22-31, as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** will be implemented to minimize impacts to Swainson's hawk. The avoidance and minimization efforts described in Section 2.3.7, Avoidance and Minimization Measures, below would reduce the potential for adverse effect Swainson's hawk during project construction.

2.3.7 Avoidance and Minimization Measures and Project Mitigation Measures

To avoid and minimize effects to sensitive species and their habitats within the BSA, Caltrans would implement the avoidance and minimization measures described below. The measures would be included as part of the special provisions of the construction bid package as measures that would be implemented during construction. These measures apply to all of the proposed improvements under the Build Alternative. These measures include project features such as minimizing the area of impact, installing wildlife exclusion fencing, implementing work windows, conducting environmental education for the construction crews, conducting preconstruction surveys, requiring presence of an on-site biological monitor during designated periods, and other construction-site BMPs.

AMM BIO-1 - Restricting in-water work to July 1 to October 15 to minimize adverse effects to fish spawning and movement. The actual work window may be a subset of that time, and will depend upon the current water year, river conditions and timing of fish migrations. For seasonal avoidance of the delta smelt, construction will not occur outside of the cofferdam from October 15 through July 31 in the maximum extent practicable.

AMM BIO-2- Dewatering of the cofferdam will be overseen by a qualified fisheries biologist. The qualified fisheries biologist will also conduct fish rescues and relocation and will remain onsite during the entire dewatering process. Relocation would be accomplished by means and methods stipulated in the final NMFS BO and California Department of Fish and Wildlife Incidental Take permits.

AMM BIO-3- Caltrans will install ESA fencing around the project limits along the banks of the Sacramento River to protect riparian vegetation adjacent to the project site. This will prevent the encroachment of construction personnel into sensitive areas not needed for construction of the project. Specific locations will be determined during the PS&E phase of design and will be delineated on the final project plans. The project Biologist will oversee installation of the ESA and will make adjustments to the fencing as appropriate.

AMM BIO-4- All personnel will attend an environmental education program delivered by the Service-approved biologist prior to working on the project site.

AMM BIO-5- A Service-approved biologist(s) will be designated for the activities that will affect CTS habitat which has been defined as the entire project area. The qualified biologist will be onsite during specific construction activities that may be reasonably result in the take of CTS. The qualifications of the biologist(s) will be presented to the Service for review and written approval prior to ground-breaking at the project site. The biologist(s) will coordinate through the Resident Engineer (RE) to stop any work that may result in take of the CTS.

AMM BIO-6- The Resident Engineer will halt work and immediately contract the Service-approved project biologist(s) and the Service in the event that a CTS gains access to a construction zone. The RE will suspend construction activities within a 50 foot radius of the identified animal that could reasonably result in take of a CTS until the animal leaves the site voluntarily or is removed by the biologist(s) to release site using Service-approved handling techniques.

AMM BIO-7 -All construction supervisory personnel will attend an environmental education program delivered by the Service-approved biologist prior to working on the project site. The program will include an explanation as how to best avoid take of the CTS.

AMM BIO-8- No more than thirty (30) calendar days prior to any ground disturbance, pre-construction surveys will be conducted by a Service-approved biologist for CTS. These surveys will consist of walking surveys of the project limits and accessible adjacent areas to determine presence of the species. The biologist(s) will investigate all potential CTS cover sites.

AMM BIO-9- Should a CTS be found at the project site, on-call consultant will the appropriate section 10(a)(1)(a) permit to handle the CTS will be utilized. Caltrans will submit the name and credentials of the Caltrans staff biologist(s) and the name and permit number of the on-call consultant to the Service prior to ground breaking on the project.

AMM BIO-10- For work that could reasonably result in the take of CTS, a Service-approved biologist will be on-site to monitor initial ground disturbance activities for the road construction. The biologist will perform a clearance survey immediately prior the initial ground disturbance. Safety permitting, the Service-approved biologist(s) will investigate areas of disturbed soil for signs of listed species within thirty (30) minutes following the initial disturbance of that given area.

AMM BIO-11 -To minimize temporary disturbances in the areas of CTS habitat, project related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas also will be included in pre-construction surveys and, to the maximum extent practicable, will be established in locations disturbed by previous activities to prevent further adverse effects. Project related vehicles will observe a 20-mile per hour speed limit.

AMM BIO-12- Work in the vicinity of water crossings will be scheduled to occur between May 15th and October 15th.

AMM BIO-13- Dust control measures will consist of regular truck watering of construction access areas and disturbed soil areas with the use of organic soil stabilizers to minimize airborne

dust and soil particles generated from graded areas. Regular truck watering will be a requirement of the construction contract.

AMM BIO-14- To eliminate an attraction to predators of the CTS, all food-related trash items such as wrappers, cans, bottles, and food scraps, will be disposed of in closed containers and removed at least once a day from the action area.

AMM BIO-15- Plastic mono-filament netting (erosion control matting) or similar material will not be used at the project site because CTS may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or trackified hydroseeding compounds.

AMM BIO-16- All construction supervisory personnel will attend an environmental education program delivered by the Service-approved biologist prior to working on the project site. The program will include an explanation as how to best avoid take of the branchiopods. The Service-approved biologist(s) will conduct a training session that will be scheduled as a mandatory informational meeting by the Caltrans RE for all construction contractor supervisory personnel. The field meeting will include topics of species identification, life history, descriptions, and habitat requirements during various life stages.

AMM BIO-17- The limits of construction zones will be delineated with high visibility temporary fencing at least four feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto sensitive areas during construction activities. The fencing will be removed only when all construction equipment is removed from the site. Activities within the action area will be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.

AMM BIO-18- To the extent practicable, Caltrans and its contractors will conduct all work in or within 250 feet of potential habitat for vernal pool crustaceans between May 1 and November 1. When construction activities must take place after November 1 and before May 1, daily biological monitoring will occur for the vernal pool crustaceans.

AMM BIO-19- To the extent practicable, Caltrans will incorporate design modifications such as minimizing the staging and storage area as much as possible to avoid direct permanent effects on potential habitat for federally listed branchiopods.

AMM BIO-20- Caltrans will avoid potential vernal pool fairy shrimp, conservancy fairy shrimp, vernal pool tadpole shrimp habitat to the maximum extent practicable, during construction activities in temporary work areas. All potential large branchiopod habitat not directly affected will be designated as ESA and protected with appropriate fencing and signage. All ESA areas will be shown on the final construction drawings.

AMM BIO-21- Caltrans proposes to install and properly maintain erosion control and water quality protection measures that will minimize downstream effects on seasonal wetlands and the branchiopods that occupy them.

AMM BIO-22- Avoid siting of construction staging areas and temporary work areas in occupied covered species habitat.

AMM BIO-23- Design developments to minimize indirect impacts. 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.

AMM BIO-24- Confine and delineate work areas or minimize source contaminants

AMM BIO-25- Conduct nesting bird surveys

AMM BIO-26- Caltrans biologist and/or biomonitor will coordinate with CDFW on appropriate buffer distances.

AMM BIO-27- Minimize night-time lighting of project construction sites

AMM BIO-28- No construction-related activities will occur between March 1 and September 15 up to 0.5 mile of a nesting Swainson's hawk.

AMM BIO-29- 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.

AMM BIO-30- 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 avoidance and minimization measures can be established to avoid these impacts.

AMM BIO-31- To avoid and minimize effects to sensitive species and their habitats within the BSA, Caltrans would install ESA fencing will surround the location where the tarplant was observed during floristic surveys.

AMM BIO-32- 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.

AMM BIO-33: 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.

Compensatory Mitigation Measures

Compensatory mitigation as described below will minimize adverse effects to threatened and endangered species to a negligible level. A portion of the overall mitigation acreage requirements may be satisfied by restoring temporarily impacted areas (on-site mitigation). The remaining acreage requirement would be satisfied either through purchase of credits if necessary at an approved mitigation bank, or through off-site mitigation. Since some species have similar habitat requirements, some mitigation acreage may be considered as having value for several species, and consequently would be applied as multi-species conservation credits when tracking Caltrans' fulfillment of the proposed mitigation.

Mitigation Measure BIO-A: Caltrans will compensate for their effects for individual CTS utilizing the project area with the purchase of 0.58 acres (at a ratio of 3:1) of CTS upland habitat credits at the Service-approved conservation bank.

Mitigation Measure BIO-B: The amount of mitigation for large branchiopods has not been decided at this time, coordination with USFWS will continue into the Design Phase. Mitigation acreage requirements may also be satisfied either through purchase of credits if necessary at an approved mitigation bank, or through off-site mitigation.

Measure WET-1: Mitigation for potential direct impacts to wetlands and waters of the U.S. and will continue to coordinate with ACOE in the approval and implementation of mitigation. The overall mitigation acreage requirements may be satisfied by restoring temporarily impacted areas within the BSA (on-site mitigation). Mitigation for branchiopods is usually 10:1, but will be determined during PS&E.

2.3.6 INVASIVE SPECIES

Regulatory Setting

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

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 and are unlikely to be present.

Environmental Consequences

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. Caltrans will also implement truck- and equipment-washing measures when vehicles before vehicles enter/re-enter the work site.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance and minimization Measure BIO-33 In Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures below would reduce the potential to introduce or spread invasive species during project construction. In addition, the following measures would further reduce the potential for adverse effects related to the spread of invasive species under the Build Alternative.

Table 11 Regional Special Status Species with the Potential to Occur in the Study Area

Scientific Name	Common Name	Status ^a	Specific Habitat Present/Absent ^b	Species Presence/Absence ^b	Rationale
FISH					
<i>Acipenser medirostris</i>	Green sturgeon	FT, SC	P	P	Potentially present in the Sacramento River.
Designated Critical Habitat	Green sturgeon	NA			Critical habitat not present within the BSA.
<i>Hypomesus transpacificus</i>	Delta smelt	FT	P	P	Endemic to the upper Sacramento-San Joaquin estuary of California. Habitat present within the Sacramento River.
Designated Critical Habitat	Delta smelt	NA			Critical habitat not present within the BSA.
<i>Oncorhynchus kisutch</i>	Central California coast coho salmon	FE	P	P	Ephemeral streams in the BSA are not suitable for anadromous fish.
<i>Oncorhynchus mykiss irideus</i>	Central Valley steelhead	FT, SC	P	P	Ephemeral streams in the BSA are not suitable for anadromous fish.
Designated Critical Habitat	Central Valley steelhead	NA			Critical habitat not present within the BSA.
<i>Oncorhynchus tshawytscha</i>	Central California coastal steelhead	FT	A	P	Potential to occur within the Sacramento River.
Designated Critical Habitat	Central California coastal steelhead	NA			Critical habitat not present within the BSA.
<i>Oncorhynchus tshawytscha</i>	Central Valley spring run Chinook salmon	FT, ST	A	A	Ephemeral streams in the BSA are not suitable for anadromous fish.
Designated Critical Habitat	Central Valley spring run Chinook salmon	NA			Critical habitat not present within the BSA.
<i>Oncorhynchus tshawytscha</i>	Sacramento River winter run Chinook salmon	FE, SE	A	A	Ephemeral streams in the BSA are not suitable for anadromous fish.
Designated Critical Habitat	Sacramento River winter run Chinook salmon	NA			Critical habitat not present within the BSA.
REPTILES AND AMPHIBIANS					
<i>Ambystoma californiense</i>	California tiger salamander	FT, ST	P	IP	BSA contains suitable dispersal and aestivation habitat. No protocol surveys conducted.
Designated Critical Habitat	California tiger salamander	NA			Critical habitat not present within the BSA.
<i>Masticophis lateralis euryxanthus</i>	Alameda whipsnake	FT	A	A	Open desert, oak woodland, pine forest, chaparral, and associated open landscapes. Habitat not present in the BSA.

Table 11 Regional Special Status Species with the Potential to Occur in the Study Area

Scientific Name	Common Name	Status^a	Specific Habitat Present/Absent^b	Species Presence/Absence^b	Rationale
<i>Rana draytonii</i>	California red-legged frog	FT, SC	A	IA	No historic occurrences recorded in the Delta area east of the Coastal Ranges.
Proposed Critical Habitat	California red-legged frog	NA			Critical habitat not present within the BSA.
<i>Thamnophis gigas</i>	Giant garter snake	FT, ST	A	A	BSA does not contain suitable aquatic habitat.
MAMMALS					
<i>Agelaius tricolor</i>	Tricolored blackbird	SC	A	A	Although foraging habitat is present in the BSA, nesting habitat is not – no recorded occurrences in the CNDDDB.
<i>Athene cunicularia</i>	Western burrowing owl	SC	P	IA	No habitat present – no suitable ground burrows observed during Phase II survey of the ROW and accessible areas of the BSA.
<i>Buteo swainsoni</i>	Swainson’s hawk	ST	P	IP	No raptor nests observed in the BSA, windshield surveys between April-August will be conducted prior to construction.
<i>Charadrius alexandrinus nivosus</i>	Western snowy plover	FT	A	A	Coastal beaches, sand spits, dunes, and salt pans at lagoons and estuaries.
<i>Charadrius montanus</i>	Mountain plover	ST	P	IP	Prefers short vegetation, bare ground and flat topography. Does not nest in California.
<i>Lanius ludovicianus</i>	Loggerhead shrike	ST	P	P	Suitable habitat observed in the BSA, nesting bird surveys between April-August will be conducted prior to construction.
<i>Lasiurus blossevillii</i>	Western red bat	ST	A	A	Roosting habitat not present in the BSA.
<i>Laterallus jamaicensis coturniculus</i>	California black rail	ST	A	A	Limited to tidal marsh transition areas.
<i>Pelecanus occidentalis californicus</i>	California brown pelican	FE	A	A	Coastal areas and occasionally inland lakes.
<i>Rallus longirostris obsoletus</i>	California clapper rail	FE, SE	A	A	Restricted to tidal marshes.
<i>Reithrodontomys raviventris</i>	Saltmarsh harvest mouse	FE, SE	A	A	Saltmarsh and pickleweed are absent.
<i>Sterula antillarum browni</i>	California least tern	FE	A	A	Bays in the Pacific Ocean.
INVERTEBRATES					

Table 11 Regional Special Status Species with the Potential to Occur in the Study Area

Scientific Name	Common Name	Status ^a	Specific Habitat Present/Absent ^b	Species Presence/Absence ^b	Rationale
<i>Branchinecta conservatio</i>	Conservancy fairy shrimp	FE	P	IA	Potential playa vernal pools present onsite.
Designated Critical Habitat	Conservancy fairy shrimp	NA			Critical habitat not present within the BSA.
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	FT	P	IA	Vernal pools. Not detected, but assumed present during protocol-level of the ROW. Entire BSA not surveyed due to restricted access.
Designated Critical Habitat	Vernal pool fairy shrimp	NA			Critical habitat not present within the BSA.
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT	A	A	Elderberry not present within the BSA.
<i>Elaphrus viridis</i>	Delta green ground beetle	FT	A	A	Restricted to Jepson Prairie vernal pool edges.
Designated Critical Habitat	Delta green ground beetle				Critical habitat not present within the BSA.
<i>Lepidurus packardii</i>	Vernal pool tadpole shrimp	FE	P	IA	Vernal pools. Not detected during protocol-level wet and dry survey of the ROW. Entire BSA not surveyed due to restricted access.
Designated Critical Habitat	Vernal pool tadpole shrimp	NA			Critical habitat not present within the BSA.
<i>Speyeria callippe callippe</i>	Callippe silverspot butterfly	FE	A	A	Known only from San Bruno Mountain and one undisclosed park in Alameda County.
PLANTS					
<i>Atriplex cordulata</i>	Heartscale	CNPS List 1B.2	A	A	Chenopod scrub, Meadows and seeps, Valley and foothill grassland (sandy) saline or alkaline. Not detected during protocol-level rare plant surveys.
<i>Atriplex joaquiniana</i>	San Joaquin spearscale	CNPS List 1B.2	A	A	Chenopod scrub, Meadows and seeps, Valley and foothill grassland (sandy) saline or alkaline. Not detected during protocol-level rare plant surveys.
<i>Centromadia parryi</i> ssp. <i>parryi</i>	Pappose tarplant	CNPS List 1B.2	P	P	Marshes and swamps, vernal valley and foothill grassland; Observed during protocol-level rare plant surveys.
<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	Suisun thistle	FE, CNPS List 1B.1	A	A	Marshes and swamps. Not detected during protocol-level rare plant surveys.
<i>Cordylanthus mollis</i> ssp. <i>mollis</i>	Soft bird's beak	FE, CNPS List 1B.2	A	A	Marshes. Not detected during protocol-level rare plant surveys.
Proposed Critical Habitat	Soft bird's beak	NA			Critical habitat not present within the BSA.

Table 11 Regional Special Status Species with the Potential to Occur in the Study Area

Scientific Name	Common Name	Status^a	Specific Habitat Present/Absent^b	Species Presence/Absence^b	Rationale
<i>Fritillaria liliacea</i>	Fragrant fritillary	CNPS List 1B.2	P	A	Valley and foothill grassland; Not detected during protocol-level rare plant surveys.
<i>Hibiscus lasiocarpus</i>	Wooly rose mallow	CNPS List 2.2	A	A	Marshes. Not detected during protocol-level rare plant surveys.
<i>Isocoma arguta</i>	Carquinez goldenrush	CNPS List 1B.1	P	A	Valley and foothill grassland. Not detected during protocol-level rare plant surveys.
<i>Juglans hindsii</i>	Northern California black walnut	CNPS List 1B.1	A	A	Riparian forest and woodland. Not detected during protocol-level rare plant surveys.
<i>Lasthenia conjugens</i>	Contra Costa goldfields	FE, CNPS List 1B.1	A	A	Not detected during protocol-level rare plant surveys.
Designated Critical Habitat	Contra Costa goldfields	NA			Critical habitat not present within the BSA.
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	CNPS List 1B.2	A	A	Marshes. Not detected during protocol-level rare plant surveys.
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	SR, CNPS List 1B.1	A	A	Marshes. Not detected during protocol-level rare plant surveys.
<i>Limosella subulata</i>	Delta mudwort	CNPS List 2.1	A	A	Marshes. Not detected during protocol-level rare plant surveys.
<i>Neostapfia colusana</i>	Colusa grass	FT, SE, CNPS List 1B.1			Vernal pools. Not detected during protocol-level rare plant surveys.
<i>Plagiobothrys hystriculus</i>	Bearded popcorn-flower	CNPS List 1B.1	P	A	Valley and foothill grassland; Not detected during protocol-level rare plant surveys.
<i>Sidalcea keckii</i>	Keck's checkerbloom	FE, CNPS List 1B.1	A	A	Serpentinite clay in valley and foothill grassland. Not detected during protocol-level rare plant surveys.
<i>Symphotrichum lentum</i>	Suisun Marsh aster	CNPS List 1B.2	A	A	Marshes. Not detected during protocol-level rare plant surveys.
<i>Tuctoria mucronata</i>	Solano grass	FE, SE, CNPS List 1B.1	A	A	Valley and foothill grassland and vernal pools. Not detected during protocol-level rare plant surveys.

Table 11 Regional Special Status Species with the Potential to Occur in the Study Area

Scientific Name	Common Name	Status ^a	Specific Habitat Present/Absent ^b	Species Presence/Absence ^b	Rationale
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Notes:

^a Status codes:

	FE	Federal endangered
CNPS California Native Plant Society	FT	Federal threatened
List 1A Plants presumed extinct in California	SE	State endangered
List 1B Plants rare, threatened or endangered in California or elsewhere	Ssc	State species of special concern
List 2 Plants rare, threatened or endangered in California but more common elsewhere	ST	State threatened

^b Presence/Absence:

A	Absent—general habitat is absent	IA	Inferred Absent
P	Present—general habitat is present	IP	Inferred Present

2.4 CUMULATIVE IMPACTS

Regulatory Setting

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

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

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

Affected Environment

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

Resources with No Cumulative Effects

As stated previously at the beginning of this chapter, scoping for the environmental review of this SR 12 Roadway Resurfacing, Restoration, and Rehabilitation Project Initial Study/Environmental Assessment identified certain resource topics that are not applicable to the following resources:

- Existing and Future Land Uses
- Coastal Zone
- Consistency with Federal, State, Regional and Local Plans and Programs
- Wild and Scenic Rivers
- Growth
- Community Character and Cohesion
- Environmental Justice
- Farmlands/Timberlands
- Wildfires

Similarly, the following resources were evaluated in this chapter, but it has been determined that the proposed project will not result in a direct or indirect adverse effect on the resource, and therefore will not contribute to a cumulative impact on that resource:

- Parks and Recreational Facilities
- Cultural
- Geology, Soils, Seismic
- Paleontology

The following resources were evaluated as noted in this chapter, but it has been determined that the proposed project will not result in adverse effects, thus no cumulative impacts, on the following resources:

- Utilities/Emergency Services
- Air Quality
- Hazardous Waste
- Hydrology and Floodplain
- Water Quality
- Noise
- Natural Communities
- Plant Species
- Animal Species (except those that are Threatened and Endangered species discussed below)
- Invasive Species

Hydrology/Floodplain are not susceptible to have cumulative effects because within segment 3, Caltrans is proposing to upsize the drainage systems within Caltrans' ROW, and connecting the existing inlets within this area to downstream drainage systems. This will improve the existing drainage efficiency within Caltrans' ROW in this project location.

Water Quality will have no cumulative impacts because although some activities are of particular water quality concern as described previously in **2.2.2 Water Quality and Storm Water Runoff**, these concerns will be prevented and restored by the Water Quality AMMs. These AMMs are listed in **Appendix D. Avoidance, Minimization and/or Mitigation Summary**.

Natural Communities

Natural communities will not have any cumulative impacts because overall the build alternative construction would have minimal affects on the natural communities within the study area and would be further minimized by implementing several natural community-related AMMs, which are described **Appendix D. Avoidance, Minimization and/or Mitigation Summary**.

Plant Species

Plant species will have no cumulative impacts because the two special-status plants found in the project location, Parry's rough tarplant and Suisun Marsh aster will not be impacted because the area that the plants are previously observed has been designated as an ESA. ESA fencing will be placed around the

habitat suitable for the tarplant and aster. The area where the tarplant was observed is designated as ESA and will not have any active construction and staging around it.

Animal Species

Special-status species animal species discussed previously include: Central Valley- fall/late fall Run Chinook Salmon, Migratory Birds (northern harrier, Tri-colored blackbird, Loggerhead shrike), Burrowing Owl, and Western red bat. There will be no cumulative impacts on each of these species.

Central Valley- Run Chinook Salmon would be exposed to increased sedimentation and turbidity but these stressors will be minimal and last during installation of the cofferdam. Installation of cofferdam will temporarily impede salmonid movement but will not significantly modify or destroy critical habitat. There is also a chance that these listed fish species could become entrapped, during the dewatering process, and would have to be handled by a biologist to be relocated.

Northern harrier has been observed in the vicinity of the BSA although none were observed within the BSA. Northern harrier is not expected to nest within the project location. Tri-colored blackbird is also present within the immediate adjacent to the BSA, but the tri-colored blackbird has not been recorded breeding in the BSA. They might forage in the BSA, they are not expected to nest in the project location. Loggerhead shrike's suitable breeding and foraging habitat is present in the BSA and species were observed in the BSA. The possibility of loggerhead shrikes nesting in the BSA is very low.

Invasive Species

Moderately invasive species like wild oats, Italian thistle and dogtail grass are found within the annual grassland areas of the study area. Disposal methods that would prevent the spread of these species will be implemented. Construction equipment has the potential to introduce and spread new or existing invasive plant species into the study area. 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. Please see AMM Measure BIO-33 in **Appendix D**.

There is no additive effect of the Aesthetics, Hydrology/Floodplain, Water Quality, Natural Communities, Plant Species, Animal Species, and Invasive Species associated with other approved or foreseeable development together with the proposed project; therefore, no further cumulative analysis of these resources is warranted.

Resources with the Potential to Contribute to Cumulative Effects

Aesthetic Resources

The removal of up to 74 trees will contribute to a cumulative impact from current and planned projects that include tree removal along the project corridor. The Acevedo project (EA 2A620) removed 44 trees and the Church Road Intersection project (EA 0G050) will remove an additional 25 trees. In all of these

projects, roadway widening will result in insufficient space to replant trees at removal locations. Many of the existing trees are in poor health and are invasive, and not of high visual quality. The combined tree removal will result in a change to the visual character along the project corridor, but the impact will be less than significant.

Wetlands and Other Waters

The build alternative will result in direct unavoidable impacts to potentially jurisdictional Waters of the U.S., including up to 0.706 acre of ephemeral waters and 0.295 acre of seasonal wetlands. A total of 0.197 acre of perennial waters was delineated at the Sacramento River. The area of impact in the Sacramento River is not known at this time but is expected to be less than 0.1 acre.

Wetlands and Other Waters has the potential to contribute to cumulative effects but it will not be a cumulative effect because Caltrans will implement AMMs to reduce and minimize impacts to wetlands and waters. Implementation of these measures (**Measures WATER-1-5, BIO-1, and BIO-2**) would provide the avoidance and minimization measures required to minimize the indirect impacts to wetlands and other water features located within the BSA. Caltrans anticipates onsite mitigation for potential direct impacts to wetlands and waters of the U.S. and will continue to coordinate with USACE for approval and implementation of onsite mitigation. See **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures, Measure WET-1.**

For the Azevedo project (EA 2A620) wetlands and other waters were not significantly impacted. However, there was 0.09 acres of permanent loss and 0.16 acres of temporary loss of Waters of the US were permanently lost. The Azevedo project mitigated 0.09 acres of permanent impacts to Waters of the US (roadside drainages, wetlands, isolated wetlands, and ephemeral drainages) through the purchase of restoration or creation credits at an USACE-approved mitigation bank.

For the Church Road Intersection project (EA 0G050), there were no jurisdictional wetlands documented within the BSA.

Threatened & Endangered Species

The proposed project will potentially affect protected fish Species and Habitat (Delta smelt, Longfin smelt, Central Valley steelhead, Central Valley spring-run chinook salmon, Sacramento River winter run Chinook salmon, Southern Green Sturgeon), CTS, Large branchiopods (Vernal Pool Tadpole Shrimp, Vernal Pool Fairy Shrimp, Conservancy Fairy Shrimp), and Swainson's hawk. This project will have no effect on the giant garter snake because the project area lacks suitable habitat.

This project will not potentially contribute to cumulative effects because Caltrans plans to implement and follow AMMs to further protect and reduce the amount of adverse effects to threatened and endangered species. See **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures, Measure BIO-5-16, BIO-20, and BIO-22-32.**

For the Azevedo project (EA 2A620), threatened and endangered species that might have been affected but likely to adversely affect included: vernal pool fairy shrimp, vernal pool tadpole shrimp, and conservancy shrimp. Threatened and endangered species with no effects include the Swainson's hawk.

For the Church Road Intersection project (EA 0G050), Swainson's hawk and California tiger salamander are the threatened species both have the potential to occur in the BSA. The Tricolored blackbird and Loggerhead shrike are the only two listed California species of special concern that also have the possibility of occurring in the BSA.

Both the Azevedo and the Church Road Intersection project implemented AMMs to protect and prevent impacts to special status and threatened and endangered species.

Chapter 3 – California Environmental Quality Act (CEQA) Evaluation

This chapter is used to document and discuss Caltrans' significance determinations under CEQA. According to CEQA Guidelines, Section 15064(b), "the determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area."

The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the Project Development Team, based to the extent possible on the results of field surveys and technical studies. Because the significance of an effect may vary depending on the environmental setting, the context within which the impact takes place is critical and set rules for determining significance in every case have not been established. Some public agencies have established thresholds of significance for CEQA. Because Caltrans has statewide jurisdiction and the setting for projects varies so extensively across the state, Caltrans has not developed statewide thresholds of significance for CEQA and does not intend to. The determination of significance under CEQA is left to the internal Project Development Team, with particular deference paid to the expertise of environmental staff and other specialists.

This chapter is largely organized around the CEQA Checklist and includes guidance to ensure consistency with Caltrans' posted guidance on "[Mitigation under CEQA](#)."

Determining Significance under CEQA

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

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

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

CEQA Environmental Checklist

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

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

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	<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
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a) No Impact

There are no scenic vistas in this project location therefore there will be no substantial adverse effects.

b) No Impact

State Route 12 is not a designated or eligible State Scenic Highway. Scenic resources will not be damaged in this project.

c) Less Than Significant Impact

The visual character of the proposed build alternative will be somewhat compatible with the existing visual character of the corridor. Proposed changes will not obscure the dominant rural character of the highway. However, the visual quality of the existing corridor will be altered by the proposed project due to the roadway widening, which will require the removal of 74 trees, and the vertical curve correction.

Caltrans is proposing to **Preserve Existing Vegetation by** saving as many existing trees in the project study area as possible and **Landscape Plantings** Using drought-tolerant plants, including California native species, as part of the planting palette where regionally appropriate. These planting efforts must be maintainable, durable, and site appropriate.

With the above project features implemented as part of the project, the impact to the visual resources will be less than significant.

d) Less Than Significant Impact

Nighttime construction activities could add new sources of light and glare for residents, businesses, and local motorists along the project corridor. However, these new sources of light will be temporary during the construction period and will not contribute to long-term light impacts.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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:				
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 type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>

a b, c, d, e) No Impact

The proposed project, encompassing all construction related work for segment 1,2 and 3 of this project, is anticipated to have no impact to agriculture and forest resources. All construction related work will remain within Caltrans ROW or TCE's, and will therefore have no effect on converting farmland to non-agricultural use or conversion of forest land to non-forest use. There is no land under the Williamson Act in the project area, nor is there land zoned as forest land or timberland.

	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 district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

b) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a, b, c, d) No Impact

This project is not a capacity-increasing transportation project. It will have no impact on traffic volumes and would generate a less than significant amount of pollutants due to the very short duration of project construction. Therefore, the proposed project will not conflict with an air quality management plan, violate any air quality standard, result in a net increase of any criteria pollutant, or create objectionable odors. No mitigation is required.

Caltrans is proposing to properly tune and maintain construction equipment and vehicles and will use low sulfur fuel for construction equipment to reduce odors that can affect a substantial number of people. With this project features implemented as part of the project, the impact to the air quality resources will be less than significant.

e) Less Than Significant

Temporary construction activities could generate fugitive dust from the operation of construction equipment. The project will comply with construction standards adopted by the Yolo-Solano Air Quality Management District (SCAQMD) as well as Caltrans standardized procedures for minimizing air pollutants during construction. The project is listed in the Metropolitan Transportation Commission’s (MTC) most recent RTIP. Impacts will be less than significant. No mitigation is required.

	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, U.S. Fish and Wildlife Service, or NOAA Fisheries?	<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 U.S. Fish and Wildlife Service?	<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
c) Have a substantial adverse effect on state or federally protected wetlands (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"/>
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"/>

a) Less Than Significant with Mitigation Incorporated

The proposed project would impact **vernal pool habitat, Vernal Pool Tadpole Shrimp, Vernal Pool Fairy Shrimp, and Conservancy Fairy Shrimp** are inferred. The following mitigation (see the Threatened and Endangered Species section in Chapter 2 for a detailed discussion) along with implementation of the measures and project features below, the impacts to Vernal Pool Tadpole Shrimp, Vernal Pool Fairy Shrimp, and Conservancy Fairy Shrimp would be less than significant with mitigation incorporated.

Mitigation Measure BIO-B: The amount of mitigation for large branchiopods has not been decided at this time, coordination with USFWS will continue into the Design Phase. Mitigation acreage requirements may also be satisfied either through purchase of credits if necessary at an approved mitigation bank, or through off-site mitigation.

AMM BIO-19: To the extent practicable, Caltrans will incorporate design modifications to avoid direct permanent effects on potential habitat for federally listed branchiopods.

AMM BIO-20: Caltrans will avoid potential vernal pool fairy shrimps, conservancy fairy shrimp, vernal pool tadpole shrimp habitat to the maximum extent practicable, during construction activities in temporary work areas. All potential large branchiopod habitat not directly affected will be designated as ESA and protected with appropriate fencing and signage. All ESA areas will be shown on the final construction drawings.

AMM BIO-21: Caltrans proposes to install and properly maintain erosion control and water quality protection measures that will minimize downstream effects on seasonal wetlands and the branchiopods that occupy them.

Project Features:

ESA Fencing: the final construction plans will show all ESAs (including areas that may potentially support sensitive species as described in Section 2.3.3 and 2.3.4). Caltrans will delineate all environmentally sensitive areas on the final construction plans. The USFWS-approved biological monitor will be onsite to direct the installation of this fencing.

Seasonal Avoidance. Construction will be confined to the minimal area necessary to facilitate construction activities.

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.

The proposed project will have permanent impacts upland, threatened *California tiger salamander, dispersal and breeding habitat*. The project will have direct and indirect impacts to this species. The following mitigation measures and project features below (see the Threatened and Endangered Species section in Chapter 2 for a detailed discussion). With implementation of the measures and project features below, the impacts CTS would be less than significant with mitigation incorporated.

Mitigation Measure BIO-A: Caltrans will compensate for their effects for individual CTS utilizing the project area with the purchase of 0.58 acres (at a ratio of 3:1) of CTS upland habitat credits at the Service-approved conservation bank.

AMM BIO-5: A Service-approved biologist(s) will be designated for the activities that will affect CTS habitat which has been defined as the entire Project area. The qualified biologist will be onsite during specific construction activities that may be reasonably result in the take of CTS. The qualifications of the biologist(s) will be presented to the Service for review and written approval prior to ground-breaking at the Project site. The biologist(s) will coordinate through the Resident Engineer (RE) to stop any work that may result in take of the CTS.

AMM BIO-15: Plastic mono-filament netting (erosion control matting) or similar material will not be used at the Project site because CTS may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or trackified hydroseeding compounds.

Project Features:

ESA Fencing: the final construction plans will show all ESAs (including areas that may potentially support sensitive species as described in Section 2.3.3 and 2.3.4). Caltrans will delineate all environmentally sensitive areas on the final construction plans. The USFWS-approved biological monitor will be onsite to direct the installation of this fencing.

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.

b) No Impact

This project would not affect riparian habitat or other sensitive natural communities; however, the project proposes to remove 74 non-riparian, no-native trees. Caltrans is not proposing to replant these trees.

c) Less Than Significant with Mitigation Incorporated

As detailed in the Wetlands section in Chapter 2, the proposed project would will result in unavoidable impacts to potentially jurisdictional Waters of the U.S., including up to 0.706 acre of ephemeral waters and 0.295 acre of seasonal wetlands. A total of 0.197 acre of perennial waters was delineated at the Sacramento River. The area of impact in the Sacramento River is not known at this time but is expected to be less than 0.1 acre.

The proposed project will result in insignificant and temporary impacts to 0.2 acres of open water critical habitat in the Sacramento River. Jurisdiction of the river is currently the responsibility of both the USACE and Central Valley Flood Protection Board and permission will have to be approved for any construction work on the riverbanks.

With implementation of the measure below, the impacts to federally-protected wetlands are less than significant with mitigation incorporated.

Wetland-1 Mitigation for potential direct impacts to wetlands and waters of the U.S. will be coordinated with USACE in the approval and implementation of mitigation. The overall mitigation acreage requirements may be satisfied by restoring temporarily impacted areas within the BSA (on-site mitigation).

d) Less Than Significant Impact

This project will not affect any migratory wildlife corridors or the movement of any native resident or migratory fish or wildlife species. This project will not impede the use of native wildlife nursery sites.

Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA are maintained for the special-status species that could be present in these aquatic habitats. Water quality during construction and project operation would be protected by BMPs that would be developed and approved prior to construction (see Water Quality section in Chapter 2, and Threatened and Endangered Species section in Chapter 2 for a detailed discussion. Compensatory mitigation for aquatic critical habitat is not anticipated because proposed construction activities will not destroy or modify critical habitat or affect the PCEs or physical or biological features required for each listed species.

e) No Impact

This project will not conflict with any local policies or ordinances protecting biological resources.

f) No Impact

This project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

	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 pursuant to in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) No Impact

This project will not cause a substantial adverse change in the significance of a historical resource.

b) No Impact

This project will not cause a substantial adverse change in the significance of an archaeological resource.

c) No Impact

No human remains, including those interred outside of dedicated cemeteries will be impacted.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VI. ENERGY: Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b) No Impact

This project will not produce any wasteful, inefficient, or unnecessary consumption of energy resources, during project construction and operation. This project will not conflict with state and local plans for renewable energy and energy efficiency.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VII. GEOLOGY AND SOILS: Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>
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 type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect 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"/>
f) 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"/>

a, b, c, d, e f) No Impact

The proposed project will not impact geologic or soil conditions. Most of the project lies in agricultural land underlain by the Pleistocene Montezuma Formation, consisting of sand, silt, and gravel and can contain fossils. There will be no increase in risk of seismic activity to the traveling public as a result of any part of this project. There are no geologic or seismic impacts from this project.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) Less Than Significant Impact

While the proposed project will result in GHG emissions during construction, it is anticipated that the project will not result in any increase in operational GHG emissions. With implementation of construction GHG-reduction measures, the impact would be less than significant. Please see Climate Change section of **chapter 2.4** for measures.

b) No Impact

The proposed project does not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IX. 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 checked="" type="checkbox"/>	<input 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 result in a safety hazard or excessive noise for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) 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"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b, c, d, e, f, g) No Impact

The project would not create a hazard to the public or environment through the transport, use, or disposal of hazardous materials. The project would not create a hazard to the public through the release of hazardous materials into the environment. There are no schools within the study area. The project is not located within an airport land use plan, public airport, or private airstrip. The proposed project is designed to accommodate emergency response vehicles during and after construction.

d) Less than Significant Impact

Impacts from the ADL could occur if contaminated media are encountered during construction. The project anticipates using almost exclusively imported soil for widening work. Soil determined to contain lead concentrations exceeding stipulated thresholds will be managed under the ADL Agreement between Caltrans and the California Department of Toxic Substances Control. This ADL Agreement allows such soils to be safely reused within the project limits as long as all requirements of the ADL Agreement are met.

With all Caltrans efforts discussed above, the hazardous waste impacts will be less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
X. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such the project may impede sustainable groundwater management of the basin?	<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
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
(i) result in substantial erosion or siltation on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(iii) 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; or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(iv) impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b, i, ii, iii, d, e) No Impact

The proposed project would not violate any water quality standards or Waste Discharge Requirements (WDRs). This project would not deplete groundwater supplies, substantially alter drainage patterns, create runoff water or otherwise substantially degrade water quality. This project would not place housing within a 100-year floodplain, expose people or structures to a risk of failure of a levee, or dam, or inundation by seiche, tsunami, or mudflow.

iv) Less Than Significant Impact

The project would add 6.2 acres of new and replaced impervious surfaces and a 401 permit will be needed. There is a potential for redirecting flood flow because of the proposed drainage work.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XI. 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) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b) No Impact

The project would improve vehicle, pedestrian, and bicycle access and safety in segment 3 in the City of Rio Vista. The project would be consistent with Solano’s General Plan. The proposed project would not divide an established community.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XII. 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"/>

a, b) No Impact

There are no mineral resources that will be affected by the proposed project.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIII. NOISE: Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project 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 checked="" type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) For a project located within the vicinity of a private airstrip or 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"/>

a) Less Than Significant Impact

The project would not cause people to experience heightened noise levels during construction, those levels would be temporary and only moderately exceed current standards.

The following project features will reduce the generation of substantial temporary and permanent noise:

1. If feasible, schedule construction activities during the day, between 6:00am to 9:00pm.
2. Combine noisy operations to occur within the same period. The total noise level will not be significantly greater than the level produced if operations are performed separately.
3. Construct noise barriers (temporary encloses or stockpiles of excavated material) between noisy activities and noise sensitive receptors or around activities with high noise levels or group of noisy equipment (e.g. shields can be used around pile drivers).
4. Utilize “quiet” air compressors and other “quiet” equipment where such technology exists.
5. Maintain all internal combustion engines properly to minimize noise generation.

b) No Impact

The project would not cause excessive groundborne vibration or groundborne noise levels.

c) No Impact

The project is not within the vicinity of a private airport.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIV. POPULATION AND HOUSING: Would the project:				
a) Induce substantial unplanned 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 people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b) No Impact

The project will not add travel lanes to SR 12 and is therefore not a capacity increasing project. The project is not growth inducing, nor will it displace any housing units or people.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XV. 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:				
Fire protection?	<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
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"/>

a) No Impact

Construction of the project will not result in the provision of new or physically altered governmental facilities. The project also will not result in a need for new or physically altered governmental facilities, including fire protection, police protection, schools, park, and other public facilities.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVI. 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"/>

a, b) No Impact

This project would not increase the use of existing neighborhood and regional parks/recreational facilities and this project will not include expansion of recreational facilities which might adversely affect the environment.

XVII. TRANSPORTATION: Would the project:				
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially increase hazards due to a geometric 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"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b, c, d) No Impact

This project will not conflict with any program, plan, ordinance, or policy addressing circulation systems. This project is consistent with CEQA, will not substantially increase hazards due to geometric design feature, and would not result in inadequate emergency access.

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

a, b) No Impact

There are no tribal cultural resources identified within the study area as defined by PRC 21074. AB 52 outreach was conducted as part of this project. None of the tribes contacted requested AB 52 consultation or indicated the presence of AB 52 resources within the project's APE. A summary of AB 52 consultation outreach and Native American tribal responses can be found in Chapter 2.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) 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"/>
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, d) No Impact

The project does not require or result in the construction of new water or wastewater treatment facilities, or the expansion of existing facilities. The project also does not require the services of a landfill where the project would impact the capacity of a landfill.

b, c, e) No Impact

The project would not exceed wastewater treatment requirements. The project does not require water supplies to serve the project from existing entitlements or where the project would impact new or expanded entitlements. The Rio Vista Finance Department provides water services for the City of Rio Vista residents and businesses including the project study area. The project does not require the services of a wastewater treatment provider where the project would impact the capacity of the provider. The project would comply with all regulations regarding solid waste.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XX. WILDFIRE: If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b, c, d) No Impact

The project would not impair emergency management plans or exacerbate wildfire risks. The project would not require installation of infrastructure that would exacerbate wildfire risks. The project would not expose people or structures to significant risks due to downslope flooding or landslides as a result of post-fire slope instability or drainage changes.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XXI. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input 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"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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"/>

a) Less than Significant with Mitigation

The biological resource identified that may be impacted by the proposed project is the California tiger salamander, vernal pool (Vernal Pool Tadpole Shrimp, Vernal Pool Fairy Shrimp, and Conservancy Fairy Shrimp are inferred), and wetlands. With the proposed mitigation measures (Please see **Appendix D** the impacts to this resource would be reduced to a level of insignificance. No other habitat, fish, or wildlife species will be degraded by the proposed project.

b) No Impact

A cumulative impact analysis focuses only on those resources that are significantly impacted by the project. The proposed project will not result in any cumulative impact on the Swainson’s hawk. Within the project vicinity, the completed Azevedo project (EA 2A620), design project Solano 12 Rehabilitation project (EA 0R10U), and Roundabout Intersection Improvement project (EA 4G560) were identified. Future projects within this project include the pavement rehabilitation project (EA 2Q550), and pedestrian accessibility & safety improvements project (EA 0K100). Current project within this project includes the Church Road Intersection Improvement project (EA 0G050). These projects will follow AMMs including standard Caltrans BMPs, which will protect surrounding habitats.

c) No Impact

This project will not have any environmental effects that will cause adverse effects on human beings either directly or indirectly.

CLIMATE CHANGE

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

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF₆), and various hydrofluorocarbons (HFCs). CO₂ is the most abundant GHG; while it is a naturally occurring component of Earth's atmosphere, fossil-fuel combustion is the main source of additional, human-generated CO₂.

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

Regulatory Setting

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

Federal

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

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

The FHWA recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices.⁴ This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—“the triple bottom

⁴ <https://www.fhwa.dot.gov/environment/sustainability/resilience/>

line of sustainability.”⁵ Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects. The most important of these was the Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Economy (CAFE) Standards. This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the CAFE program on the basis of each manufacturer’s average fuel economy for the portion of its vehicles produced for sale in the United States.

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

The U.S. EPA⁶ in conjunction with the National Highway Traffic Safety Administration (NHTSA) is responsible for setting GHG emission standards for [new cars and light-duty vehicles](#) to significantly increase the fuel economy of all new passenger cars and light trucks sold in the United States. The current standards require vehicles to meet an average fuel economy of 34.1 miles per gallon by 2016. EPA and NHTSA are currently considering appropriate mileage and GHG emissions standards for 2022–2025 light-duty vehicles for future rulemaking.

NHTSA and EPA issued a Final Rule for “Phase 2” for medium- and heavy-duty vehicles to improve fuel efficiency and cut carbon pollution in October 2016. The agencies estimate that the standards will save up to 2 billion barrels of oil and reduce CO₂ emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

⁵ <https://www.sustainablehighways.dot.gov/overview.aspx>

⁶ U.S. EPA’s authority to regulate GHG emissions stems from the U.S. Supreme Court decision in [Massachusetts v. EPA](#) (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing [Clean Air Act](#) and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court’s ruling, U.S. EPA finalized an [endangerment finding](#) in December 2009. Based on scientific evidence it found that six GHGs constitute a threat to public health and welfare. Thus, it is the Supreme Court’s interpretation of the existing Act and EPA’s assessment of the scientific evidence that form the basis for EPA’s regulatory actions.

State

California has been innovative and proactive in addressing GHG emissions and climate change by passing multiple Senate and Assembly bills and executive orders (EOs) including, but not limited to, the following:

EO 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 year 1990 levels by 2050. This goal was further reinforced with the passage of Assembly Bill (AB) 32 in 2006 and Senate Bill (SB) 32 in 2016.

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

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

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

SB 391, Chapter 585, 2009, California Transportation Plan: This bill requires the State's long-range transportation plan to identify strategies to address California's climate change goals under AB 32.

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

EO B-30-15 (April 2015) establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon

dioxide equivalent (MMT CO_2e).⁷ Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, *Safeguarding California*, every 3 years, and to ensure that its provisions are fully implemented.

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

SB 1386, Chapter 545, 2016, declared "it to be the policy of the state that the protection and management of natural and working lands ... is an important strategy in meeting the state's greenhouse gas reduction goals, and would require all state agencies, departments, boards, and commissions to consider this policy when revising, adopting, or establishing policies, regulations, expenditures, or grant criteria relating to the protection and management of natural and working lands."

AB 134, Chapter 254, 2017, allocates Greenhouse Gas Reduction Funds and other sources to various clean vehicle programs, demonstration/pilot projects, clean vehicle rebates and projects, and other emissions-reduction programs statewide.

Senate Bill 743, Chapter 386 (September 2013): This bill changes the metric of consideration for transportation impacts pursuant to CEQA from a focus on automobile delay to alternative methods focused on vehicle miles travelled, to promote the state's goals of reducing greenhouse gas emissions and traffic related air pollution and promoting multimodal transportation while balancing the needs of congestion management and safety.

Senate Bill 150, Chapter 150 2017, Regional Transportation Plans: This bill requires ARB to prepare a report that assesses progress made by each metropolitan planning organization in meeting their established regional greenhouse gas emission reduction targets.

Executive Order B-55-18, (September 2018) sets a new statewide goal to achieve and maintain carbon neutrality no later than 2045. This goal is in addition to existing statewide targets of reducing GHG emissions.

Environmental Setting

SR 12 is a two-lane highway facility set in the unincorporated portions of Solano County, in a rural landscape that is flat grassland to the west and rolling hilly terrain to the east. Segment 1 runs through agricultural land, primarily used for livestock grazing, on both sides of the alignment. Segment 2 runs adjacent to a housing development and Segment 3 is within the city of Rio Vista. The highway is the only east-west route connecting Solano County to the Sacramento and Stockton areas, and as such, handles a significant amount of interregional traffic. This stretch of SR 12 is also an important east-west link for motorists traveling between the Fairfield/Suisun City area and Rio Vista. These towns are destinations as well as transportation hubs for commuters using mass transit. SR 12 connects to northbound SR 113 and serves as an interregional, recreational, commercial, agricultural, and commuter

⁷ GHGs differ in how much heat each traps in the atmosphere (global warming potential, or GWP). CO_2 is the most important GHG, so amounts of other gases are expressed relative to CO_2 , using a metric called "carbon dioxide equivalent" (CO_2e). The global warming potential of CO_2 is assigned a value of 1, and the GWP of other gases is assessed as multiples of CO_2 .

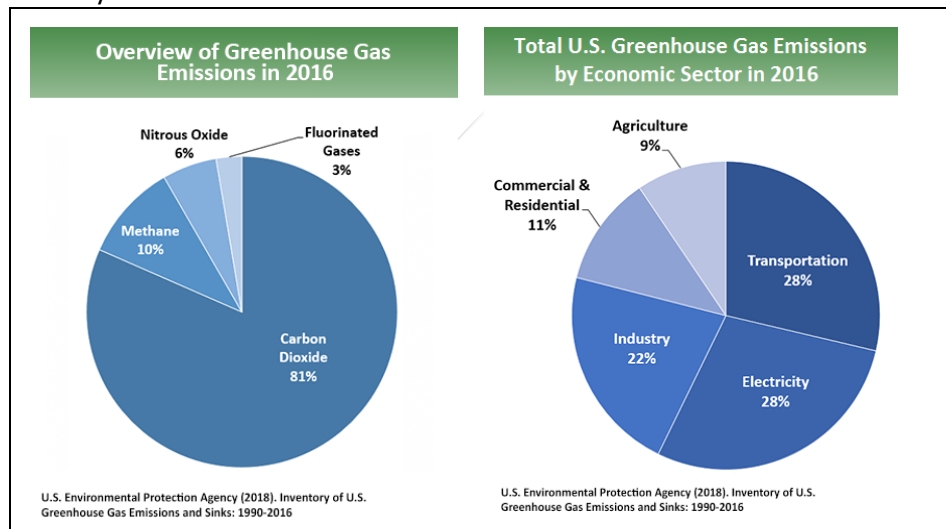
route. It provides an important link to interstate truck routes including US-101, I-80 and I-5, as well as a route for long-distance recreational bicycle travel.

Solano County is in the jurisdiction of the Bay Area Metropolitan Transportation Commission and Association of Bay Area Governments (MTC/ABAG), whose *Plan Bay Area* guides transportation development in the county.

A GHG emissions inventory estimates the amount of GHGs discharged into the atmosphere by specific sources over a period of time, such as a calendar year. Tracking annual GHG emissions allows countries, states, and smaller jurisdictions to understand how emissions are changing and what actions may be needed to attain emission reduction goals. U.S. EPA is responsible for documenting GHG emissions nationwide, and the ARB does so for the state, as required by H&SC Section 39607.4.

National GHG Inventory

The U.S. EPA prepares a national GHG inventory every year and submits it to the United Nations in accordance with the Framework Convention on Climate Change. The inventory provides a comprehensive accounting of all human-produced sources of GHGs in the United States, reporting emissions of CO₂, CH₄, N₂O, HFCs, perfluorocarbons, SF₆, and nitrogen trifluoride. It also accounts for emissions of CO₂ that are removed from the atmosphere by “sinks” such as forests, vegetation, and soils that uptake and store CO₂ (carbon sequestration). The 1990–2016 inventory found that of 6,511 MMTCO₂e GHG emissions in 2016, 81% consist of CO₂, 10% are CH₄, and 6% are N₂O; the balance consists of fluorinated gases (EPA 2018a).⁸ In 2016, GHG emissions from the transportation sector accounted for nearly 28.5% of U.S. GHG emissions.



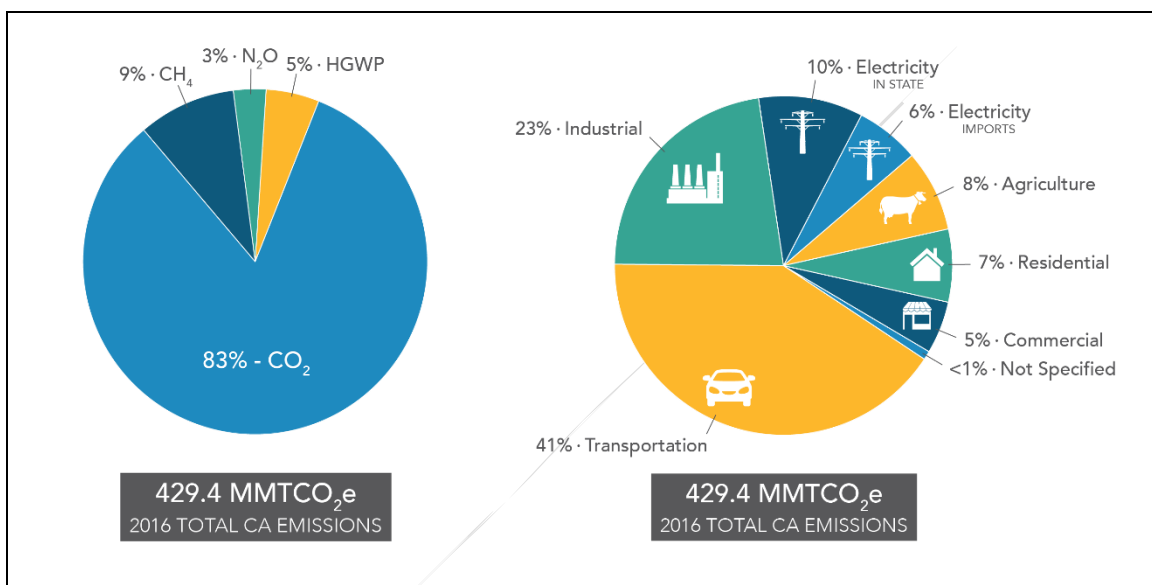
<https://www.arb.ca.gov/cc/inventory/data/bau.htm>

⁸ U.S. Environmental Protection Agency. 2018. Inventory of U.S. Greenhouse Gas Emissions and Sinks. <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>

State GHG Inventory

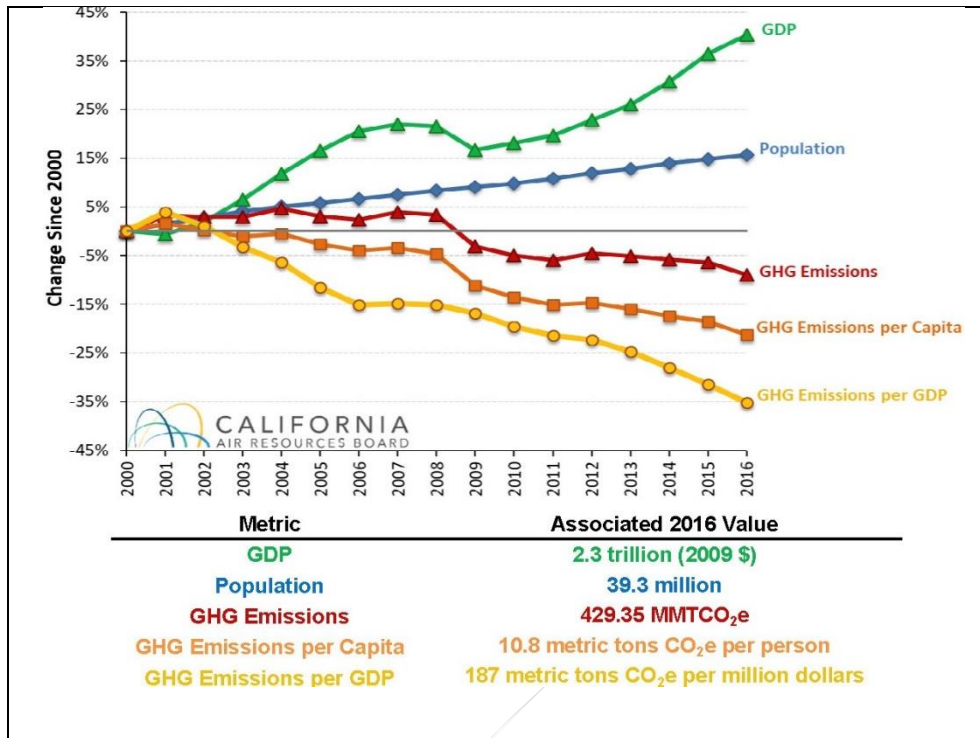
ARB collects GHG emissions data for transportation, electricity, commercial/residential, industrial, agricultural, and waste management sectors each year. It then summarizes and highlights major annual changes and trends to demonstrate the state's progress in meeting its GHG reduction goals. The 2018 edition of the GHG emissions inventory found total California emissions of 429 MMTCO₂e for 2016, with the transportation sector responsible for 41% of total GHGs. It also found that overall statewide GHG emissions have declined from 2000 to 2016 despite growth in population and state economic output.⁹

FIGURE 20. CALIFORNIA 2016 GREENHOUSE GAS EMISSIONS



⁹ 2018 Edition of the GHG Emission Inventory (July 2018).
<https://www.arb.ca.gov/cc/inventory/data/data.htm>

FIGURE 21. CHANGE IN CALIFORNIA GDP, POPULATION, AND GHG EMISSIONS SINCE 2000



AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020, and to update it every 5 years. ARB adopted the first scoping plan in 2008. The second updated plan, [California's 2017 Climate Change Scoping Plan](#), adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32. The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions.

Regional Plans

ARB sets regional targets for California's 18 MPOs to use in their RTP/SCSs to plan future projects that will cumulatively achieve GHG reduction goals. Targets are set at a percent reduction of passenger vehicle GHG emissions per person from 2005 levels. The MPO for the proposed project is Bay Area MTC and ABAG, and *Plan Bay Area* is the RTP/SCS for the region, which includes Solano County. The regional GHG reduction target for MTC/ABAG as of October 1, 2018 is 20 percent by 2020 and 19 percent by 2035.¹⁰

¹⁰ <https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets>

The Solano County General Plan Transportation and Circulation element (adopted in 2008)¹¹ and Public Health and Safety element (adopted in 2015)¹² address GHGs in the project area. Solano County also adopted a climate action plan on June 7, 2011. These documents describe goals, policies, and actions that Solano County will pursue to reduce GHG emissions, including those from transportation and other sources. Goals and policies of these plans include supporting carpooling, public transit use, and active transportation; minimizing exhaust emissions from construction equipment; and reducing per-capita vehicle miles traveled (VMT).

Project Analysis

GHG emissions from transportation projects can be divided into those produced during operation of the SHS and those produced during construction. The primary GHGs produced by the transportation sector are CO₂, CH₄, N₂O, and HFCs. CO₂ emissions are a product of the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of CH₄ and N₂O are emitted during fuel combustion. In addition, a small amount of HFC emissions are included in the transportation sector.

The CEQA Guidelines generally address greenhouse gas emissions as a cumulative impact due to the global nature of climate change (Pub. Resources Code, § 21083(b)(2)). As the California Supreme Court explained, “because of the global scale of climate change, any one project's contribution is unlikely to be significant by itself.” (Cleveland National Forest Foundation v. San Diego Assn. of Governments (2017) 3 Cal.5th 497, 512.) 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. Although climate change is ultimately a cumulative impact, not every individual project that emits greenhouse gases must necessarily be found to contribute to a significant cumulative impact on the environment.

Operational Emissions

The purpose of this proposed project is to rehabilitate SR 12 in three segments to enhance highway safety and ride quality for users; improve drainage efficiency; satisfy ADA compliance requirements in downtown Rio Vista; and incorporate complete streets design elements in downtown Rio Vista. The proposed project will not increase roadway capacity or vehicle miles traveled on SR 12, so it is not anticipated to result in any increase in operational GHG emissions. While some construction GHG emissions would be unavoidable, there will likely be long-term GHG benefits from improved operation on smoother pavement surfaces. Other project elements would support non-motorized transportation.

Construction Emissions

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

¹¹ https://www.solanocounty.com/depts/rm/planning/general_plan.asp

¹² https://www.solanocounty.com/depts/rm/planning/climate_action_plan/documents/default.asp

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 activities.

Based on project information available for environmental studies, the construction-related GHG emissions were calculated using the Road Construction Emissions Model (RCEM), version 8.1.0, provided by the Sacramento Metropolitan Air Quality Management District. CO₂ is the single most important GHG pollutant due to its abundance when compared with other vehicle-emitted GHGs. The estimated total amount of CO₂ produced for the construction of all three segments during the 14-month construction period would be 1,604 tons. CO₂e (CO₂, CH₄, and N₂O¹³) emissions would be 1,468.37 metric tons.

Table 12: Summary of Construction-related GHG Emissions¹

SEGMENT	PARAMETERS			PROJECT TOTAL
	CO2 (tons)	CH4 (tons)	N2O (tons)	CO2e (metric tons)
Segment 1 MP 20.57 - 22.70 (Curry Rd - Azevedo Rd.)	587.46	0.14	0.01	538.14
Segment 2 MP 23.7 - 25.5 (Summerset Rd. - City of Rio Vista urban boundary)	665.65	0.17	0.01	609.73
Segment 3 MP 25.5 - 26.41 (City of Rio Vista urban area)	350.46	0.07	0.00	320.50
ANNUAL	1,374.49	0.33	0.01	1,258.60
TOTAL	1,603.58	0.38	0.02	1,468.37

All construction contracts include Caltrans Standard Specifications Section 7-1.02A and 7-1.02C, Emissions Reduction, which require contractors to comply with all laws applicable to the project and to certify they are aware of and will comply with all ARB emission reduction regulations; and Section 14-9.02, Air Pollution Control, which requires contractors to comply with all air pollution control rules, regulations, ordinances, and statutes. Use of construction best management practices and certain common regulations, such as equipment idling restrictions and regular vehicle and equipment maintenance, that reduce construction vehicle emissions also help reduce GHG emissions.

A TMP will be implemented during construction to alleviate and minimize delay to the traveling public and associated idling emissions. Additionally, if practicable, nonhazardous waste and excess material will be recycled, and solar-powered signal boards will be used if feasible.

¹³ Gases are converted to CO₂e by multiplying by their global warming potential (GWP). Specifically, GWP is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO₂).

CEQA Conclusion

While the proposed project will result in GHG emissions during construction, it is anticipated that the project will not result in any increase in operational GHG emissions. The proposed project does not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. With implementation of construction GHG-reduction measures, the impact would be less than significant.

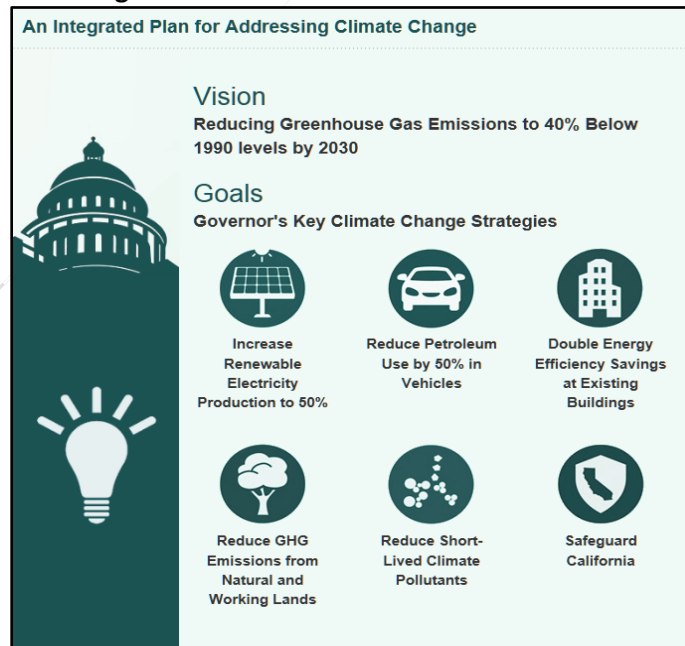
Caltrans is firmly committed to implementing measures to help reduce GHG emissions. These measures are outlined in the following section.

Greenhouse Gas Reduction Strategies

Statewide Efforts

Major sectors of the California economy, including transportation, will need to reduce emissions to meet the 2030 and 2050 GHG emissions targets. Former Governor Edmund G. Brown promoted GHG reduction goals that involved (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farms and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, *Safeguarding California*.

Figure 16: CALIFORNIA CLIMATE STRATEGY



The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that we build on our past successes in reducing criteria and toxic air pollutants from transportation and goods movement activities. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled. A key state [goal for reducing greenhouse gas emissions](#) is to reduce today's petroleum use in cars and trucks by up to 50 percent by 2030.

In addition, SB 1386 (Wolk 2016) established as state policy the protection and management of natural and working lands and requires state agencies to consider that policy in their own decision making. Trees and vegetation on forests, rangelands, farms, and wetlands remove carbon dioxide from the atmosphere through biological processes and sequester the carbon in above- and below-ground matter.

Caltrans Activities

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

California Transportation Plan (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. In 2016, Caltrans completed the *California Transportation Plan 2040*, which establishes a new model for developing ground transportation systems

consistent with CO₂ reduction goals. It serves as an umbrella document for all the other statewide transportation planning documents. Over the next 25 years, California will be working to improve transit and reduce long-run repair and maintenance costs of roadways and developing a comprehensive assessment of climate-related transportation demand management and new technologies rather than continuing to expand capacity on existing roadways.

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

Caltrans Strategic Management Plan

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

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

Funding and Technical Assistance Programs

In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several sustainable transportation planning grants. These grants encourage local and regional multimodal transportation, housing, and land use planning that furthers the region's RTP/SCS; contribute to the State's GHG reduction targets and advance transportation-related GHG emission reduction project types/strategies; and support other climate adaptation goals (e.g., *Safeguarding California*).

Caltrans Policy Directives and Other Initiatives

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities. [Caltrans Activities to Address Climate Change](#) (April 2013) provides a comprehensive overview of Caltrans' statewide activities to reduce GHG emissions resulting from agency operations.

Project-Level Features to Reduce Construction Emissions

1. Alternative fuels such as renewable diesel should be used for construction equipment
2. Schedule truck trips outside of peak morning and evening commute hours.
3. Reduce construction waste and maximize the use of recycled materials (reduces consumption of raw materials, reduces landfill waste, and encourages cost savings).
4. Encourage Improved fuel efficiency from construction equipment (examples provided below):
5. Maintain equipment in proper tune and working condition
6. Right size equipment for the job
7. Salvage large removed trees for lumber or similar on-site beneficial uses other than standard wood-chipping. (e.g. use in roadside landscape projects or green infrastructure components). On-site recycling of existing project features is encouraged: (E.g., MBGR, light standards, subbase granular material, or native material that meets Caltrans specifications for incorporation into new work
8. Lower the rolling resistance of highway surfaces as much as possible while still maintaining design and safety standards.
9. Earthwork Balance: Reduce the need for transport of earthen materials by balancing cut and fill quantities.
10. Reduce need for electric lighting by using ultra-reflective sign materials that are illuminated by headlights.
11. Alternative fuels such as renewable diesel should be used for construction equipment.
12. Limit idling to 5 minutes for delivery and dump trucks and other diesel-powered equipment.
13. Schedule truck trips outside of peak morning and evening commute hours.
14. Reduce construction waste and maximize the use of recycled materials (reduces consumption of raw materials, reduces landfill waste, and encourages cost savings).
15. Encourage Improved fuel efficiency from construction equipment (examples provided below):

16. Maintain equipment in proper tune and working condition
17. Right size equipment for the job
18. Maximize use of recycled materials (e.g., tire rubber).
19. Salvage large removed trees for lumber or similar on-site beneficial uses other than standard wood-chipping. (E.g., use in roadside landscape projects or green infrastructure components).
20. On-site recycling of existing project features is encouraged: (E.g., MBGR, light standards, sub-base granular material, or native material that meets Caltrans specifications for incorporation into new work).
21. Lower the rolling resistance of highway surfaces as much as possible while still maintaining design and safety standards.
22. Earthwork Balance: Reduce the need for transport of earthen materials by balancing cut and fill quantities.
23. Reduce need for electric lighting by using ultra-reflective sign materials that are illuminated by headlights.

Adaptation

Reducing GHG emissions is only one part of an approach to addressing climate change. Caltrans must 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 their intensity, and in the frequency and intensity of wildfires. Flooding and erosion can damage or wash out roads; longer periods of intense heat can buckle pavement and railroad tracks; storm surges combined with a rising sea level can inundate highways. Wildfire can directly burn facilities and indirectly cause damage when rain falls on denuded slopes that landslide after a fire. Effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. Accordingly, Caltrans must consider these types of climate stressors in how highways are planned, designed, built, operated, and maintained.

Federal Efforts

Under NEPA assignment, Caltrans is obligated to comply with all applicable federal environmental laws and FHWA NEPA regulations, policies, and guidance.

The U.S. Global Change Research Program (USGRCP) delivers a report to Congress and the president every 4 years, in accordance with the Global Change Research Act of 1990 ([15 U.S.C. ch. 56A § 2921 et seq.](#)). The *Fourth National Climate Assessment*, published in 2018, presents the foundational science and the "human welfare, societal, and environmental elements of climate change and variability for 10 regions and 18 national topics, with particular attention paid to observed and projected risks, impacts, consideration of risk reduction, and implications under different mitigation pathways." Chapter 12, "Transportation," presents a key discussion of vulnerability assessments. It notes that "asset owners and operators have increasingly conducted more focused studies of particular assets that consider multiple climate hazards and scenarios in the context of asset-specific information, such as design lifetime."

U.S. DOT Policy Statement on Climate Adaptation in June 2011 committed the federal Department of Transportation to “integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely, and that transportation infrastructure, services and operations remain effective in current and future climate conditions.”¹⁴

FHWA order 5520 (*Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events*, December 15, 2014)¹⁵ established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems.

FHWA has developed guidance and tools for transportation planning that foster resilience to climate effects and sustainability at the federal, state, and local levels.¹⁶

State Efforts

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system. [California’s Fourth Climate Change Assessment](#) (2018) is the state’s latest effort to “translate the state of climate science into useful information for action” in a variety of sectors at both statewide and local scales. It adopts the following key terms used widely in climate change analysis and policy documents:

- *Adaptation* to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
- *Adaptive capacity* is the “combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities.”
- *Exposure* is the presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.
- Resilience is the “capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience”. Adaptation actions contribute to increasing resilience, which is a desired outcome or state of being.
- *Sensitivity* is the level to which a species, natural system, or community, government, etc., would be affected by changing climate conditions.
- *Vulnerability* is the “susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt.” Vulnerability can increase because of physical (built and environmental), social, political, and/or economic factor(s). These factors include, but are not limited to: ethnicity, class, sexual orientation and identification, national origin, and income inequality.² Vulnerability is often defined as the combination of sensitivity and adaptive capacity as affected by the level of exposure to changing climate.

¹⁴ https://www.fhwa.dot.gov/environment/sustainability/resilience/policy_and_guidance/usdot.cfm

¹⁵ <https://www.fhwa.dot.gov/legsregs/directives/orders/5520.cfm>

¹⁶ <https://www.fhwa.dot.gov/environment/sustainability/resilience/>

Several key state policies have guided climate change adaptation efforts to date. Recent state publications produced in response to these policies draw on these definitions.

EO S-13-08, issued by then-governor Arnold Schwarzenegger in November 2008, focused on sea-level rise and resulted in the *California Climate Adaptation Strategy* (2009), updated in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan). The Safeguarding California Plan offers policy principles and recommendations and continues to be revised and augmented with sector-specific adaptation strategies, ongoing actions, and next steps for agencies.

EO S-13-08 also led to the publication of a series of sea-level rise assessment reports and associated guidance and policies. These reports formed the foundation of an interim *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance) in 2010, with instructions for how state agencies could incorporate “sea-level rise (SLR) projections into planning and decision making for projects in California” in a consistent way across agencies. The guidance was revised and augmented in 2013. *Rising Seas in California – An Update on Sea-Level Rise Science* was published in 2017 and its updated projections of sea-level rise and new understanding of processes and potential impacts in California were incorporated into the *State of California Sea-Level Rise Guidance Update* in 2018.¹⁷

EO B-30-15, signed in April 2015, requires state agencies to factor climate change into all planning and investment decisions. This EO recognizes that effects of climate change other than sea-level rise also threaten California’s infrastructure. At the direction of EO B-30-15, the Office of Planning and Research published *Planning and Investing for a Resilient California: A Guidebook for State Agencies* in 2017, to encourage a uniform and systematic approach. Representatives of Caltrans participated in the multi-agency, multidisciplinary technical advisory group that developed this guidance on how to integrate climate change into planning and investment.

AB 2800 (Quirk 2016) created the multidisciplinary Climate-Safe Infrastructure Working Group, which in 2018 released its report, *Paying it Forward: The Path Toward Climate-Safe Infrastructure in California*. The report provides guidance to agencies on how to address the challenges of assessing risk in the face of inherent uncertainties still posed by the best available science on climate change. It also examines how state agencies can use infrastructure planning, design, and implementation processes to address the observed and anticipated climate change impacts.

Caltrans Adaptation Efforts

Caltrans Vulnerability Assessments

Caltrans is conducting climate change vulnerability assessments to identify segments of the State Highway System vulnerable to climate change effects including precipitation, temperature, wildfire, storm surge, and sea-level rise. The approach to the vulnerability assessments was tailored to the practices of a transportation agency, and involves the following concepts and actions:

- *Exposure* – Identify Caltrans assets exposed to damage or reduced service life from expected future conditions.
- *Consequence* – Determine what might occur to system assets in terms of loss of use or costs of repair.

¹⁷ <http://www.opc.ca.gov/updates/californias-sea-level-rise-guidance/>

- *Prioritization* – Develop a method for making capital programming decisions to address identified risks, including considerations of system use and/or timing of expected exposure.

The climate change data in the assessments were developed in coordination with climate change scientists and experts at federal, state, and regional organizations at the forefront of climate science. The findings of the vulnerability assessments will guide analysis of at-risk assets and development of adaptation plans to reduce the likelihood of damage to the State Highway System, allowing Caltrans to both reduce the costs of storm damage and to provide and maintain transportation that meets the needs of all Californians.

Sea-Level Rise

The proposed project is outside the coastal zone and not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected.

Precipitation and Flooding

The Caltrans Vulnerability Assessment for District 4¹⁸ (pages 17–18) analyzed the potential change (relative to historic rainfall) in the 100-year storm precipitation depth in 2025, 2055, and 2085, under a business-as-usual scenario. At the project location in eastern Solano County, in the eastern portion of the district, the 100-year rainfall event is expected to increase up to 4.9 percent. (For scale, a 15 percent increase represents an estimated additional 1 inch of rainfall in a day.)

Segment 2 of the proposed project includes culvert work in a Zone A floodplain (no base flood elevation has been established), Zone AO, and in a Zone X floodplain (denoting an area between a 1 percent and 0.2 percent annual chance flood). The proposed project would improve stormwater drainage by upgrading drainage facilities from their current capacities, raising the roadway profile in some locations, and correcting cross-slopes as needed. Caltrans proposes installing a new drainage system and outfall to the Sacramento River in Segment 3 within the city of Rio Vista from PM 25.5 to the bridge approach at PM 26.4. This will enable the system to handle a 10 percent annual chance storm at that location.

Temperature

The District 4 Vulnerability Assessment indicates a potential 7-day maximum temperature increase of up to 7.9 degrees Fahrenheit in the project area by 2055 under a worst-case scenario. Pavement exposed to high temperatures over time will cause pavement to wear faster, crack, or heave, and require more maintenance or earlier replacement. Asphalt pavement is generally replaced after about 20 to 25 years but would have to be replaced sooner if it deteriorates more rapidly. Higher temperatures would also affect landscaping plants.

Wildfire

The project area traverses agricultural and urban lands. According to CalFire fire hazard severity zone mapping (2007), the project location in eastern Solano County is not in a State Responsibility Area, and

¹⁸ <http://www.dot.ca.gov/transplanning/ocp/vulnerability-assessment.html>

not in a fire hazard severity zone. The Caltrans District 4 Vulnerability Assessment also shows that the project location is not in an area of wildfire concern.



Chapter 4 – List of Preparers

Caltrans District 4

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Zachary Gifford	Associate Environmental Planner, Office of Environmental Analysis
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Kathleen Reilly	District Branch Chief, Office of Hydraulic Engineering
Hassen Bolanos	Project Engineer, Office of Design – North Counties
Hillal Hamdan	Branch Chief, Office of Design- North Counties
Jason Mac	Project Manager, Office of Project Management

Chapter 5 – Distribution List

FEDERAL AGENCIES

US Fish and Wildlife
2800 Cottage Way W-2605
Sacramento, CA 95825

US Army Corps of Engineers,
Sacramento District
ATTN: Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95825

National Marine Fisheries Services
777 Sonoma Avenue Room 325
Santa Rosa, CA 95404

Environmental Protection Agency, Region IX
Federak Activities Office, CMD-2
75 Hathorne Street
San Francisco, CA 94105-3901

STATE AGENCIES

State Clearinghouse, Executive Officer
1400 Tenth Street, Room 156
P.O. Box 3044
Sacramento, CA 95812-3044

California Department of Fish & Wildlife
Region 3
7329 Silverado Trail
Napa, CA 94558

Bay Area Air Quality Management District
Chief Executive Officer
939 Ellis Street
San Francisco, CA 94109

California Air Resources Board
1001 I Street
P.O. Box 2815
Sacramento, CA 95812

California Department of Conservation
801 K Street, MS 24-011
Sacramento, CA 95814

California Highway Patrol,
Special Projects Section
P.O. Box 942898
Sacramento, CA 92298

California Transportation Commission
1120 N Street, MS-52
Sacramento, CA 95814

Regional Water Quality Control Board District 2
1515 Clay Street, Suite 1400
Oakland, CA 94612

REGIONAL AND LOCAL AGENCIES

Association of Bay Area Governments
101 Eighth Street, P.O. Box 2050
Oakland, CA 94604-2050

Metropolitan Transportation Commission
101 Eighth Street – Metrocenter
Oakland, CA 94607

Solano Transportation Authority
One Harbor Center, Suite 130
Suisun City, CA 94585

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United State Senate
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United State House of Representatives (CA-3)
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Appendix A. Section 4(f)

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

*Making Conservation
a California Way of Life.*

To: File

Date: April 22, 2019

File: OJ630
0414000020
SOL-12-20.6-26.4

From: WAHIDA RASHID *WR*
Office of Environmental Analysis
Branch Chief

Subject: SECTION 4(F) ANALYSIS

The Office of Environmental Analysis has reviewed the State Route 12 Roadway Resurfacing, Restoration, and Rehabilitation Project for possible Section 4(f) impacts. The anticipated level of environmental document is a CEQA/NEPA IS/EA.

This project proposes work in three segments of State Route (SR) 12 in Solano County. Work will consist of pavement rehabilitation, adding standard shoulders, widening to bring existing non-standard travel lanes up to standard, bringing existing non-standard vertical sight distances up to standard, and bringing non-standard cross slopes up to standard.

As part of the NEPA process, the Department is required to prepare documentation required by Section 4(f) of the U.S. Department of Transportation Act, referred to herein as the *Section 4(f) evaluation*. Section 4(f), codified in federal law of the United States Code, Title 14, Section 303, declares that "i[t] is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreational lands, wildlife and waterfowl refuges, and historic sites."

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 refuges, or historic sites.

Section 4(f) Resources near the project location include:

Segment 3, SR 12 SOL PM 25.4:

- Buena Vista Park is about 50 feet away from construction work on SR 12

Segment 3, SR 12 SOL PM 25.5:

- St. Joseph Cemetery is about 173 feet away from construction work on SR 12

Memo to File
April 22, 2019
Page 2 of 2

Both Buena Vista Park and St. Joseph Cemetery will not be touched nor, will their entrances be blocked during construction (permanently or temporarily). Construction work in this area is mainly pavement rehabilitation and upgrading existing curb ramps. Therefore, no potential Section 4(f) resources within the project vicinity will be impacted.

This memo confirms that the proposed project has been evaluated for the presence of archaeological and historic sites, public and private parks, recreational facilities, and wildlife refuges within approximately 0.5 mile of the project area to determine whether they are protected Section 4(f) resources and whether the project would "use" the properties. An analysis of the surrounding area shows that there are potential Section 4(f) resources present within the study area that will not be affected. Therefore, no further analysis of Section 4(f) resources is required.

If you have any questions regarding this Section 4(f) Analysis, please contact Cindy Fong, Environmental Planner at (510) 286 – 6454 (Cindy.Fong@dot.ca.gov).

Appendix B. Title VI Policy Statement

DEPARTMENT OF TRANSPORTATION

OFFICE OF THE DIRECTOR
P.O. BOX 942873, MS-49
SACRAMENTO, CA 94273-0001
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www.dot.ca.gov



*Making Conservation
a California Way of Life.*

April 2018

NON-DISCRIMINATION POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964, ensures *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."*

Related federal statutes and state law further those protections to include sex, disability, religion, sexual orientation, and age.

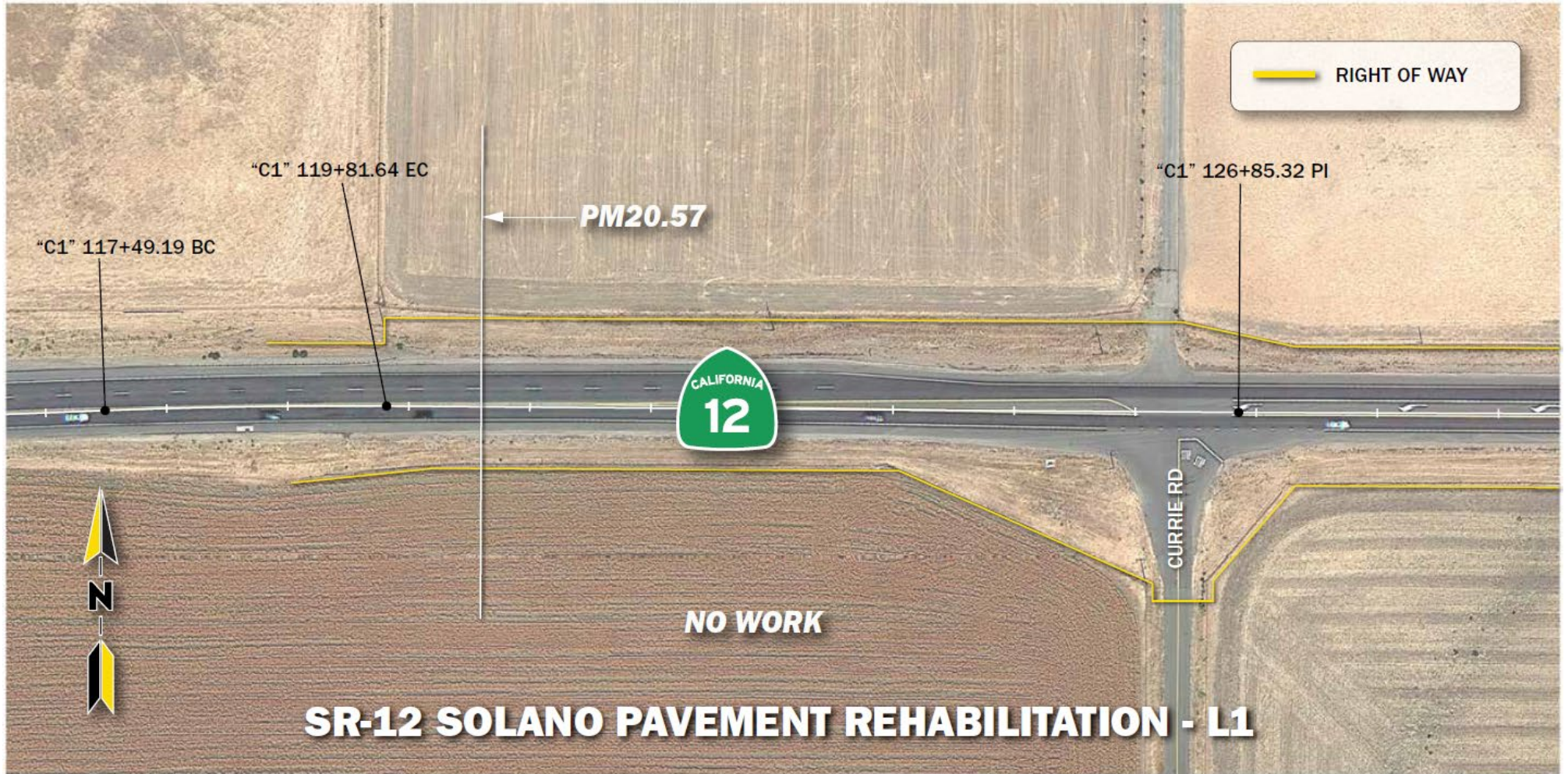
For information or guidance on how to file a complaint, please visit the following web page:
http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

To obtain this information in an alternate format such as 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) 324-8379, TTY 711, email Title.VI@dot.ca.gov, or visit the website www.dot.ca.gov.

A handwritten signature in blue ink that reads "Laurie Berman".

LAURIE BERMAN
Director

Appendix C. Project Footprint Maps L-1 to L-23





— RIGHT OF WAY



NO WORK

SR-12 SOLANO PAVEMENT REHABILITATION - L2

PROJECT/CONSTRUCTION FOOTPRINT
RIGHT OF WAY
ESA

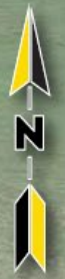
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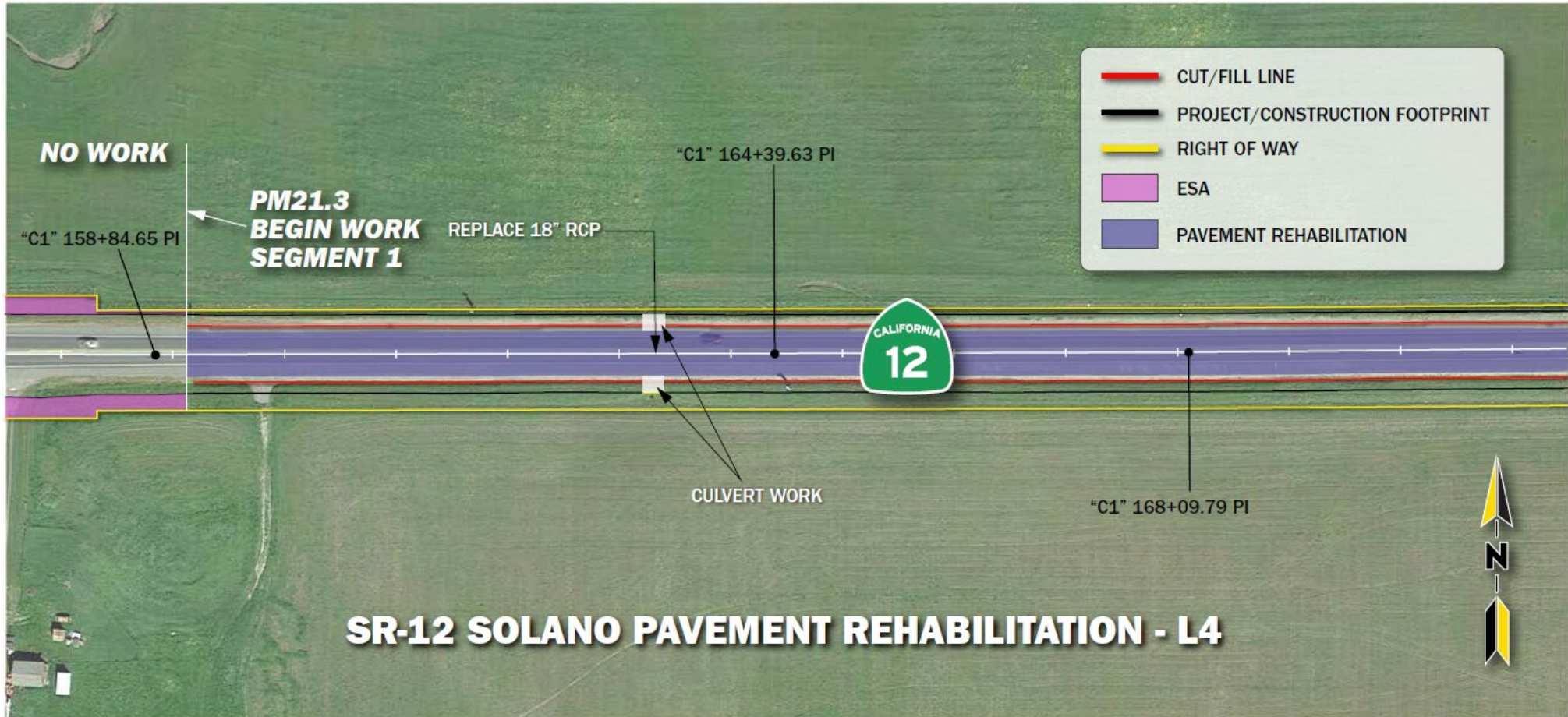
MCCLOSKEY RD








NO WORK

SR-12 SOLANO PAVEMENT REHABILITATION - L3





-  CUT/FILL LINE
-  PROJECT/CONSTRUCTION FOOTPRINT
-  RIGHT OF WAY
-  ESA
-  PAVEMENT REHABILITATION

"C1" 172+72.25 PI

"C1" 179+91.54 PI

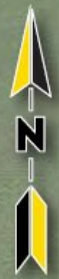
"C1" 182+00.52 PI

"C1" 185+16.15 PI



CULVERT WORK
REPLACE 36" RCP

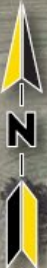
CULVERT WORK
REPLACE 18" RCP



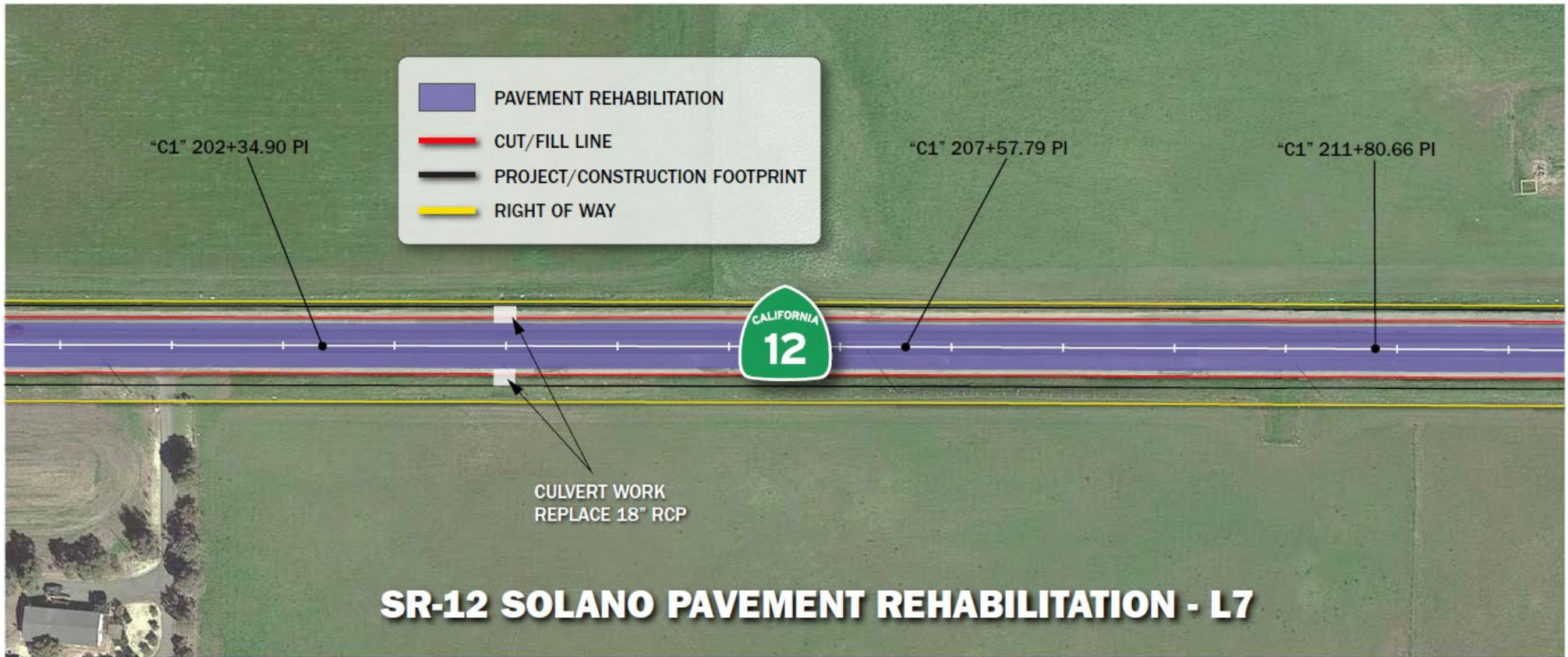
SR-12 SOLANO PAVEMENT REHABILITATION - L5

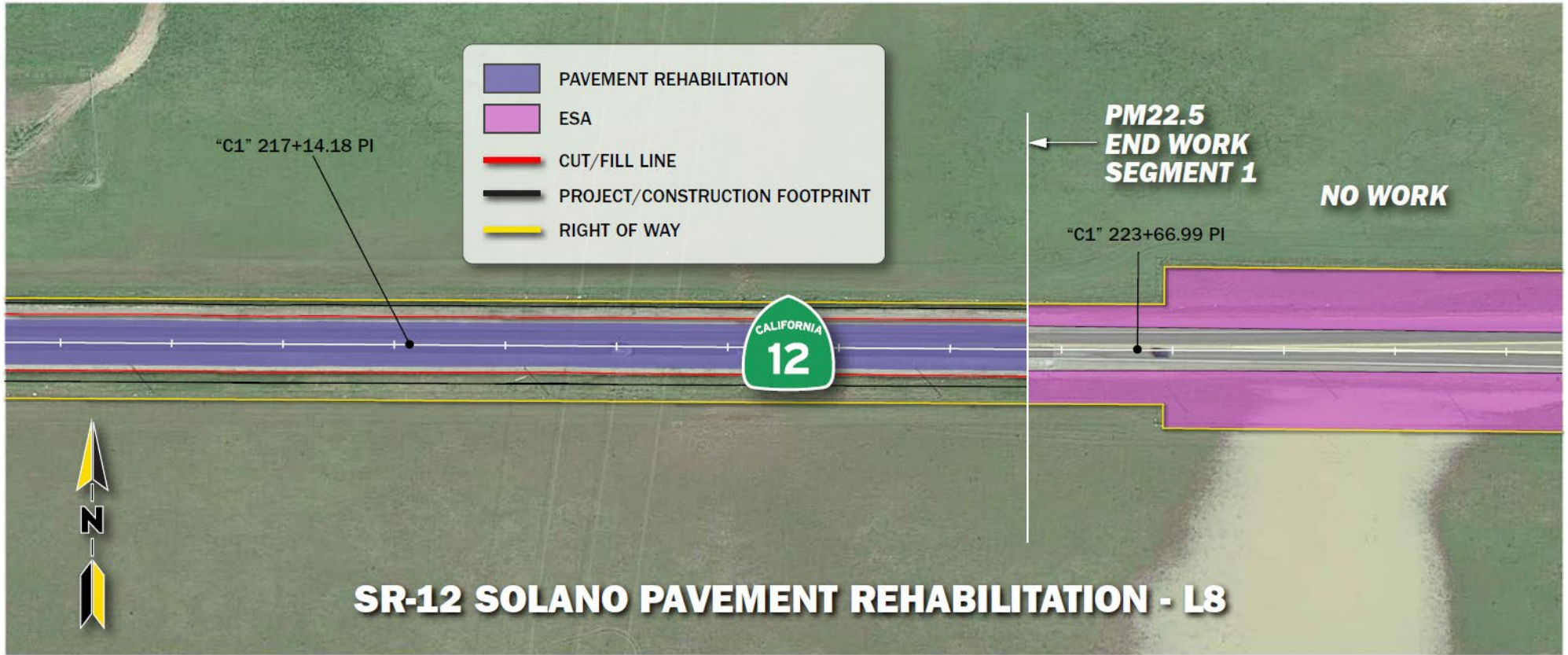
- PAVEMENT REHABILITATION
- CUT/FILL LINE
- PROJECT/CONSTRUCTION FOOTPRINT
- RIGHT OF WAY

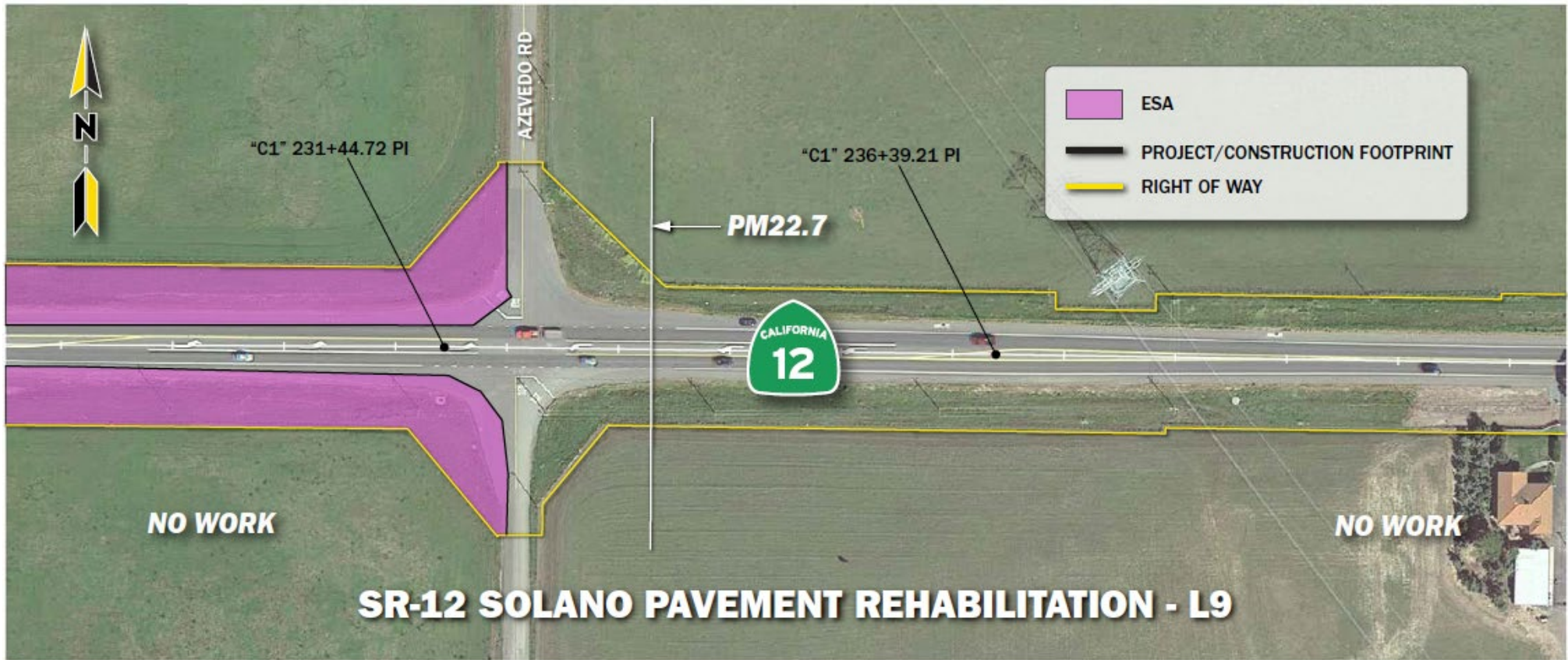
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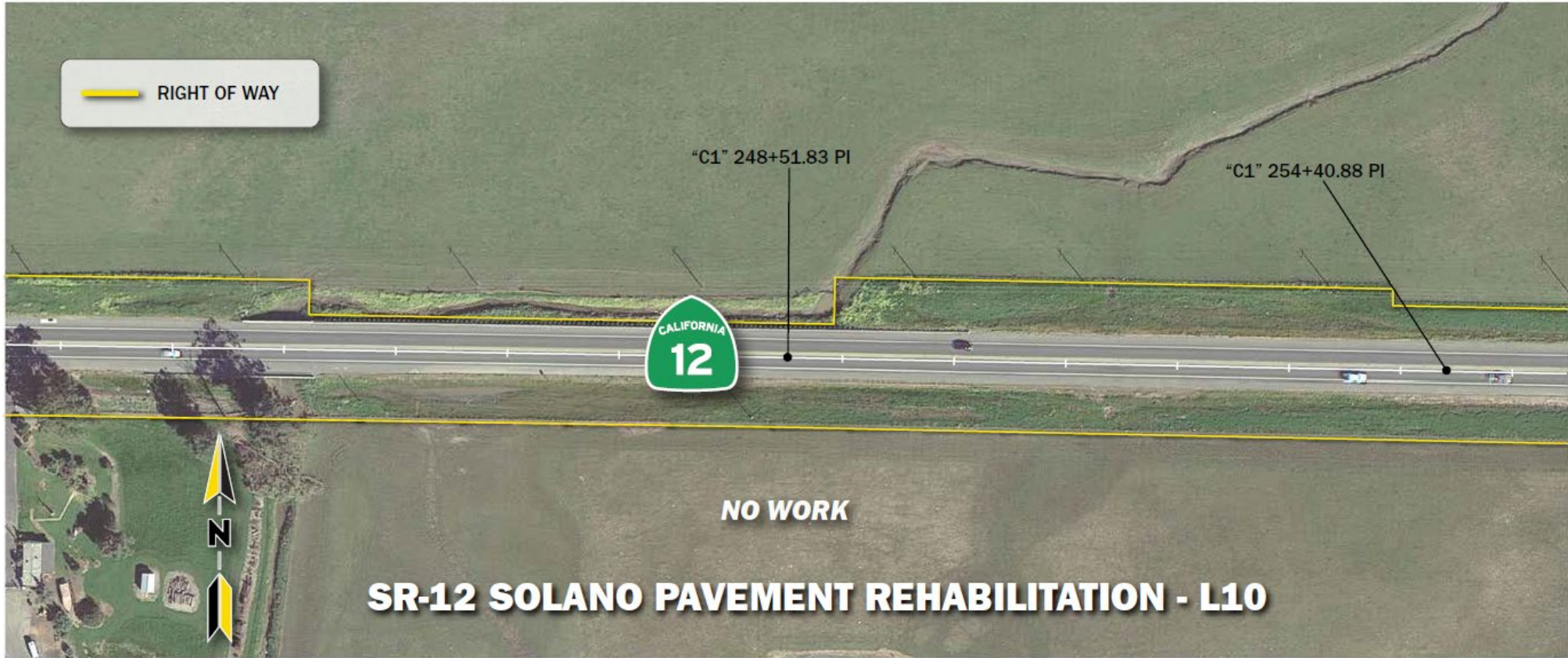


SR-12 SOLANO PAVEMENT REHABILITATION - L6









RIGHT OF WAY

"C1" 248+51.83 PI

"C1" 254+40.88 PI




NO WORK

SR-12 SOLANO PAVEMENT REHABILITATION - L10



"C1" 258+68.20 PI

"CN1" 262+56.67 BEG

 RIGHT OF WAY



NO WORK

SR-12 SOLANO PAVEMENT REHABILITATION - L11



PROPOSED STAGING AREAS

"CN1" 272+25.52 BC

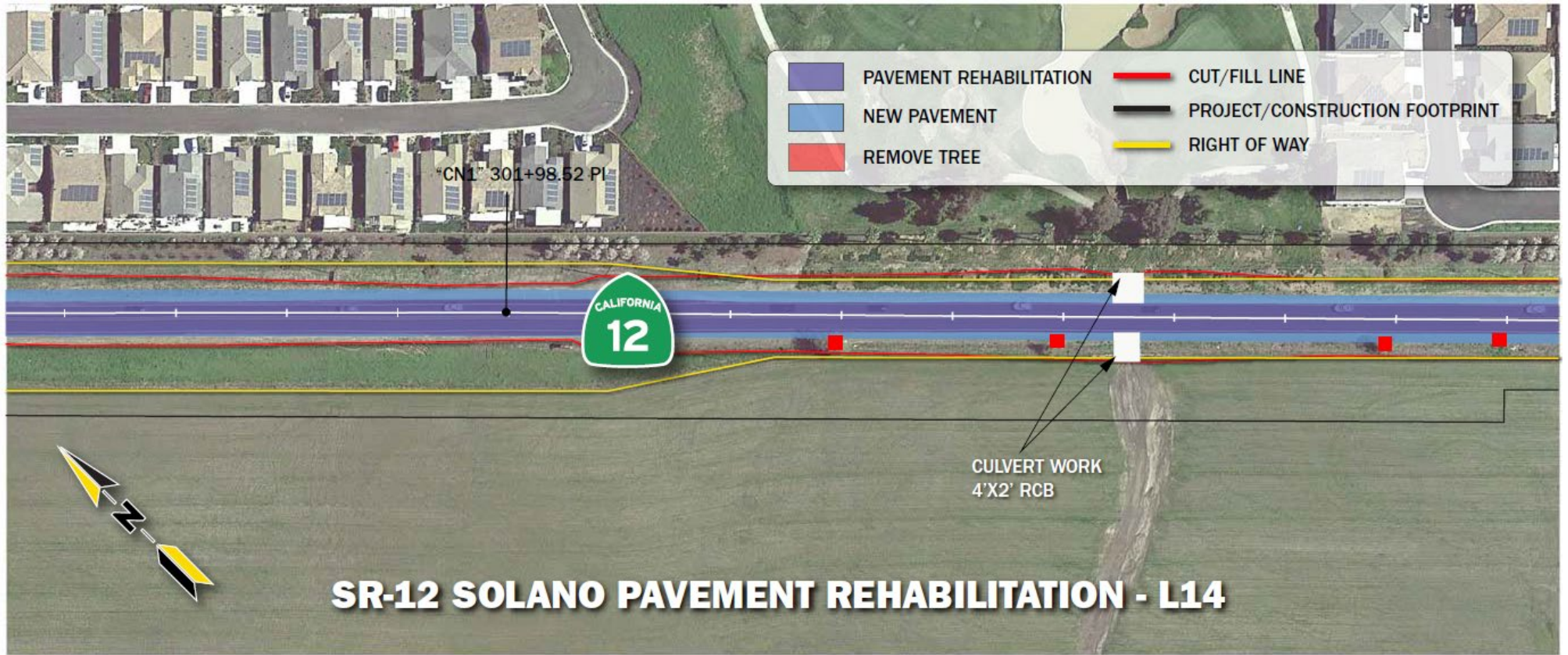


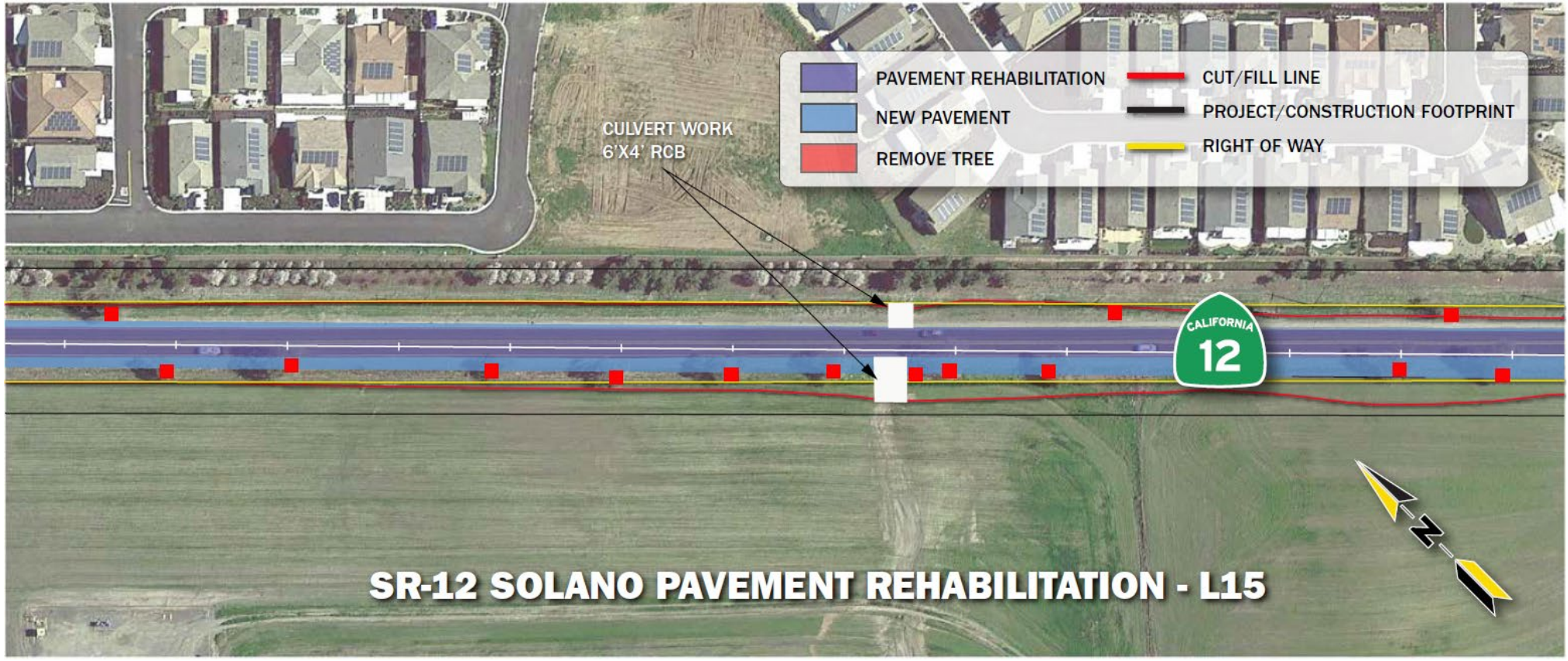
STAGING FOOTPRINT

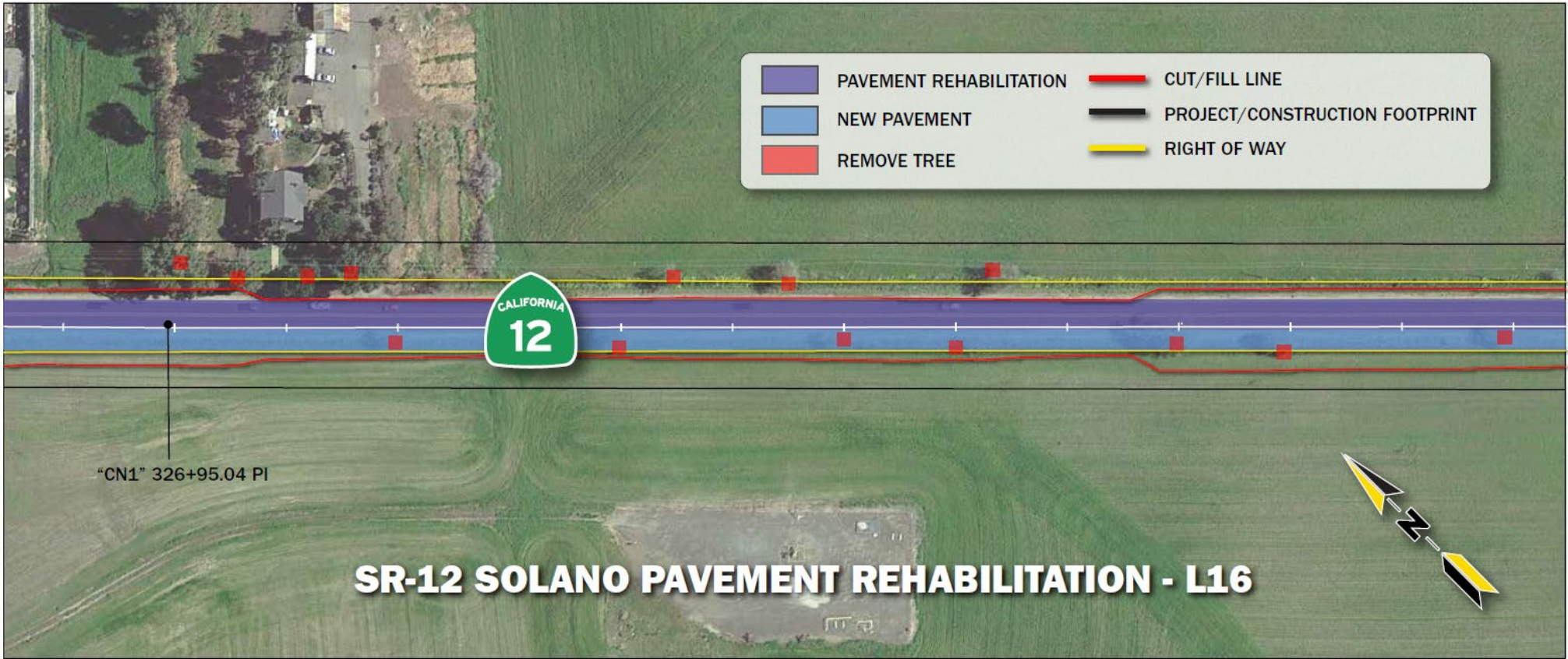
RIGHT OF WAY

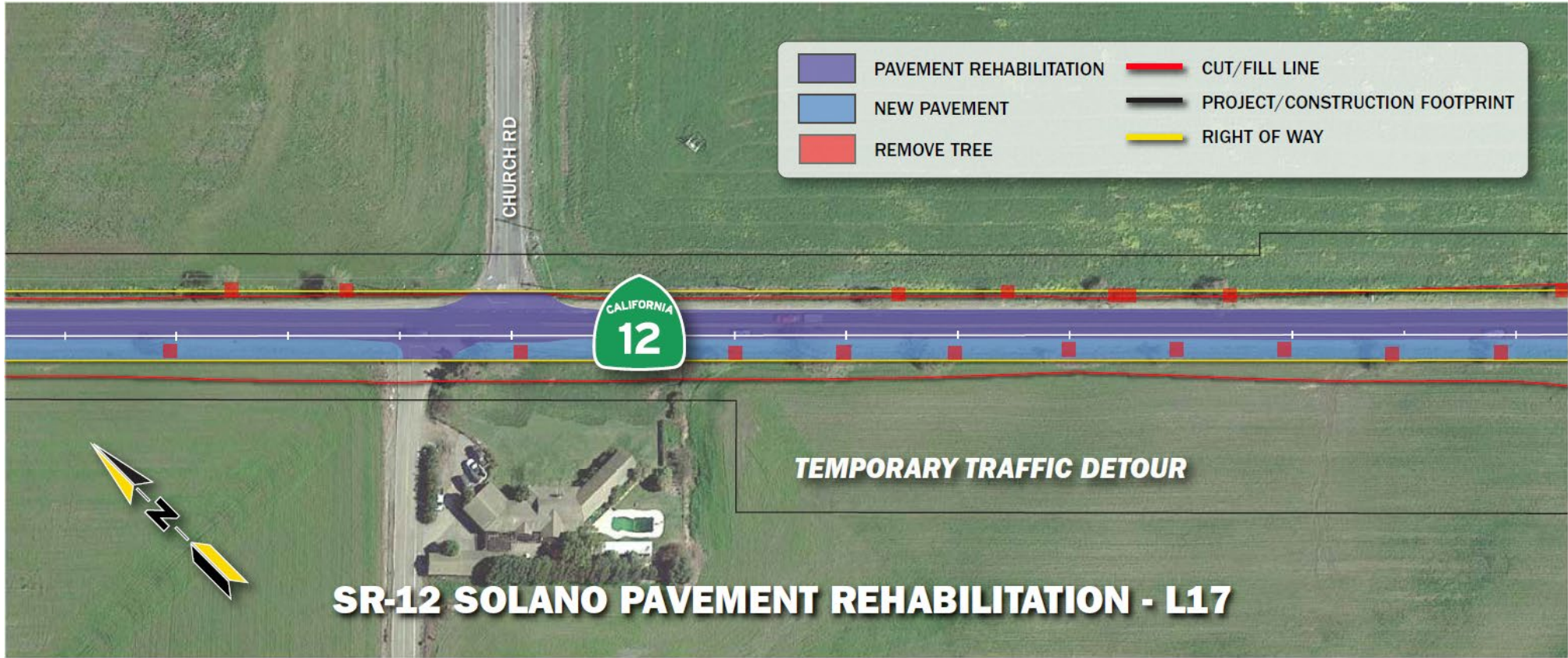
SR-12 SOLANO PAVEMENT REHABILITATION - L12











- | | | | |
|---|-------------------------|---|--------------------------------|
|  | PAVEMENT REHABILITATION |  | CUT/FILL LINE |
|  | NEW PAVEMENT |  | PROJECT/CONSTRUCTION FOOTPRINT |
|  | REMOVE TREE |  | RIGHT OF WAY |

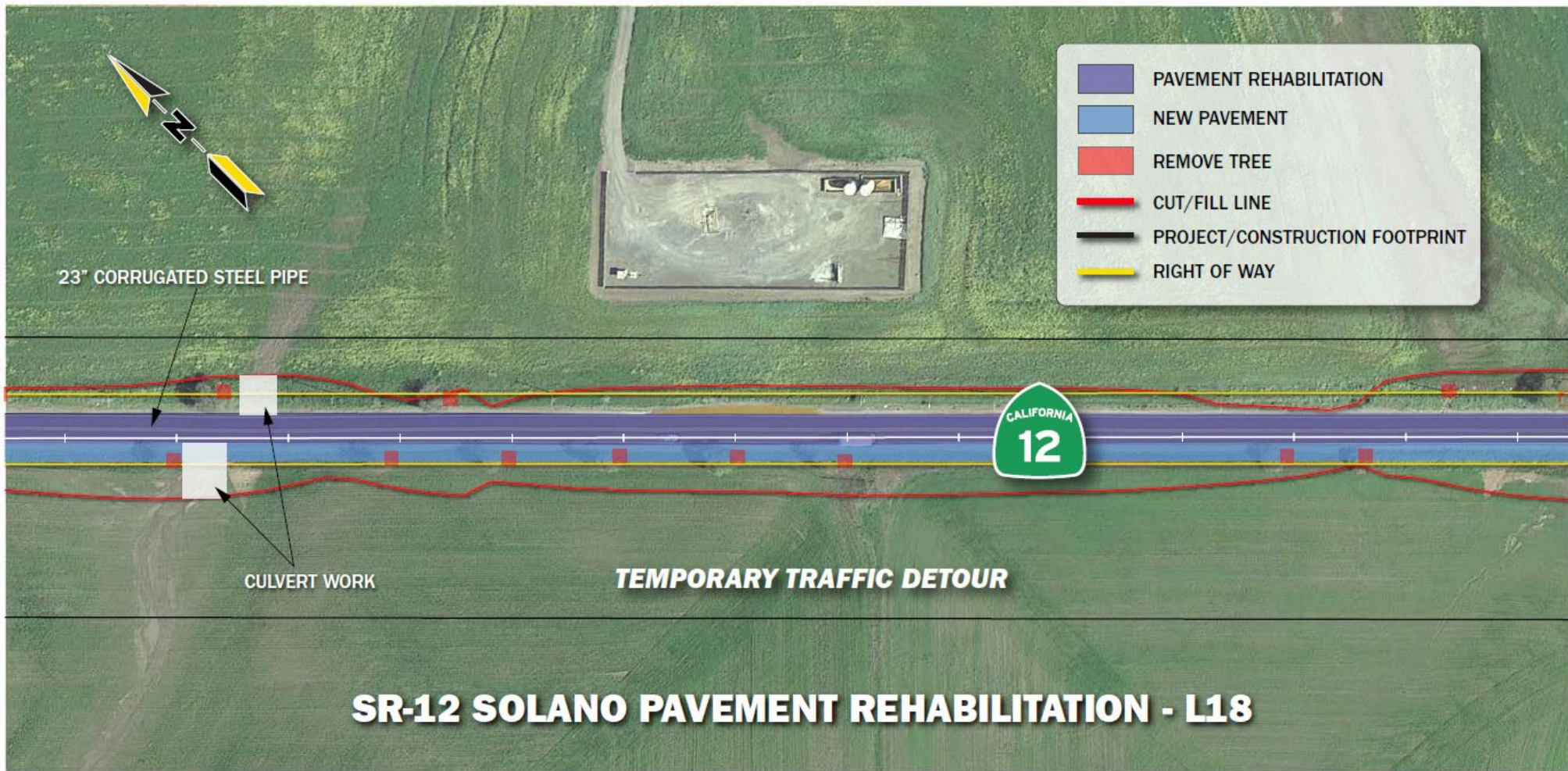
CHURCH RD



TEMPORARY TRAFFIC DETOUR


SR-12 SOLANO PAVEMENT REHABILITATION - L17





CULVERT WORK
48" CORRUGATED
STEEL PIPE/
INDUSTRIAL CREEK



	PAVEMENT REHABILITATION		CUT/FILL LINE
	NEW PAVEMENT		PROJECT/CONSTRUCTION FOOTPRINT
	REMOVE TREE		RIGHT OF WAY



SR-12 SOLANO PAVEMENT REHABILITATION - L19



SR-12 SOLANO PAVEMENT REHABILITATION - L21







Appendix D. Avoidance, Minimization and/or Mitigation Summary

Visual Resources
VIS-1: The project development team (PDT) will solicit input from local stakeholders for context-sensitive design of streetscape elements in Segment 3.
VIS-2: Tree and vegetation removal will be minimized to the extent feasible.
VIS-3: Trees and vegetation outside of clearing and grubbing limits shall be protected from the contractor's operations, equipment, and materials storage.
VIS-4: Newly constructed retaining walls shall include aesthetic treatments. Wall texture and color treatments shall be context-sensitive.
VIS-5: The barrier portion at the base of retaining walls shall incorporate aesthetic treatments to minimize contrast with retaining walls.
VIS-6: Cut slopes shall use slope rounding and/or vegetation to blend with the surrounding environment.
VIS-7: Construction activities shall limit all construction lighting to within the area of work and avoid light trespass in residential areas through directional lighting, shielding, and other measures as needed.
Cultural Resources
CULT-1: 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.
CULT-2: If Caltrans professionally qualified staff determines that cultural materials includes human remains, 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. Caltrans Cultural Resources Studies Office will contact the Solano County Coroner. Pursuant to CA PRC Section 5097.98, if the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission, which will then notify the Most Likely Descendent. Caltrans, District 4, Cultural Resources Studies Office will work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.
Geology
GEO-1: To address the potential for disturbing significant fossils, a Paleontological Mitigation Plan and/or a Paleontological Evaluation Report will need to be prepared when the limits and depth of excavation are known. The PER should address whether the proposed excavation has the potential to reach into the potentially fossiliferous Montezuma Formation.
Paleontology
PALEO-1: To address the potential for disturbing significant fossils, a Paleontological Mitigation Plan and/or a Paleontological Evaluation Report will need to be prepared when the limits and depth of excavation are known. The PER should address whether the proposed excavation has the potential to reach into the potentially fossiliferous Montezuma Formation.
Hazardous Waste
HAZ-1: Private property owners are legally responsible to cleanup-regulated contamination on their properties. A soil investigation would be conducted during the project's design phase to characterize the soil to be excavated. Based upon the soil testing results, specifications for proper soil handling and management will be developed and incorporated into the construction contract documents.
HAZ-2: During construction, measures will need to be taken to protect against the accidental spillage of gasoline and other contaminants.
Air Quality
AIR-1: Equip all internal combustion engine driven equipment with manufacturer recommended intake and exhaust mufflers that are in good condition and appropriate for the equipment.

AIR-2: Use energy and fuel-efficient vehicles and equipment
AIR-3: Use alternative (non-petroleum based) fuels
AIR-4: Because construction activities are short-term, the GHG emissions resulting from construction activities would not result in long-term adverse effects. However, implementation of Caltrans Standard Specifications, such as complying with air-pollution-control rules, regulations, ordinances, and statutes that apply to work performed under the Contract and the use of construction best management practices, would also result in reducing GHG emissions from construction activities, e.g. (1) Regular vehicle and equipment maintenance (2) Limiting idling of vehicle and equipment onsite.
AIR-5: In addition, with innovations such as longer pavement lives, improvement in traffic management and changes in materials, construction-related GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.
AIR-6: Solid waste will be reduced, recycled, and reused to the maximum extent feasible.
AIR-7: Improve fuel efficiency from construction equipment by minimizing idling time and maintaining construction equipment in proper working condition.
Biology
BIO-1: Restricting in-water work to July 1 to October 15 to minimize adverse effects to fish spawning and movement. The actual work window may be a subset of that time, and will depend upon the current water year, river conditions and timing of fish migrations. For seasonal avoidance of the delta smelt, construction will not occur outside of the cofferdam from October 15 through July 31 in the maximum extent practicable.
BIO-2: Dewatering of the cofferdam will be overseen by and, fish rescues and relocation will be conducted by a qualified fisheries biologist. The qualified fisheries biologist will remain onsite during the entire dewatering process. Relocation would be accomplished by means and methods stipulated in the final NMFS BO and California Department of Fish and Wildlife Incidental Take permits.
BIO-3: Caltrans will install ESA fencing around the Project limits along the banks of the Sacramento River to protect riparian vegetation adjacent to the Project site. This will prevent the encroachment of construction personnel into sensitive areas not needed for construction of the Project. Specific locations will be determined during the PS&E phase of design and will delineated on the final Project plans. The Project Biologist will oversee installation of the ESA and will make adjustments to the fencing as appropriate.
BIO-4: All personnel will attend an environmental education program delivered by the Service-approved biologist prior to working on the Project site.
BIO-5: A Service-approved biologist(s) will be designated for the activities that will affect CTS habitat which has been defined as the entire Project area. The qualified biologist will be onsite during specific construction activities that may be reasonably result in the take of CTS. The qualifications of the biologist(s) will be presented to the Service for review and written approval prior to ground-breaking at the Project site. The biologist(s) will coordinate through the Resident Engineer (RE) to stop any work that may result in take of the CTS.
BIO-6: The Resident Engineer will halt work and immediately contract the Service-approved Project biologist(s) and the Service in the event that a CTS gains access to a construction zone. The RE will suspend construction activities within a 50 foot radius of the identified animal that could reasonably result in take of a CTS until the animal leaves the site voluntarily or is removed by the biologist(s) to release site using Service-approved handling techniques.

<p>BIO-7: All construction supervisory personnel will attend an environmental education program delivered by the Service-approved biologist prior to working on the Project site. The program will include an explanation as how to best avoid take of the CTS.</p>
<p>BIO-8: No more than thirty (30) calendar days prior to any ground disturbance, pre-construction surveys will be conducted by a Service-approved biologist for CTS. These surveys will consist of walking surveys of the Project limits and accessible adjacent areas to determine presence of the species. The biologist(s) will investigate all potential CTS cover sites.</p>
<p>BIO-9: Should a CTS be found at the Project site, on-call consultant will the appropriate section 10(a)(1)(a) permit to handle the CTS will be utilized. Caltrans will submit the name and credentials of the Caltrans staff biologist(s) and the name and permit number of the on-call consultant to the Service prior to ground breaking on the Project.</p>
<p>BIO-10: For work that could reasonably result in the take of CTS, a Service-approved biologist will be on-site to monitor initial ground disturbance activities for the road construction. The biologist will perform a clearance survey immediately prior the initial ground disturbance. Safety permitting, the Service-approved biologist(s) will investigate areas of disturbed soil for signs of listed species within thirty (30) minutes following the initial disturbance of that given area.</p>
<p>BIO-11: To minimize temporary disturbances in the areas of CTS habitat, Project related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas also will be included in pre-construction surveys and, to the maximum extent practicable, will be established in locations disturbed by previous activities to prevent further adverse effects. Project related vehicles will observe a 20-mile per hour speed limit.</p>
<p>BIO-12: Work in the vicinity of water crossings will be scheduled to occur between May 15th and October 15th.</p>
<p>BIO-13: Dust control measures will consist of regular truck watering of construction access areas and disturbed soil areas with the use of organic soil stabilizers to minimize airborne dust and soil particles generated from graded areas. Regular truck watering will be a requirement of the construction contract.</p>
<p>BIO-14: To eliminate an attraction to predators of the CTS, all food-related trash items such as wrappers, cans, bottles, and food scraps, will be disposed of in closed containers and removed at least once a day from the action area.</p>
<p>BIO-15: Plastic mono-filament netting (erosion control matting) or similar material will not be used at the Project site because CTS may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or trackified hydroseeding compounds.</p>
<p>BIO-16: All construction supervisory personnel will attend an environmental education program delivered by the Service-approved biologist prior to working on the Project site. The program will include an explanation as how to best avoid take of the branchiopods. The Service-approved biologist(s) will conduct a training session that will be scheduled as a mandatory informational meeting by the Caltrans RE for all construction contractor supervisory personnel. The field meeting will include topics of species identification, life history, descriptions, and habitat requirements during various life stages.</p>
<p>BIO-17: The limits of construction zones will be delineated with high visibility temporary fencing at least four feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto sensitive areas during construction activities. The fencing will be removed only when all construction equipment is removed from the site. Activities within the action area will be limited to vehicle and equipment operation on existing roads. No Project activities will occur outside the delineated Project construction area.</p>

BIO-18: To the extent practicable, Caltrans and its contractors will initiate all work in or within 250 feet of potential habitat for vernal pool crustaceans between May 1 and November 1. When construction activities must take place after November 1 and before May 1, daily biological monitoring will occur for the vernal pool crustaceans.
BIO-19: To the extent practicable, Caltrans will incorporate design modifications to avoid direct permanent effects on potential habitat for federally listed branchiopods.
BIO-20: Caltrans will avoid potential vernal pool fairy shrimps, conservancy fairy shrimp, vernal pool tadpole shrimp habitat to the maximum extent practicable, during construction activities in temporary work areas. All potential large branchiopod habitat not directly affected will be designated as ESA and protected with appropriate fencing and signage. All ESA areas will be shown on the final construction drawings.
BIO-21: Caltrans proposes to install and properly maintain erosion control and water quality protection measures that will minimize downstream effects on seasonal wetlands and the branchiopods that occupy them.
BIO-22: Avoid siting of construction staging areas and temporary work areas in occupied covered species habitat.
BIO-23: Design developments to minimize indirect impacts.
BIO-24: 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.
BIO-25: Confine and delineate work areas or minimize source contaminants
BIO-26: Conduct Nesting Bird surveys
BIO-27: Caltrans biologist and/or biomonitor will coordinate with CDFW on appropriate buffer distances.
BIO-28: Minimize night-time lighting of project construction sites
BIO-29: No construction-related activities will occur between March 1 and September 15 up to 0.5 mile of a nesting Swainson’s hawk.
BIO-30: 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.
BIO-31: 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 avoidance and minimization measures can be established to avoid these impacts.
BIO-32: To avoid and minimize effects to sensitive species and their habitats within the BSA, Caltrans would install ESA fencing will surround the location where the tarplant was observed during floristic surveys.
BIO-33: 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.
BIO -35: Segment 1 construction work is proposed to start near the intersection of McClosky Road and SR 12. The start of construction in this area will be restricted and coordination with Caltrans Office of Biological Sciences and Permits will be required.
Hydrology
HYDRO-1: To mitigate the placement of fill within the floodplain, an equal volume of material should be removed from the floodplain. This mitigation should be considered when determining the required ROW.
Water Quality
WATER-1: Temporary Impacts – Construction Site BMPs To prevent or reduce impacts, temporary Construction Site BMPs will be deployed for sediment control and material management. These include cover, check dam, drainage inlet protection, fiber roll, silt fence, hydraulic mulch, concrete washout, and street sweeping.
WATER-2: Temporary Impacts – Diversion and Drainage Systems Construction entrances, temporary construction roadway, dewatering, and water diversions will also be required in addition to stormwater sampling and analysis, required under a SWPPP for risk levels 2 and 3, water quality monitoring will be required for in-water work during construction of the drainage systems.
WATER-3: Permanent Impacts - Water Quality Treatment BMPs The project will need to install permanent Water Quality Treatment BMPs. Due to the flat and undeveloped terrain, biofiltration strips and swales and/or infiltration trenches will be considered.
WATER-4: Permanent Impacts – Erosion Control Permanent erosion control will be proposed for disturbed areas and new side slopes and will consist of hydroseeding, hydromulch and/or netting.
WATER-5: Water Quality Pollution Prevention Plan (SWPPP) Prior to commencement of construction activities, a SWPPP will be prepared by the Contractor and approved by the Department. The SWPPP addresses potential temporary impacts via implementation of appropriate BMPs, such as those mentioned above, to the Maximum Extent practicable.
WATER-6: Impervious Pavement Treatment The proposed project must treat for approximately 6.19 acres of impervious pavement. This will occur on-site, off-site, or a combination of the two in Segment 2. Stormwater treatment may consist of bio-retention swales. Stormwater treatments may also occur in Segment 1 should the need arise. Further details will be developed during the design phase of the project

Appendix E. List of Technical Studies

Caltrans District 4 Office of Biological Sciences. Amended Natural Environment Study for the Solano Highway 12, 3R, Roadway Rehabilitation project. Oakland, CA. March 2019.

Caltrans District 4 Office of Biological Sciences. Revised Final Aquatic Resources Delineation Report for the Solano Highway 12, 3R, Roadway Rehabilitation project. Oakland, CA. March 22, 2019.

Caltrans District 4 Office of Cultural Resources. Memorandum, "Completion of Cultural Resources Environmental Compliance Review for the State Route 12 Roadway Rehabilitation Project in Solano County, California". Oakland, CA. August 29, 2018.

Caltrans District 4 Office of Water Quality. Water Quality Study for the State Route 12 Resurfacing, Restoration, and Rehabilitation Project. Oakland, CA. May 14, 2018.

Caltrans District 4 Office of Landscape Architecture. Roadway Rehabilitation In and Near Rio Vista from Currie Road to Sacramento County Line Visual Impact Analysis. Oakland, CA. May 23, 2019.

Caltrans District 4 Office of Geotechnical Design – West. Memorandum, "Geological and Paleontological Impacts". Oakland, CA. November 2, 2017.

Caltrans District 4 Office of Hydraulic Engineering. Floodplain Encroachment Review Addendum Oakland, CA. November 15, 2018.

Caltrans District 4 Office of Environmental Engineering. Memorandum, "Comments from the Air/Noise/Energy Branch" and "Comments from the Hazardous Waste Branch". Memorandum, May 1, 2018.

Metropolitan Transportation Commission (MTC). Plan Bay Area 2040. 2017

Rio Vista. General Plan. 2001

Solano County. General Plan. November 5, 2008.

Appendix F. Biological Figures

Figure3: Location of Parry's Rough Tarplant

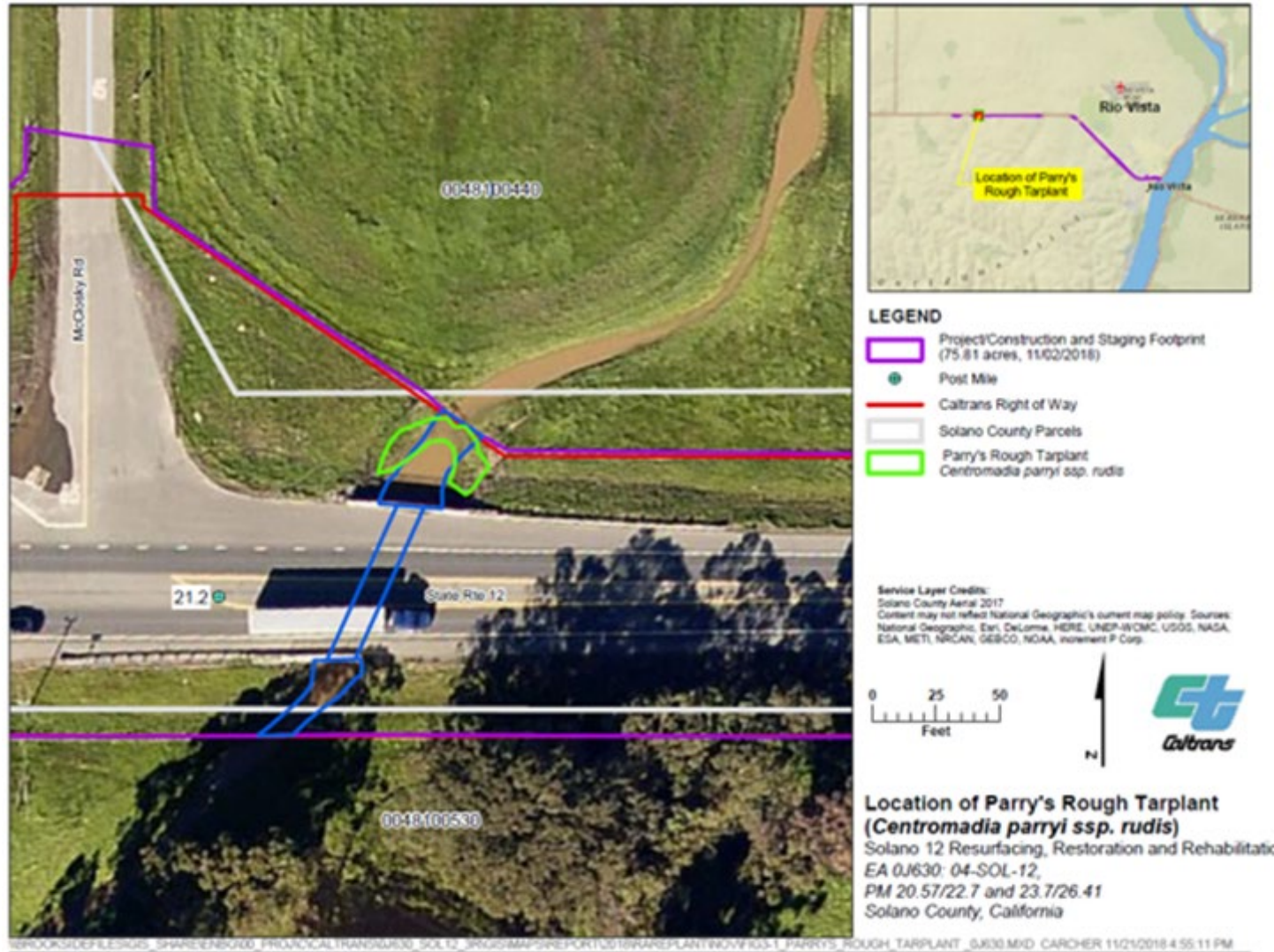
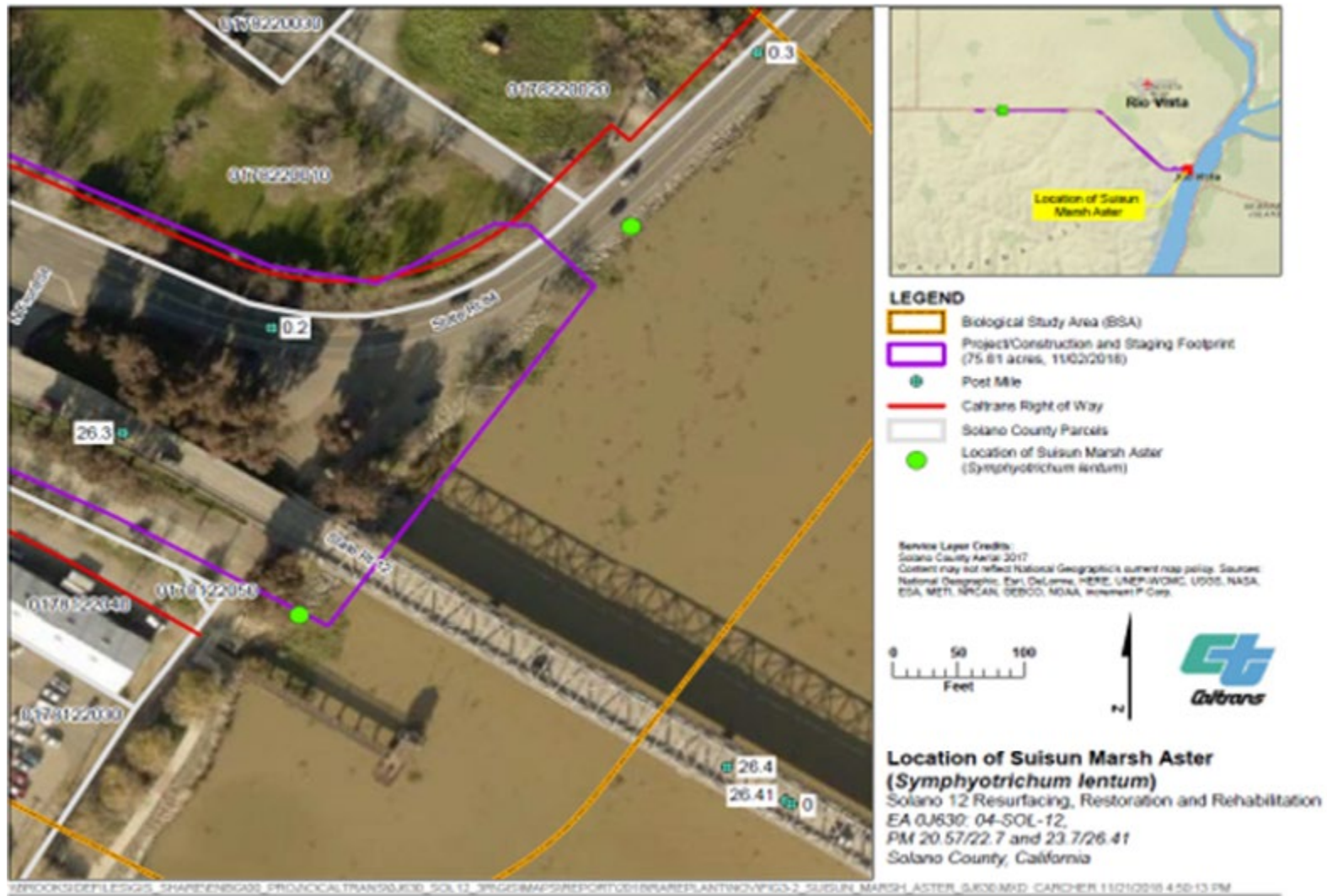


Figure 4: Location of Suisun Marsh Aster

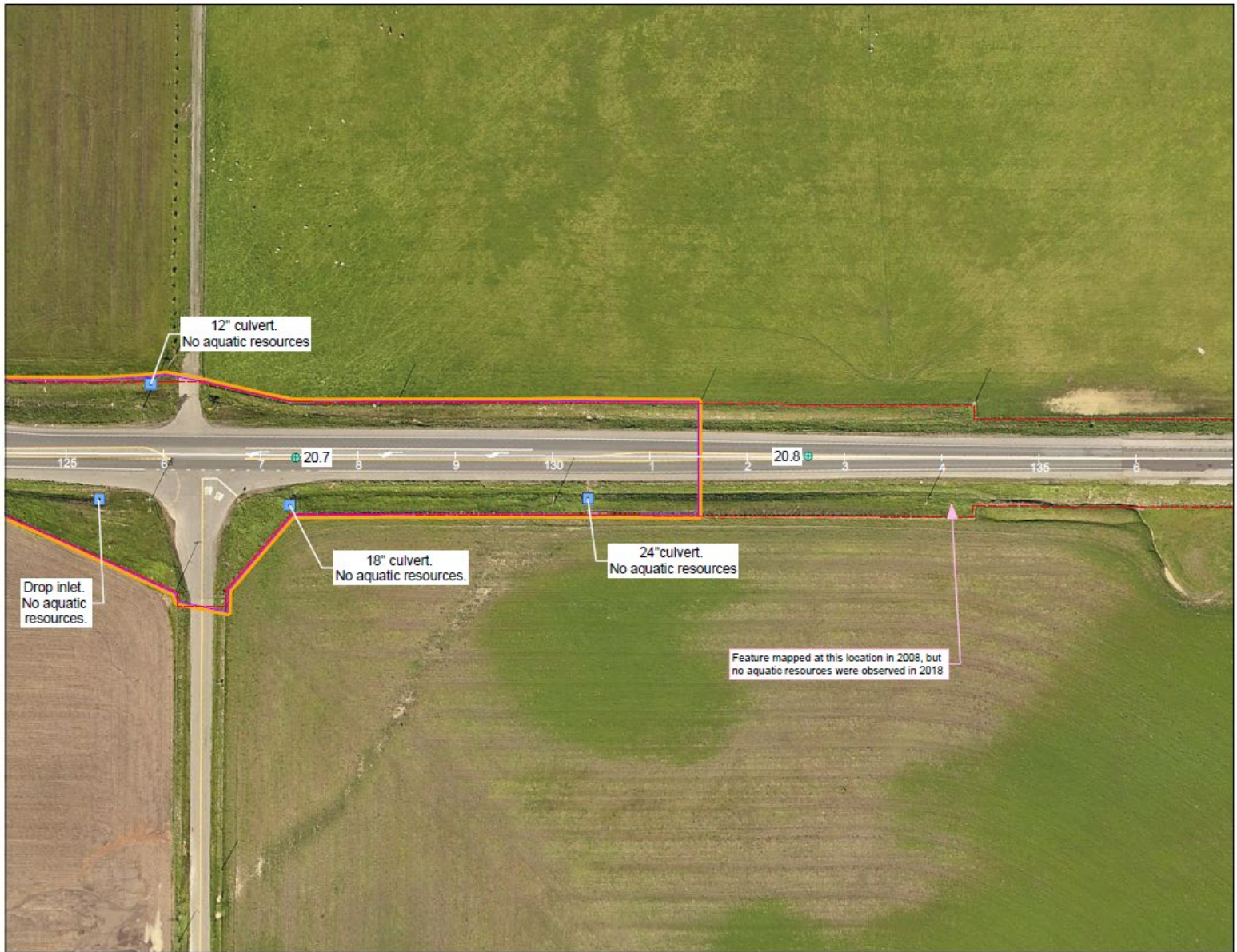


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Potential Waters of the U.S. Maps 1-26

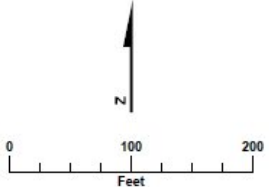


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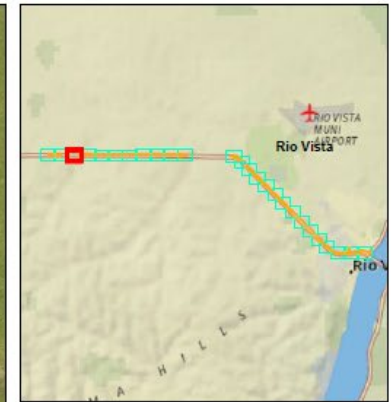
- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - ⊕ Post Mile
 - Project Stations
 - Culvert

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



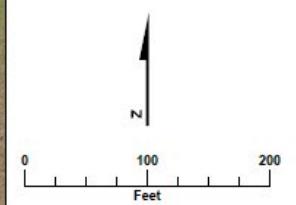
Map 02 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

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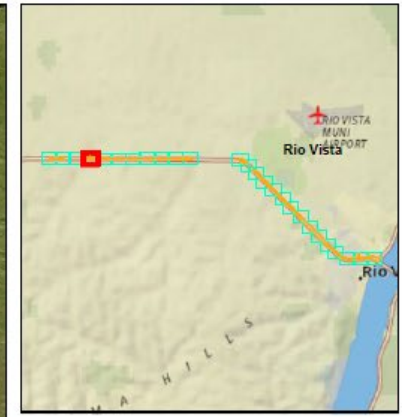
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 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



Map 03 of 26
Potential Waters of the U.S.
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 Solano County, California

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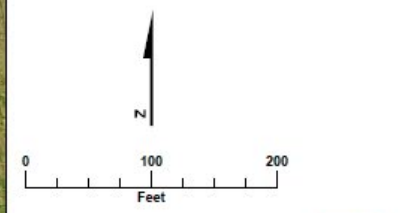
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- Project Stations
- Sample Point
- Culvert

Potential Wetlands and Waters

- PEM2E - Palustrine, Emergent, Nonpersistent, Seasonally Flooded/Saturated
- R4SBC - Riverine, Intermittent, Streambed, Seasonally Flooded

Delineators: K. Fisher, S. Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



Map 04 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
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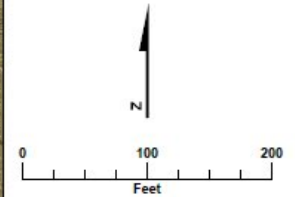




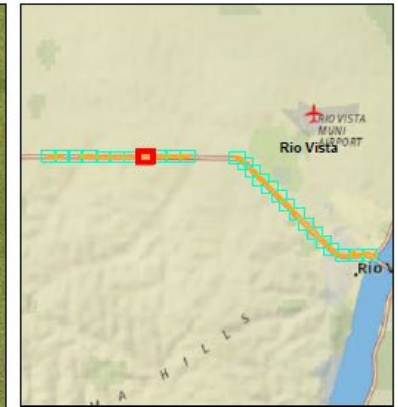
LEGEND

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- + Post Mile
- Project Stations
- + Culvert

Delineators: K. Fisher, S.Long
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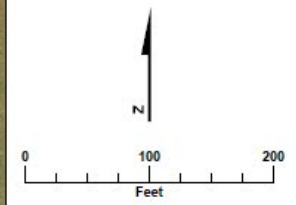


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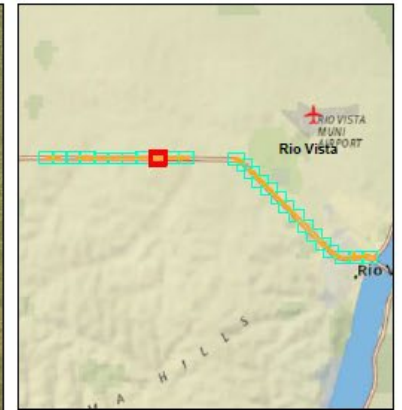
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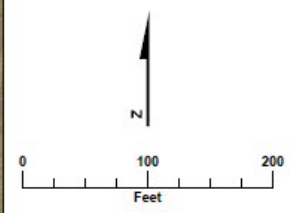
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 Solano County, California

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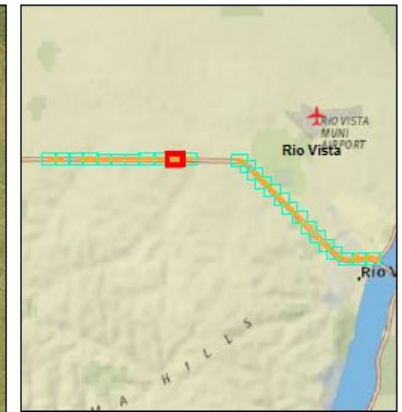


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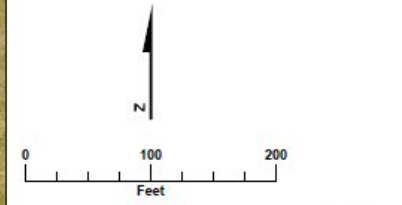


Map 09 of 26
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 Solano County, California

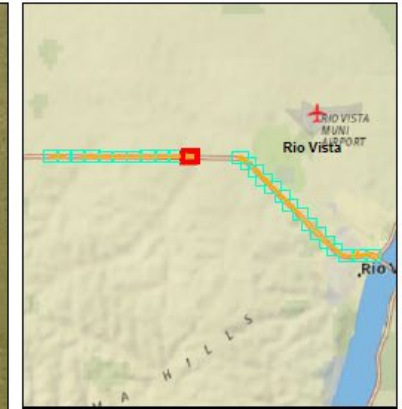
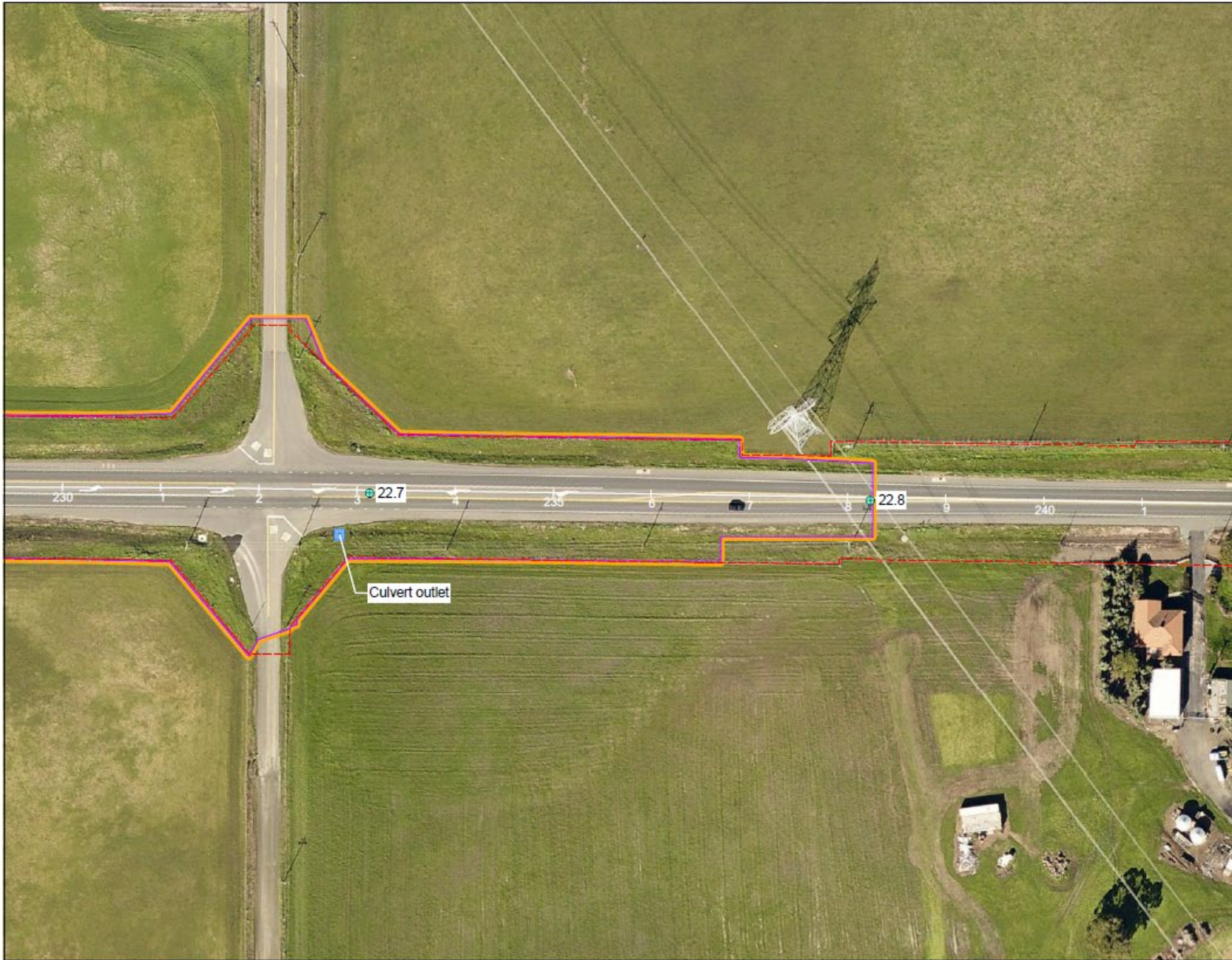


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 - Sample Point
- Potential Wetlands and Waters**
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Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
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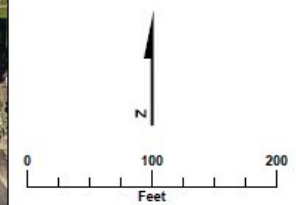


Map 10 of 26
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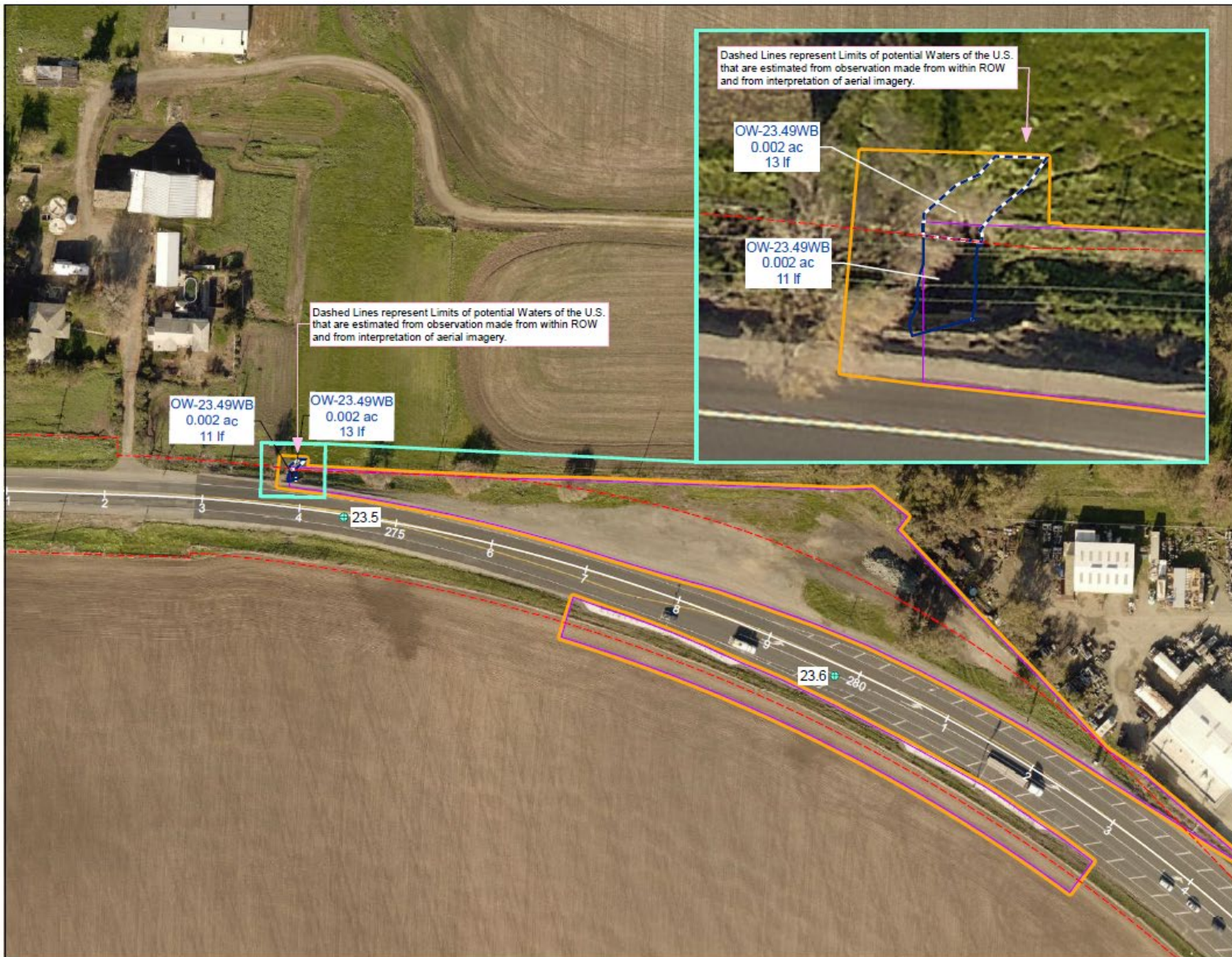
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 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



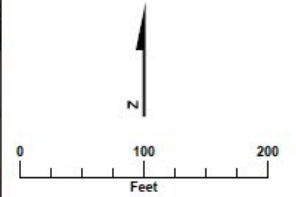
Map 11 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

T:\BROOKSIDE\FILES\GIS_SHARE\ENBG\00_PROD\GICALTRANS\0J630_SOL12_3R\GISMAPS\REPORT\2018\WDR\NOVEMBER\FIG3-1_AQUATIC_RESOURCES_0J630.MXD CARCER 11/30/2018 10:05:07 AM



- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - Post Mile
 - Project Stations
 - Potential Wetlands and Waters**
 - R4SBC - Riverine, Intermittent, Streambed, Seasonally Flooded

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



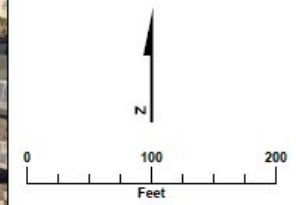
Map 12 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

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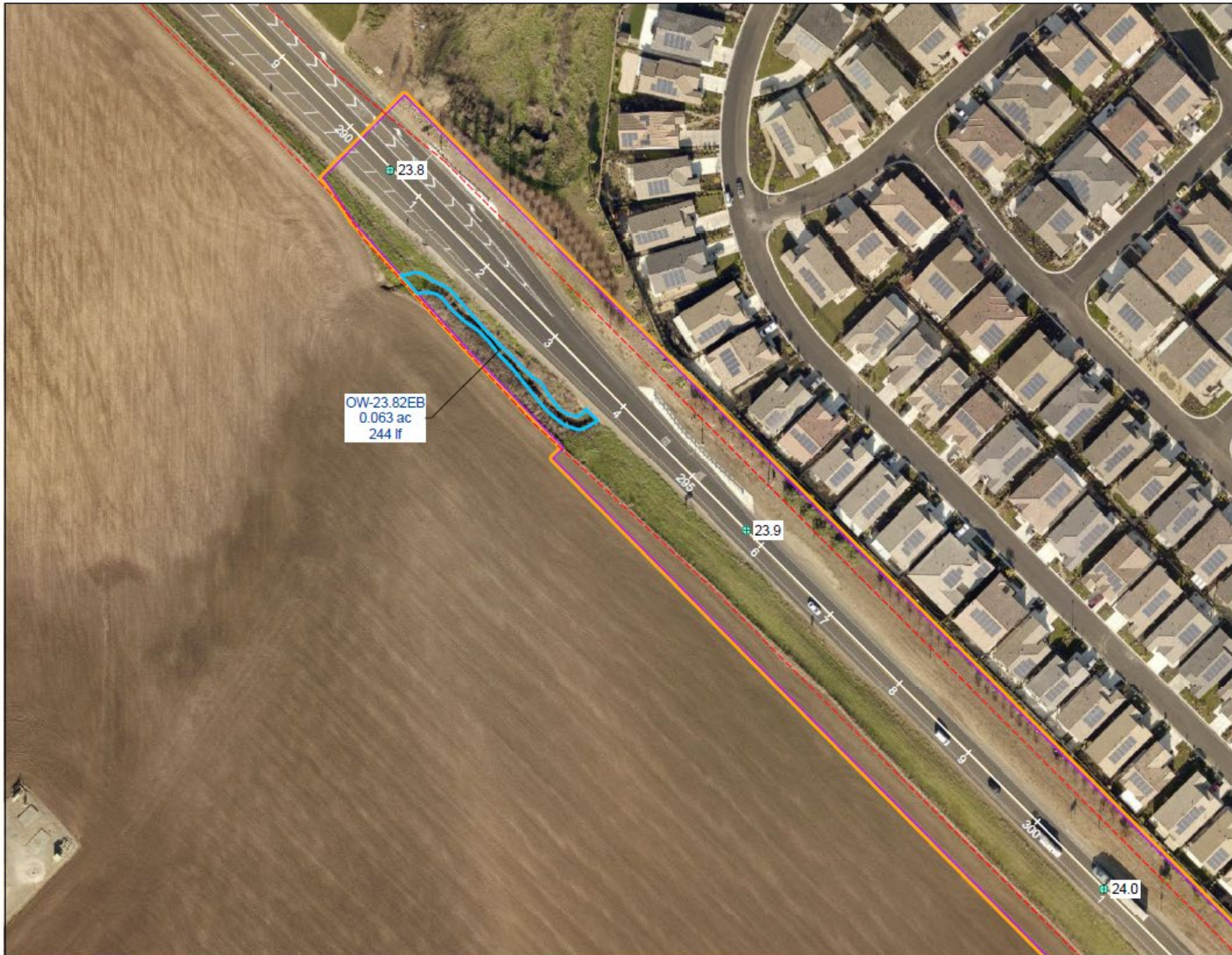
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 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - + Post Mile
 - Project Stations

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



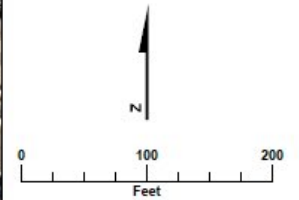
Map 13 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

\\P010001\proj\18\180404-SOL-12-PM 20.57-22.7-23.7-26.41\GIS\Map13.mxd 11/15/2018 10:15:10 AM

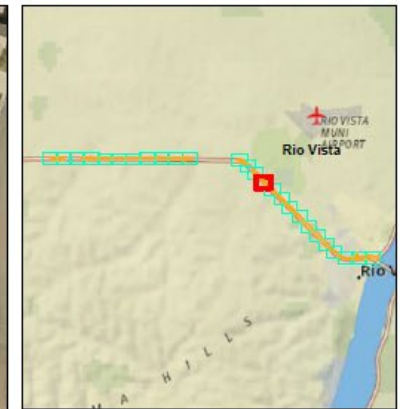


- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - Post Mile
 - Project Stations
 - Potential Wetlands and Waters**
 - ~ R4SBA - Riverine, Intermittent, Streambed, Temporarily Flooded

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017

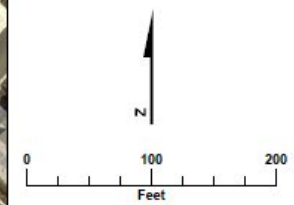


Map 14 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California



- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - + Post Mile
 - + Project Stations
 - Sample Point
 - Culvert
- Potential Wetlands and Waters**
- PEM1K - Palustrine, Emergent, Persistent, Artificially Irrigated

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



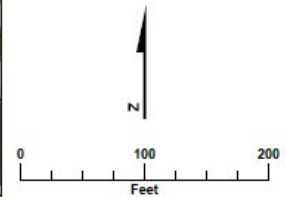
Map 15 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

\\BROOKSIDE\FILES\GIS_SHARE\ENR\G00_PROJECT\CALTRANS\0J630_SOL12_3R\GISMAPS\REPORT\2018\WDR\NOVEMBER\FIGS-1_AQUATIC_RESOURCES_0J630.MXD CARCHER 11/30/2018 10:35:07 AM



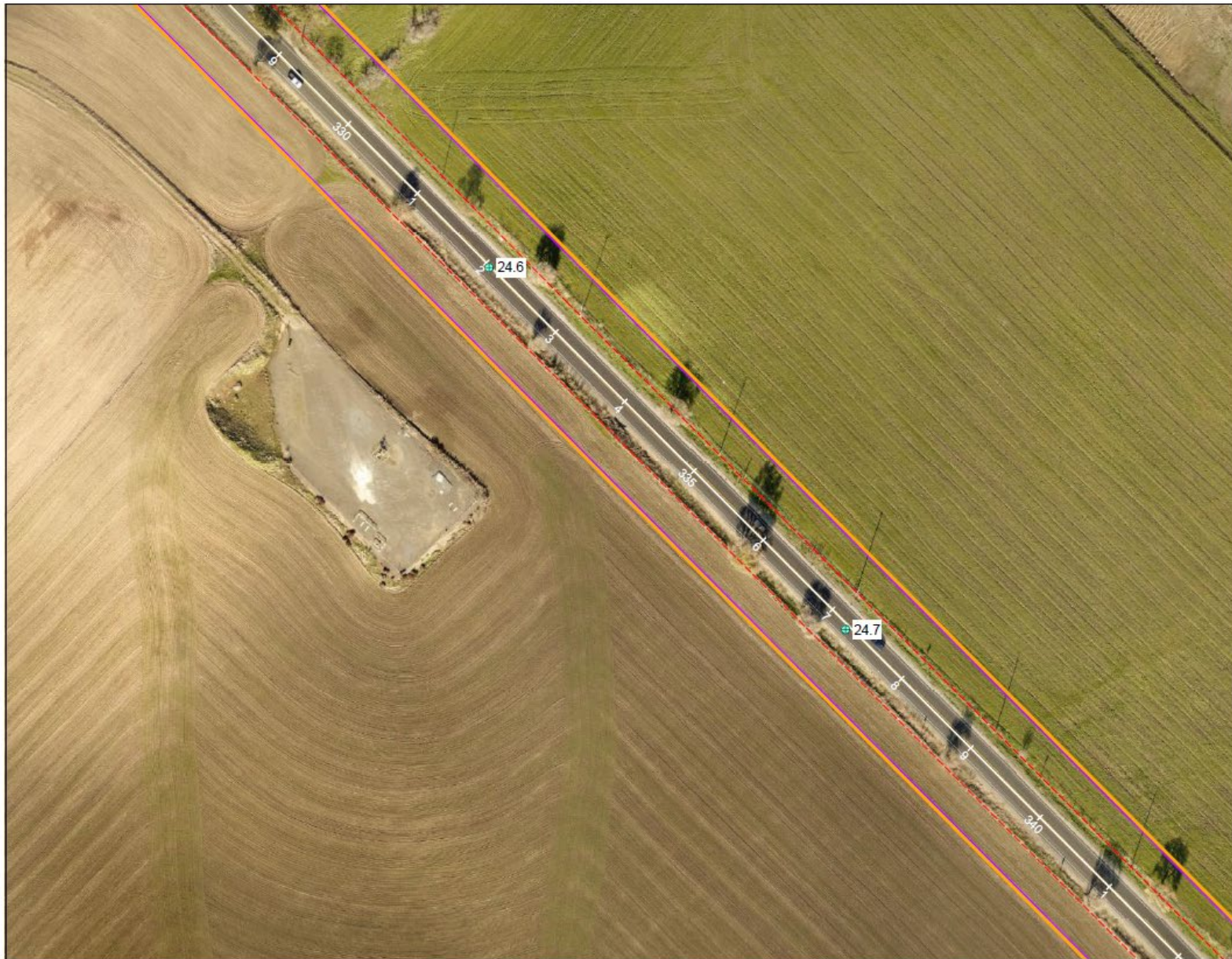
- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - Post Mile
 - Project Stations
 - Culvert
 - Potential Wetlands and Waters**
 - PEM1K - Palustrine, Emergent, Persistent, Artificially Irrigated
 - R4SBC - Riverine, Intermittent, Streambed, Seasonally Flooded

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/11/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



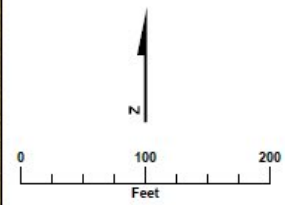
Map 16 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

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- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - + Post Mile
 - Project Stations

Delineators: K. Fisher, S. Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



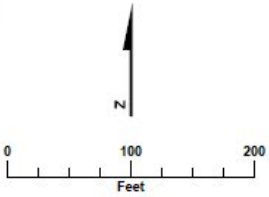
Map 18 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

\\BROOKSIDE\FILES\GIS_SHARE\ENBG\00_PROJECT\CALTRANS\0J630_SOL12_3R\GIS\MAPS\REPORT\2018\WDR\NOVEMBER\FIGS-1_AQUATIC_RESOURCES_0J630.MXD CARCER 11/30/2018 10:05:07 AM



- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - + Post Mile
 - Project Stations

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/8/18, 11/17/18
 Aerial Imagery from Solano County 2017



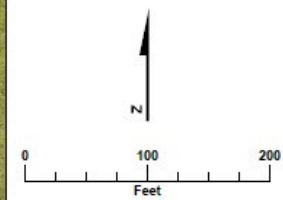
Map 19 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

\\BROOKSIDE\FILES\GIS_SHARE\ENBG\00_PROJECT\CALTRANS\0J630_SOLT2_3R\GIS\MAPS\REPORT\2018\WDR\NOVEMBER\FIGS-1_AQUATIC_RESOURCES_0J630.MXD CARCHER 11/30/2018 10:05:07 AM



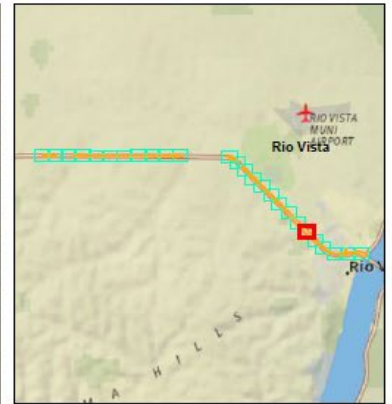
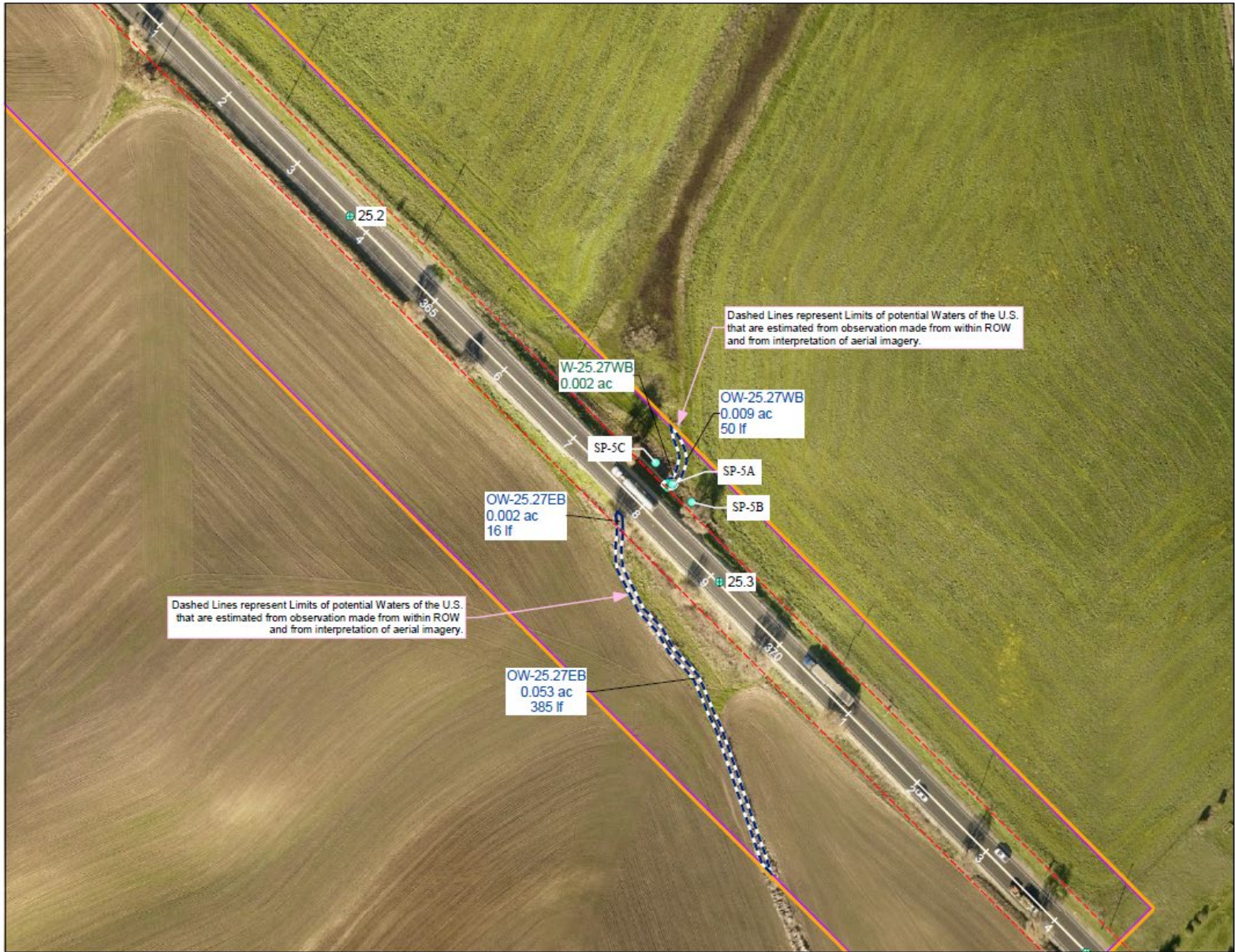
- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - + Post Mile
 - Project Stations

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



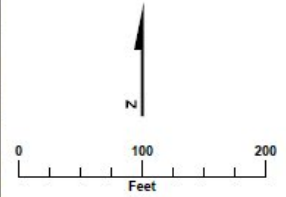
Map 20 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

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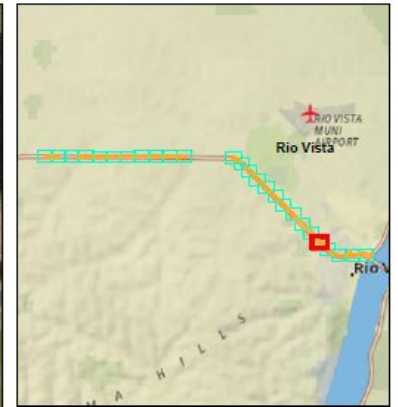
- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - + Post Mile
 - Project Stations
 - Sample Point
 - Potential Wetlands and Waters**
 - ~ PEM1A - Palustrine, Emergent, Persistent, Temporarily Flooded
 - ~ R4SBC - Riverine, Intermittent, Streambed, Seasonally Flooded

Delineators: K. Fisher, S. Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



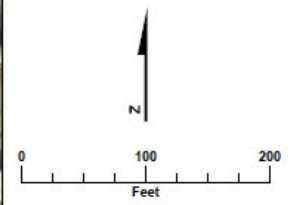
Map 21 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

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- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - ⊕ Post Mile
 - Project Stations
- Potential Wetlands and Waters**
- ⊕ R4SBC - Riverine, Intermittent, Streambed, Seasonally Flooded

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



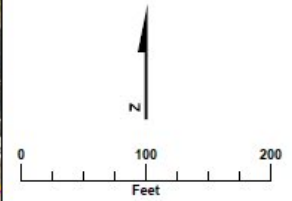
Map 22 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

\\BROOKSIDE\FILES\GIS\SHARE\ENB\G00\PROJECT\CALTRANS\UJ630\SOLT2\3R\GIS\MAPS\REPORT\2018\WDR\NOVEMBER\FIGS-1\AQUATIC_RESOURCES_UJ630.MXD CARCER 11/30/2018 10:05:07 AM



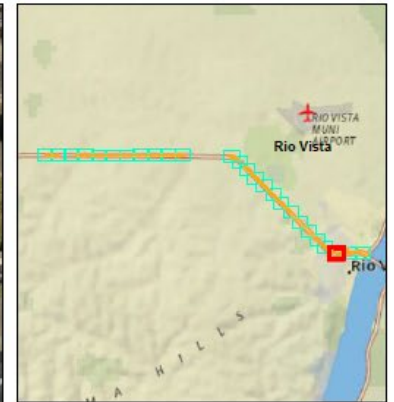
- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - + Post Mile
 - Project Stations

Delineators: K. Fisher, S. Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



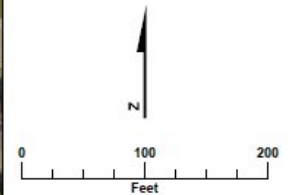
Map 23 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

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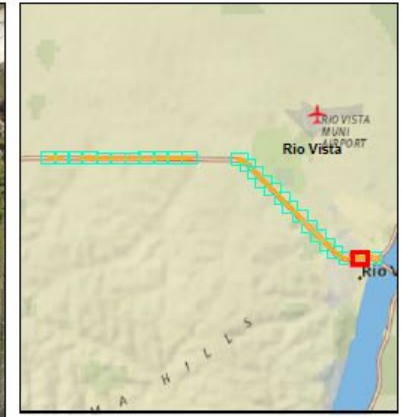
- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - Post Mile
 - Project Stations

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



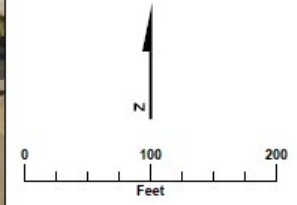
Map 24 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

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- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - + Post Mile
 - Project Stations

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017

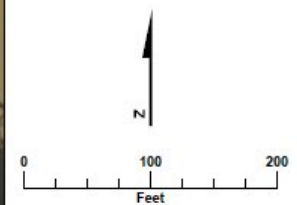


Map 25 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California



- LEGEND**
- Aquatic Resource Study Area (76.1 acres)
 - Project/Construction and Staging Footprint (75.81 acres, 11/02/2018)
 - Caltrans Right of Way
 - + Post Mile
 - Project Stations
- Potential Wetlands and Waters**
- ~ R1UBV - Riverine, Tidal, Unconsolidated Bottom, Permanently Flooded-Tidal

Delineators: K. Fisher, S.Long
 Delineation Dates: 11/1/18, 11/9/18, 11/17/18
 Aerial Imagery from Solano County 2017



Map 26 of 26
Potential Waters of the U.S.
 Solano 12 Resurfacing, Restoration and Rehabilitation
 EA 0J630: 04-SOL-12, PM 20.57/22.7 and 23.7/26.41
 Solano County, California

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Appendix G. Species List



United States Department of the Interior



FISH AND WILDLIFE SERVICE
San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
Phone: (916) 930-5603 Fax: (916) 930-5654
[http://kim_squires@fws.gov](mailto:kim_squires@fws.gov)

In Reply Refer To:

April 10, 2019

Consultation Code: 08FBDT00-2019-SLI-0045

Event Code: 08FBDT00-2019-E-00371

Project Name: 04-0J630 SR 12

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

San Francisco Bay-Delta Fish And Wildlife

650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

Sacramento Fish And Wildlife Office

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08FBDT00-2019-SLI-0045

Event Code: 08FBDT00-2019-E-00371

Project Name: 04-0J630 SR 12

Project Type: TRANSPORTATION

Project Description: The existing pavement within the project limits must be rehabilitated due to alligator cracks. Segments of SR-12 are also without shoulders, have no standard travel lanes, non-standard vertical sight distances, and non-standard cross-slopes. In addition there is an existing flooding problem and non-compliant ADA facilities near or at downtown Rio Vista.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.17168208979235N121.71032888184482W>



Counties: Solano, CA

Endangered Species Act Species

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
California Clapper Rail <i>Rallus longirostris obsoletus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Delta Green Ground Beetle <i>Elaphrus viridis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2319	Threatened
San Bruno Elfin Butterfly <i>Callophrys mossii bayensis</i> There is proposed critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp <i>Branchinecta conservatio</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> https://ecos.fws.gov/ecp/species/321#crithab	Final



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713



In Reply Refer To:
Consultation Code: 08ESMF00-2019-SLI-0325
Event Code: 08ESMF00-2019-E-05204
Project Name: 04-0J630 SR 12

April 10, 2019

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

San Francisco Bay-Delta Fish And Wildlife

650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

Project Summary

Consultation Code: 08ESMF00-2019-SLI-0325

Event Code: 08ESMF00-2019-E-05204

Project Name: 04-0J630 SR 12

Project Type: TRANSPORTATION

Project Description: The existing pavement within the project limits must be rehabilitated due to alligator cracks. Segments of SR-12 are also without shoulders, have no standard travel lanes, non-standard vertical sight distances, and non-standard cross-slopes. In addition there is an existing flooding problem and non-compliant ADA facilities near or at downtown Rio Vista.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.17168208979235N121.71032888184482W>



Counties: Solano, CA

Endangered Species Act Species

There is a total of 14 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse <i>Reithrodontomys raviventris</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

Birds

NAME	STATUS
California Clapper Rail <i>Rallus longirostris obsoletus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern <i>Sterna antillarum browni</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Delta Green Ground Beetle <i>Elaphrus viridis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2319	Threatened
San Bruno Elfin Butterfly <i>Callophrys mossii bayensis</i> There is proposed critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp <i>Branchinecta conservatio</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Keck's Checker-mallow <i>Sidalcea keckii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5704	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Caviel, Cristan@DOT

From: Caviel, Cristan@DOT
Sent: Thursday, June 13, 2019 2:48 PM
To: nmfswcrca.specieslist@noaa.gov
Subject: Caltrans Solano, 12, 3R

CALTRANS: SOLANO, 3R, ROADWAY REHABILITATION PROJECT 04-0j630
POINT OF CONTACT: CRISTAN CAVIEL

Quad Name **Rio Vista**
Quad Number **38121-B6**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat - **X**
SRWR Chinook Salmon Critical Habitat - **X**
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -

MMPA Pinnipeds -

Quad Name **Birds Landing**

Quad Number **38121-B7**

ESA Anadromous Fish

SONCC Coho ESU (T) -

CCC Coho ESU (E) -

CC Chinook Salmon ESU (T) -

CVSR Chinook Salmon ESU (T) - **X**

SRWR Chinook Salmon ESU (E) - **X**

NC Steelhead DPS (T) -

CCC Steelhead DPS (T) - **X**

SCCC Steelhead DPS (T) -

SC Steelhead DPS (E) -

CCV Steelhead DPS (T) - **X**

Eulachon (T) -

sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -

CCC Coho Critical Habitat -

CC Chinook Salmon Critical Habitat -

CVSR Chinook Salmon Critical Habitat -

SRWR Chinook Salmon Critical Habitat -

NC Steelhead Critical Habitat -

CCC Steelhead Critical Habitat -

SCCC Steelhead Critical Habitat -

SC Steelhead Critical Habitat -

CCV Steelhead Critical Habitat -

Eulachon Critical Habitat -

sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -

Caviel, Cristan@DOT

From: NMFSWCRCA Specieslist - NOAA Service Account
<nmfswcrca.specieslist+canned.response@noaa.gov>
Sent: Thursday, June 13, 2019 12:29 PM
To: Caviel, Cristan@DOT
Subject: Re: Caltrans, Solano State Route 12, 3R

Receipt of this message confirms that NMFS has received your email to nmfswcrca.specieslist@noaa.gov. If you are a federal agency (or representative) and have followed the steps outlined on the California Species List Tools web page (http://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html), you have generated an official Endangered Species Act species list.

Messages sent to this email address are not responded to directly. For project specific questions, please contact your local NMFS office.

Northern California/Klamath (Arcata) 707-822-7201

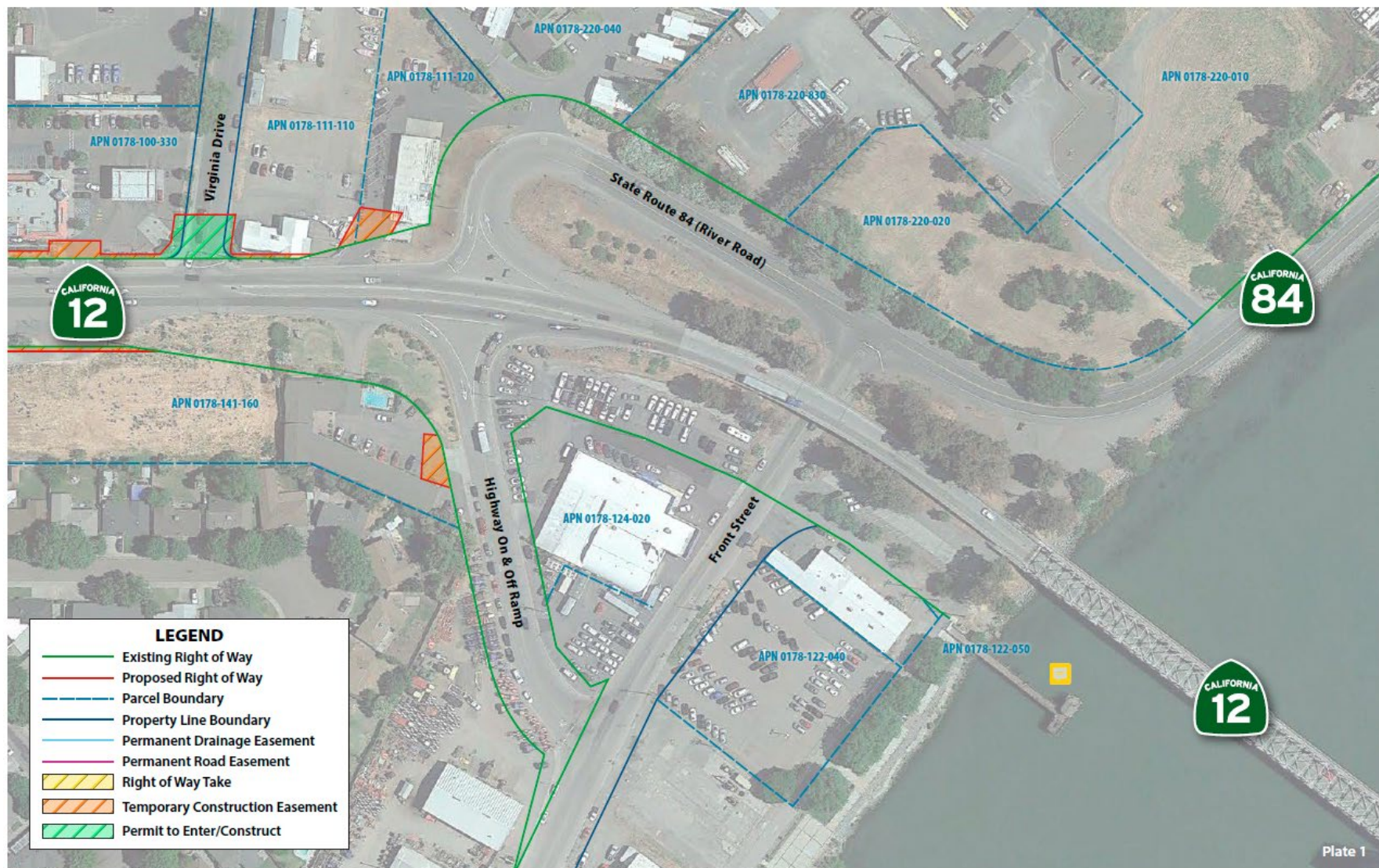
North-Central Coast (Santa Rosa) 707-387-0737

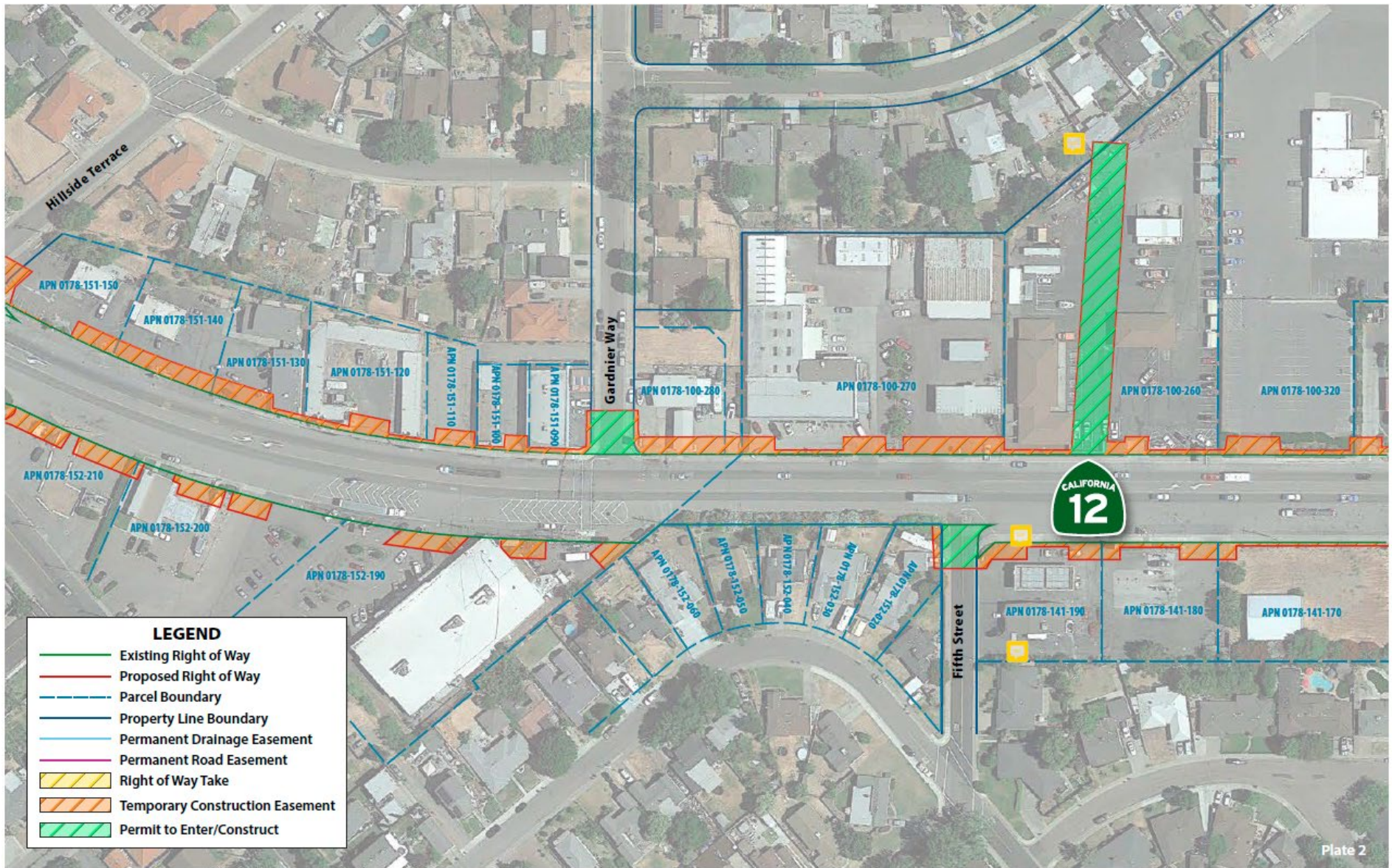
Southern California (Long Beach) 562-980-4000

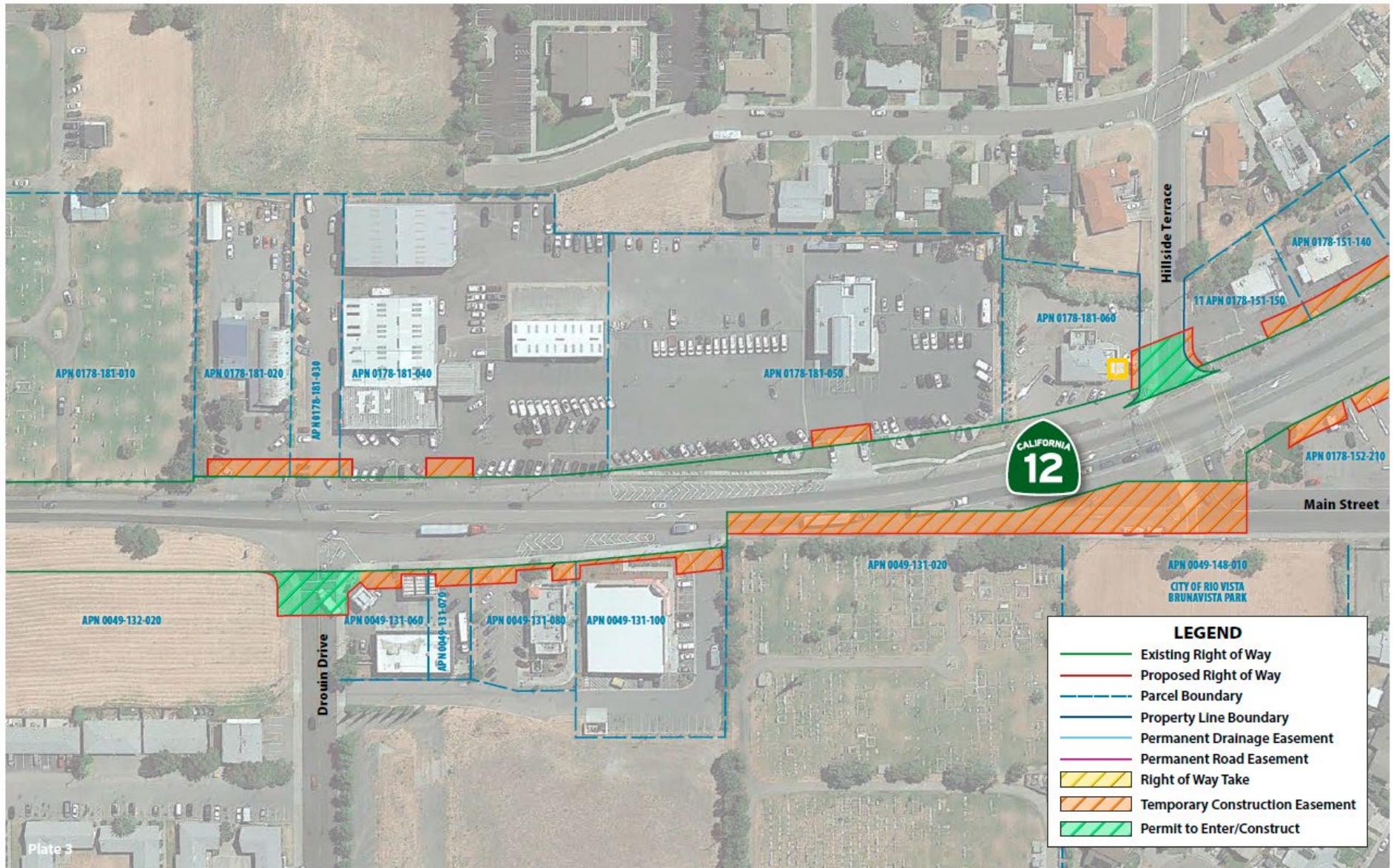
California Central Valley (Sacramento) 916-930-3600

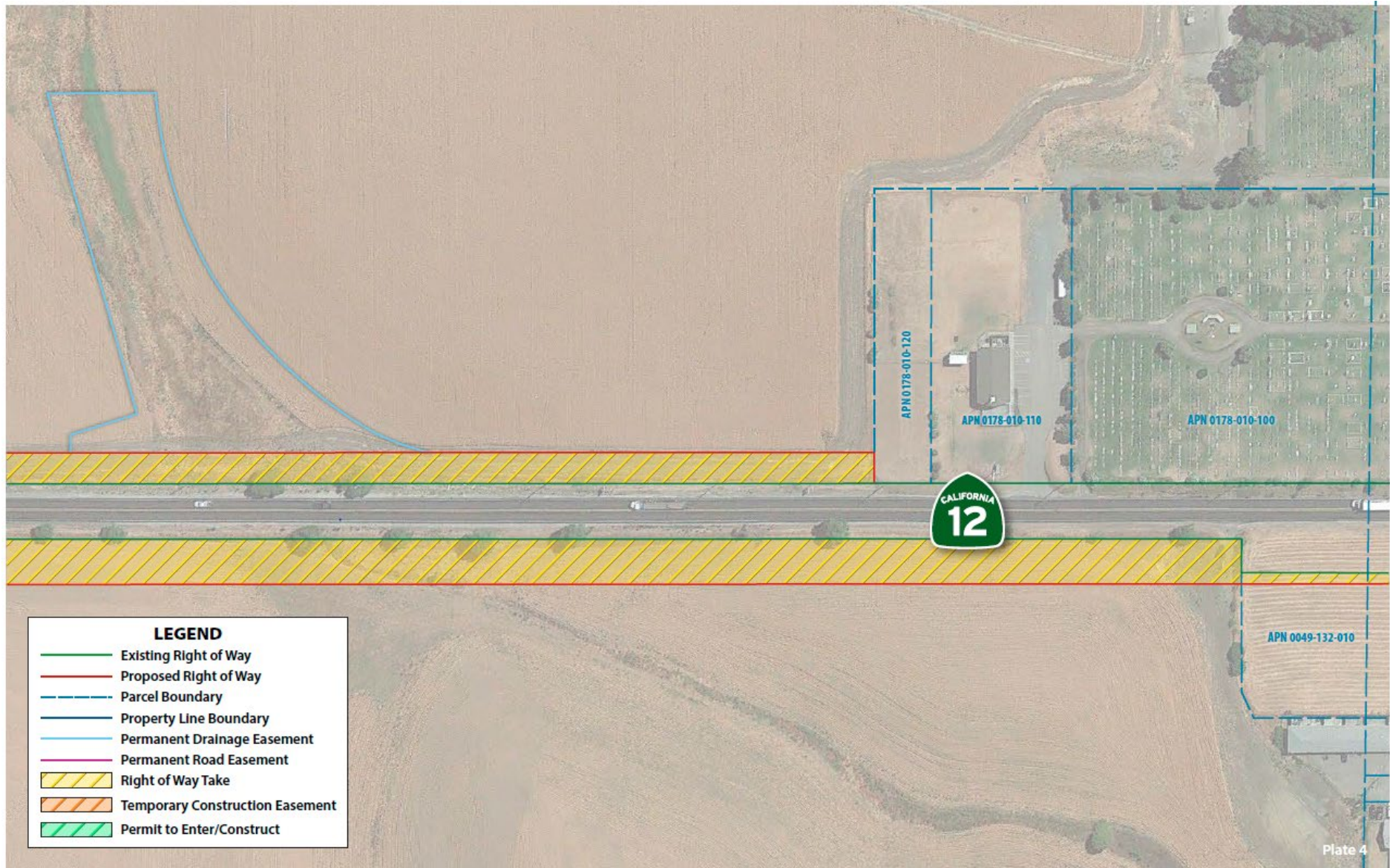
Appendix H. ROW Figures

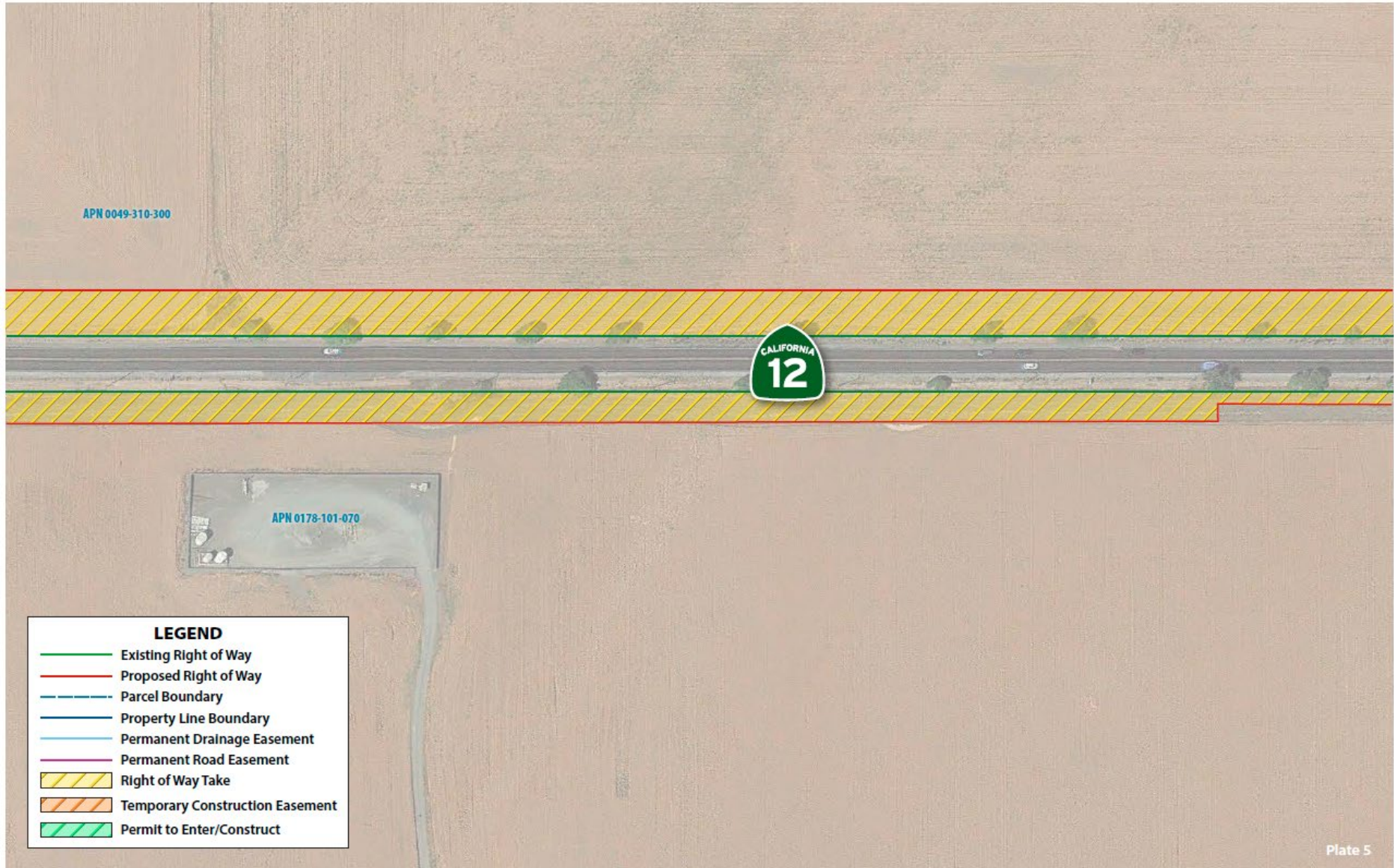
Figure 2: Maps of each parcel location of ROW acquisition



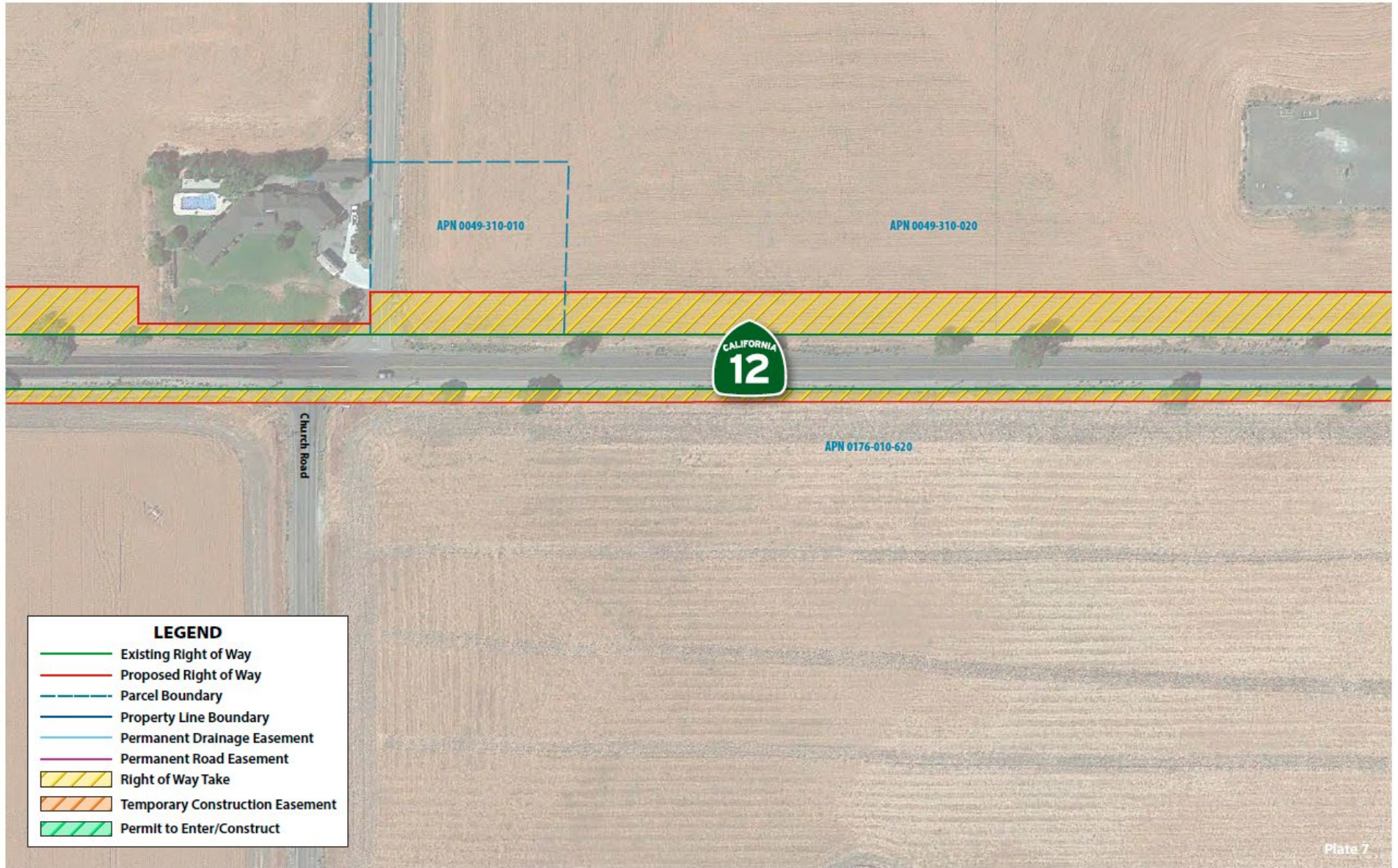


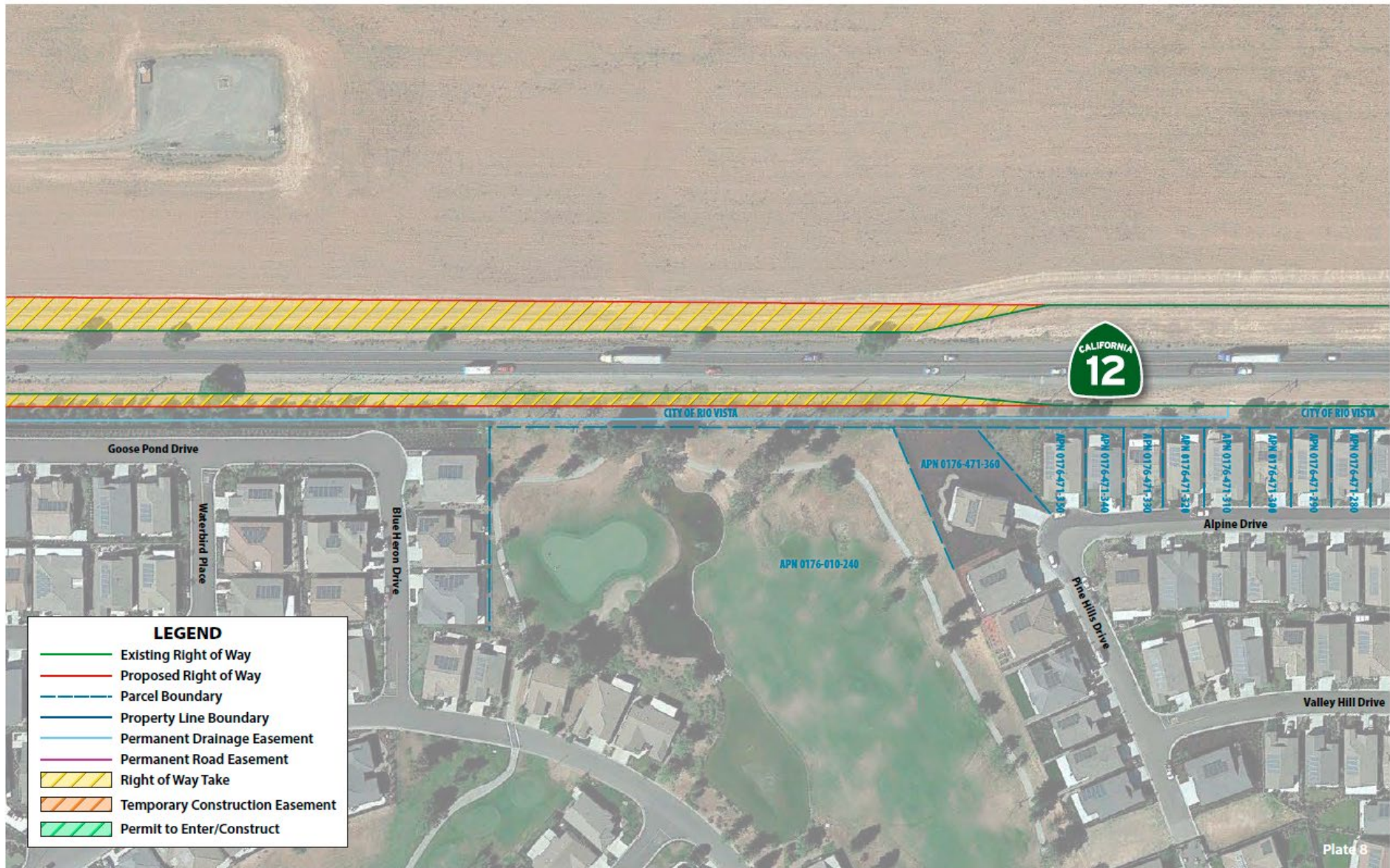












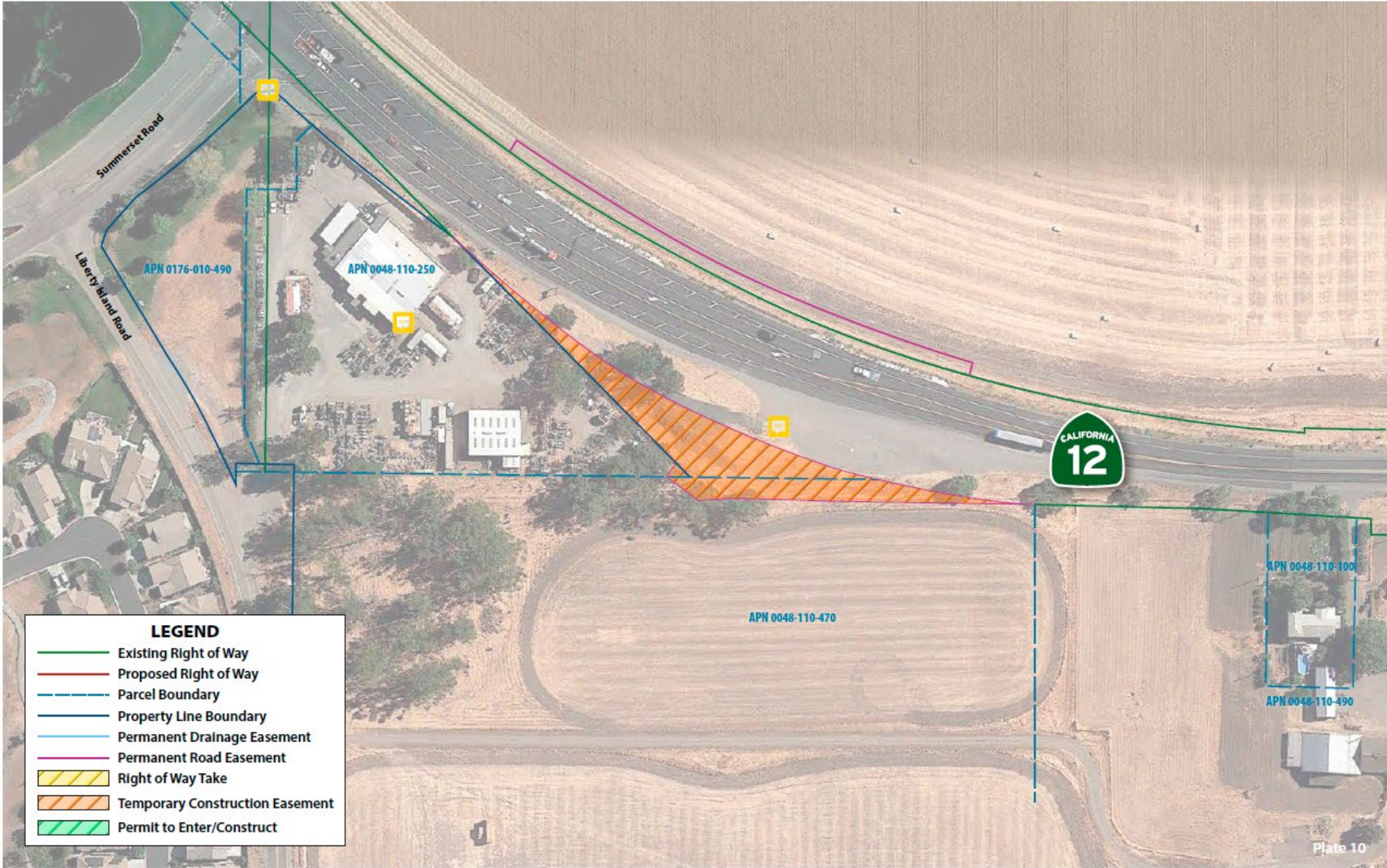


Table 6 outlines the PTE&C necessary for the proposed project.

Table 6: PTE&C

Assessor's Parcel Number (APN)	Permits to Enter and Construct (ft²)
Public Road Intersection: Summerset Road and SR 12 (APN unavailable)	12,918.21
Public Road Intersection (APN unavailable)	3,644.07
Public Road Intersection: Gardnier Way and SR 12 (APN unavailable)	2,596.72
Public Road Intersection (APN unavailable)	400.02
0178-100-260	14,335.46
Public Road Intersection: Virginia Drive and SR 12 (APN unavailable)	2,520.43
Public Road Intersection: Summerset Road and SR 12 (APN unavailable)	2,122.95
Public Road Intersection: Summerset Road and SR 12 (APN unavailable)	22,172.33
Public Road Intersection: Drouin Drive and SR 12 (APN unavailable)	3,171.96

Table 7: outlines the TCE necessary for the proposed build alternative

Table 7: TCE

Assessor's Parcel Number (APN)	Temporary Construction Easements (ft²)
0048-110-100	28.77
0048-110-490	225.57
0048-110-470	8,839.05
State of California (APN unavailable)	13,185.48
0048-110-250	1,401.33
0176-010-490	7.66
0178-181-020	1,893.53

0178-181-030	1,148.28
0178-181-040	1,398.44
0178-181-050	1,339.37
0178-181-060	446.20
0178-151-150	1,506.32
0178-151-140	2,430.51
0178-151-130	1,622.73
0178-151-120	1,375.01
0178-151-110	972.60
0178-151-100	705.24
0178-151-090	546.62
0178-100-280	2,194.85
0178-100-270	4,514.57
0178-100-260	1,323.71
0178-100-320	1,749.99
0178-100-330	3,723.35
0178-111-110	1,202.37
0178-111-120	1,481.12
0178-141-160	2,367.35
0178-141-170	1,305.50
0178-141-180	1,657.00
0178-141-190	2,098.4
0178-152-020	451.51

0178-152-190	3400.05
0178-152-200	2,164.09
0178-152-210	2,935.88
0049-131-100	2,005.41
0049-131-080	1,772.88
0049-131-070	847.42
0049-131-060	1,710.95
0049-132-020	563.77

Table 8: outlines the PRE necessary for the proposed project.

Table 8: PRE

Assessor's Parcel Number (APN)	Permanent Road Easements (ft ²)
0048-120-580	8,804.98
City of Rio Vista (APN unavailable)	2,694.54

Table 9 outlines the PDE necessary for the proposed project.

Table 9: PDE

Assessor's Parcel Number (APN)	Permanent Drainage Easements (ft ²)
City of Rio Vista (APN unavailable)	34,283.24
0178-101-070	67,359.79
0178-220-020	5,209.5

Appendix I. Class of Action Determination Form and Email

CALTRANS CLASS OF ACTION DETERMINATION FORM

DIST./CO./RTE.	04/SOL/12
PM/PM	20.57/22.7 & 23.7/26.42
E.A. or Fed-Aid Project No.	04-0J630K
Other Project No. (specify)	0414000020
PROJECT TITLE	SOL 12 Roadway Rehabilitation Project
PROJECT DESCRIPTION	<p>The proposed project would resurface, reconstruct and rehabilitate (3R) 3 segments of SR 12 in Solano County. The project will require new right of way. Work in Segment 1 (Currie Road to Azevedo Road) would include providing a 20-foot clear recovery zone and replacing 4 cross culverts. Segment 2 (Summerset Road to City of Rio Vista urban area) is the last segment of SR 12 without shoulders. It would be widened to provide 8-foot shoulders and 12-foot lanes. It would also correct horizontal curves and 3 vertical curves. Retaining walls will be necessary, with the largest expected to be 20 feet high and 1,600 feet high. Two culverts would be replaced with larger culverts and two new drainage systems would be added. Segment 3 is in the City of Rio Vista. Work here includes reconstructing driveways that connect to SR 12 and all sidewalks along the highway to meet current ADA. Drainage deficiencies as reported by maintenance crews would also be addressed. This may require trenching to place new culverts.</p> <p>The project may involve high mitigation costs based on another nearby project: EA 04-2A620 involved contentious consultation with USFWS and CDFW regarding impacts to California tiger salamander. 2A620 was required to install a permanent wildlife directional fence. Both agencies then charged 3:1 mitigation for everything behind the fence. However, there is no known controversy, no debate concerning purpose and need, no issues related to logical termini or independent utility, and no Individual Section 4(f). Therefore, District 4 recommends a Routine Environmental Assessment for this project.</p>

Based on the information above for the subject project, the District 4 Office of Environmental Analysis has made the following Class of Action Determination.

CLASS OF ACTION DETERMINATION PER 23 CFR 771.115	<p><i>NEPA Environmental Document Type:</i></p> <p><input checked="" type="checkbox"/> Routine Environmental Assessment (EA)</p> <p><input type="checkbox"/> Complex Environmental Assessment</p> <p>Complex EAs are defined as those EAs that include multiple location alternatives, debate related to purpose and need, strong public controversy, issues related to logical termini or independent utility, individual Section 4(f) determinations, complex Endangered Species Act issues, numerous cumulative impacts or high mitigation costs.</p> <p><input type="checkbox"/> Environmental Impact Statement (EIS)</p>
---	--

Kathy Boltz
D4 Environmental Analysis Planner

6/17/2015
Date

Kathy Boltz
D4 Environmental Senior

6/17/2015
Date

HQ DEA Environmental Coordinator concurrence 6/18/15 E-mail concurrence attached.
(date)

Boltz, Kathryn M@DOT

From: Ketchum, Jeremiah S@DOT
Sent: Thursday, June 18, 2015 3:37 PM
To: Galvez-Abadia, Stefan@DOT; Brent, Melanie@DOT
Cc: Boltz, Kathryn M@DOT
Subject: FW: 04-0J630K - SOL 12 Roadway Rehabilitation Project - COA REQUEST
Attachments: 0J630 COA Form.pdf

From: Ketchum, Jeremiah S@DOT
Sent: Thursday, June 18, 2015 3:36 PM
To: Boltz, Kathryn M@DOT
Subject: RE: 04-0J630K - SOL 12 Roadway Rehabilitation Project - COA REQUEST

Based on the information provided (June 2015 *PEAR and COA Determination Form*), this project (04-0J630) does not meet the description of a complex Environmental Assessment (EA) under U.S.C. 327. I concur that this project is a Class III action, a routine EA.

Under 23 USC 327, as amended by MAP-21, EAs have been divided into two categories: complex EAs and routine EAs. Complex EAs are defined as those EAs that include multiple location alternatives, debate related to purpose and need, strong public controversy, issues related to logical termini or independent utility, individual Section 4(f) determinations, complex Endangered Species Act issues, numerous cumulative impacts or high mitigation costs.

Please note that the HQ/DEA portions of the quality process outlined in the "Review Procedures for Environmental Documents under the NEPA Assignment Program (October 1, 2012)" are not required. However, the process includes items required under NEPA Assignment Program.

All EA documents require:

- completion of the District/Region Quality Control Review process
- completion of the applicable Quality Control Review Certification form(s)
- concurrence from FHWA for Air Quality Conformity
- completion of the Environmental Document Preparation and Review Tool checklist
- completion of the draft Environmental Commitments Record at Final ED
- record keeping per the Uniform Environmental File System (UFS)
- a copy of this Class of Action Concurrence in the project file
- update STEVE project information with NEPA document type and class of action (COA) date

The project schedule should reflect the duration required for the District Quality Control process for both the draft and final environmental document.

Additional information can be found at:

<http://www.dot.ca.gov/ser/vol1/sec6/ch38nepa/chap38.htm>

Review of the climate change analysis by DEA Environmental Management Office is required before the document is approved at draft and at final. Material for climate change review must be submitted at the following Microsoft Outlook address:
HQ Climate Change Reviews@DOT

Please retain a copy of this email concurrence in your project files (UFS). The hardcopy of the COA Determination form is in the mail.

From: Boltz, Kathryn M@DOT
Sent: Wednesday, June 17, 2015 11:07 AM
To: Ketchum, Jeremiah S@DOT
Subject: 04-0J630K - SOL 12 Roadway Rehabilitation Project - COA REQUEST

Hello Jeremy,

Please see a request attached for concurrence on a Routine EA for the **SOL 12 Roadway Rehabilitation Project**.

Stefan and I already discussed the project and decided to recommend a Routine EA. I attached the PEAR, however, since there could be high mitigation costs involved.

Let me know if you have any questions. I don't have any electronic version of the mapping, but can show you hard copies the next time you're in the office – too many pages to email at any rate.

Thank you for your help.

Kathy Boltz
Senior Environmental Planner
510-622-8706

Appendix J. Cross Sections

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

REVISIONS: REVISION NO., DATE, REVISION BY, DATE REVISION BY, CALCULATED/DESIGNED BY, CHECKED BY, FUNCTIONAL SUPERVISOR

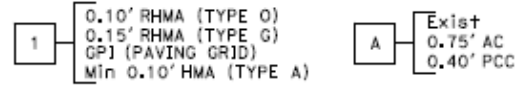
NOTES:

- DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
- SUPERELEVATIONS ARE SHOWN ON THE SUPERELEVATION DIAGRAMS.
- EXACT LOCATIONS AND TYPES OF HMA DIKES, CURBS, GUARD RAILING AND CONCRETE ARE SHOWN ON THE LAYOUTS AND THE SUMMARY OF QUANTITIES SHEETS.

ABBREVIATION:

&	AND
CB	CONCRETE BARRIER
DE	DRAINAGE EASEMENT
GP1	PAVING GRID
HMA	HOT MIX ASPHALT
PET	PAVEMENT EDGE TREATMENT
RHMA	RUBBERIZED HOT MIX ASPHALT
RHMA (G)	RUBBERIZED HOT MIX ASPHALT (GAP GRADED)
RHMA (O)	RUBBERIZED HOT MIX ASPHALT (OPEN GRADED FRICTION COURSE)

TYPICAL PAVEMENT STRUCTURE SECTIONS

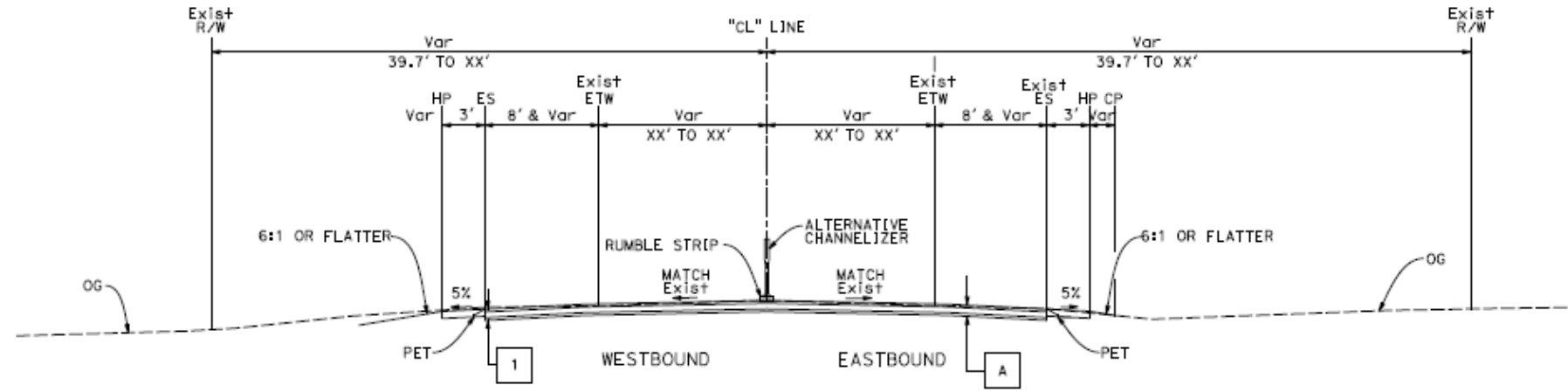


DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Sol	12	20.6/26.4		ZYX

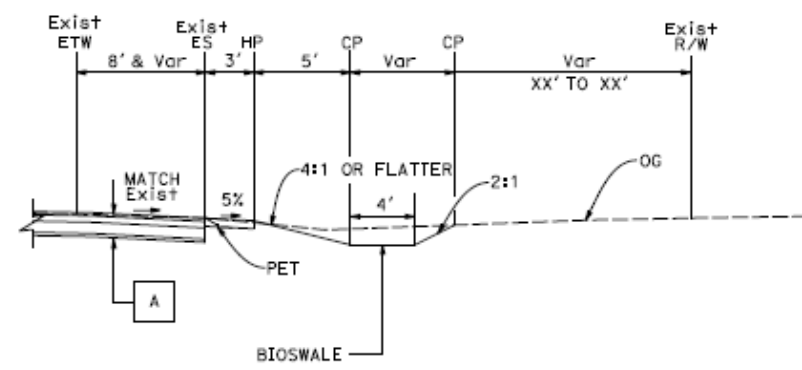
REGISTERED CIVIL ENGINEER DATE _____

PLANS APPROVAL DATE _____

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



"CL" 145+00 TO 235+00
ROUTE 12



"CL" 167+00 TO 169+00
 "CL" 175+00 TO 189+00
 "CL" 193+00 TO 210+00
 "CL" 219+00 TO 222+00
ROUTE 12

TYPICAL CROSS SECTIONS
NO SCALE

X-1

LAST REVISION: DATE PLOTTED => 15-MAY-2019
 05-06-19 TIME PLOTTED => 09:26

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

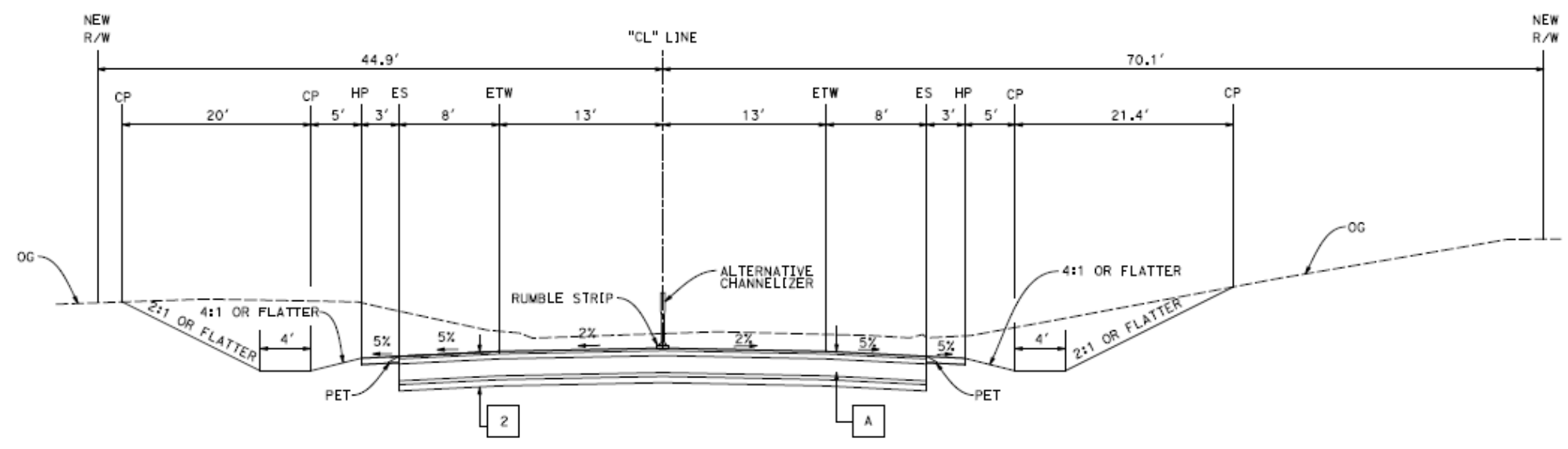
FUNCTIONAL SUPERVISOR
 CALCULATED-DESIGNED BY
 CHECKED BY

REVISED BY
 DATE REVISED

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Sol	12	20.6/26.4		ZYX

REGISTERED CIVIL ENGINEER DATE _____
 PLANS APPROVAL DATE _____

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"CL" 295+00 TO 303+00
 "CL" 330+00 TO 335+00
ROUTE 12

**SEGMENT 2
 NEW CONSTRUCTION**

TYPICAL CROSS SECTIONS
 NO SCALE

X-3

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET X-1

LAST REVISION: DATE PLOTTED => 15-MAY-2019
 05-06-19 TIME PLOTTED => 09:26

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CDT **DESIGN**

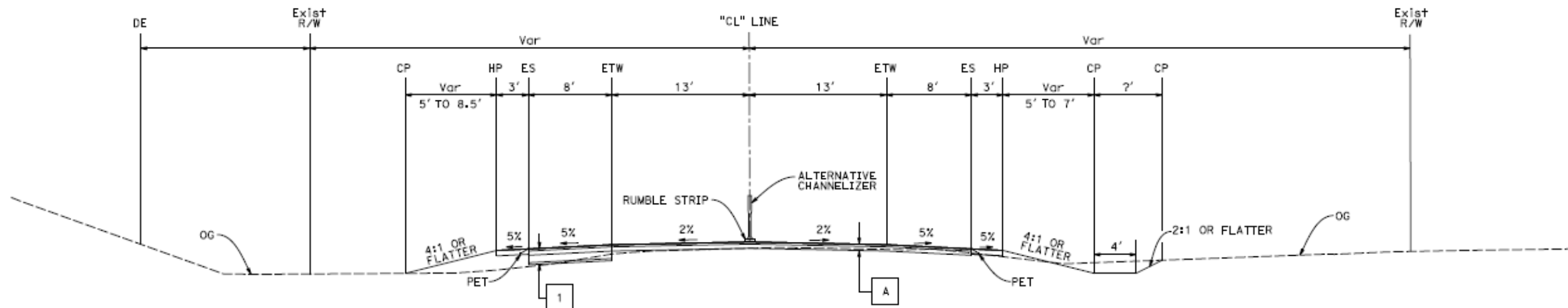
FUNCTIONAL SUPERVISOR
 CALCULATED-DESIGNED BY
 CHECKED BY

REVISED BY
 DATE REVISED

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Sol	12	20.6/26.4		ZYX

REGISTERED CIVIL ENGINEER DATE
 PLANS APPROVAL DATE

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"CL" 303+00 TO 304+00
 "CL" 324+00 TO 330+00
 "CL" 335+00 TO 346+00
ROUTE 12

**SEGMENT 2
 OVERLAY**

TYPICAL CROSS SECTIONS
 NO SCALE

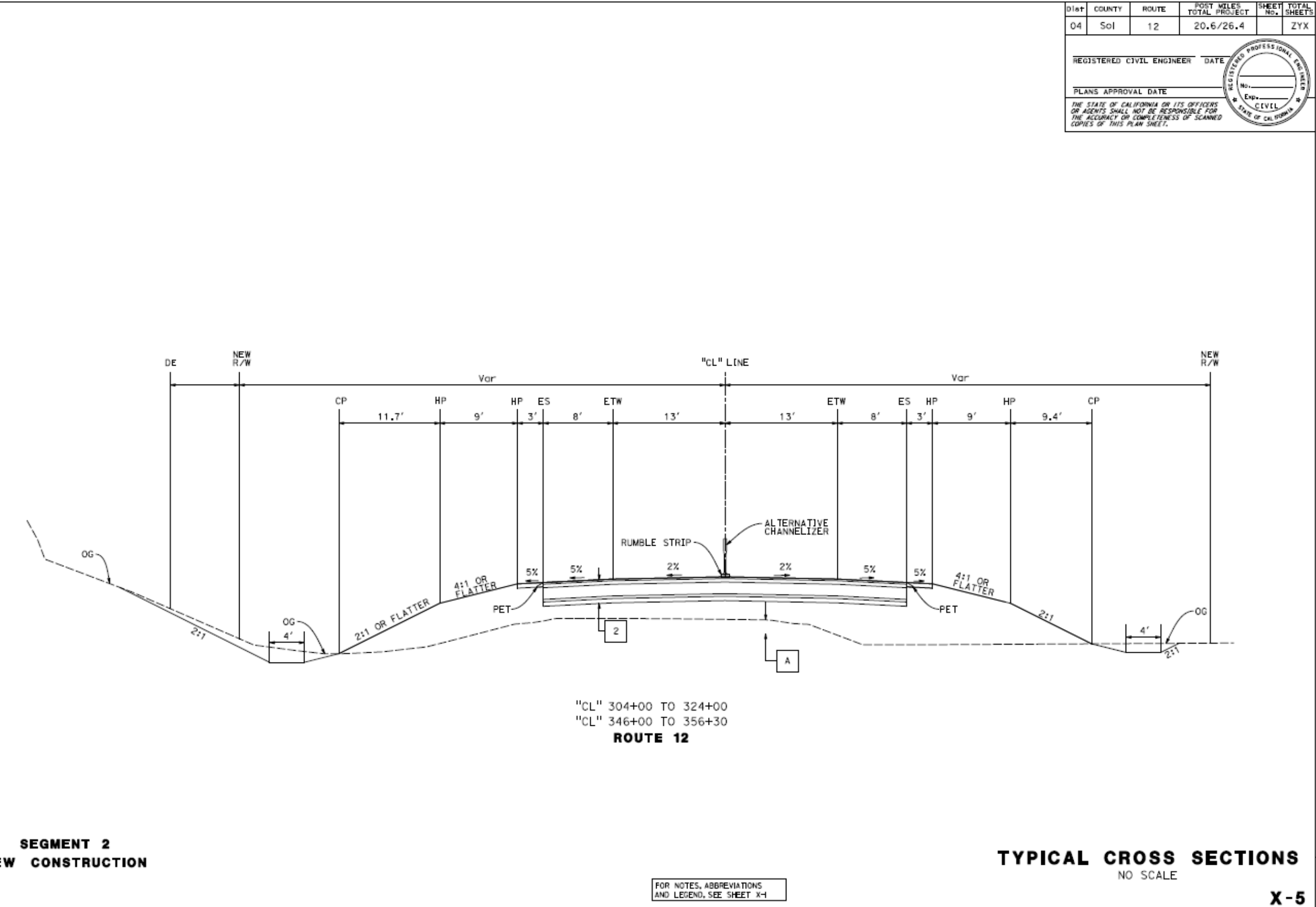
FOR NOTES, ABBREVIATIONS
 AND LEGEND, SEE SHEET X-1

X-4

LAST REVISION DATE PLOTTED => 15-MAY-2019 05-07-19 TIME PLOTTED => 09:26

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DESIGN


FUNCTIONAL SUPERVISOR
 CHECKED BY
 CALCULATED-DESIGNED BY
 REVISIONS
 REVISION BY DATE
 REVISION DATE



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SoI	12	20.6/26.4		ZYX

REGISTERED CIVIL ENGINEER DATE _____
 PLANS APPROVAL DATE _____
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**SEGMENT 2
NEW CONSTRUCTION**

TYPICAL CROSS SECTIONS
NO SCALE

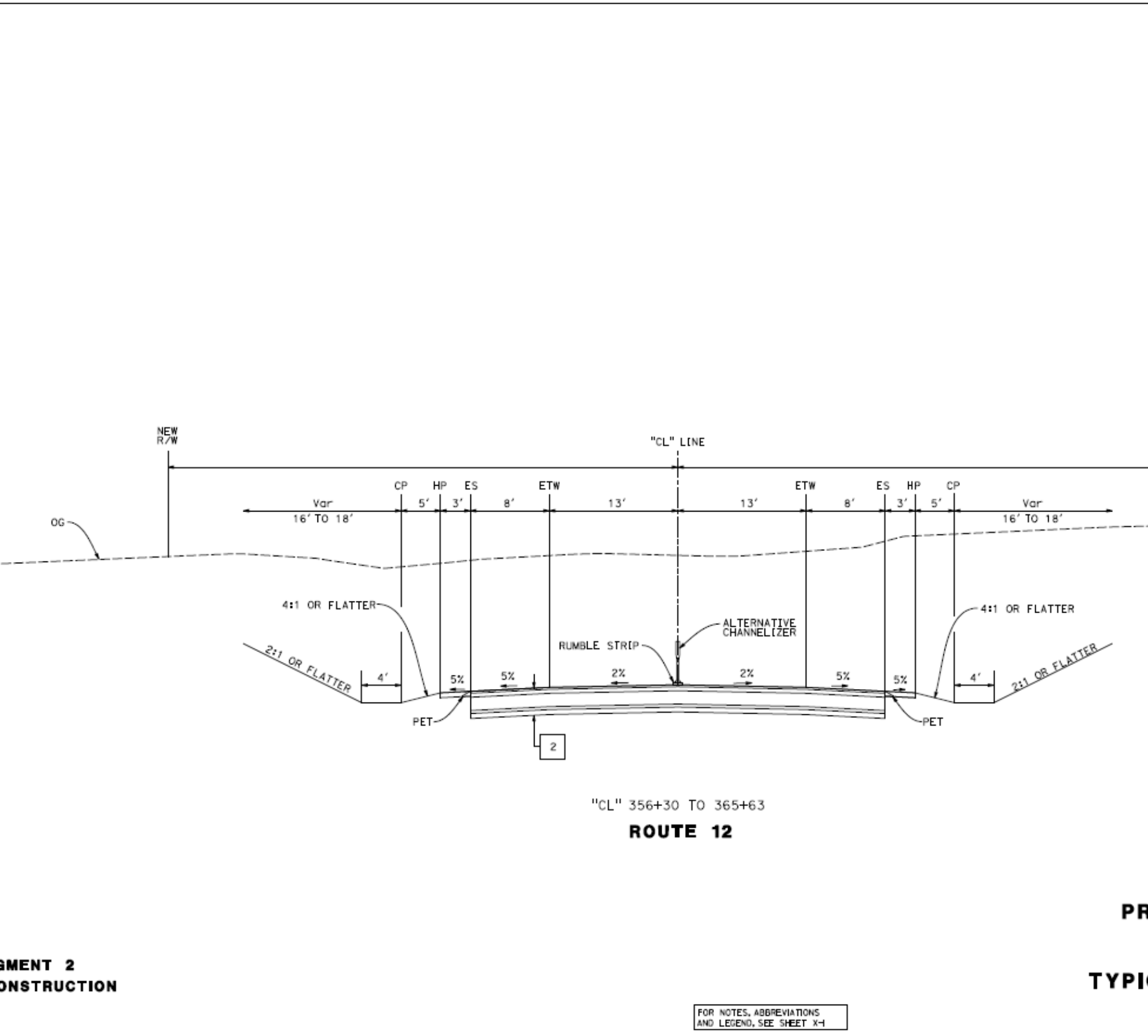
X-5

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET X-1

LAST REVISION: DATE PLOTTED => 15-MAY-2019
 05-07-19 TIME PLOTTED => 09:28

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

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 REVISION NO. | REVISION DESCRIPTION | DATE



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Sol	12	20.6/26.4	ZYX	

REGISTERED CIVIL ENGINEER DATE _____
 PLANS APPROVAL DATE _____

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**SEGMENT 2
 NEW CONSTRUCTION**

"CL" 356+30 TO 365+63
ROUTE 12

**PROFILE CORRECTION
 CUT-SECTION
 ALTERNATIVE 1
 TYPICAL CROSS SECTIONS**
 NO SCALE

X-6

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET X-1


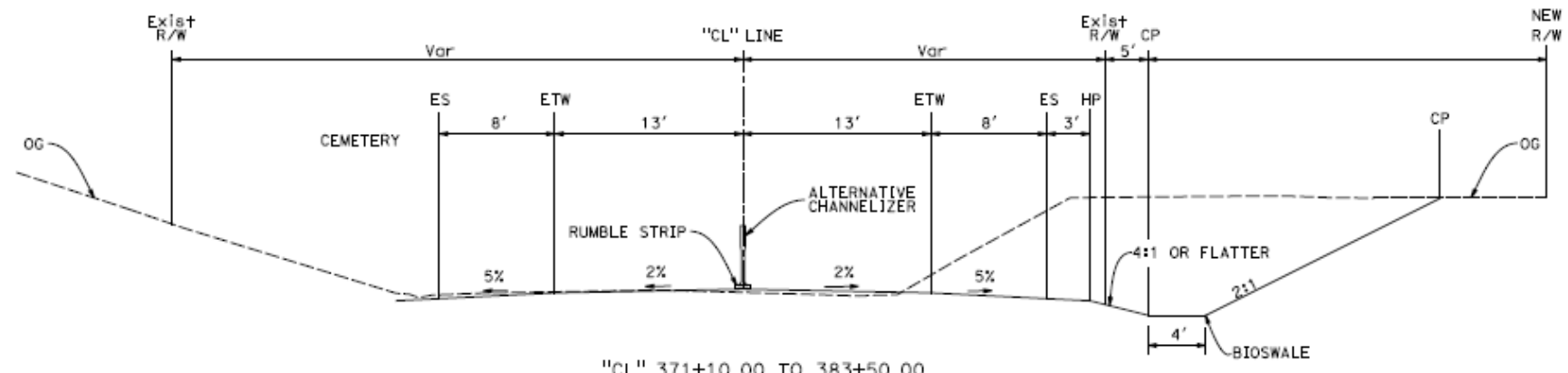
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 05-09-19 TIME PLOTTED => 09:26

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DESIGN

 FUNCTIONAL SUPERVISOR
 CALCULATED-DESIGNED BY
 CHECKED BY
 REVISED BY
 DATE REVISED

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Sol	12	20.6/26.4		ZYX

REGISTERED CIVIL ENGINEER DATE _____
 PLANS APPROVAL DATE _____
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"CL" 371+10.00 TO 383+50.00

ROUTE 12

375+50.00

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET X-1

TYPICAL CROSS SECTIONS
NO SCALE

X-8

BORDER LAST REVISED 7/2/2010	USERNAME => x133066 DGN FILE => 0414000020cc008.dgn	RELATIVE BORDER SCALE IS IN INCHES	0 1 2 3	UNIT 0752	PROJECT NUMBER & PHASE	04140000201
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LAST REVISION: DATE PLOTTED => 15-MAY-2019
 OS-13-19 TIME PLOTTED => 09:28

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR

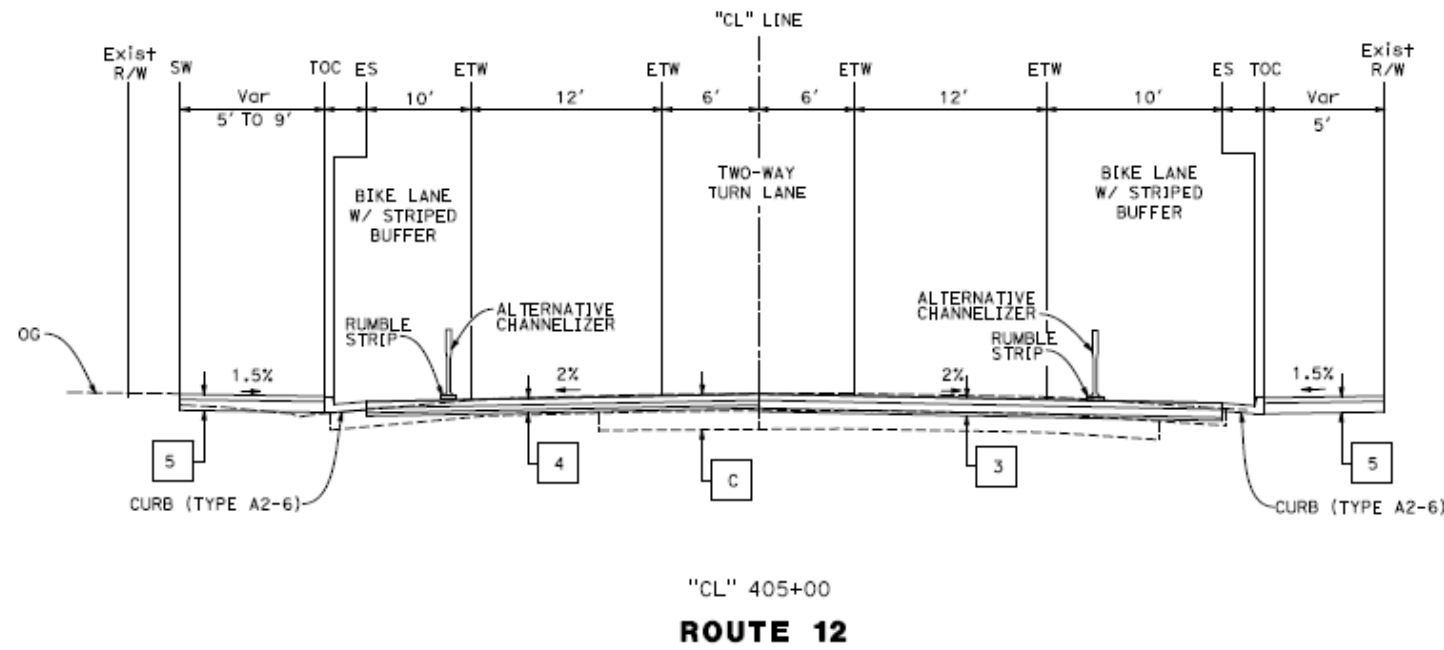
CALCULATED-DESIGNED BY
 CHECKED BY

REVISED BY
 DATE REVISED

REVISIONS

NO. DESCRIPTION

**SEGMENT 3
 COLDPLANE**



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Sol	12	20.6/26.4		ZYX

REGISTERED CIVIL ENGINEER DATE _____

PLANS APPROVAL DATE _____

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TYPICAL CROSS SECTIONS
 NO SCALE

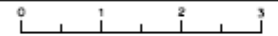
X-11

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET X-1

BORDER LAST REVISED 7/2/2010

USERNAME => s133066
 DGN FILE => 0414000020co011.dgn

RELATIVE BORDER SCALE (5 IN INCHES)



UNIT 0752

PROJECT NUMBER & PHASE

04140000201

LAST REVISION DATE PLOTTED => 15-MAY-2019
 05-14-19 TIME PLOTTED => 09:28

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DESIGN
Caltrans

REVISOR BY
 DATE REVISED

CALCULATED-
 DESIGNED BY
 CHECKED BY

FUNCTIONAL SUPERVISOR


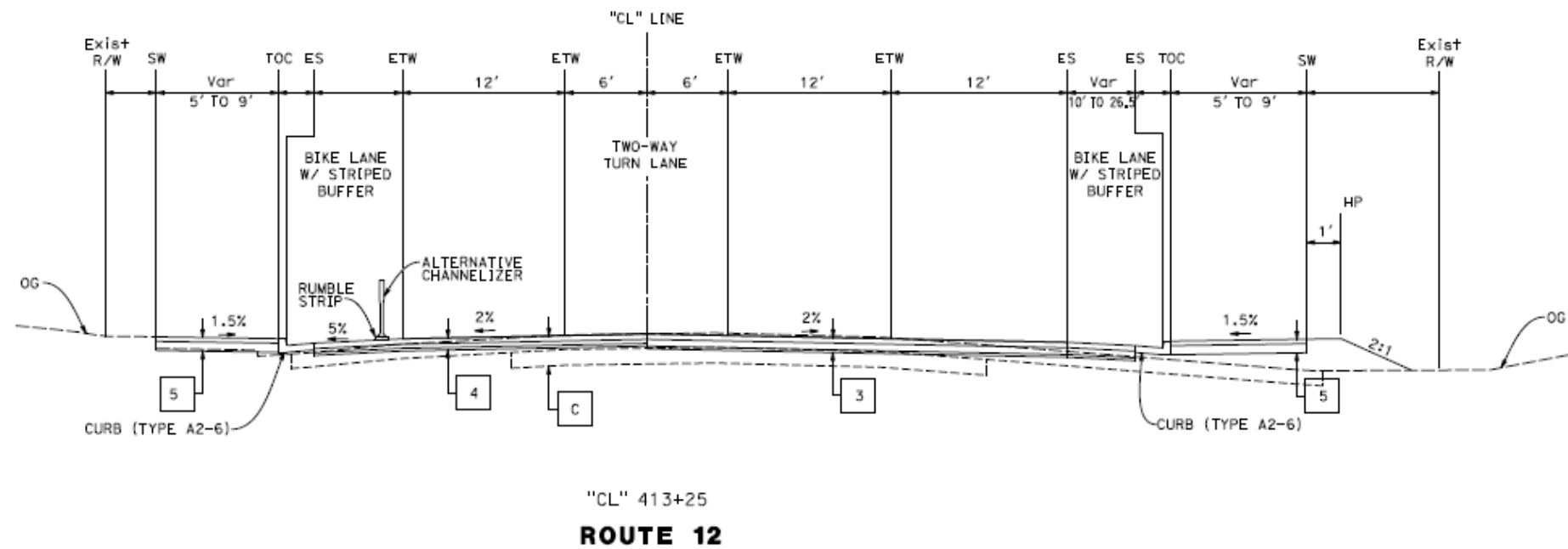
DESIGN

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SoI	12	20.6/26.4	ZYX	

REGISTERED CIVIL ENGINEER DATE _____

PLANS APPROVAL DATE _____

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**SEGMENT 3
 COLDPLANE**

TYPICAL CROSS SECTIONS
 NO SCALE

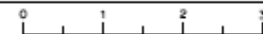
X-12

FOR NOTES, ABBREVIATIONS
 AND LEGEND, SEE SHEET X-1

BORDER LAST REVISED 7/2/2010

USERNAME => x133066
 DGN FILE => 0414000020co012.dgn

RELATIVE BORDER SCALE
 IS IN INCHES



UNIT 0752

PROJECT NUMBER & PHASE

04140000201

LAST REVISION: DATE PLOTTED => 15-MAY-2019
 05-14-19 TIME PLOTTED => 09:26