Final

Supplemental Environmental Impact Statement/ Environmental Impact Report
American River Watershed Common Features, Water Resources Development Act of 2016 Project
Sacramento Weir Widening

State Clearinghouse Number 2020070575

Prepared for:

U.S. Army Corps of Engineers
Sacramento District

Central Valley Flood Protection Board

May 2021

Final

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American River Watershed Common Features, Water Resources Development Act of 2016 Project Sacramento Weir Widening

Sacramento County, California

Final Supplemental Environmental Impact Statement/ Environmental Impact Report

May 2021

Type of Statement: Draft Supplemental Environmental Impact Statement/Environmental Impact Report (EIS/EIR)

Lead NEPA Agency: U.S. Army Corps of Engineers, Sacramento District

Lead CEQA Agency: State of California, Central Valley Flood Protection Board

Cooperating Agency: Sacramento Area Flood Control Agency

Abstract: The U.S. Army Corps of Engineers and its non-Federal partners, the State of California Central Valley Flood Protection Board and the Sacramento Area Flood Control Agency, propose to widen the Sacramento Weir and Bypass by constructing a new weir structure extending approximately 1,500 feet upstream from the existing weir. This Supplemental EIS/EIR supplements the American River Watershed Common Features General Reevaluation Report Final Environmental Impact Statement/Environmental Impact Report to address refinement in the design of the Sacramento Weir widening. This Supplemental EIS/EIR describes the environmental resources in the project area; evaluates the direct, indirect, and cumulative environmental effects of three alternatives, including the no action alternative; and describes avoidance, minimization, and compensation measures. Most potential adverse effects would be either short term or would be avoided or reduced using best management practices. However, there would be some significant and unavoidable impacts associated with the Proposed Action. The beneficial effects of each alternative are also discussed.

Public Review and Comment: The public review period for the draft Supplemental EIS/EIR occurred from July 31 through September 14, 2020. Written comments or questions concerning this document should be directed to the following: U.S. Army Corps of Engineers, Sacramento District; Attn: Mr. Robert Chase; 1325 J Street; Sacramento, California 95814-2922, or by e-mail: SacWeir@usace.army.mil or California Department of Water Resources; Attn: Mr. Miles Claret; 3464 El Camino Avenue, Suite 150; Sacramento, California 95821, or by e-mail: PublicCommentARCF16@water.ca.gov.

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Abbreviations and Acronyms

AB	Assembly Bill
ADT	Average Daily Traffic
APE	Area of Potential Effects
ARB	California Air Resources Board
ARCF GRR	American River Common Features General Reevaluation Report
Basin Plan	Water Quality Control Plan for the Sacramento and San Joaquin River Basins
BMPs	Best Management Practices
BPWG	Bank Protection Working Group
BWFS	Basin-Wide Feasibility Studies
CAA	Clean Air Act
CAS	Climate Adaptation Strategy
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
Cfs	cubic feet per second
CHP	California Highway Patrol
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
CRHR	California Register of Historical Resources
CVFMP	Central Valley Flood Management Planning
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CWA	Clean Water Act
dBA	A-weighted decibels
Delta	Sacramento-San Joaquin Delta
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources

EC	Electrical Conductivity
EFH	Essential Fish Habitat
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Administration
GEI	GEI Consultants, Inc.
GHG	greenhouse gas
GPS	Global Positioning System
gpm	gallons per minute
HMMP	Habitat, Mitigation, and Monitoring Plan
HPMP	Historic Properties Management Plan
HPTPs	Historic Properties Treatment Plans
I-5	Interstate 5
I-80	Interstate 80
ICF	ICF International, Inc.
ITE	Institute of Transportation Engineers
IWG	Interagency Working Group
IWM	instream woody material
JFP	Joint Federal Project or Folsom Dam Safety and Flood Damage Reduction Project
L_{dn}	day-night average sound level
LEBLS	Lower Elkhorn Basin Levee Setback
LMA	Local Maintaining Agency
L_{max}	maximum sound level
LOS	level of service
µmoh/cm	micromhos/centimeter
MBTA	Migratory Bird Treaty Act
Mcl	maximum contaminant level
MIAD	Mormon Island Auxiliary Dam
MLD	Most Likely Descendant
MMRP	Mitigation Monitoring and Reporting Program
MRZ	Mineral Resource Zone
Msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NAHC	California Native American Heritage Commission
NAVD88	North American Vertical Datum of 1988

NEMDC	Natomas East Main Drainage Canal
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O&M	operations and maintenance
PA	Programmatic Agreement
PCE	passenger car equivalent
PG&E	Pacific Gas and Electric Company
Phase I ESA	Phase I Environmental Site Assessment
PM	particulate matter
PM_{10}	PM equal to or less than 10 micrometers in diameter
$PM_{2.5}$	PM equal to or less than 2.5 micrometers in diameter
Ppb	parts per billion
Ppm	parts per million
PPV	peak particle velocity
PRC	Public Resources Code
RD	Reclamation District
RECs	Recognized Environmental Conditions
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SAFCA	Sacramento Area Flood Control Agency
SCAS	Sacramento County Airport System
SHPO	State Historic Preservation Officer
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	sulfur dioxide
SPCCP	Spill Prevention Control and Countermeasures Plan
SR	State Route
SRA	shaded riverine aquatic
SRBPP	Sacramento River Bank Protection Project
SRFCP	Sacramento River Flood Control Project
SVAB	Sacramento Valley Air Basin
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
TACs	toxic air contaminants

TDS	total dissolved solids
TMDL	total maximum daily load
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VdB	vibration decibels
VMT	vehicle miles traveled
WCM	Water Control Manual
WRDA	Water Resources Development Act
WSE	Water Surface Elevation
YSAQMD	Yolo-Solano Air Quality Management District

EXECUTIVE SUMMARY

Summary of the Project

The Sacramento Weir Widening project includes constructing a 1,500-foot-long passive weir, with associated levee, roadway, rail, and fish passage improvements. Many of the improvements that are part of the Proposed Action were analyzed in the American River Common Features General Reevaluation Report (ARCF GRR) Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR). This Supplemental EIS/EIR is needed because some elements of the Proposed Action (passive weir design and fish passage structure) were not analyzed in the ARCF GRR Final EIS/EIR, when the weir design had not yet been sufficiently developed to accurately assess its potential environmental impacts. Through project design and refinement, the U.S. Army Corps of Engineers (USACE), as the Federal lead agency responsible for conformance with the requirements of the National Environmental Policy Act (NEPA), has identified sufficient detail to support an analysis of effects from two alternative project designs: a passive weir structure with a crest elevation at 26 feet on the North American Vertical Datum of 1988 (NAVD88) (the Proposed Action), and a passive weir structure with a crest elevation at 26 feet NAVD88, with stop logs to raise the crest elevation to 29.8 feet NAVD88 (the Higher Weir Elevation Alternative).

The Central Valley Flood Protection Board (CVFPB) is the state lead agency responsible for conformance with the requirements of the California Environmental Quality Act (CEQA) and CEQA Guidelines. CVFPB and the Sacramento Area Flood Control Agency (SAFCA) are the non-Federal sponsors of the ARCF 2016 Project.

The weir and bypass widening is proposed under the ARCF 2016 Project. The American River Watershed Common Features Project was originally authorized by Section 101(a)(1)(A) of the Water Resources Development Act (WRDA) 1996, Pub. L. No. 104-303 § 101(a) (1), 110 Stat. 3658, 3662-3663 (1996), as amended by Section 366 of WRDA of 1999, Pub. L. No. 106-53, § 366, 113 Stat. 269, 319-320 (1999). Additional authority was provided following the interim general reevaluation study in Section 1322(b) of WRDA 2016, Pub. L. No. 114-322 § 1322, 130 Stat. 1707.

Summary of Environmental Consequences

Table ES-1 summarizes the effects analysis provided in detail in Sections 3.2 through 3.16 of this Supplemental EIS/EIR, as well as cumulative effects provided in Section 4.2, “Cumulative Effects.” Effect titles, significance conclusions before and after mitigation implementation, and mitigation measures are provided in this summary.

Areas of Controversy and Issues to be Resolved

The ARCF GRR Final EIS/EIR identified several areas of controversy based on the comments received during the public scoping period and the history of the NEPA and CEQA processes undertaken by USACE, CVFPB, and SAFCA. Several of these areas of controversy are applicable to the Proposed Action, including:

- Construction-related impacts on biological resources,
- Vegetation and tree removal,

- Effects to cultural resources and resources significant to Native American tribes,
- Effects to recreation facilities, and
- Effects to endangered species and their habitats.

In addition to the areas of controversy identified during public scoping for the ARCF GRR Final EIS/EIR, the potential downstream effects of a passive design for the widened weir, including effects on agriculture, have been identified as potential areas of controversy based on outreach with project stakeholders.

Table ES-1. Summary of Effects and Mitigation Measures for the Proposed Action

Effect Threshold	Significance Before Mitigation	Avoidance, Minimization, and Mitigation Measures	Significance After Avoidance, Minimization, and Mitigation Measures
Geological Resources			
Potential for Damage to Project Features Due to Unstable Soils	LTS	None	LTS
Potential Temporary, Short-term Construction-related Erosion	S	Mitigation Measure GEO-1: Acquire Appropriate Regulatory Permits and Prepare and Implement a Storm Water Pollution Prevention Plan, Spill Prevention Control and Countermeasures Plan, and Associated Best Management Practices	LTS
Potential to Directly or Indirectly Destroy a Unique Paleontological Resource or Site	S	Mitigation Measure GEO-2: Conduct Construction Personnel Education, Stop Work if Paleontological Resources are Discovered, Assess the Significance of the Find, and Prepare and Implement a Recovery Plan, as Required	LTS
Land Use			
Conversion of Prime Farmland	S	Mitigation Measure AG-1: Purchase Conservation Easements to Offset Conversion of Prime Farmland	SU
Hydrology and Hydraulics			
Effects to Water Surface Elevation	LTS	None	LTS
Effects to Agricultural Operations	LTS	None	LTS

B = Beneficial NI = No Impact LTS = Less than Significant S = Significant SU = Significant and Unavoidable

Table ES-1. Summary of Effects and Mitigation Measures for the Proposed Action

Effect Threshold	Significance Before Mitigation	Avoidance, Minimization, and Mitigation Measures	Significance After Avoidance, Minimization, and Mitigation Measures
Water Quality and Groundwater Resources			
Violate Any Water Quality Standards or Waste Discharge Requirements or Otherwise Substantially Degrade Surface or Groundwater Quality, Result in Substantial Erosion or Siltation On- or Offsite, or Conflict with or Obstruct Implementation of a Water Quality Control Plan or Sustainable Groundwater Management Plan	S	Mitigation Measures GEO-1: Acquire Appropriate Regulatory Permits and Prepare and Implement a Storm Water Pollution Prevention Plan, Spill Prevention Control and Countermeasures Plan. Mitigation Measures HWQ-1: Obtain Appropriate Discharge and Dewatering Permit and Implement Provisions for Dewatering.	LTS
Substantially Decrease Groundwater Supplies or Interfere Substantially with Groundwater Recharge Such That the Project May Impede Sustainable Groundwater Management of the Basin	LTS	None	LTS
Create or Contribute Runoff Water Which Would Exceed the Capacity of Existing or Planned Stormwater Drainage Systems or Provide Substantial Additional Sources of Polluter Runoff	LTS	None	LTS
Risk Release of Pollutants Due to Project Inundation in Flood Hazard, Tsunami, or Seiche Zones	LTS	None	LTS

Table ES-1. Summary of Effects and Mitigation Measures for the Proposed Action

Effect Threshold	Significance Before Mitigation	Avoidance, Minimization, and Mitigation Measures	Significance After Avoidance, Minimization, and Mitigation Measures
Vegetation and Wildlife			
Adverse Effects on Riparian Habitat, Forestland, and Waters of the United States	S	Mitigation Measure VEG-1: Compensate for Riparian and Woodland Habitat Removal Mitigation Measure WATERS-1: Compensate for Fill of state and Federally Protected Waters Mitigation Measure GEO-1: Acquire Appropriate Regulatory Permits and Prepare and Implement a Storm Water Pollution Prevention Plan, Spill Prevention Control and Countermeasures Plan, and Associated Best Management Practices	LTS long term, SU short term (riparian habitat) LTS (waters)
Conflict with Tree Preservation Policies or Ordinances or Provisions of an Adopted Habitat Conservation Plan or Natural Community Conservation Plan	S	Mitigation Measure VEG-1: Compensate for Riparian and Woodland Habitat Removal	LTS
Fisheries			
Potential Impacts to Fish Passage	B	Mitigation Measure FISH-3: Fish Rescue Plan	B
Operation and Maintenance for Fish Passage	S	Mitigation Measure FISH-1: In-water Work Window Mitigation Measure GEO-1: Acquire Appropriate Regulatory Permits and Prepare and Implement a Storm Water Pollution Prevention Plan, Spill Prevention Control and Countermeasures Plan, and Associated Best Management Practices	LTS
Potential Increase in Stranding	S	Mitigation Measure FISH-1: In-water Work Window Mitigation Measure FISH-4: Fish Rescue Plan	LTS
Impacts of Stage Changes on Critical Habitat	B	None	B

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Table ES-1. Summary of Effects and Mitigation Measures for the Proposed Action

Effect Threshold	Significance Before Mitigation	Avoidance, Minimization, and Mitigation Measures	Significance After Avoidance, Minimization, and Mitigation Measures
Impacts of Construction and Erosion Control Measures on Critical Habitat	S	Mitigation Measure FISH-2: Shaded Riverine Aquatic and Aquatic Habitat Mitigation Measure FISH-4: Fish Rescue Plan Mitigation Measure GEO-1: Acquire Appropriate Regulatory Permits and Prepare and Implement a Storm Water Pollution Prevention Plan, Spill Prevention Control and Countermeasures Plan, and Associated Best Management Practices Mitigation Measures HWQ-1: Obtain Appropriate Discharge and Dewatering Permit and Implement Provisions for Dewatering.	LTS
Special-Status Plant and Terrestrial Wildlife Species			
Adverse Effect on Special-status Species: Plants	S	Mitigation Measure PLANT-1: Implement Measures to Minimize Impacts on Special-status Plants	LTS
Adverse Effect on Special-status Species: Valley Elderberry Longhorn Beetle	S	Mitigation Measure VELB-1: Implement Current US Fish and Wildlife Service Avoidance, Minimization, and Compensation Measures for Valley Elderberry Longhorn Beetle	LTS
Adverse Effect on Special-status Species: Giant Garter Snake	S	Mitigation Measure GGS-1: Implement Measures to Avoid, Minimize, and Compensate Impacts on Giant Garter Snake	LTS
Adverse Effect on Special-status Species: Swainson's Hawk and Other Special-status Birds	S	Mitigation Measure BIRD-1: Implement Measures to Protect Nesting Migratory Birds	LTS
Adverse Effect on Special-status Species: Special-status Bats	S (CEQA only)	Mitigation Measure BAT-1: Implement Measures to Protect Maternity Roosts of Special-status Bats	LTS (CEQA only)

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Table ES-1. Summary of Effects and Mitigation Measures for the Proposed Action

Effect Threshold	Significance Before Mitigation	Avoidance, Minimization, and Mitigation Measures	Significance After Avoidance, Minimization, and Mitigation Measures
Cultural Resources			
Damage to or Destruction of Built-Environment Historic Properties	S	Mitigation Measure CR-1: Prepare a Historic Properties Treatment Plan and Continue Consultation in Accordance with the Programmatic Agreement and the Historic Properties Management Plan	LTS
Potential Damage to or Destruction of Previously Undiscovered Archaeological Sites or Tribal Cultural Resources	S	Mitigation Measure CR-1: Prepare a Historic Properties Treatment Plan and Continue Consultation in Accordance with the Programmatic Agreement and the Historic Properties Management Plan Mitigation Measure CR-2: Prepare an Archaeological Discovery Plan and an Archaeological Monitoring Plan. Mitigation Measure CR-3: Conduct Cultural Resources Awareness Training Mitigation Measure CR-4: Implement Procedures for Inadvertent Discovery of Cultural Material Mitigation Measure CR-5: In the Event that Tribal Cultural Resources are Discovered Prior to or During Construction, Implement Procedures to Evaluate Tribal Cultural Resources and Implement Avoidance and Minimization Measures to Avoid Significant Adverse Effects	LTS
Damage to or Destruction of Human Remains During Construction	S	Mitigation Measure CR-6: Implement Procedures for Inadvertent Discovery of Human Remains	LTS
Potential Damage to or Destruction of Traditional Cultural Landscape	LTS	None	LTS

Table ES-1. Summary of Effects and Mitigation Measures for the Proposed Action

Effect Threshold	Significance Before Mitigation	Avoidance, Minimization, and Mitigation Measures	Significance After Avoidance, Minimization, and Mitigation Measures
Transportation and Circulation			
Conflict with a Program, Plan, or Ordinance: Exceed Level of Service or Conflict with Vehicle-Miles-Traveled Standards	NI	None	NI
Increase in Traffic Volumes or Decrease in Capacity along Designated Roadways in the Project Area	S	Mitigation Measure TR-1: Prepare and Implement a Traffic Control and Road Maintenance Plan	SU
Conflict with a Program, Plan, or Ordinance: Decreased Performance or Safety of Alternative Modes of Transportation	S	Mitigation Measure TR-1: Prepare and Implement a Traffic Control and Road Maintenance Plan	LTS
Increased Hazards Due to a Design Feature or Incompatible Uses	S	Mitigation TR-1: Prepare and Implement a Traffic Control and Road Maintenance Plan	LTS
Disrupt Railroad Services	S	Mitigation Measure TR-2: Adjust Rail Traffic	LTS
Air Quality			
Potential Conflict with Air Quality Plan or Contribute Substantially to Air Quality Violation – Yolo-Solano Air Quality Management District Standards	S	Mitigation Measures AIR-1: Implement the Sacramento Metropolitan Air Quality Management Districts' Basic Construction Emission Control Practices Mitigation Measure AIR-2: Implement the Sacramento Metropolitan Air Quality Management District's Enhanced Fugitive PM Dust Control Practices Mitigation Measure AIR-3: Require Lower Exhaust Emissions for Construction Equipment Mitigation Measure AIR-4: Pay Mitigation Fees to Reduce and Offset NOx Emissions Mitigation Measure AIR-5: Implement Marine Engine Standards	LTS

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Table ES-1. Summary of Effects and Mitigation Measures for the Proposed Action

Effect Threshold	Significance Before Mitigation	Avoidance, Minimization, and Mitigation Measures	Significance After Avoidance, Minimization, and Mitigation Measures
Potential Conflict with Air Quality Plan or Contribute Substantially to Air Quality Violation – Bay Area Air Quality Management District Standards	S	Mitigation Measure AIR-4: Pay Mitigation Fees to Reduce and Offset NOx Emissions Mitigation Measure AIR-6: Implement Marine Engine Standards	LTS
Potential Conflict with Air Quality Plan or Contribute Substantially to Air Quality Violation – General Conformity with the Clean Air Act	S	Mitigation Measure AIR-4: Pay Mitigation Fees to Reduce and Offset NOx Emissions	LTS
Climate Change			
Temporary, Short-term Generation of Greenhouse Gas Emissions	S	Mitigation Measure GHG-1: Implement GHG Reduction Measures	LTS
Conflict with an Applicable GHG Emissions Reduction Plan and Effects of Climate Change	LTS	None	LTS
Involve Wasteful Energy Consumption or Conflict with Energy Efficiency Plans	LTS	Mitigation Measure AIR-3: Require Lower Exhaust Emissions for Construction Equipment	LTS
Noise			
Potential Increase in Ambient Noise Levels or Exposure of Sensitive Receptors to Excessive Noise or Vibration	S	Mitigation Measure NOI-1: Implement Measures to Reduce Construction Noise and Vibration Effects	LTS
Recreation			
Temporary and Short-term Changes in Recreational Opportunities during Project Construction Activities	S	Mitigation Measure REC-1: Implement Bicycle and Pedestrian Detours, Provide Construction Period Information on Facility Closures, and Coordinate with Yolo County and California Department of Fish and Wildlife to Repair Damaged Facilities Mitigation Measure REC-2: Implement Water Safety Measures for Barges	SU

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Table ES-1. Summary of Effects and Mitigation Measures for the Proposed Action

Effect Threshold	Significance Before Mitigation	Avoidance, Minimization, and Mitigation Measures	Significance After Avoidance, Minimization, and Mitigation Measures
Permanent Changes to Recreational Opportunities	LTS	None	LTS
Visual Resources			
Damage to Scenic Vistas or Resources Along State or County Designated Scenic Highways	S	None Feasible	SU
Short-Term Changes in Existing Visual Character	S	None Feasible	SU
Create New Sources of Substantial Light or Glare	S	Mitigation Measure VIS-2: Coordinate Nighttime Lighting with Sacramento International Airport Operations and Restrict Night Lighting within and Near Airport Runway Approaches and Near CHP Academy Airport Mitigation Measure VIS-3: Provide Shielding from Nighttime Construction Activities or Offer to Temporarily Relocate Affected Residents.	LTS
Public Utilities and Service Systems			
Potential Disruption of Utility Service	S	Mitigation Measure UTL-1: Verify Utility Locations, Coordinate with Affected Utility Owners/Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage	LTS
Exceed Solid Waste Disposal Capacity or Waste Reduction Standards	LTS	None	LTS
Hazardous Wastes and Materials			
Potential Accidental Spills of Hazardous Materials Used During Construction	S	Mitigation Measure HAZ-1: Conduct Phase II Investigations as Needed	LTS
Possible Creation of Wildland Fire Hazards	LTS	None	LTS

Source: GEI Consultants, Inc. 2019

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1.0 INTRODUCTION

This document is a joint Supplemental Environmental Impact Statement/Supplemental Environmental Impact Report (Supplemental EIS/EIR) prepared by the U.S. Army Corps of Engineers (USACE), Sacramento District, as the Federal lead agency under the National Environmental Policy Act (NEPA), and the Central Valley Flood Protection Board (CVFPB) as the state lead agency under the California Environmental Quality Act (CEQA). The Sacramento Area Flood Control Agency (SAFCA) and the CVFPB are the non-Federal sponsors for the American River Common Features (ARCF) 2016 Project.

1.1 Sacramento Weir Widening

The Sacramento Weir Widening project includes constructing a 1,500-foot-long passive weir, with associated levee, roadway, rail, and fish passage improvements. Most of the improvements that are part of the Proposed Action were analyzed in the American River Common Features General Reevaluation Report (ARCF GRR) Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR). This Supplemental EIS/EIR supplements the ARCF GRR Final EIS/EIR. Some elements of the Proposed Action (passive weir design and fish passage structure) were not analyzed in the ARCF GRR Final EIS/EIR, because project design had not yet been developed to a level to provide the specificity required for project implementation. Through project design and refinement, USACE has identified sufficient detail to support analysis of two alternative project designs: a passive weir structure with a crest elevation at 26 feet on the North American Vertical Datum of 1988 (NAD88) (the Proposed Action), and a passive weir structure with a crest elevation at 26 feet NAD88, with stop logs to raise the crest elevation to 29.8 feet NAD88 (the Higher Weir Elevation Alternative).

1.2 Location of the Project

The project is located along the west bank of the Sacramento River in Yolo County, California. **Figure 1-1** illustrates the project vicinity.

1.3 Background, Purpose of, and Need for Proposed Action

The Proposed Action and Higher Weir Elevation Alternative have been formulated to achieve the purpose of and need for the project, as summarized below. The project need and objectives, as identified in the ARCF GRR, define the underlying need for the project to which USACE is responding, in conformance with NEPA requirements (40 Code of Federal Regulations [CFR] 1502.13 and 33 CFR Part 325, Appendix B). CVFPB is the state lead agency responsible for conformance with CEQA requirements (Pub. Resources Code, § 21000 et seq.) and CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.). The purpose, need, and objectives for the Proposed Action are presented below.

1.3.1 Project Purpose

The purpose of the ARCF 2016 Project is to reduce the overall flood risk within the study area. An unacceptably high risk of flooding from levee failure threatens the safety of approximately 530,000 people, as well as property and critical infrastructures throughout the study area. Additionally, the state Capitol and many state agencies are located within the study area. Periodic flooding events have caused loss of life and extensive economic damages within the study area over the last century. Approximately 83,000 structures throughout the study area are at risk of flooding in a 100-year event (1% annual chance of flooding).

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Figure Source: GEI Consultants, Inc. 2019.
Source: SAFCA 2016a

Figure 1-1. Project Location

The Sacramento metropolitan area is one of the most at-risk areas for flooding in the United States. There is a high probability that flows in the Sacramento River would stress the network of levees protecting central and southern Sacramento to the point that levees could fail. The consequences of such a levee failure would be severe, because the inundated area is highly urbanized, and flooding could be up to 20 feet deep.

The Sacramento metropolitan area has a high probability of flooding due to its location at the confluence and within the floodplain of the Sacramento and American Rivers. Both of these rivers have large watersheds with very high potential runoff that has overwhelmed the existing flood management system in the past. The existing levee system was designed and built many years ago, before modern construction methods were employed. These levees were constructed close to the rivers to increase velocities that would flush out hydraulic mining debris. This debris is now essentially gone, but the high velocities associated with flood flows are eroding the levees that are critical components of the flood management system; restoration of their integrity is essential to reduce the flood risk in the study area. In addition to the high probability of flooding, the consequences of flooding in the study area would be catastrophic.

The purpose of the Proposed Action is specifically to lower the flood stage in the Sacramento River below the weir during high-flow events to support the broader purpose of reducing flood risk to the urban area associated with the Sacramento River.

1.3.2 Project Need

The project is needed to reduce stage on the Sacramento River below the weir and avoid expensive and disruptive levee raises which would otherwise be needed to meet flood risk reduction requirements for the vulnerable urban areas of Sacramento south of the weir. Fortunately, the levees in the Sacramento area have not been overtopped in recent flood events, although several floods have come close. Because these levees were not built to modern engineering standards, levee overtopping could lead to levee failure and cause devastating flooding. The state has established a standard for urban flood protection in California which applies to cities with populations greater than 10,000 inhabitants. This standard requires levees to withstand flows with a top elevation equal to the mean 200-year water surface profile, plus 3 feet of freeboard, 1 foot to account for climate change, and an allowance for wave run up.

1.3.3 Project Objectives

The project objectives under CEQA were identified in the ARCF GRR Final EIS/EIR and are as follows:

- Reduce the chance of flooding and damages, once flooding occurs, and improve public safety preparedness, and emergency response.

- Reduce maintenance and repair requirements by modifying the flood management system in ways that are compatible with natural processes.

- Integrate the recovery and restoration of key physical processes, self-sustaining ecological functions, native habitat, and species.

- Ensure that technically feasible and cost-effective solutions are implemented to maximize the flood risk reduction benefits given the practical limitations of applicable funding sources.

1.4 Related Documents

The Proposed Action is a component of a larger effort in the Sacramento region. USACE and CVFPB jointly published the ARCF GRR Draft EIS/EIR in March 2015, in accordance with the requirements of NEPA and CEQA (State Clearinghouse No. 2005072046). The Draft EIS/EIR analyzed the impacts of the plan proposed in the ARCF GRR within the delineated study area. The study area includes the City of Sacramento and surrounding areas. A Final EIS/EIR was issued in January 2016, and comments were received between January 22 and February 22, 2016. A revised Final EIS/EIR was issued in May 2016. The Record of Decision (ROD) for the plan specified in the ARCF GRR was signed by the Assistant Secretary of the Army (Civil Works) on August 29, 2016. The ARCF GRR plan was authorized by Congress in December 2016 and is referred to as the ARCF 2016 Project. This Supplemental EIS/EIR supplements the ARCF GRR Final EIS/EIR.

The documents which relate to the environmental review of the Proposed Action include:

- May 1988, Sacramento River Flood Control System Evaluation, Initial Appraisal Report – Sacramento Urban Area. Phase I. USACE, Sacramento District.

- December 1991, American River Watershed Investigation California Feasibility Report: Part I—Main Report and Part II—Environmental Impact Statement/Environmental Impact Report. USACE, Sacramento District.

- December 1991, American River Watershed Investigation, California Feasibility Report, Volume 2, Appendix G: Section 404 Evaluation. USACE, Sacramento District.

- March 1996, Supplemental Information Report, American River Watershed Project, California: Part I—Main Report and Part II—Final Supplemental Environmental Impact Statement/Environmental Impact Report. USACE, Sacramento District.

- June 27, 1996, Chief's Report on FSEIS, signed by Acting Chief of Engineers, Major General Pat M. Stevens; and July 1, 1997, ROD on Final Supplemental Environmental Impact Statement, signed by Director of Civil Works, Major General Russell L. Furman.

- November 2008, Final Environmental Impact Statement for 408 Permission and 404 Permit to Sacramento Area Flood Control Agency for the Natomas Levee Improvement Project, Sacramento CA. USACE, Sacramento District. Prepared by EDAW/AECOM, Sacramento, CA.

- October 2010, Final Environmental Impact Statement on the Natomas Levee Improvement Project Phase 4b Landside Improvement Project, Sacramento CA. USACE, Sacramento District. Prepared by AECOM, Sacramento, CA.

- December 2015 (revised May 2016), American River Watershed Common Features General Reevaluation Report, Final Environmental Impact Statement/Environmental Impact Report. USACE, Sacramento District.

- April 22, 2016 American River Watershed Common Features Project, California, Findings and Approval, for the General Reevaluation Report and Environmental Impact Statement/Environmental Impact Report, Central Valley Flood Protection Board, Resolution No. 2016-04.

- July 2016, Final Environmental Impact Report, North Sacramento Streams, Sacramento River East Levee, Lower American River, and Related Flood Improvements Project. Prepared for Sacramento Area Flood Control Agency by GEI Consultants, Inc.

- August 2016, ROD on 2015 American River Watershed Common Features General Reevaluation Report, Final Environmental Impact Statement/Environmental Impact Report signed by Assistant Secretary of the Army (Civil Works), Jo-Ellen Darcy.

- February 2019, Final Supplemental Environmental Assessment/Initial Study, American River Watershed Common Features 2016 Project Front Street Stability Berm, Reach D Contract 1. USACE, Sacramento District, and SAFCA.

- June 2019 Final Supplemental Environmental Assessment/Initial Study, American River Watershed Common Features 2016 Project Beach Stone Lakes Mitigation Site. USACE, Sacramento District, and SAFCA.

- August 2019 Draft Supplemental Environmental Assessment/Environmental Impact Report, American River Watershed Common Features 2016 Project Sacramento River East Levee Contract 1. USACE, Sacramento District, and SAFCA.

1.5 Authority

The weir and bypass widening is proposed under the ARCF 2016 Project. The American River Watershed Common Features Project was originally authorized by Section 101(a)(1)(A) of the Water Resources Development Act (WRDA) 1996, Pub. L. No. 104-303 § 101(a) (1), 110 Stat. 3658, 3662-3663 (1996), as amended by Section 366 of WRDA of 1999, Pub. L. No. 106-53, § 366, 113 Stat. 269, 319-320 (1999). Additional authority was provided following the interim general reevaluation study in Section 1322(b) of WRDA 2016, Pub. L. No. 114-322 § 1322, 130 Stat. 1707.

1.6 Purpose of the Supplemental Environmental Impact Statement/Environmental Impact Report

On April 22, 2016, as the CEQA lead agency, CVFPB adopted the CEQA Statement of Findings, certified the Final EIS/EIR for the American River Watershed common Features Project GRR prepared in compliance with CEQA and executed the Notice of Determination under CEQA. CVFPB will consider the information presented in this Supplemental EIS/EIR when considering approval of the project modifications and certification of the Supplemental EIS/EIR. This Supplemental EIS/EIR: (1) describes the existing environmental resources in the project area; (2) evaluates the environmental effects of the alternatives on these resources; and (3) identifies measures to avoid, minimize, or reduce any significant or potentially significant effects to a less-than-significant level. This Supplemental EIS/EIR has been prepared in accordance with NEPA and CEQA. USACE and CVFPB anticipate that USACE can implement the portion of the authorized ARCF 2016 Project described in this document as the Proposed Action without additional NEPA or CEQA analysis beyond this Supplemental EIS/EIR, if there are no substantial deviations from proposed uses or the conditions of these uses.

Section 15162 of the CEQA Guidelines provides that when an EIR has been certified for a project, a subsequent EIR need not be prepared unless a substantial change in the project, a substantial change in the surrounding circumstances, or new information of substantial importance comes to light

that reveals the project would have one or more significant environmental effects not discussed in the certified EIR. A lead agency may choose to prepare a supplement to an EIR, rather than a subsequent EIR, when "only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation" (California Code of Regulations, tit. 14, [CCR] Section 15163). This Supplemental EIS/EIR supplements (rather than replaces) the previously certified ARCF GRR Final EIS/EIR and addresses project modifications, changed circumstances, and new information that was not known and could not have been known with the exercise of reasonable diligence at the time the prior document was certified, as required under CEQA Guidelines (CCR Section 15163).

The purpose of a supplemental EIR is to provide the additional information necessary to make the previous EIR adequate for the project as modified. Accordingly, pursuant to the CEQA Guidelines (CCR Section 15163), the Supplemental EIS/EIR need contain only the information necessary to analyze the project modifications, changed circumstances, and new information that triggered the need for additional environmental review. This Supplemental EIS/EIR is intended to:

- address new or substantially more severe significant environmental effects related to any project modifications,

- incorporate mitigation measures to avoid any new or more severe significant environmental effects or reduce them to a less-than-significant level, and

- update impact analyses and mitigation measures where conditions have changed since the publication of the ARCF GRR Final EIS/EIR.

This Supplemental EIS/EIR to the ARCF GRR Final EIS/EIR is warranted for the following reasons:

- the Proposed Action is expected to cause no new potentially significant and unavoidable or significant and unavoidable impacts;

- the few new impacts expected from the Proposed Action can be mitigated to a less-than-significant level with implementation of measures identified in Section 3, "Affected Environment and Environmental Consequences," of this Supplemental EIS/EIR; and

- mitigation measures in the ARCF GRR Final EIS/EIR and CEQA Mitigation Monitoring and Reporting Program (MMRP) continue to apply to the Proposed Action.

As the CEQA lead agency, CVFPB will consider the information presented in this Supplemental EIS/EIR, comments received after publication of the Supplemental EIS/EIR, responses to those comments, and the entire administrative record (including the administrative record for the ARCF GRR Final EIS/EIR), when determining whether to certify the Supplemental EIR, adopt a revised Mitigation Monitoring and Reporting Program (MMRP) if necessary, and approve the project modifications. This Supplemental EIS/EIR has been prepared in accordance with CEQA and the CEQA Guidelines. The Supplemental EIS/EIR process is described further in Section 3.1.1, "Approach to Analysis."

The analysis in this Supplemental EIS/EIR focuses on project modifications, refinements and details regarding the widening of the Sacramento weir that were not analyzed in the ARCF GRR Final EIS/EIR, including changes to the railroad and roadway alignments, fish passage structure, and passive weir design. More detailed biological and cultural resources information associated with the Proposed

Action is also provided. Each topic section below includes a summary of the analysis in the ARCF GRR Final EIS/EIR and a discussion of those issues and impacts that were not addressed in the ARCF GRR Final EIS/EIR at the level-of-specificity necessary for project implementation.

1.7 Decisions Needed

The Sacramento District Engineer must decide whether to approve the environmental analysis and findings contained in the Supplemental EIS/EIR in a ROD. CVFPB must decide whether to certify the Supplemental EIR under CEQA, adopt a revised MMRP specific to the project, and approve the project, as modified from the ARCF GRR EIS/EIR.

1.8 Community Outreach, Agency Coordination, and Issues of Known Controversy

Community outreach and agency coordination for the ARCF GRR Final EIS/EIR are documented in Section 1.9, "Community Outreach, Agency Coordination, and Issues of Known Controversy," within that document. This section describes outreach associated with this Supplemental EIS/EIR.

USACE held a one-hour scoping meeting on April 13, 2020. Due to stay-at-home orders in place at that time in both Sacramento County and the state of California, this meeting was held via WebEx online conferencing and telephone.

Comment received at the scoping meeting addressed the following topics:

- Rationale for completing a supplemental EIS rather than a supplemental Environmental Assessment, including identification of likely significant impacts.

  A supplemental EIS was prepared because the ARCF GRR Final EIS/EIR did not address the fish passage structure and associated impacts in detail. Furthermore, the compressed construction schedule of the project could result in a new significant effect related to General Conformity with the Clean Air Act.

- Cumulative impacts of the Salmonid Project (Yolo Bypass Fish Passage and Habitat Improvement Project) and the project on downstream landowners in the Yolo Bypass, particularly with respect to effect on rice farming and grazing timing and quality. The question was also raised whether the project would have the effect of extending flows when combined with the Salmonid Project.

  Cumulative hydraulic and hydrologic impacts of the project, including impacts on agriculture, are addressed in Section 3.4, "Hydrology and Hydraulics."

- Downstream effects on recreation and environmental education, including cumulative inundation effects on the Yolo and Sacramento Bypass Wildlife Areas.

  Section 3.14, "Recreation" addresses the question of downstream recreation impacts.

- The potential for upgrading the existing Sacramento Weir to match the specifications of the proposed widened weir.

  The project authorization does not include alteration of the existing Sacramento Weir.

USACE received written scoping comments from the U.S. Environmental Protection Agency (EPA). These comments touched on alternatives, changes to weir operations, water resources, air quality, land use planning, habitat restoration, fish passage, hazardous materials, cumulative impacts, and environmental justice.

2.0 ALTERNATIVES

This chapter describes and compares the alternatives evaluated in detail in this Supplemental EIS/EIR, including the Proposed Action ("Proposed Project" under CEQA, also described as the Proposed Action Alternative), the Higher Weir Elevation Alternative, and the required No Action Alternative. Alternatives that were considered but rejected are identified. Rejected alternatives were not carried forward through a full analysis. The discussion of each Action Alternative includes incorporates steps to reduce or eliminate the significant or potentially significant adverse environmental effects, while still meeting most, if not all, of the basic project objectives.

2.1 Requirements for Alternatives Development, Selection, and Evaluation

NEPA and CEQA require consideration of the potential effects of a reasonable range of action alternatives that could feasibly attain the majority of a project's basic objectives and accomplish the specified project purpose and need, while avoiding and/or minimizing potentially significant and significant environmental impacts. NEPA also requires consideration of future conditions under the No Action Alternative, as a basis of comparison with the action alternatives. The following sections identify the purpose, need, and objectives, and summarize the requirements for development of alternatives in NEPA and CEQA.

2.1.1 Project Purpose, Need, and Objectives

The basic project purpose comprises the fundamental, essential, or irreducible purpose of the project. The overall project purpose is to construct a new weir upstream of the existing weir along the Sacramento River to reduce flood risk by lowering high water surface elevations against urban levees and reducing flow farther downstream in urbanized areas. The ARCF 2016 Project identified the need for additional and improved flood risk management features to be implemented within the lower American and Sacramento River watersheds.

The project objectives under CEQA were identified in the ARCF GRR Final EIS/EIR and are presented in Section 1.3.3, above.

2.1.2 National Environmental Policy Act

NEPA requires that all alternatives, including the Proposed Action, be evaluated at a comparable level of detail (Title 40, CFR Part 1502.14[b]). Similarly, the Council on Environmental Quality (CEQ) regulations for implementing NEPA (Title 40, CFR Part 1502.14) require the range of reasonable alternatives in an EIS be objectively evaluated at an equal level of detail. Alternatives that cannot reasonably meet the project purpose and need do not require detailed analysis.

2.1.3 California Environmental Quality Act

CEQA requires the lead agency to consider alternatives that would avoid or reduce one or more of the significant impacts of a project. The CEQA Guidelines state that an EIR needs to describe and

evaluate only those alternatives necessary to permit a reasoned choice and to foster informed decision-making and informed public participation (CEQA Guidelines Section 15126.6[f]). Consideration of alternatives focuses on those that can eliminate significant adverse environmental impacts, or reduce impacts to less-than-significant levels; alternatives considered in this context may include those that are more costly and those that could impede, to some degree, the attainment of all project objectives (CEQA Guidelines Section 15126.6[b]). CEQA does not require the alternatives to be evaluated at the same level of detail as the project.

2.2 Alternative Formulation and Screening

The ARCF GRR Final EIS/EIR, which this EIS/EIR supplements, considered and rejected the following alternatives:

- Upstream Storage on the American River (Auburn Dam),
- Transitory Storage in Upstream Basins,
- Yolo Bypass Improvements,
- Reoperation of Upstream Reservoirs,
- Sacramento River I Street Bridge Diversion Structure, and
- Non-Structural Measures.

In the ARCF GRR Final EIS/EIR, two action alternatives were evaluated in detail, alongside a No Action Alternative. The two action alternatives were the GRR Alternative 1, "Improve Levees," and GRR Alternative 2, "Sacramento Bypass and Improve Levees;" Alternative 2 was the selected alternative. The overall components of the Sacramento Weir Widening Project analyzed in this Supplemental EIS/EIR were included in the "Sacramento Bypass and Improve Levees" alternative, the GRR Alternative 2. But the Proposed Action differs in several ways from the GRR Alternative 2; most notably, the Proposed Action includes a passive weir with a sill elevation of 26 feet NAVD88, compared to an operable weir with similar elevations to the existing Sacramento Weir in the GRR Alternative 2. Because of this, the Higher Weir Elevation Alternative in this Supplemental EIS/EIR approximately matches the operational characteristics of the widened weir proposed in the GRR Alternative 2.

The ROD for the ARCF 2016 Project was signed by the Assistant Secretary of the Army (Civil Works) on August 29, 2016. After the ARCF 2016 Project was authorized by Congress in 2016, USACE began detailed design for the proposed Sacramento Weir Widening Project. During project design, several adjustments were considered. The primary alternative that was developed included a fixed weir crest on the widened weir at a lower elevation than the top of the needle gates on the existing weir. Under this alternative, which became the Proposed Action Alternative, the widened weir would spill sooner than the existing weir, changing the frequency of flows entering the Sacramento Bypass. Figure 2-1 illustrates the Proposed Action Alternative. The Higher Weir Elevation Alternative is similar to the project proposed in the ARCF 2016 Project, in that stop logs (wood or metal beams) would be affixed to the crest of the new section of the widened weir to raise its top elevation, causing the existing weir section to spill sooner than the new section of the widened weir.

An additional option to discontinue Sierra Northern Railway service across the existing Sacramento Weir and the proposed new section of a widened weir by removing the existing embankment and rails was considered. This option does not constitute a stand-alone alternative but was considered as an optional scenario in both of the action alternatives analyzed in this Supplemental EIS/EIR.

2.3 No Action Alternative

With the No Action Alternative, it is assumed that the Sacramento Weir would not be widened by the Federal Government or by local interests to achieve the project purpose. Because the capacity of the Sacramento Bypass to receive floodwaters would not be increased, the stage in the Sacramento River at which flooding of the urban area is likely to occur would remain unchanged, leaving approximately 780,000 people in the Lower Sacramento River Basin area vulnerable to the present unacceptably high risk of levee overtopping failure and subsequent catastrophic flooding. Options to achieve adequate flood risk reduction for these urban areas without the project could include increasing the height of levees in other parts of the system, which would be substantially more costly than the ARCF GRR Final EIS/EIR Proposed Action, could take decades to achieve, and would cause significantly greater adverse impacts to urban residents living along the levee reaches to be improved. Urban residents and urban development within the Sacramento area would remain vulnerable to a higher risk of flooding, with possibly catastrophic consequences. If a levee failure were to occur, major Federal and state government facilities would be impacted until flood waters receded and workers would be unable to perform their duties until buildings could be re-occupied. A temporary shutdown or slowdown of many state and local government functions could lead to significant administrative handicaps and slowdowns throughout California. Also, many transportation corridors within the study area could be flooded.

2.4 Alternative 1: Proposed Action

2.4.1 Project Features

New Weir and River Road Bridge

The proposed new weir structure would extend 1,520 feet from an abutment at the north end of the existing Sacramento Weir and would include a fixed concrete structure a roadway above it. The weir and roadway alignment deviate slightly as the structure trends from south to north to maintain optimal weir hydraulics while the roadway alignment stays more parallel to the west bank of the river. This results in the weir structure being approximately 50 feet west of the roadway structure at the most northern end of the widened weir. The weir and roadway would bend approximately 18 degrees north of the existing River Road alignment. Figure 2-1 illustrates the location and alignment of the proposed weir and bridge.

The proposed weir would be composed of 38, 36-foot-wide weir bays separated by 3- to 5-foot-wide piers. One of the bays would contain a gate(s) to control flow into a fish passage channel (described in more detail in Section 2.4.1.6). A concrete approach slab and weir crest would form the floor between the piers. The weir crest elevation would be at 26 feet NAVD88; under Alternative 2 (the Higher Weir Elevation Alternative) stop logs could be added to raise the weir to a maximum elevation of 29.2 feet NAVD88. The top of the weir would be located just downstream of the roadway bridge, to allow use of a crane positioned on the bridge to service the weir and the Alternative 2 stop logs.

The new weir would discharge to a downstream concrete stilling basin designed to dissipate energy from water flowing over the top of the weir. The downstream apron of the new stilling basin

would be constructed at elevation 22 feet NAVD88, with the bottom sloped southward towards the fish passage channel invert to reduce fish stranding during flood recession. The centerline of the bridge deck roadway would be at the same elevation as the roadway on the existing bridge (an estimated 43.3 feet NAVD88). The soffit elevation would be no lower than the 39.5 feet NAVD88 elevation of the existing bridge to provide a similar clearance to pass floating debris across the weir during high flows. The bridge deck would be 43.6 feet wide, with two 12-foot-wide lanes, a 6-foot-wide shoulder on the east side, a 10-foot-wide shoulder on the west side, and two 1.75-footwide bridge railings.

Erosion protection (riprap, articulated concrete mats, or a similar material) would be placed on the Sacramento River side of the weir and upstream, on the fish passage outlet into the Tule Canal, and along the Sacramento Bypass North Levee along the west bank of the Sacramento River (as shown on Figure 2-1) to prevent erosion.

Road Realignments

River Road would be realigned to integrate with the new weir and bridge and designed and constructed in compliance with Yolo County road design standards. Figure 2-1 illustrates the proposed location of the realigned portion of River Road.

The California Department of Water Resources (DWR) Lower Elkhorn Basin Levee Setback (LEBLS) Project would construct a new County Road 124 alignment. This roadway would be constructed along the north side toe of the new north setback levee of the Sacramento Bypass, including the temporary LEBLS levee as shown in Figure 2-1. The roadway would climb the finished embankment of the setback Sacramento Bypass north levee to meet the railroad grade at elevation 44.0 feet NAVD88. It would then terminate at an intersection with the realigned Old River Road. County Road 126 would eventually be abandoned as the embankment it sits upon is degraded as part of the LEBLS project. Under the Proposed Action, the final alignment of County Road 124 would extend along the north side of the new setback levee eastward toward the river, climb the finished Sacramento River embankment, and terminate at an intersection with the realigned Old River Road. A portion of the LEBLS-constructed County Road 124 at the toe of the temporary LEBLS levee would be removed as part of the Proposed Action to open the proposed floodway downstream of the new weir.

Sacramento Bypass North Levee Setback

A new Sacramento Bypass North Levee would be constructed at a 1,500-foot setback from the existing levee tie-in with the existing Sacramento Weir. This setback levee would extend from the new section of the widened Sacramento Weir westward, connecting to the LEBLS setback levee that starts construction in 2020. The LEBLS levee and the Proposed Action levee would meet approximately 300 feet west of the Sierra Northern Railway.

The new Sacramento Bypass North Levee would be 25 feet tall and would have a 20-foot-wide crown. The levee side slopes would be 4:1 H:V. A 100-foot-wide, 10-foot-tall seepage and stability berm would be constructed along the north side slope of the new levee. The final alignment of County Road 124 would be constructed on the landside toe of the levee and associated berm as described under "Road Realignments."

Lower Elkhorn Basin Interior Drainage

A drainage ditch would be constructed north of the levee, parallel to the proposed County Road 124, to address impacts to the drainage system severed by the new levee. The new drainage ditch would include a culvert or other conveyance through the railroad embankment and would discharge to a new drainage ditch being constructed north of the LEBLS setback levee. The LEBLS ditch would discharge to a new pumping plant being constructed as part of the LEBLS project that would pump drainage from within the interior of the Lower Elkhorn Basin over the levee and discharge into the Sacramento Bypass.

Railroad Bridge and Approach

Two scenarios are considered for the railroad bridge and approach in each of the action alternatives. In Scenario 1, a new 1,700-foot-long railroad bridge would be constructed north of the existing railroad bridge to cross the new section of the weir. The bridge would be constructed with a series of 28-foot span ballast decks of precast, pre-stressed box girders supported on precast concrete caps and founded on an exposed H-pile substructure. The bridge would be 17 feet wide, including a 3-foot-wide walkway. The top of rail elevation would be the same as the existing railroad bridge (44.0 feet NAVD88). The minimum soffit elevation would be approximately 39.5 feet NAVD88, which is similar to the soffit elevation of the existing railroad bridge. The horizontal position of the bridge would be aligned with the existing rail line.

The elevation of the existing embankment at the north end of the proposed bridge is approximately 32.0 feet NAVD88. Therefore, the embankment to the north of the bridge would need to be raised to accommodate the change in grade.

In Scenario 2, rail service on the existing rail line would be discontinued, and the existing rail embankment would be removed. The railroad bridge across the existing weir would be left in place.

Fish Passage Structure and Channel

The project includes a fish passage structure which would enable migrating salmonids to pass the weir on their way upstream following events when the weir would overtop and flow. Two fish passage channels would be constructed as part of the Proposed Action. One channel would accommodate fish passage when Sacramento River stages are relatively higher, and one fish passage channel would accommodate fish passage when Sacramento River stages are relatively lower. A single trapezoid channel would connect the Sacramento River to two electronically controlled gate structures located just west of the Old River Road Bridge, and the gates to the two channels would be individually operated based on river stage. The high stage passage uses a gate with an approximate sill elevation of 12 feet NAVD88 and a fish ladder with baffles and pools approximately 400 feet long to transit fish from the bypass to the Sacramento River. The low stage passage utilizes a gate with approximate sill elevation of 8 feet NAVD88 and an open channel that is parallel but lower in invert (bottom) elevation to transit fish from the bypass to the Sacramento River., These fish passage channels are individually operated based on river stage. The fish passage structure would flow to a basin and then conform to an open channel approximately at the location where the existing north bypass levee would have been degraded as part of the LEBLS project. Construction of the fish passage channel may include modifications to this LEBLS ditch, potentially including depth, shape, (e.g., general channel width and pooling features) alignment, erosion countermeasures, and downstream point of discharge to the Tule Canal. The LEBLS ditch would integrate with the new stilling basin downstream of the weir to allow fish in the new stilling basin

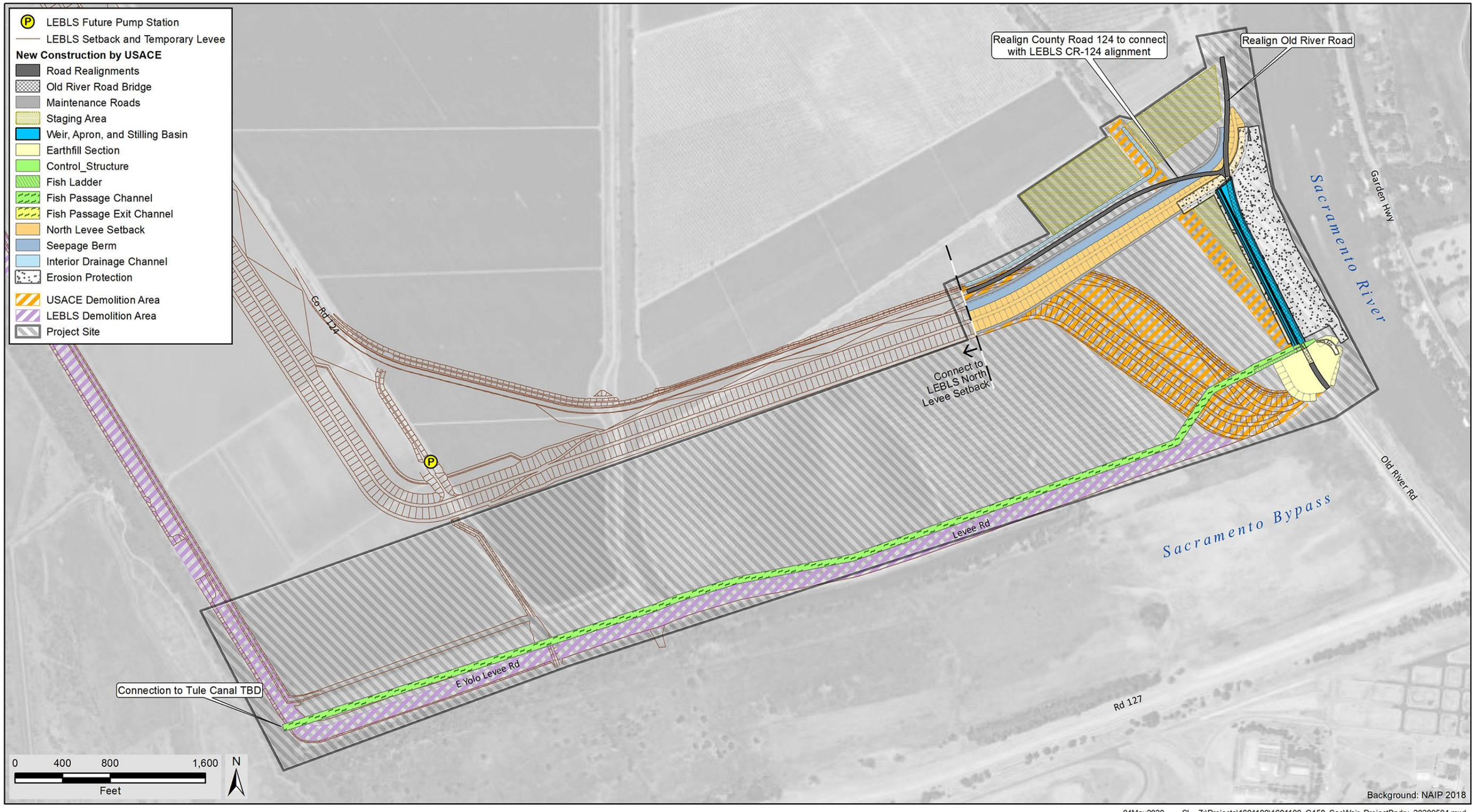


Figure Source: GEI Consultants, Inc. 2020.

Figure 2-1. Proposed Action Alternative

access to the channel or passage structure. Vehicle access would be provided along the fish passage structure and channel to facilitate operations and maintenance, including sediment removal. Debris management features on the Sacramento River side of the structure would include a floating boom, debris control berm, retaining walls, and deflection walls.

Erosion Countermeasures

Erosion countermeasures would be included in several features to address high velocities and erosion potential. Erosion countermeasures may include concrete surfacing, riprap, or interlocking concrete blocks. Erosion countermeasures would be incorporated into the design at the following locations:

- along the Sacramento River right bank adjacent to the weir,
- upstream and downstream of the weir,
- along portions of the fish passage channel,
- along the waterside slope of the of the setback levee, and
- along the abutments of the weir and bridges.

The existing Sacramento Weir recording stream gage would be relocated if the current location is impacted by the project features. The gage would be referenced to the same vertical datum.

2.4.2 Weir Operation

Existing Weir Operation

Operation of the expanded portion of the Sacramento Weir would be integrated with the existing Sacramento Weir. This would require a few changes to the operation of the existing Sacramento Weir, as defined in its Operation Schedule in the USACE operations and maintenances (O&M) manual (operation schedule adopted in 1975).

The operational objectives of the Sacramento Weir are to limit flood stages in the Sacramento River to the project floodplain, insofar as possible, with maximum feasible use of the flood capacity of the Sacramento River Channel below the weir. Operational objectives include:

1. Opening of the weir gates would not be initiated until a stage of 27.5 feet mean sea level (msl) datum [29.9 feet NAVD88] is exceeded at I Street gage, Sacramento.

2. As many gates as necessary shall be opened so that the stage at I Street does not exceed 29.0 feet msl datum [31.4 feet NAVD88], insofar as possible.

3. Subject to provisions 1 and 2 above, the stage at the Sacramento Weir shall be maintained during the gate opening period at 27.5 feet msl datum [29.8 ft NAVD88], insofar as practicable.

4. Gates shall be closed as the stage drops below 25.0 feet msl datum [27.3 ft NAVD88] at the Sacramento Weir. The gate closing shall be prosecuted with dispatch so that all gates are closed within as short a period as practicable.

Widened Weir Operation

The expanded portion of the Sacramento Weir would be a passive structure with a fixed crest elevation at 26.0 feet NAVD88. The concrete broad-crested weir would be designed to accept potential future installation of stop logs to a maximum elevation of 29.9 feet NAVD88 as contemplated in Alternative 2. The fish passage gates would only be opened after a flood event has overtopped the passive weir crest. The fish passage structure would then be operated depending on fish passage considerations. Operation with the stop logs in place is evaluated in Alternative 2. The following describes how the weir would operate for the crest elevation at 26.0 feet NAVD88, under rising and receding flood conditions.

Rising Flood Condition

1. River stage below the lower fish passage gate sill at elevation 8 feet NAVD88. No flow from the Sacramento River into the Sacramento Bypass.

2. River stage between lower fish passage gate sill at 8 feet NAVD88 and stilling basin apron elevation (22.0 feet NAVD88). The fish exit channel between the gate and the Sacramento River is full. The fish passage gates would remain closed.

3. River stage between stilling basin apron elevation (22.0 feet NAVD88) and existing needle gate sill elevation (23.4 feet NAVD88). The fish passage gates would remain closed.

4. River stage between existing needle gate sill elevation (23.4 feet NAVD88) and new passive weir crest elevation (26.0 feet NAVD88). The fish passage gates would remain closed. Along the existing weir, the stilling basin apron would overflow along the entire length, due to leakage from the needle gates. DWR estimates leakage from all 48 of the existing needle gates would be 0 cubic feet per second (cfs) at elevation 23.4 feet NAVD88 and 250 cfs at elevation 26.0 feet NAVD88. Leakage from the existing needle gates would slowly inundate the Sacramento Bypass as unconfined shallow sheet flow with undefined flow paths, unless the Sacramento Bypass is already inundated from the Yolo Bypass.

5. River stage between new passive weir crest elevation (26.0 feet NAVD88) and top of existing needle gates (29.2 feet NAVD88). Stage at I Street is less than 29.9 feet NAVD88 and does not require opening of needle gates. Water would overtop the entire length of the new weir. At a stage of 29.2 feet NAVD88, the leakage from the existing needle gates would be completely overwhelmed by overflow from the new weir, and the entire surface of the Sacramento Bypass would likely be inundated. The discharge of the weir is often impacted by backwater during these larger events.

6. River stage at weir exceeds 29.2 feet NAVD88 but stage at I Street gage is less than 29.9 feet NAVD88 and does not require opening of needle gates. Water would overtop the new weir and the needle gates along the existing weir. The entire width of the Sacramento Bypass would be inundated. The discharge of the weir is often impacted by backwater during these larger events.

7. River stage at weir exceeds elevation 26.0 feet NAVD88 and new weir is spilling. Despite the spilling passive weir, the stage at I Street gage exceeds 29.9 feet NAVD88. The needle gates in the existing weir would be opened, based on the existing schedule of operations described in Section 2.4.2.1. Gate opening is accomplished by depressing a mechanical trip lever at the top of each pier. The trip lever releases an airtight hollow tubular steel cross beam that holds the top of the wooden planks in

place. When released, the planks hinge down onto the downstream concrete apron. The released cross beam floats in the downstream floodwater and is tethered to the pier by a cable.

8. River Stage at weir rises above 31.37 feet NAVD88. Stages higher than 31.37 feet NAVD88 would only occur after all needle gates in the existing weir have been opened. Both existing and new weirs would be completely submerged, and discharge would be uncontrolled. For larger floods, the stage would continue to increase until the uncontrolled flood discharge has crested. The discharge of the weir is impacted by backwater from the Yolo Bypass during larger events.

9. River stage at weir rises above 42.0 feet NAVD88. The levee along the Sacramento River and Sacramento Bypass overtops, resulting in likely failure of the levee and flooding of large tracts of land.

Receding Flood Condition

1. River stage at weir falls below 27.32 feet NAVD88 but is higher than 26.0 feet NAVD88. The needle gates would remain open. Based on the existing operation manual, the needle gates would be closed when the stage falls below 27.32 feet NAVD88. However, water would continue to flow over the new passive structure, so closure of the existing needle gates would provide no operational benefit. Therefore, the Proposed Action includes changes to the operation manual to allow the gates to remain open during this stage range. This modification would require a change in the operation criteria for the existing weir and would be described in the design documentation.

2. River stage at new weir falls below 26.0 feet NAVD88 but is higher than the needle gate sill of the existing weir (23.4 ft NAVD88). Water has receded below the crest of the new weir. Closure of the existing weir is made by first blocking flow through the needle gate opening. This is accomplished by sliding an aluminum bulkhead with integrated catwalk into an aluminum guiderail upstream from the needle gates. Each submerged wooden plank is manually lifted into an upright position from the catwalk. The planks are temporarily held in the vertical position with temporary hooks affixed to the catwalk. When all planks are in the vertical position, a steel cross beam is placed along the downstream side of planks and the trip lever is reset. The aluminum bulkhead is then removed. This process is repeated for each gate needing closure.

3. The existing weir's stilling basin apron would continue to overflow along the entire length, due to leakage from the needle gates. DWR estimates that leakage from all 48 of the existing needle gates would be 0 cfs at elevation 23.4 feet NAVD88 and 250 cfs at elevation 26.0 feet NAVD88. The floodwater would flow along the Sacramento Bypass as unconfined shallow sheet flow with undefined flow paths.

4. River stage falls below existing needle gate sill elevation (23.4 feet NAVD88) but is higher than stilling basin apron elevation (22.0 feet NAVD88). Water would stop flowing through the needle gates.

Fish Passage Operation

1. Sacramento River stage rises above 27.32 feet NAVD88. Both fish passage gates would be closed.

2. After water has overtopped the new weir and flowed from the Sacramento River into the Sacramento Bypass, when the river stage has dropped below elevation 27.32 feet NAVD88, the fish passage gate into the fish ladder would be opened. The fish passage gate into the open channel would

remain closed. The Sacramento Bypass would be inundated. Fish in the Sacramento Bypass would be able to migrate into the Sacramento River through the fish ladder.

3. When the Sacramento River stage falls below the new weir stilling basin elevation (22.0 feet NAVD88), the fish passage gate into the fish ladder would remain open, and the fish passage gate into the open channel would remain closed. The new stilling basin would be inundated to approximately the same surface level as the Sacramento River and would drain into the fish passage structure. Fish in the stilling basin or Sacramento Bypass would be able to migrate into the Sacramento River through the fish ladder. Water would begin to recede in the Sacramento Bypass.

4. Sacramento River recedes to a stage between 14.0 feet and 17.0 feet NAVD88. The fish passage gate into the open channel would be opened and the gate into the fish ladder would remain open. Water would flow through both the fish ladder and the open channel of the fish passage structure. The Sacramento Bypass would no longer be fully inundated. The new stilling basin would be inundated to approximately the same water level as the Sacramento River. The new stilling basin would drain into the fish passage structure. Fish in the stilling basin or fish passage channel would be able to migrate into the Sacramento River through either the fish ladder or the open channel.

5. Sacramento River recedes to a stage below 14.0 feet NAVD88. The fish passage gate into the fish ladder would be closed. The fish passage gate into the open channel would remain open. The Sacramento Bypass would no longer be fully inundated. Fish in the stilling basin or fish passage channel would be able to migrate into the Sacramento River through the open channel. However, operation of the fish passage structure would be halted if it would cause overtopping of the Tule Canal.

6. Sacramento River recedes to a stage below the fish passage gate sill (elevation 12.0 feet NAVD88) or tailwater elevation in the fish passage structure recedes to less than 9.0 feet NAVD88. Both fish passage gates would be closed. There would be no flow from the Sacramento River into the Sacramento Bypass. Under no circumstances would the fish passage gate remain open if flows through the fish passage structure would cause overtopping of the Tule Canal.

7. Operation of the fish passage structure would not continue beyond May 31.

2.4.3 Operations and Maintenance

Agencies and organizations that currently have management responsibility for the levees along the Yolo and Sacramento Bypasses would continue to provide O&M after project construction, although the project analyzed in this Supplemental EIS/EIR includes updates to O&M practices to address the new structures as described in this section, and the associated modifications to the existing O&M manual. DWR would be responsible for the design and construction of all levee improvements and for maintenance access. CVFPB is the non-Federal sponsor for the project and is responsible for performing O&M and/or overseeing O&M responsibilities transferred to other entities. At the end of the project construction period, all constructed features would be in public ownership and/or would be under the permanent control of a Local Maintaining Agency (LMA) or natural resource conservation entity, with easements on the lands to facilitate O&M activities. LMAs, DWR, and CVFPB may continue their routine O&M responsibilities, as they occur under existing conditions. Alternately, a Joint Powers Authority for continued O&M may be created among local partner agencies.

The project falls within the Sacramento River Flood Control Project (SRFCP) authorized by the 1917 Flood Control Act, officially transferred to CVFPB in 1944 as the operating and maintaining

authority, and maintained in accordance with USACE's SRFCP *Operation and Maintenance Manual* (USACE 1955):

- O&M Manual No. SAC 122.1: right bank (north levee) of the Sacramento Bypass – maintained by DWR Sacramento Maintenance Yard as authorized by California Water Code Section 8361(e); left bank (east levee) of the Yolo Bypass from Woodland Highway to the Sacramento Bypass – maintained by Reclamation District (RD) Nos. 785 and 827.

- O&M Manual No. SAC 158: Sacramento Weir – operated and maintained by DWR Sacramento Maintenance Yard as authorized by California Water Code Section 8361(j).

The Sacramento Bypass Channel is maintained by the DWR Sacramento Maintenance Yard, as authorized by California Water Code Section 8361(d). Maintenance includes sediment, debris, and vegetation removal to maintain as-built bypass capacities specified in applicable unit-specific O&M manuals.

Presently, to meet Federal flood management regulations (33 CFR 208.10) and state requirements (California Water Code Section 8370), the Federal flood management facilities are inspected four times each year, at intervals not exceeding 90 days. DWR inspects the system twice a year; LMAs inspect it twice a year and immediately following major high-water events. The findings of these inspections are reported to the CVFPB's chief engineer through DWR's Flood Protection Integrity and Inspection Branch. O&M activities would continue to be conducted in the same manner and with the same frequency as presently performed.

33 CFR 208.10 provides general O&M guidance to obtain the maximum benefits for the following facilities constructed by the Federal government for local flood protection:

- Structures and facilities
- Levees
- Floodwalls
- Drainage structures
- Closure structures
- Pumping plants
- Channels and floodways

Under existing conditions, typical maintenance activities include mowing, vegetation spraying, and erosion control and repair. Mowing typically occurs twice a year, using a standard riding lawnmower where possible, a specialized slope mower, and a larger tractor with a boom where slope mowing is not practical. Herbicide application and bait stations used for rodent control are conducted under county permit by state-licensed Pest Control Advisors. Monthly herbicide application reports are filed with Yolo County. Erosion control and repair activities include backhoe fill of eroded areas and placement of gravel along the levee crown shoulder to reestablish and maintain the minimum crown width. These activities are performed throughout the year, a total of approximately 20 days annually.

Patrol road reconditioning activities are performed once a year and include placing, spreading, grading, and compacting aggregate base or substrate.

If the Proposed Action is implemented Regular O&M activities for the reconstructed and expanded weir, Sacramento Bypass and appurtenant levees would include inspections, weed abatement, encroachment and high-hazard vegetation removal, and erosion control and repair to ensure levee integrity and adequate levee access along the levee toe road. The patrol road would be used, as currently used, to access the length of the levees during these activities and during high-flow events for flood-fighting purposes. O&M inspections would consist of a patrol vehicle traveling along the levee and use of small machinery for weed abatement, such as mowers (i.e., standard riding lawnmower, specialized slope mower, and tractor with a mower boom), herbicide applicator trailers, weed trimmers, or other equipment. Erosion control and repair activities would involve the use of a backhoe to fill eroded areas and to place gravel along the levee crest shoulder to reestablish and maintain the minimum crown width. These activities would occur periodically, as under existing conditions. O&M activities would not introduce substantial new land uses into the area. Existing gates in the area would be removed temporarily to undertake levee construction but would be replaced following construction completion to restrict public access.

O&M Best Management Practices (BMPs) to reduce the likelihood of introducing invasive species via O&M activities may include:

- Providing annual environmental awareness training by a qualified biologist to all maintenance personnel and to new field-based personnel before engaging in maintenance activities. Environmental awareness training would include descriptions of all special-status wildlife species potentially occurring in the project area (or maintenance activity area for activity specific training), their habitats, and methods of identification, including visual aids as appropriate. Training would inform staff on weed biology, identification, and invasive plant prevention. The training would also describe activity-specific measures that would be followed to avoid impacts. The measures would be provided to the Maintenance Yard Supervisor, crew leader, and any contractors participating in maintenance activities.

- To minimize the potential for invasive plants to be introduced or spread during maintenance activities, a qualified biologist would work with maintenance yard staff, as needed, to develop and implement an invasive species management plan that would include invasive plant prevention BMPs, based on *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers* (Cal-IPC, 2012).

O&M to support adequate operation of the fish passage structure and channel may include the following activities, which would be developed in consultation with National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Wildlife (CDFW):

- Sediment and debris removal from the fish passage structure and channel, using heavy equipment. Sediment and debris removal would occur as needed to avoid hazards or reduced function, likely following each flood event. The invert elevation of the exit channel to the Sacramento River and the entrance channel from Tule Canal to the gate structures would likely result in circumstances where debris removal must occur when fish passage channels are still full, though typically not flowing. Also, circumstances may occur when debris removal is required to prevent damage to the fish passage facility,

the weir, the road bridge, or for matters of public safety while channels are flowing. In these instances when debris removal is required while the channels are still inundated, there may be incidental take of protected fish species or giant garter snake (GGS).

- Fish rescue. As water recedes from the fish passage structure and stilling basin, fish would be removed from isolated areas to prevent stranding and returned to the Sacramento River.

- Vegetation removal and trimming. Vegetation along the fish passage structure and channel would be removed or trimmed to maintain flow capacity and characteristics.

- Repairs to the fish passage structure in the event that the structure is damaged by trees or large debris or erosion.

2.4.4 Construction

Expected Construction Sequence

Construction would occur over three construction seasons, beginning on approximately April 15, 2021. Vegetation removal could occur before February 15, 2021. The expected sequence of construction activities is presented below, although the order of construction and the year in which specific activities take place could change:

- Year 1: The new Sacramento Bypass North Levee would be constructed, and construction would begin on the passive weir structure and realigned Old River Road construction.

- Year 2: The passive weir structure, realigned Old River Road, and fish passage structure construction would be completed, and the railroad trestle under Scenario 1 would be constructed.

- Year 3: Erosion protection would be installed, and the temporary LEBLS levee and existing Sacramento River levee would be degraded.

Vegetation Removal

Vegetation removal would include clearing, grubbing, and stripping activities. Clearing activities would involve removal of larger woody vegetation, such as trees and shrubs using excavators and bulldozers. Grubbing would consist of root removal using excavators and bulldozers, and stripping would involve excavating approximately 6 inches of organic material from the land surface using a wheel tractor scraper.

Setback Levee

Setback levee and seepage berm foundation preparation would include constructing a levee "keyway," an area excavated 3 to 5 feet below the ground surface across the entire setback levee footprint and backfilled with engineered fill. A smaller but deeper excavated inspection trench (up to 20 feet wide and 10 feet deep), centered beneath the waterside hinge point of the setback levee, would be constructed beneath a small portion of the keyway. The levee embankment and landside seepage berms would be constructed with engineered fill. Fill would be placed in lifts by motor graders. Each lift would be moisture-conditioned using water trucks and would be compacted consistent with USACE and CVFPB requirements for lift thickness and compaction densities using a suitable compactor, such as

a sheepsfoot roller or smooth-drum roller. A "frac-out" plan (to avoid spills during installation of the cutoff wall), spill prevention and countermeasure plan, and other standard construction specifications, would be prepared as warranted.

A ditch would be constructed to convey interior drainage to a location where it would be conveyed waterside of the levee. Drainage infrastructure would be constructed in conjunction with setback levee construction. The drainage ditch would likely be excavated with an excavator and rock imported from an off-site source may be placed by an excavator along the slopes of the ditch.

Sheet Pile Wall

Sheet pile walls may be required beneath the weir, and to enable construction if groundwater is encountered at shallow depths in construction areas, or to enable construction below the water level in the Sacramento River. If a sheet pile wall is required, the contractor would sequentially drive interlocking prefabricated steel sections into the ground. The sheet pile sequence would be developed by the contractor and pieces laid out at the desired location. Adjacent sheet pile elements would be test fit before installation and then driven into the ground sequentially. Sheet pile elements would be interlocked with previously installed elements at the surface and then driven to the desired depth. Sheet pile driving may be conducted by hydraulic pressing, vibratory driving, or hammering by specialized sheet pile driving equipment.

Weir and Bridge

To construct the extended weir and roadway bridge, the contractor would first clear and grub the project site using a dozer and haul trucks, assuming that cleared material is hauled off site. During all earth-disturbing activities, water trucks would provide on-site dust control. The contractor would then excavate the area for the weir foundation using Global Positioning System (GPS) enabled scrapers, excavators, and dozers. Haul trucks would relocate excavated material to another on-site location. The contractor would then compact the earth within the design footprint of the planned weir, using sheepsfoot rollers and water trucks for water conditioning of the soil. Following this compaction, the contractor would install the piles using either a drill rig with an auger or a driver. After the piles are installed, the contractor would pour the pile caps, followed by the weir foundation, using a concrete pump and concrete trucks. After the concrete for the foundation has sufficiently cured, extensive forming would be necessary to place the rest of the weir using a concrete pump (boom truck) and concrete trucks.

Other structures in support of the weir include the stilling basins and approach apron. Work related to these features would require equipment similar to the weir construction. For the approach apron, the contractor would use GPS enabled scrapers and excavate the area to in which concrete would be poured. Haul trucks would relocate excavated material to another on-site location. Concrete would then be placed, using a concrete pump and concrete trucks. The stilling basins would require excavation by an excavator. When forming is complete, the contractor would use a concrete pump and concrete trucks to pour the stilling basins.

The roadway bridge would be prefabricated offsite and assembled onsite. The foundations and piers would be constructed in a manner similar to the weir foundations. The bridge abutments would be excavated by an excavator and concrete would be poured using a concrete pump. Haul trucks would relocate excavated material to another on-site location. The abutments would be backfilled using a sheepsfoot roller and water trucks for water conditioning. Trucks would transport the prefabricated

bridge pieces to the project site and a large crane is anticipated to be used for on-site roadway bridge assembly. After the bridge is assembled, the contractor would pour the bridge deck using a concrete pump and concrete trucks. A striping truck would then stripe the bridge.

Road Realignment

Road demolition would include removing sections of County Road 126, a two-lane asphalt rural county road. A bulldozer and excavator with a percussion hammer attachment would be used to break up road material. Rubble would be loaded into waste containers using a front-end loader and transported by haul truck to a permitted disposal site within 50 miles of the project site. Pavement design for new roadway would use California Department of Transportation (Caltrans) and Yolo County standards, supported by subgrade resistance R-value testing.

During construction activities, Old River Road would be subject to short-term closure or detour in accordance with Yolo County standards. County Road 126 would be realigned and reopened as County Road 124. County Road 126 would eventually be closed permanently and demolished when LEBLS degrades the existing Sacramento Bypass north levee. Old River Road and County Road 124 would be subject to intermittent one-way circulation governed by flaggers, and temporary stop signs might be used to control traffic on these roadways during construction. Both these roadways could be closed intermittently during construction, with no through traffic permitted during these intermittent closures.

Railroad Bridge and Approach

The contractor would demolish the existing tracks and railroad embankment, likely using an excavator to remove the tracks, ballast, and railroad ties, which would be loaded into a dump truck and hauled offsite. Scrapers would be used to degrade the embankment, until reaching the required depth for pile installation, and haul trucks would relocate excavated material to another on-site location. During all earth-disturbing activities, water trucks would provide on-site dust control. The contractor would then excavate the area for the railroad bridge foundation, using GPS enabled scrapers, and compact the earth under the bridge, using sheepsfoot rollers and water trucks for water conditioning of the soil. Following this compaction, the contractor would install the piles using either a drill rig with an auger or a driver to install the piles. The contractor would pour the bridge deck using concrete trucks and a concrete pump and finally install the railroad tracks, ties, and ballast using a crane.

The railroad approach would be re-worked to meet the elevation of the bridge. The approach embankment would be degraded using the methods described above and rebuilt to the proper height standards for track slope. Tracks, ties, and ballast would be reinstalled using an excavator to lift them into place.

Fish Passage Structure

The fish passage structure footprint would be prepared by clearing and grubbing. The contractor would then excavate the area for the fish passage structure, which would include an exit pool, channel, and technical fishway, using GPS enabled scrapers, excavators, and dozers. Modifications to the LEBLS ditch would potentially need excavation and grading to adjust the depth, profile, or alignment of the ditch to meet fish passage objectives. Haul trucks would relocate excavated material to another on-site location. The contractor would then compact the earth using sheepsfoot rollers and water trucks for water conditioning of the soil. Following this compaction, the contractor would install the piles using

either a drill rig with an auger or a driver to install the piles. After the piles are installed, the contractor would pour the pile caps, followed by the weir foundation, using a concrete pump and concrete trucks. Once the concrete for the foundation has sufficiently hardened, extensive forming would be necessary to pour the rest of the fish passage channel using a concrete pump (boom truck) and concrete trucks. Riprap may be placed, using an excavator, in the channels for erosion protection. The fish passage structure would likely include two mechanical gates and a control system. The mechanical gates would likely require a crane for installation.

No in-water work is anticipated for the construction of the fish passage structure itself. However, the exit channel connecting the weir and the gates to the Sacramento River, and the connection from the fish passage channel to the Tule Canal, may require in-water work if installation of a temporary cofferdam, or sheet pile is feasible.

Erosion Protection

Quarry stone riprap, or another acceptable alternative (e.g., buried rock, articulated concrete blocks, pyramat) would be transported to the project site by trucks from a source within 50 miles and stockpiled at the project site, or transported by barge from up to 100 miles away. This material would be applied to protect against erosion at the new weir. Excavators would be used to place the embankment protection material from the levee crown or the waterside of the levee as per design. For waterside erosion protection on the bank of the Sacramento River, embankment protection material could be placed from barge-mounted equipment. Erosion protection material may also be placed at the connection from the fish passage channel to the Tule Canal.

Borrow and Disposal of Soil

Borrow material would be obtained from locations on the project site that would undergo grade changes as a part of project implementation, or from permitted offsite locations within 30 miles of the project site. Excess soil would be used on the project site in constructing the proposed improvements and finishing the surface grade following construction.

Stormwater Pollution Prevention

Temporary erosion/runoff BMPs would be implemented during construction to minimize stormwater pollution resulting from erosion and sediment migration from the construction, borrow, and staging areas. These temporary measures may include implementing construction staging in a manner that minimizes the amount of area disturbed at any one time; secondary containment for storage of fuel and oil; and managing stockpiles and disturbed areas by means of earthen berms, diversion ditches, straw wattles, straw bales, silt fences, gravel filters, mulching, revegetation, and temporary covers, as appropriate. Erosion and stormwater pollution control measures would be consistent with National Pollution Discharge Elimination System (NPDES) permit requirements and would be included in a Stormwater Pollution Prevention Plan (SWPPP).

In-water work may be required for removing the existing Sacramento River levee, constructing the fish passage exit channel and gates, connecting the fish passage channel to the Tule Canal, and placing erosion protection. Whenever possible, in-water work would be avoided by installing coffer dams, sheet piles, or other barriers to dewater work areas, and flows would be reintroduced gradually to reduce sediment transport. If dewatering is not feasible, silt curtains would be installed to limit turbidity increase and sediment transport to the immediate proximity of the work area.

After construction is complete, the temporary facilities would be demobilized, and the site would be restored to pre-project conditions. Site restoration activities for areas disturbed during construction, including borrow and staging areas, may include regrading, reseeding, constructing permanent diversion ditches, using straw wattles and bales, and applying straw mulch and other measures deemed appropriate. Reseeding would vary depending on the future use of specific areas but would generally use native species (only grasses and forbs) or sterile wheat.

Utility Relocation

The project would remove and replace existing wood electrical transmission and distribution poles and related equipment. New easements would be established, and new facilities would be constructed within the designated utility corridors, in advance of other construction activities to minimize utility outages.

Pacific Gas and Electric Company (PG&E) work areas are approximately 125 feet long by 125 feet wide. PG&E would require up to 10 work areas, which would be located within the construction footprint, access roads, and identified staging areas. Planned vegetation removal throughout the utility and O&M corridors would accommodate pole installation activities. Vegetation removal on access roads to facilitate PG&E equipment may also be required.

Utility pipe relocations and/or deepening efforts would also be required to complete the project in accordance with agency standards.

Construction Equipment

Contractor plant equipment could include construction office and equipment trailers, equipment storage and maintenance facilities, a batch plant, and fuel pumps and fuel storage tanks. Mobile construction equipment would depend on the selected contractor's planned operations. Typical equipment that may be used throughout the project is shown in Table 2-1.

Additional equipment would likely include utility equipment to install power lines, an air compressor, welding equipment, pumps and piping, communications and safety equipment, erosion control materials, miscellaneous equipment customary to the mechanical and electrical crafts, and vehicles used to deliver equipment and bulk materials (including soil and cement). It is expected that any concrete would be shipped to the site in ready-mix trucks.

Site Access and Construction-related Traffic

Personnel, equipment, and imported materials would reach the project site on vehicles via Interstate 5 (I-5) and Interstate 80 (I-80), U.S. Route 50, Reed Avenue, Old River Road, and Harbor Boulevard. These potential routes are the likely access routes from the primary access points to the project site. Materials for erosion protection and in-water construction activities may be transported to the site by barge on the Sacramento River.

The primary access to the project site would be from I-80 and U.S. Route 50, via Harbor Boulevard and/or Reed Avenue. From there, trucks would travel northwest on Old River Road. Access to the project site from the north would be via I-5 and Old River Road. Final access points would be determined in coordination with Caltrans, Yolo County, and the City of West Sacramento, based on project construction schedules.

Approximately 100 trailer ("low-boy") truck round trips are expected to be required to transport the contractor's plant and equipment listed above to the project site. A similar number of round trips would be needed to remove the equipment from the site as the work is completed.

Table 2-1. Typical Construction Equipment that May Be Used for the Proposed Sacramento Weir Widening

Construction Year	Equipment Type and Number
Year 1	Excavator (3)
	Generator Set (1)
	Off-Highway Trucks (5)
	Bore/Drill Rig (1)
	Other Equipment (1)
	Tractor/Loader/Backhoe (2)
	Trencher (1)
Year 2	Cement/Mortar Mixer (2)
	Crane (2)
	Excavator (3)
	Grader (1)
	Off-Highway Trucks (5)
	Other Construction Equipment (1)
	Other Material Handling Equipment (1)
	Paving Equipment (1)
	Rubber-tired Dozer (1)
	Scraper (1)
	Surfacing Equipment (1)
	Tractor/Loader/Backhoe (2)
	Trencher (1)
Year 3	Cement/Mortar Mixer (2)
	Crane (2)
	Excavator (3)
	Grader (1)
	Off-Highway Trucks (5)
	Other Construction Equipment (1)
	Other Material Handling Equipment (1)
	Paving Equipment (1)
	Rubber-tired Dozer (1)
	Scraper (1)

Table 2-1. Typical Construction Equipment that May Be Used for the Proposed Sacramento Weir Widening

Construction Year	Equipment Type and Number
	Surfacing Equipment (1)
	Tractor/Loader/Backhoe (2)
	Trencher (1)

Source: GEI Consultants, Inc. 2019

Necessary aggregate base rock material would be obtained from a commercial sand and gravel operation, most likely in the Sacramento area. Riprap material would be obtained from a commercial source or would be transported by barge from quarries located within 100 miles of the site. Soil material would be obtained from onsite or from the adjacent LEBLS project site, or could be obtained from a permitted source within 30 miles of the project site. The construction contractor would select the specific suppliers based on suitability and pricing. All materials would be determined to be suitable for use and would be demonstrated to be free of contamination. Transportation of all aggregate, asphalt, erosion control materials, and ancillary equipment from suppliers to the site is expected to occur via highway. In addition, highway truck trips could be required to dispose of surplus material from excavation (if hauled off-site), and may be needed to carry demolition debris, construction debris, and other materials to a suitable landfill.

2.5 Alternative 2: Higher Weir Elevation Alternative

The Recommended Plan in the ARCF GRR Final EIS/EIR (also called Alternative 2), included an operable weir with needle gates, similar to the existing Sacramento Weir, with a top elevation of 29.2 feet NAVD88. The weir included in the Recommended Plan in the ARCF GRR Final EIS/EIR would operate in the same manner as the existing Sacramento Weir, with no changes in the frequency of operation for the widened weir; the widened weir EIR would simply pass more water into the Sacramento Bypass than the existing Sacramento Weir on those occasions when it did operate. Subsequent to the publication of the ARCF GRR Final EIS/EIR, USACE and CVFPB determined that a fixed weir (i.e., a weir which did not require that needle gates be routinely opened and closed during operation) would be preferred. Therefore, Alternative 2, the Higher Weir Elevation Alternative would include the same features as the Proposed Action, but with a higher top of weir elevation. Operation of the weir under the Higher Weir Elevation Alternative would be unchanged from existing conditions, except that the fish passage gate would open after water had overtopped the 29.2-foot elevation of the widened weir; the fish passage would open when water levels dropped below 27 feet NAVD88, and operate as described in Alternative 1.

The higher elevation relative to the Proposed Action would be achieved by installing stop logs at the top of the weir, increasing the elevation of the passive weir to 29.2 feet NAVD88, the same elevation as the top of the needle gats on the existing weir. The stop logs would be approximately 30 feet long and constructed of high-strength steel. A forklift would be used to lift the stop logs into the grooves cast into the piers and supports along the crest of the weir.

2.6 Environmentally Superior Alternative

Section 1505.2(b) of the Council on Environmental Quality (CEQ) regulations requires the NEPA lead agency to identify the "environmentally preferable alternative" in its ROD on the EIS. The CEQ regulations define the environmentally preferable alternative as, "…the alternative that will

promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." (CEQ 1981.) The selection of the preferred alternative is independent of the identification of the environmentally preferable alternative, although the identification of both is based on the information presented in the EIS/EIR.

Similar to the environmentally preferable alternative under NEPA, CEQA Guidelines Sections 15120 and 15126.6(e)(2) require identification of an "environmentally superior alternative" in an EIR. If the environmentally superior alternative is the "no project" alternative, CEQA Guidelines Section 15126.6(e)(2) requires identification of an environmentally superior alternative among the action alternatives.

Based on the environmental analysis presented in Chapters 3 and 4 of this Supplemental EIS/EIR, the Proposed Action (Alternative 1) and the Higher Weir Elevation Alternative (Alternative 2) have similar environmental impacts; no impact conclusions differed between the Proposed Action and the Higher Weir Elevation Alternative. However, the Proposed Action has a greater beneficial effect related to lowered stage in the Sacramento River compared to the Higher Weir Elevation Alternative (and corresponding reduced flood-related environmental impacts). Therefore, the Proposed Action is the environmentally preferable alternative under NEPA and the environmentally superior alternative under CEQA.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

3.1.1 Approach to Analysis

For NEPA purposes, the assessment of potential effects takes into consideration the significance of the Proposed Action in terms of its context and its intensity (40 CFR 1508.27). To aid in the evaluation of context, USACE has determined that the affected region is the project site, including the location of the widened weir and bypass, as shown in Figure 2-1. Intensity refers to the severity of the potential effect. The intensity of the potential effects for each resource element is addressed under "Environmental Consequences."

Each resource topic section includes a brief summary of the analysis of this topic in the ARCF GRR Final EIS/EIR. Supplemental information on existing conditions is provided for particular resource topics, where necessary to support the supplemental impact analysis. For resources on which the Proposed Action may have significant effects, mitigation measures are proposed. These mitigation measures are consistent with those identified in the ARCF GRR Final EIS/EIR. For some impacts, mitigation described in the ARCF GRR Final EIS/EIR may not apply to the Proposed Action (for instance, visual resources mitigation related to urban landscaping). For other impacts, additional or equivalent but different mitigation measures are required to reduce significant effects of the project refinements described in the Proposed Action (Alternative 1) or the Higher Weir Elevation Alternative (Alternative 2). In either case, the proposed changes to mitigation from the ARCF GRR Final EIS/EIR Recommended Plan are identified. All mitigation measures necessary to reduce significant or

potentially significant impacts from the Proposed Action or Alternative 2 are presented fully within this Supplemental EIS/EIR.

As described in Section 2.3.7 in Chapter 2, "Alternatives," the project includes ongoing O&M activities associated with the proposed improvements, including the widened weir, the widened Sacramento Bypass, and the fish passage structure and channel. O&M activities for the relocated levees would be similar to existing O&M activities but the impacts of any new or expanded O&M activities are discussed in this Supplemental EIS/EIR.

3.1.2 Resource Topics Not Discussed in Detail

Some resources have been eliminated from further analysis in this Supplemental EIS/EIR because effects are negligible, or the project refinements described in the Proposed Action would not create additional impacts to the resources beyond the scope of those addressed regionally within the ARCF GRR Final EIS/EIR. These resource topics are briefly described and dismissed in the following discussions.

Mineral Resources

The ARCF GRR Final EIS/EIR study area was classified as either Mineral Resource Zone (MRZ)-1 or MRZ-3, classifications which the ARCF GRR Final EIS/EIR determined were not affected by state policies pertaining to the maintenance of access to regionally significant mineral deposits under the California Surface Mining and Reclamation Act. Therefore, the ARCF GRR Final EIS/EIR determined that no effect would occur.

For the Proposed Action and Higher Weir Elevation Alternative, the project site is not designated as a significant mineral resource extraction zone (Yolo County 2009). Therefore, mineral resources impacts would not differ from those described in the ARCF GRR Final EIS/EIR.

Socioeconomics, Population, and Environmental Justice

Socioeconomics and Population

The ARCF GRR Final EIS/EIR analysis found that much of the study area is located immediately adjacent to established communities, and the acquisition of some private properties in established communities would be required. No change in population is expected. Any disruptions to the community would be temporary and short-term during construction activities, and would be related to traffic congestion, noise, recreation, and leisure activities. Therefore, socioeconomic effects (including population and housing) were determined to be less than significant in the GRR Final EIS/EIR.

The Proposed Action and the Higher Weir Elevation Alternative would be constructed in a rural area, with large parcels and only one nearby residence. The Proposed Action and the Higher Weir Elevation Alternative would not create any new developed land uses and would not remove any housing. The Proposed Action and the Higher Weir Elevation Alternative would include approximately 75 workers and construction over a 3-year period. Existing residents in the region who are employed in the construction industry would be sufficient to meet the demand for construction workers that would be generated by the project, without inducing population growth. Therefore, socioeconomics and population impacts would not differ from those described in the GRR Final EIS/EIR.

Environmental Justice

The ARCF GRR Final EIS/EIR analysis found that all of the components of the project would be constructed to the same criteria and standard. The benefits of the project would extend to all of the Sacramento metropolitan area; therefore, disproportionate benefits or effects to any minority or low-income populations would not occur, and this effect was determined to be less than significant in the ARCF GRR Final EIS/EIR.

The Proposed Action and the Higher Weir Elevation Alternative would be constructed within the footprint considered in the ARCF GRR Final EIS/EIR. The project site is located in a rural agricultural area of Yolo County. Most surrounding properties are agricultural fields or managed as a wildlife area; there is only one residence within a 0.5-mile radius of the project site. Therefore, adverse environmental effects would not disproportionately affect particular segments of the population, and environmental justice impacts would not differ from those described in the ARCF GRR Final EIS/EIR.

3.2 Geological Resources

3.2.1 Existing Conditions

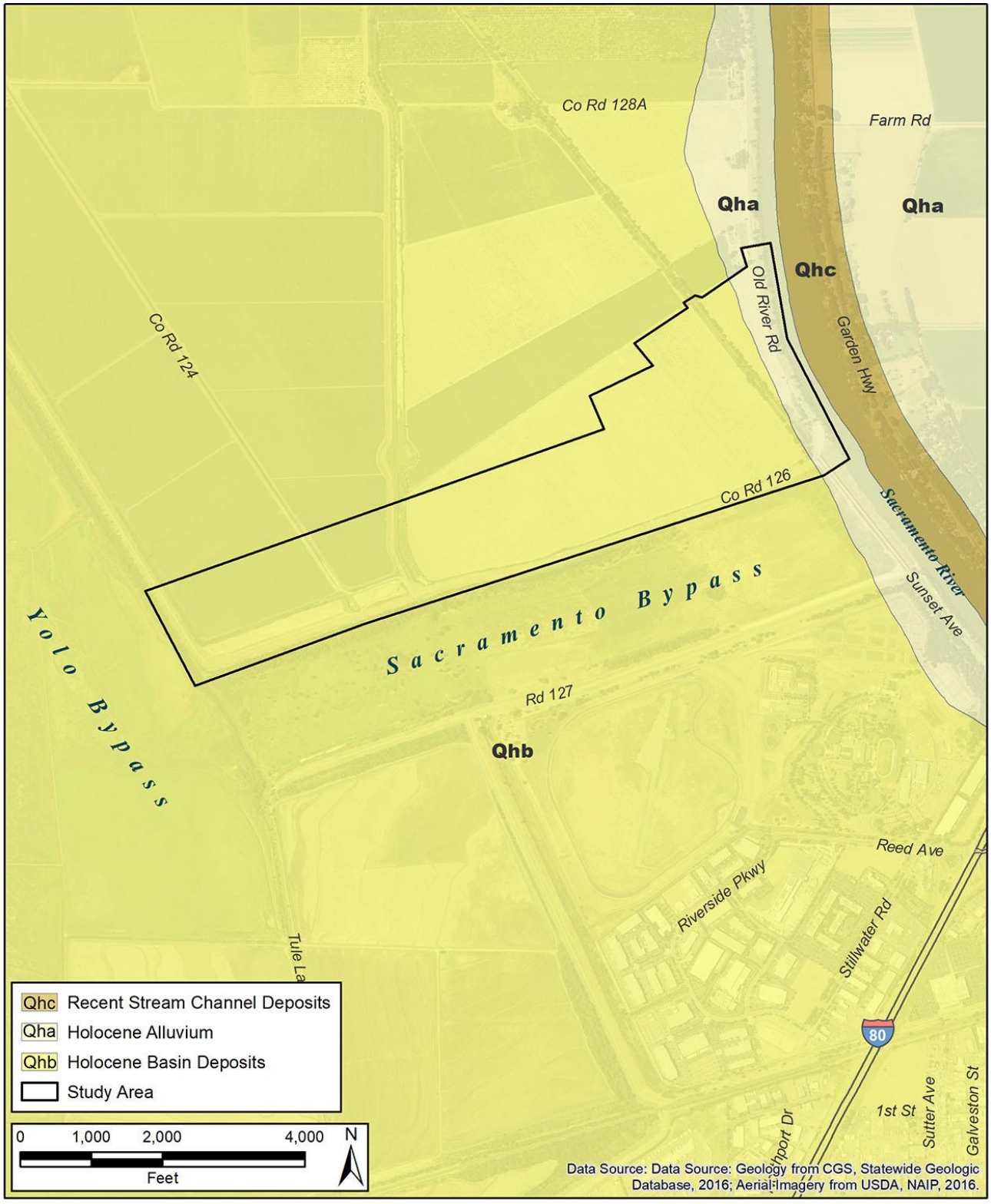
Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Site-specific conditions are described below.

Geology

Based on a review of regional geologic mapping prepared by Gutierrez (2011), surficial deposits at the project site consist of recent stream channel deposits, Holocene Alluvium and Holocene Basin deposits, which are underlain by the Pleistocene-age Riverbank Formation. Figure 3.2-1 shows the surficial geologic formations at the project site and in the project vicinity.

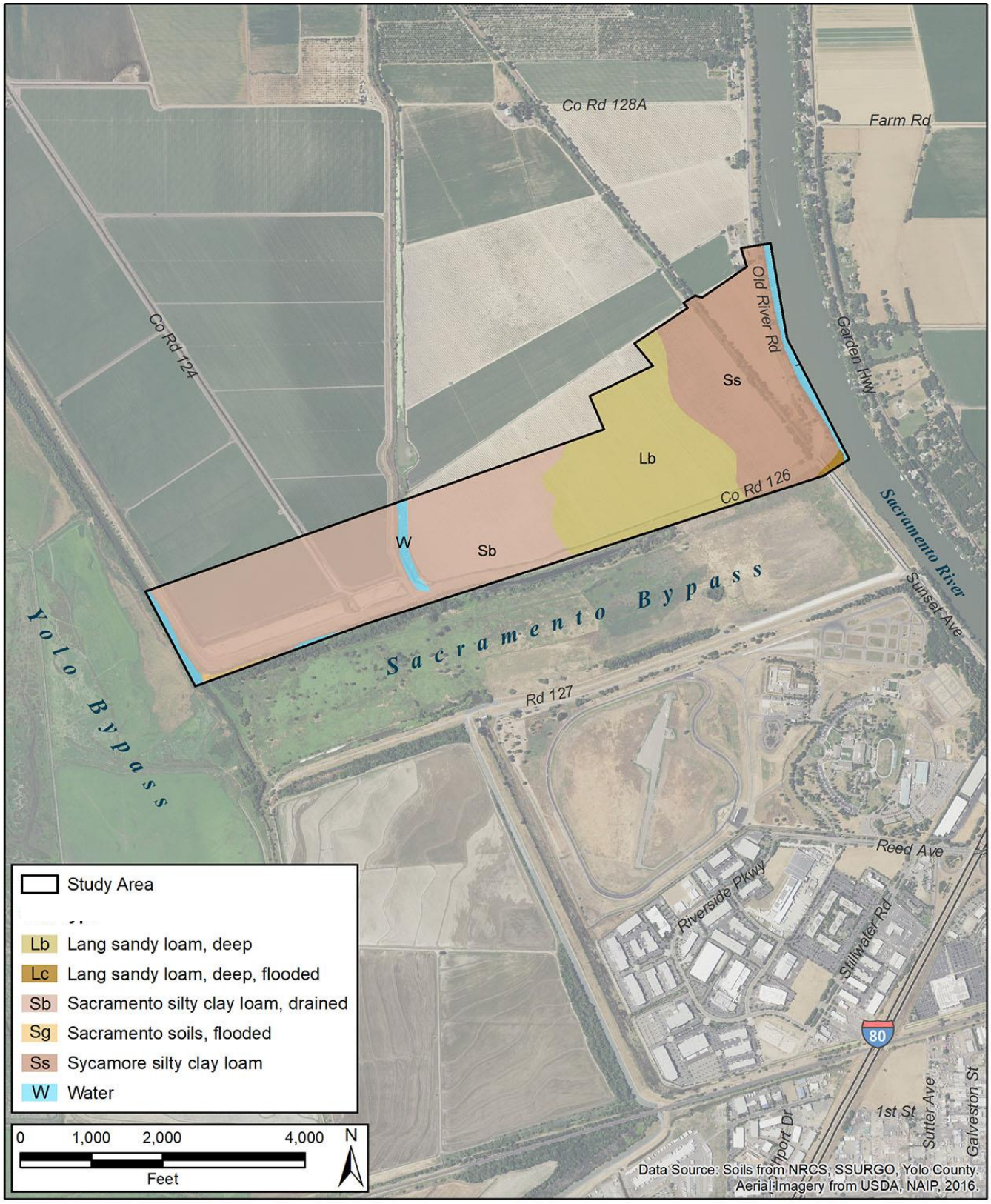
Soils

Figure 3.2-2 shows the locations of each soil type at the project site. Table 3.2-1 summarizes several relevant characteristics of soils at the project site, based on the Yolo County Soil Survey (NRCS 2016a). Shrink-swell potential varies across project site soils. Onsite soil types are generally rated by NRCS as limited for use in levees.



Source: Gutierrez 2011

Figure 3.2-1. Geologic Formations in the Project Site and Vicinity



Source: Natural Resources Conservation Service 2016b

Figure 3.2-2. Soils on the Project Site

Table 3.2-1. Project Site Soil Types and Characteristics

Soil Map Unit Name	Shrink-Swell Potential[1]	Drainage Class	Permeability[2]	Wind Erosion Hazard[3]	Water Erosion Hazard[4]	NRCS Soil Limitations for Levees
Lang sandy loam, deep	Low	Somewhat poorly drained	High	3	Moderate	Very limited: soil piping, shallow depth to saturated zone
Sacramento silty clay loam, drained	High	Poorly drained	Moderately high	6	Moderate	Very limited: hard to pack, dusty
Sycamore silty clay loam	Moderate	Somewhat poorly drained	Moderately high	6	Moderate	Somewhat limited: dusty, shallow depth to saturated zone

Notes: NRCS = Natural Resources Conservation Service
1 Based on percentage of linear extensibility, shrink-swell potential ratings of "moderate" to "very high" can result in damage to buildings, roads, and other structures.
2 Based on standard NRCS saturated hydraulic conductivity (Ksat) class limits. Ksat refers to the ease with which pores in a saturated soil transmit water.
3 Soils assigned to wind erodibility group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.
4 Based on the erosion factor "Kw whole soil," which is a measurement of relative soil susceptibility to sheet and rill erosion by water.
Source: NRCS 2016a

3.2.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR found liquefiable material at several locations within the GRR study area. However, it was determined that the ARCF project would not substantially alter the composition of the levees or foundation soils or change their susceptibility to liquefaction. Because of the relatively small likelihood of a flood event and a major earthquake occurring at the same time, and because the expected magnitude of ground-shaking from large regional earthquakes is relatively low in the project area, the ARCF GRR Final EIS/EIR determined the potential for failure or significant damage to ARCF 2016 Project structures from seismic issues to be low.

Significance Criteria

For this analysis, an effect was considered significant if it would:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

- 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 California Geological Survey Special Publication 42.);

- Strong seismic ground shaking;

- Seismic-related ground failure, including liquefaction; or

- Landslides

- Result in substantial soil erosion or the loss of topsoil;

- 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;

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

- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Effects Analysis and Mitigation Measures

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass, and no temporary or short-term construction-relation erosion effects would occur. However, the Sacramento Weir and Bypass are integral to the function of the regional flood management system. If a future flood event or levee failure were to occur, it could result in collapse of miles of levee slopes and alteration of regional and local flows that would result in substantial increases in erosion and sedimentation. Erosion causing the loss of the levee foundation and eroded topsoil from banks of a river or sloughs would increase turbidity and total dissolved solids in the Sacramento River. Levee failure would require immediate flood-fighting efforts that would not include BMPs to reduce erosion. A flood event could lead to widespread bank erosion, soil loss, loss or damage to existing riparian habitat, siltation of existing channels, and substantial alteration of the Sacramento River channel. If a levee breach were to occur, emergency repair activities would be implemented and could result in the loss of channel capacity and alteration of present-day geomorphic processes, with the placement of large quantities of rock in the river to close the breach. All of these effects could be considered significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alternative

Potential for Damage to Project Features Due to Unstable Soils

As described in the ARCF GRR Final EIS/EIR, the Sacramento Valley has historically experienced very low levels of seismic activity. Known active faults that pose a hazard for strong seismic ground-shaking are located along the margin between the western Sacramento Valley and the eastern Coast Ranges, and within the Coast Ranges itself.

As described in the ARCF GRR Final EIS/EIR, the project site includes soils containing liquefiable material at several locations, and a potential for differential settlement exists where low-density and unconsolidated material is encountered, such as overbank river deposits (present day and historical) that are common along the Sacramento River. The project site soils also are poorly to somewhat poorly drained and have varying shrink-swell potential (Table 3.2-1). Therefore, construction

of the project components could be subject to hazards from liquefaction and settlement and from construction in unstable and expansive soils.

The project components would be designed based on the results of detailed geotechnical engineering studies currently underway by USACE and would be required to comply with USACE standard engineering practices for levee design. CVFPB standards also apply to the Proposed Action (CCR Title 23, Division 1, Article 8, Sections 111–137) and direct that levee design and construction be in accordance with EM 1110-2-1913 *Engineering Design and Construction of Levees* (USACE 2000), the primary Federal standards applicable to levee improvements. Because the design, construction, and maintenance of levee features must comply with the regulatory standards of USACE, DWR, and CVFPB, the design and construction of the setback levee would meet or exceed applicable design standards for static and dynamic stability, seismic ground-shaking, liquefaction, subsidence, and seepage.

Yolo County requires appropriate design and construction methodologies to be used for roadway construction, including preparation of soils and geotechnical engineering studies to inform design and construction and compliance with the *County of Yolo Improvement Standards* (Yolo County 2013). Because the relocated County Road 124 and Old River Road would be turned over to Yolo County for future maintenance, the design and construction of the relocated roads would meet or exceed applicable design standards for stability, seismic ground-shaking, liquefaction, and subsidence. Thus, for the reasons stated above, project implementation would have a less-than-significant impact.

Potential Temporary, Short-term Construction-related Erosion

Project implementation would include substantial construction activity and ground disturbance over a large area. NRCS (2016a) has rated the project site soils as moderately susceptible to wind and water erosion (Table 3.2-1). Project-related earth-moving activities would result in the temporary and short-term disturbance of soil and could expose disturbed areas to winter storm events. Rainfall of sufficient intensity could dislodge soil particles from the soil surface. If particles are dislodged and the storm is large enough to generate runoff, substantial localized erosion could occur. In addition, soil disturbance during summer could result in substantial loss of topsoil because of wind erosion. Mitigation Measure GEO-1 would reduce this impact to a less-than-significant level by requiring construction BMPs to reduce wind and water erosion.

Potential to Directly or Indirectly Destroy a Unique Paleontological Resource or Site

The discovery of numerous vertebrate fossil remains in sediments of the Riverbank Formation in Yolo and Sacramento Counties, as well as other areas throughout the Central Valley, indicates that this formation is paleontologically sensitive. The Riverbank Formation underlies the Holocene-age Alluvium and Basin Deposits throughout the project site. As described in Section 3.9, "Cultural Resources," geoarchaeological trenching activities conducted as part of the LEBLS project revealed that Holocene-age deposits are present to a depth of at least 13 feet below the ground surface in the project area. Therefore, depending on the depth of excavation, this paleontologically sensitive rock formation could be encountered, and unique paleontological resources could be damaged during construction-related excavation. Mitigation Measure GEO-2 would reduce the significant impact from the possible destruction of or damage to a unique paleontological resource to a less-than-significant level because construction workers would be alerted to the possibility of encountering paleontological resources and, in the event such resources are discovered, fossil specimens would be recovered and recorded.

3.2.3 Avoidance, Minimization, and Mitigation Measures

The following measure is consistent with mitigation identified in the ARCF GRR Final EIS/EIR at pages 106-108.

> Mitigation Measure GEO-1: Acquire Appropriate Regulatory Permits and Prepare and Implement a Storm Water Pollution Prevention Plan (SWPPP), Spill Prevention Control and Countermeasures Plan, and Associated Best Management Practices.

If the project is implemented, prior to the start of earthmoving activities, USACE shall obtain coverage under the California State Water Resources Control Board (SWRCB) NPDES stormwater permit for general construction activity (Order 2009-0009-DWQ), including preparing and submitting a project-specific SWPPP at the time the Notice of Intent to discharge is filed. The SWPPP shall identify and specify the following:

- the use of an effective combination of robust erosion and sediment control BMPs and construction techniques in the project area at the time of construction that shall reduce the potential for runoff and the release, mobilization, and exposure of pollutants, including legacy sources of mercury from project-related construction sites. These may include but would not be limited to temporary erosion control and soil stabilization measures, sedimentation ponds, inlet protection, perforated riser pipes, check dams, and silt fences;

- the implementation of approved local plans, non-stormwater management controls, permanent post-construction BMPs, and inspection and maintenance responsibilities;

- the materials that are likely to be used during construction that could enter stormwater drainage and non-stormwater discharges, include fuels, lubricants, and other types of materials used for equipment operation;

- the means of waste disposal;

- spill prevention and contingency measures, including measures to prevent or clean up spills of hazardous waste and of hazardous materials used for equipment operation, and emergency procedures for responding to spills;

- personnel training requirements and procedures that shall be used to ensure that workers are aware of permit requirements and proper installation methods for BMPs specified in the SWPPP; and

- the appropriate personnel responsible for supervisory duties related to SWPPP implementation.

Where applicable, BMPs identified in the SWPPP shall be in place throughout all site work and construction/demolition activities and shall be used in all subsequent site development activities. BMPs may include, but are not limited to, such measures as those listed below.

- Conduct earthwork during low-flow periods.

- To the extent possible, stage construction equipment and materials on the landside of the levee in areas that have already been disturbed.

- Minimize ground and vegetation disturbance during project construction by establishing designated equipment staging areas, ingress and egress corridors, spoils disposal and soil stockpile areas, and equipment exclusion zones prior to the commencement of any grading operations.

- Stockpile soil landside of the levee, and install sediment barriers (e.g., silt fences, fiber rolls, and straw bales) around the base of stockpiles to intercept runoff and sediment during storm events. If necessary, cover stockpiles with geotextile fabric to provide further protection against wind and water erosion.

- Install sediment barriers on graded or otherwise disturbed slopes as needed to prevent sediment from leaving the project site and entering nearby surface waters.

- Install plant materials to stabilize cut and fill slopes and other disturbed areas once construction is complete. Plant materials could include an erosion control seed mixture or shrub and tree container stock. Temporary structural BMPs, such as sediment barriers, erosion control blankets, mulch, and mulch tackifier, could be installed as needed to stabilize disturbed areas until vegetation becomes established.

- Conduct water quality tests specifically for increases in turbidity and sedimentation caused by construction activities.

- Prepare a Spill Prevention Control and Countermeasures Plan (SPCCP). An SPCCP is intended to prevent any discharge of oil into the river and other aquatic habitats. The contractor would develop and implement an SPCCP to minimize the potential for adverse effects from spills of hazardous, toxic, or petroleum substances during construction activities. The SPCCP would be completed before any construction activities begin. Implementation of this measure would comply with Federal and state water quality regulations. The SPCCP would describe spill sources and spill pathways in addition to the actions that would be taken in the event of a spill (e.g., an oil spill from engine refueling would be immediately cleaned up with oil absorbents). The SPCCP would outline descriptions of containment facilities and practices, such as doubled-walled tanks, containment berms, emergency shut-offs, drip pans, fueling procedures, and spill response kits. It would also describe how and when employees are trained in proper handling procedure and spill prevention and response procedures.

- A copy of the approved SWPPP shall be maintained and available at all times on the construction site.

The following new mitigation measure would be implemented to address significant impacts on paleontological resources.

Mitigation Measure GEO-2: Conduct Construction Personnel Education, Stop Work if Paleontological Resources are Discovered, Assess the Significance of the Find, and Prepare and Implement a Recovery Plan, as required.

To minimize the potential for destruction of or damage to potentially unique, scientifically important paleontological resources during earth-moving activities, USACE will implement the measures described below if the project is implemented:

- Before the start of construction activities at the project site, construction personnel involved with earth-moving activities (including the site superintendent) will be informed of the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction activities, and proper notification procedures should fossils be encountered. This worker training may either be prepared and presented by an experienced field archaeologist at the same time as construction worker education on cultural resources or prepared and presented separately by a qualified paleontologist.

- If paleontological resources are discovered during earth-moving activities, the construction crew will notify USACE will immediately cease work in the vicinity of the find. USACE will retain a qualified paleontologist to evaluate the resource and prepare a recovery plan in accordance with Society of Vertebrate Paleontology Guidelines (1996). The recovery plan may include, but is not limited to, a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Recommendations in the recovery plan that are determined by USACE to be necessary and feasible will be implemented before construction activities can resume at the site where the paleontological resources were discovered.

3.3 Land Use

3.3.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. The study area includes approximately 375 acres of prime farmland, and agricultural uses on the project site include English walnut orchard and land that has historically been used for row crops.

In 2019, DWR certified the Final EIR for the LEBLS project. The LEBLS Final EIR identified 68 acres of prime farmland within the project study area and the LEBLS project footprint that would be removed from agricultural use and proposed to mitigate for agricultural impacts through purchase of conservation easements and improvements to agricultural productivity. In addition to the farmland that would be removed from agricultural use, a substantial land area would transition from the interior of the Lower Elkhorn Basin into the expanded Sacramento Bypass as a result of constructing the LEBLS project. The LEBLS Final EIR indicated that these areas would be planted in native grasses and available for grazing, remaining in agricultural use.

3.3.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR found a significant and unavoidable impact from the conversion of approximately 335.5 acres of actively cultivated prime farmland to non-agricultural use as a result of constructing the widened weir and bypass, representing a decrease of approximately 0.13 percent in the total acreage of prime farmland within Yolo County. After the ARCF GRR Final EIS/EIR was certified and the ROD signed, the LEBLS EIS/EIR also separately identified the conversion of approximately 68 acres of agricultural land within the footprint of the Sacramento Weir Widening project site. The LEBLS project is scheduled to begin construction in 2020, and the agricultural conversion identified in the LEBLS project would occur before the Proposed Action or the Higher Weir Elevation Alternative would be constructed.

Basis of Significance

The thresholds of significance encompass the factors taken into account under NEPA and CEQA to determine the significance of an action in terms of its context and intensity. Under NEPA and CEQA, consideration is given to determine possible conflicts between the proposed action and the objectives of Federal, state, regional, and local land use plans, policies, and controls for the study area. Alternatives under consideration were determined to result in a significant impact to land use if they would do any of the following:

- Conflict with any applicable land use plan, policy, or regulation;
- Conflict with approved Habitat Conservation Plans or Natural Community Conservation Plans;
- Physically divide an established community;
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere;
- Convert a significant amount of prime farmland, unique farmland, or farmland of statewide importance to non-agricultural use; or,
- Conflict with existing zoning for agricultural use.

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass, and no land use effects would occur. As a result, if a flood event were to occur, the Sacramento area would remain at greater risk of a possible levee failure due to seepage, slope stability, erosion, or overtopping, until the future construction of levee improvements. Levee failure could result in substantial flooding and widespread inundation of urban, suburban, and agricultural areas around Sacramento. Substantial damage to existing land uses, including commercial, residential, industrial, and agricultural uses, could occur as a result, potentially resulting in localized areas of land use change or slow replacement of damaged buildings and land uses, which could displace people or divide existing communities. All of these effects could be considered significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alternative

Conversion of Prime Farmland

There are approximately 375 acres of prime farmland within the project study area, including English walnut orchard and an area that has historically been used to grow row crops. The majority of this land would remain in agricultural use. After construction of the project, approximately 292 acres of this prime farmland would be planted in native grasses and available for grazing. The project would include construction of facilities, including new levee, weir, fish passage facilities, and roadways, on approximately 83 acres of prime farmland within the study area. These 83 acres would be permanently converted from agricultural use.

As described above in Section 3.3.1, the LEBLS project includes construction of setback levee and associated facilities in the study area. Within the Sacramento Weir Widening project study area, the LEBLS project identified 68 acres of prime farmland that would be converted to nonagricultural use. This total includes 32 acres of prime farmland conversion that overlaps with the 83 acres that would be converted by construction of Sacramento Weir Widening project facilities. The LEBLS project will separately mitigate for its conversion prime farmland, including through purchase of agricultural conservation easements and improvements to agricultural productivity.

The Sacramento Weir Widening project would permanently convert 83 acres of prime farmland to non-agricultural use. Of this total, 32 acres would be mitigated by DWR during implementation of the LEBLS project, through purchase of conservation easements and improvements to agricultural productivity. However, 51 acres of prime farmland conversion would remain after implementing the LEBLS project, including its mitigation commitments. This conversion is less than the 335.5 identified in the ARCF GRR Final EIS/EIR and implementing mitigation measure AG-1 would reduce the project's impact related to the conversion of prime farmland by requiring the purchase of agricultural conservation easements. However, this impact would remain significant and unavoidable.

3.3.3 Avoidance, Minimization, and Mitigation Measures

The following new mitigation measure supplements mitigation included in the ARCF GRR Final EIS/EIR.

Mitigation Measure AG-1: Purchase Conservation Easements to Offset Conversion of Prime Farmland

USACE will require purchase or establishment of property interests in agricultural land (i.e., conservation easements) requiring the preservation and/or enhancement of other land of similar agricultural quality and acreage, either directly or indirectly, to offset conversion of prime farmland to construct project facilities. These easements may include but are not limited to establishing agricultural conservation easements, paying in-lieu fees toward agricultural conservation easements, supporting agricultural land trusts, and participating in habitat conservation plans or natural community conservation plans that include conservation of agricultural lands. Conservation easements will be purchased at a 1:1 ratio.

Where feasible, the agricultural conservation easements should be acquired in the county in which the conversion would take place, Yolo County. If there is not a sufficient supply of similar prime farmland where the conversions would occur, the agricultural conservation easements may be obtained in a different county. Where conservation easements are established by USACE, they may be held by land trusts, local governments, or other appropriate agencies that are responsible for ensuring that these lands will be maintained in agricultural use.

Where easements are considered for other resources such as terrestrial biological resources, purchase of easements will be coordinated where possible so that agricultural resources are also addressed.

3.4 Hydrology and Hydraulics

3.4.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some updated and site-specific information is presented below.

Sacramento River Flood Management System Operation Context

Hydrology of the project site is heavily influenced by upstream dam operations and flood flows on the Sacramento and American Rivers, and to an extent, the Sutter Bypass. The leveed portion of the Sacramento River begins near Ord Ferry. From this point, moving downstream, excess flood flows are allowed to spill into the bypass system, with corresponding reductions in main stem river flows. This system design feature retains sufficient flows in the main channel to prevent excessive sedimentation, allows most of the bypass channel bottoms to be productively farmed, and provides a much greater net flood conveyance capacity than could be provided by the main stem Sacramento River levee system alone.

From the north, the first spill from the Sacramento River occurs just upstream from the start of the levee system at Ord Ferry. Floodwater leaves the river through three designated overflow areas (the Moulton, Colusa, and Tisdale weirs) and flows into the Butte Basin and then west of the Sutter Buttes via Butte Slough to the Sutter Bypass. Below the Sutter Bypass, system flows are discharged into the Yolo Bypass, from both the Sutter Bypass and Sacramento River, through the Fremont and Sacramento Weir/Bypass. The design-flow capacity of the main stem river is progressively reduced below each weir as water is diverted into the bypasses. For example, the design capacity of the Sacramento River upstream from the leveed system near Ord Ferry is approximately 260,000 cfs. Downstream from the Tisdale Weir, the design capacity of the river is only 30,000 cfs.

Fremont Weir and Yolo Bypass

Fremont Weir is the first overflow structure on the Sacramento River's right bank, marking the beginning of the Yolo Bypass. Its primary purpose is to release overflow waters of the Sacramento River, Sutter Bypass, and Feather River into the Yolo Bypass. Its crest length is 1.8 miles, with an elevation of 32 feet (NAVD88). The project design capacity of the weir is 343,000 cfs. The Yolo Bypass conveys 80 percent of the system’s floodwaters southward to its confluence with the Lower Sacramento River near the City of Rio Vista. The weir begins to spill when combined upstream flows exceed approximately 55,000 cfs (DWR 2016).

The Yolo Bypass has received floodwaters from the Sacramento River and Sutter Bypass via Fremont Weir in approximately 70 percent of years, joining flows from western tributaries. In approximately 10 percent of years, localized flooding is due to western tributary contributions only (Reclamation and DWR 2012). In the absence of spills at the Fremont and Sacramento weirs, the hydrology of the Yolo Bypass is dominated by inflows from Knights Landing Ridge Cut, Cache Creek, Willow Slough, and Putah Creek. Base flow discharges from these tributaries may be important sources of water for irrigation supply and to maintain aquatic and riparian habitats along the waterways. Moderate or high flows from the tributaries can cause localized flooding. During non-flood periods, surface water flows from west to east through a network of channels that cross the Yolo Bypass and discharge into the Tule Canal, an artificial channel that parallels the waterside toe of the east levee along

the entire length of the bypass. In winter, low flow in the northern half of the Yolo Bypass consists primarily of base flow discharges from Cache Creek and Willow Slough. In summer, flows are dominated by irrigation deliveries and return flows diverted from Cache Creek, the Knights Landing Ridge Cut, and the Sacramento River, as well as discharges from the Woodland wastewater treatment plants (DWR 2016). All waterways in the project vicinity are tributary to the Sacramento River, as the Yolo Bypass drains floodwater back into the river at the bypass southern end.

Sacramento Weir and Bypass

The Sacramento Weir is the only operable weir in the bypass system – all others are fixed weirs that overflow through gravity when river stages rise above their weir sill elevations. The weir limits flood stage water surface elevations (WSEs) in the Sacramento River to project design levels through the Sacramento/West Sacramento area. The project design capacity of the existing weir is 112,000 cfs. During major floods, flows from the American River channel often exceed the capacity of the Sacramento River downstream of the confluence. When this occurs, floodwaters flow upstream from the mouth of the American River to the Sacramento Weir, and are released via Sacramento Weir to the Yolo Bypass (DWR 2010).

The Sacramento Bypass is typically dry, except during flood events. DWR operates the Sacramento Weir according to criteria established by USACE. These criteria for opening the gates are designed to prevent sediment accumulation and subsequent loss of conveyance capacity in the lower Sacramento River, as well as to limit inundation of farmland in the Yolo Bypass to the extent feasible, while meeting the primary purpose of protecting the Sacramento metropolitan area from flooding. The gates are opened manually, and once opened, cannot be closed until flood stages recede below the weir sill, which is a slow and costly process. The Sacramento Weir gates have been opened 22 out of the last 74 years. During non-flood periods, internal drainage in the Sacramento Bypass occurs via levee toe drains which eventually feed into the Tule Canal.

3.4.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR concluded that the change in flow volumes in the Sacramento or Yolo Bypasses as a result of the project would be less than significant, and that flows associated with the expanded Sacramento Weir and Bypass would be contained within the existing flood management system. It was also determined that the ARCF 2016 Project would create a new drainage area within the Sacramento Bypass, but the area would be contained within the levee system and would not result in substantial new erosion, siltation, or runoff. The ARCF GRR Final EIS/EIR also determined that the net effect would be to slightly decrease the flood peak, compared to the existing peak flow in the Sacramento Bypass. Therefore, potential adverse effects on hydrology were determined to be less than significant.

Significance Criteria

The alternatives under consideration were determined in the Final EIS/EIR to result in a significant impact related to hydrology and hydraulics if they would cause any of the effects listed at p.92 of the Final EIS/EIR:

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river in a manner that would result in: (1) substantial erosion or siltation on- or off-site, and (2) substantial increase in the rate or amount of surface runoff in a manner that would result in flooding on- or off-site;

- 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;

- Place housing within a 100-year flood hazard area;

- Place structures within a 100-year flood hazard area which would impede or redirect flood flows; or

- Expose people or structures to a significant risk of loss, injury, or death involving flooding.

Three additional significance criteria not included in the ARCF GRR Final EIS/EIR are considered in this analysis. The project would also result in a significant effect if it would:

- Cause a substantial WSE increase (USACE threshold).

- Cause substantial effects to agricultural operations related to changes in the Yolo Bypass.

- Cause substantial reductions in flows in the Sacramento River related to operation of the fish passage structure.

Methodology

Hydraulic Analysis

A detailed hydraulic analysis (MBK 2019a) of the 35 percent design for the widened weir is provided in Appendix A and summarized briefly below. Key features and projects included in each analyzed scenario are shown in Table 3.4-1 and described in detail in Appendix A. The following four scenarios were evaluated:

- CEQA Baseline Condition (2008): Describes the physical environmental conditions as they existed in 2008 when the ARCF GRR EIS/EIR Notice of Preparation was prepared, prior to the construction of the Natomas Levee Improvement Program and the Southport Levee Improvement Project. The physical environmental conditions in 2008 did not include the Folsom Dam Joint Federal Project (JFP) and forecast-based releases from Folsom Dam. However, at the time of this analysis, a Central Valley Hydrology Study event selection had not been performed for the pre-JFP condition. Therefore, the CEQA Baseline Condition scenario for this analysis does not include pre-JFP conditions and includes Existing Condition Folsom Dam releases. For hydraulic modeling purposes, the CEQA Baseline Conditions scenario represents the CEQA No Project Alternative.

- NEPA Existing Condition (2019): Represents how the system performs today. For hydraulic modeling purposes, the Existing Conditions scenario is closest to representing the NEPA No Action Alternative as a comparison with the project and was used as such.

- Future Conditions with Project (2024): Baseline plus WRDA 2016 projects, to evaluate effects resulting solely from WRDA 2016 implementation. The Future Conditions with Project scenario includes the project and other reasonably foreseeable projects identified in WRDA 2016. The project was not modeled as a standalone project due to the complex nature of the flood management system and facility interactions.

- Future Conditions Cumulative (2024): Expected future condition, accounting for past, present, and reasonably foreseeable known projects that may affect system hydraulics by 2024. DWR's LEBLS project involves constructing a 1,500-foot setback along a portion of the north side of the Sacramento Bypass, beginning in 2020. The setback would be in place (although the existing levee may not have been degraded) before construction of the Proposed Action or Higher Weir Elevation Alternative is completed in 2023. Projects included in this cumulative modeling scenario may differ slightly from the projects evaluated in Chapter 4, "Cumulative and Growth-Inducing Impacts," of this Supplemental EIS/EIR, due to the complexities and constraints of the modeling environment.

The hydraulic impact analysis was performed using a modified version of the Central Valley Floodplain Evaluation and Delineation TO34 Sacramento River Basin HEC-RAS model, MBK Engineers version 201908, which runs in HEC-RAS version 5.0.7. The model includes: the Sacramento River from Colusa to Suisun Bay, the Feather River and its tributaries below Oroville Dam, and the American River below Folsom Dam. The January 1997 flood event was used for model calibration, the January 2006 flood event was used for model verification, and hydrology developed by the Central Valley Hydrology Study (USACE 2015) was used for simulations.

The project was evaluated for multiple flood frequencies (Appendix C, Table 3). However, for the purposes of this analysis, only effects on 1/100, 1/200, and 1/325 annual exceedance probability[1] (AEP) events are presented in this section, because these scenarios most accurately represent the effect of reservoir operations on the regional flood management system and the maximum short-term emergency capacity for flows on the American River, below Folsom Dam.

[1] Annual Exceedance Probability (AEP) refers to the probability of a flood event occurring in any year.

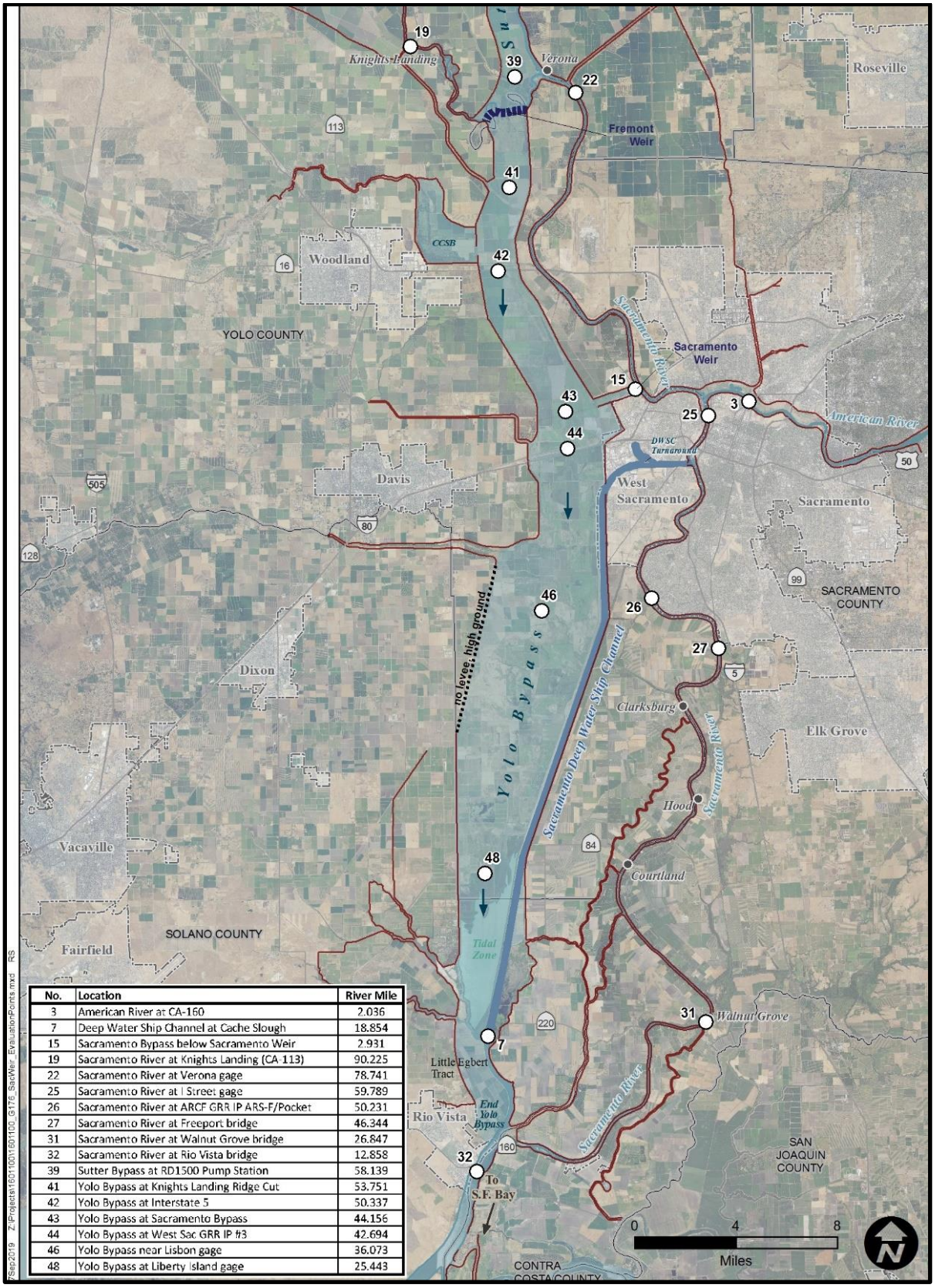
Table 3.4-1. Summary Comparison of Hydraulic Analysis Scenario Features

Feature	CEQA Baseline (2008)* [1]	NEPA Existing (2019)[1]	Future with Project (2024)[1]	Future Cumulative (2024)[1]
Folsom Joint Federal Project and forecast-based releases	Yes	Yes	Yes	Yes
Natomas Levee Improvement Program	No	Yes	Yes	Yes
Southport Levee Improvement Project	No	Yes	Yes	Yes
Sacramento Weir widening	No	No	Yes	Yes
Sacramento Bypass expansion	No	No	Yes	Yes
Arcade Creek, Dry Creek, and Magpie Creek improvements	No	No	Yes	Yes
Folsom Dam Raise Project	No	No	No	Yes
Lower Elkhorn Basin Levee Setback Project	No	No	No	Yes
Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project	No	No	No	Yes

Yes = Included
No = Not included
* At the time of the analysis, a Central Valley Hydrology Study event selection had not been performed for the pre-Joint Federal Project (JFP) condition; therefore, the Baseline Condition simulations used the Existing Condition Folsom Dam releases, which include the effects of the JFP.
Source: MBK 2019a
[1]Note: the CEQA and NEPA scenarios are referred to as Baseline 1 (CEQA) and Baseline 2 (NEPA), in Appendix A.

Computed WSE, relative to the CEQA Baseline Condition (2008) and NEPA 2019 Existing Condition were modeled for the following locations (Figure 3.4-1), and selected results representing WSE at representative points within the system are presented in Tables 3.4-2 through 3.4-7, and discussed further below:

- American River at State Route (SR) 160 (Index Point 3)
- Deep Water Ship Channel at Cache Slough (Index Point 7)
- Sacramento Bypass below Sacramento Weir (Index Point 15)
- Sacramento River at Knights Landing, SR 113 (Index Point 19)
- Sacramento River at Verona gage (Index Point 22)
- Sacramento River at I Street gage (Index Point 25)
- Sacramento River at ARCF GRR index point ARS-F/Pocket (Index Point 26)
- Sacramento River at Freeport Bridge (Index Point 27)
- Sacramento River at Walnut Grove Bridge (Index Point 31)
- Sacramento River at Rio Vista Bridge (Index Point 32)
- Sutter Bypass at RD1500 Pump Station (Index Point 39)
- Yolo Bypass at Knights Landing Ridge Cut (Index Point 41)
- Yolo Bypass at I-5 (Index Point 42)
- Yolo Bypass at Sacramento Bypass (Index Point 43)
- Yolo Bypass at West Sacramento GRR index point #3 (Index Point 44)
- Yolo Bypass near Lisbon gage (Index Point 46)
- Yolo Bypass at Liberty Island gage (Index Point 48)



No.	Location	River Mile
3	American River at CA-160	2.036
7	Deep Water Ship Channel at Cache Slough	18.854
15	Sacramento Bypass below Sacramento Weir	2.931
19	Sacramento River at Knights Landing (CA-113)	90.225
22	Sacramento River at Verona gage	78.741
25	Sacramento River at I Street gage	59.789
26	Sacramento River at ARCF GRR IP ARS-F/Pocket	50.231
27	Sacramento River at Freeport bridge	46.344
31	Sacramento River at Walnut Grove bridge	26.847
32	Sacramento River at Rio Vista bridge	12.858
39	Sutter Bypass at RD1500 Pump Station	58.139
41	Yolo Bypass at Knights Landing Ridge Cut	53.751
42	Yolo Bypass at Interstate 5	50.337
43	Yolo Bypass at Sacramento Bypass	44.156
44	Yolo Bypass at West Sac GRR IP #3	42.694
46	Yolo Bypass near Lisbon gage	36.073
48	Yolo Bypass at Liberty Island gage	25.443

Source: GEI Consultants 2019

Figure 3.4-1. Selected Hydraulic Model Evaluation Points

Table 3.4-2. Maximum Water Surface Elevation and Change from 2008 CEQA Baseline – 1/100 Annual Exceedance Probability

		Maximum Water Surface Elevation (feet, NAVD88)					Change from Baseline (feet)			
Index Point	Location	Baseline 1 (2008)	Future with Project: Proposed Action	Future with Project: High Weir Elevation Alternative	Future Cumulative: Proposed Action	Future Cumulative: High Weir Elevation Alternative	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative
3	American River at CA-160	36.33	34.89	34.93	34.81	34.86	-1.44	-1.4	-1.52	-1.47
7	Deep Water Ship Channel at Cache Slough	16.99	17.07	17.06	17.07	17.07	0.08	0.07	0.08	0.08
15	Sacramento Bypass below Sacramento Weir	33.07	31.89	31.89	31.78	31.78	-1.18	-1.18	-1.29	-1.29
19	Sacramento River at Knights Landing, CA-113	43.10	43.03	43.03	42.98	42.98	-0.07	-0.07	-0.12	-0.12
22	Sacramento River at Verona gage	42.20	42.04	42.04	41.99	42.00	-0.16	-0.16	-0.21	-0.2
25	Sacramento River at I Street gage	34.34	32.59	32.63	32.50	32.54	-1.75	-1.71	-1.84	-1.8
26	Sacramento River at ARCF GRR IP ARS-F/Pocket	29.44	28.10	28.13	28.03	28.06	-1.34	-1.31	-1.41	-1.38
27	Sacramento River at Freeport Bridge	27.79	26.56	26.58	26.49	26.52	-1.23	-1.21	-1.3	-1.27
31	Sacramento River at Walnut Grove Bridge	18.20	17.69	17.70	17.66	17.68	-0.51	-0.5	-0.54	-0.52
32	Sacramento River at Rio Vista Bridge	12.78	12.79	12.79	12.79	12.79	0.01	0.01	0.01	0.01
39	Sutter Bypass at RD1500 Pump Station	42.82	42.72	42.72	42.67	42.68	-0.1	-0.1	-0.15	-0.14
41	Yolo Bypass at Knights Landing Ridge Cut	37.13	37.08	37.08	36.87	36.87	-0.05	-0.05	-0.26	-0.26
42	Yolo Bypass at I-5	34.26	34.27	34.27	33.88	33.89	0.01	0.01	-0.38	-0.37
43	Yolo Bypass at Sacramento Bypass	31.00	31.15	31.15	31.17	31.17	0.15	0.15	0.17	0.17
44	Yolo Bypass at West Sacramento GRR IP #3	30.32	30.47	30.47	30.48	30.48	0.15	0.15	0.16	0.16
46	Yolo Bypass near Lisbon gage	27.40	27.53	27.53	27.54	27.54	0.13	0.13	0.14	0.14
48	Yolo Bypass at Liberty Island gage	21.76	21.89	21.88	21.90	21.89	0.13	0.12	0.14	0.13

Notes: Green shading indicates a stage decrease. Yellow shading indicates a stage increase of 0.1 foot or greater.
Source: MBK 2019a

Table 3.4-3. Maximum Water Surface Elevation and Change from 2008 CEQA Baseline – 1/200 Annual Exceedance Probability

		Maximum Water Surface Elevation (feet, NAVD88)					Change from Baseline 1 (feet)			
Index Point	Location	Baseline (2008)	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative
3	American River at CA-160	36.81	35.42	35.44	35.34	35.37	-1.39	-1.37	-1.47	-1.44
7	Deep Water Ship Channel at Cache Slough	17.86	17.93	17.93	17.94	17.94	0.07	0.07	0.08	0.08
15	Sacramento Bypass below Sacramento Weir	33.62	32.5	32.49	32.4	32.4	-1.12	-1.13	-1.22	-1.22
19	Sacramento River at Knights Landing, CA-113	43.57	43.49	43.5	43.44	43.44	-0.08	-0.07	-0.13	-0.13
22	Sacramento River at Verona gage	42.75	42.56	42.57	42.51	42.51	-0.19	-0.18	-0.24	-0.24
25	Sacramento River at I Street gage	34.86	33.18	33.19	33.09	33.11	-1.68	-1.67	-1.77	-1.75
26	Sacramento River at ARCF GRR IP ARS-F/Pocket	29.93	28.64	28.65	28.57	28.59	-1.29	-1.28	-1.36	-1.34
27	Sacramento River at Freeport Bridge	28.29	27.09	27.1	27.03	27.05	-1.2	-1.19	-1.26	-1.24
31	Sacramento River at Walnut Grove Bridge	18.69	18.23	18.23	18.2	18.22	-0.46	-0.46	-0.49	-0.47
32	Sacramento River at Rio Vista Bridge	13.44	13.45	13.45	13.45	13.46	0.01	0.01	0.01	0.02
39	Sutter Bypass at RD1500 Pump Station	43.33	43.23	43.23	43.17	43.18	-0.1	-0.1	-0.16	-0.15
41	Yolo Bypass at Knights Landing Ridge Cut	37.69	37.62	37.62	37.41	37.41	-0.07	-0.07	-0.28	-0.28
42	Yolo Bypass at I-5	34.82	34.83	34.83	34.45	34.45	0.01	0.01	-0.37	-0.37
43	Yolo Bypass at Sacramento Bypass	31.66	31.8	31.8	31.82	31.82	0.14	0.14	0.16	0.16
44	Yolo Bypass at West Sacramento GRR IP #3	30.98	31.12	31.11	31.13	31.13	0.14	0.13	0.15	0.15
46	Yolo Bypass near Lisbon gage	28.07	28.19	28.19	28.2	28.2	0.12	0.12	0.13	0.13
48	Yolo Bypass at Liberty Island gage	22.53	22.65	22.65	22.66	22.66	0.12	0.12	0.13	0.13

Notes: Green shading indicates a stage decrease. Yellow shading indicates a stage increase of 0.1 foot or greater.
Source: MBK 2019a

Table 3.4-4. Maximum Water Surface Elevation and Change from 2008 CEQA Baseline – 1/325 Annual Exceedance Probability

		Maximum Water Surface Elevation (feet, NAVD88)					Change from Baseline 1 (feet)			
Index Point	Location	Baseline (2008)	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative
3	American River at CA-160	39.34	37.9	37.92	36.89	36.91	-1.44	-1.42	-2.45	-2.43
7	Deep Water Ship Channel at Cache Slough	18.33	18.44	18.44	18.12	18.12	0.11	0.11	-0.21	-0.21
15	Sacramento Bypass below Sacramento Weir	34.97	33.53	33.53	32.91	32.9	-1.44	-1.44	-2.06	-2.07
19	Sacramento River at Knights Landing, CA-113	44.08	44.01	44.01	43.94	43.94	-0.07	-0.07	-0.14	-0.14
22	Sacramento River at Verona gage	43.35	43.17	43.18	43.1	43.1	-0.18	-0.17	-0.25	-0.25
25	Sacramento River at I Street gage	36.62	34.62	34.65	33.89	33.92	-2	-1.97	-2.73	-2.7
26	Sacramento River at ARCF GRR IP ARS-F/Pocket	31.46	29.86	29.89	29.21	29.24	-1.6	-1.57	-2.25	-2.22
27	Sacramento River at Freeport Bridge	29.74	28.25	28.28	27.64	27.66	-1.49	-1.46	-2.1	-2.08
31	Sacramento River at Walnut Grove Bridge	19.49	18.86	18.87	18.49	18.5	-0.63	-0.62	-1	-0.99
32	Sacramento River at Rio Vista Bridge	13.73	13.75	13.75	13.62	13.62	0.02	0.02	-0.11	-0.11
39	Sutter Bypass at RD1500 Pump Station	43.91	43.79	43.8	43.73	43.73	-0.12	-0.11	-0.18	-0.18
41	Yolo Bypass at Knights Landing Ridge Cut	38.29	38.23	38.23	37.99	37.99	-0.06	-0.06	-0.3	-0.3
42	Yolo Bypass at I-5	35.35	35.38	35.38	34.92	34.92	0.03	0.03	-0.43	-0.43
43	Yolo Bypass at Sacramento Bypass	32.16	32.45	32.46	32.19	32.19	0.29	0.3	0.03	0.03
44	Yolo Bypass at West Sacramento GRR IP #3	31.44	31.64	31.65	31.45	31.45	0.2	0.21	0.01	0.01
46	Yolo Bypass near Lisbon gage	28.46	28.63	28.64	28.38	28.38	0.17	0.18	-0.08	-0.08
48	Yolo Bypass at Liberty Island gage	22.96	23.13	23.13	22.84	22.84	0.17	0.17	-0.12	-0.12

Notes: Green shading indicates a stage decrease. Yellow shading indicates a stage increase of 0.1 foot or greater.
Source: MBK 2019a

Table 3.4-5. Maximum Water Surface Elevation and Change from 2019 NEPA Existing Conditions – 1/100 Annual Exceedance Probability

		Maximum Water Surface Elevation (feet, NAVD88)					Change from Existing Conditions (feet)			
Index Point	Location	Existing Conditions (2019)	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative
3	American River at CA-160	36.32	34.89	34.93	34.81	34.86	-1.43	-1.39	-1.51	-1.46
7	Deep Water Ship Channel at Cache Slough	16.99	17.07	17.06	17.07	17.07	0.08	0.07	0.08	0.08
15	Sacramento Bypass below Sacramento Weir	33.06	31.89	31.89	31.78	31.78	-1.17	-1.17	-1.28	-1.28
19	Sacramento River at Knights Landing, CA-113	43.1	43.03	43.03	42.98	42.98	-0.07	-0.07	-0.12	-0.12
22	Sacramento River at Verona gage	42.19	42.04	42.04	41.99	42	-0.15	-0.15	-0.2	-0.19
25	Sacramento River at I Street gage	34.33	32.59	32.63	32.5	32.54	-1.74	-1.7	-1.83	-1.79
26	Sacramento River at ARCF GRR IP ARS-F/Pocket	29.47	28.1	28.13	28.03	28.06	-1.37	-1.34	-1.44	-1.41
27	Sacramento River at Freeport Bridge	27.83	26.56	26.58	26.49	26.52	-1.27	-1.25	-1.34	-1.31
31	Sacramento River at Walnut Grove Bridge	18.22	17.69	17.7	17.66	17.68	-0.53	-0.52	-0.56	-0.54
32	Sacramento River at Rio Vista Bridge	12.78	12.79	12.79	12.79	12.79	0.01	0.01	0.01	0.01
39	Sutter Bypass at RD1500 Pump Station	42.81	42.72	42.72	42.67	42.68	-0.09	-0.09	-0.14	-0.13
41	Yolo Bypass at Knights Landing Ridge Cut	37.12	37.08	37.08	36.87	36.87	-0.04	-0.04	-0.25	-0.25
42	Yolo Bypass at I-5	34.26	34.27	34.27	33.88	33.89	0.01	0.01	-0.38	-0.37
43	Yolo Bypass at Sacramento Bypass	31	31.15	31.15	31.17	31.17	0.15	0.15	0.17	0.17
44	Yolo Bypass at West Sacramento GRR IP #3	30.32	30.47	30.47	30.48	30.48	0.15	0.15	0.16	0.16
46	Yolo Bypass near Lisbon gage	27.4	27.53	27.53	27.54	27.54	0.13	0.13	0.14	0.14
48	Yolo Bypass at Liberty Island gage	21.76	21.89	21.88	21.9	21.89	0.13	0.12	0.14	0.13

Notes: Green shading indicates a stage decrease. Yellow shading indicates a stage increase of 0.1 foot or greater.
Source: MBK 2019a

Table 3.4-6. Maximum Water Surface Elevation and Change from 2019 NEPA Existing Conditions – 1/200 Annual Exceedance Probability

		Maximum Water Surface Elevation (feet, NAVD88)					Change from Existing Conditions (feet)			
Index Point	Location	Existing Conditions (2019)	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative
3	American River at CA-160	36.8	35.42	35.44	35.34	35.37	-1.38	-1.36	-1.46	-1.43
7	Deep Water Ship Channel at Cache Slough	17.86	17.93	17.93	17.94	17.94	0.07	0.07	0.08	0.08
15	Sacramento Bypass below Sacramento Weir	33.61	32.5	32.49	32.4	32.4	-1.11	-1.12	-1.21	-1.21
19	Sacramento River at Knights Landing, CA-113	43.57	43.49	43.5	43.44	43.44	-0.08	-0.07	-0.13	-0.13
22	Sacramento River at Verona gage	42.75	42.56	42.57	42.51	42.51	-0.19	-0.18	-0.24	-0.24
25	Sacramento River at I Street gage	34.85	33.18	33.19	33.09	33.11	-1.67	-1.66	-1.76	-1.74
26	Sacramento River at ARCF GRR IP ARS-F/Pocket	29.97	28.64	28.65	28.57	28.59	-1.33	-1.32	-1.4	-1.38
27	Sacramento River at Freeport Bridge	28.32	27.09	27.1	27.03	27.05	-1.23	-1.22	-1.29	-1.27
31	Sacramento River at Walnut Grove Bridge	18.71	18.23	18.23	18.2	18.22	-0.48	-0.48	-0.51	-0.49
32	Sacramento River at Rio Vista Bridge	13.44	13.45	13.45	13.45	13.46	0.01	0.01	0.01	0.02
39	Sutter Bypass at RD1500 Pump Station	43.32	43.23	43.23	43.17	43.18	-0.09	-0.09	-0.15	-0.14
41	Yolo Bypass at Knights Landing Ridge Cut	37.68	37.62	37.62	37.41	37.41	-0.06	-0.06	-0.27	-0.27
42	Yolo Bypass at I-5	34.82	34.83	34.83	34.45	34.45	0.01	0.01	-0.37	-0.37
43	Yolo Bypass at Sacramento Bypass	31.66	31.8	31.8	31.82	31.82	0.14	0.14	0.16	0.16
44	Yolo Bypass at West Sacramento GRR IP #3	30.98	31.12	31.11	31.13	31.13	0.14	0.13	0.15	0.15
46	Yolo Bypass near Lisbon gage	28.07	28.19	28.19	28.2	28.2	0.12	0.12	0.13	0.13
48	Yolo Bypass at Liberty Island gage	22.53	22.65	22.65	22.66	22.66	0.12	0.12	0.13	0.13

Notes: Green shading indicates a stage decrease. Yellow shading indicates a stage increase of 0.1 foot or greater.
Source: MBK 2019a

Table 3.4-7. Maximum Water Surface Elevation and Change from 2019 NEPA Existing Conditions – 1/325 Annual Exceedance Probability

		Maximum Water Surface Elevation (feet, NAVD88)					Change from Existing Conditions (feet)			
Index Point	Location	Existing Conditions (2019)	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative	Future with Project Proposed Action	Future with Project High Weir Elevation Alternative	Future Cumulative Proposed Action	Future Cumulative High Weir Elevation Alternative
3	American River at CA-160	39.33	37.9	37.92	36.89	36.91	-1.43	-1.41	-2.44	-2.42
7	Deep Water Ship Channel at Cache Slough	18.32	18.44	18.44	18.12	18.12	0.12	0.12	-0.2	-0.2
15	Sacramento Bypass below Sacramento Weir	34.96	33.53	33.53	32.91	32.9	-1.43	-1.43	-2.05	-2.06
19	Sacramento River at Knights Landing, CA-113	44.08	44.01	44.01	43.94	43.94	-0.07	-0.07	-0.14	-0.14
22	Sacramento River at Verona gage	43.34	43.17	43.18	43.1	43.1	-0.17	-0.16	-0.24	-0.24
25	Sacramento River at I Street gage	36.61	34.62	34.65	33.89	33.92	-1.99	-1.96	-2.72	-2.69
26	Sacramento River at ARCF GRR IP ARS-F/Pocket	31.51	29.86	29.89	29.21	29.24	-1.65	-1.62	-2.3	-2.27
27	Sacramento River at Freeport Bridge	29.79	28.25	28.28	27.64	27.66	-1.54	-1.51	-2.15	-2.13
31	Sacramento River at Walnut Grove Bridge	19.51	18.86	18.87	18.49	18.5	-0.65	-0.64	-1.02	-1.01
32	Sacramento River at Rio Vista Bridge	13.73	13.75	13.75	13.62	13.62	0.02	0.02	-0.11	-0.11
39	Sutter Bypass at RD1500 Pump Station	43.88	43.79	43.8	43.73	43.73	-0.09	-0.08	-0.15	-0.15
41	Yolo Bypass at Knights Landing Ridge Cut	38.27	38.23	38.23	37.99	37.99	-0.04	-0.04	-0.28	-0.28
42	Yolo Bypass at I-5	35.35	35.38	35.38	34.92	34.92	0.03	0.03	-0.43	-0.43
43	Yolo Bypass at Sacramento Bypass	32.15	32.45	32.46	32.19	32.19	0.3	0.31	0.04	0.04
44	Yolo Bypass at West Sacramento GRR IP #3	31.44	31.64	31.65	31.45	31.45	0.2	0.21	0.01	0.01
46	Yolo Bypass near Lisbon gage	28.46	28.63	28.64	28.38	28.38	0.17	0.18	-0.08	-0.08
48	Yolo Bypass at Liberty Island gage	22.96	23.13	23.13	22.84	22.84	0.17	0.17	-0.12	-0.12

Notes: Green shading indicates a stage decrease. Yellow shading indicates a stage increase of 0.1 foot or greater.
Source: MBK 2019a

Effects Analysis and Mitigation Measures

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir, and no temporary or long-term changes to flood flows or hydraulics in the project area would occur, including stage decreases. The No Action Alternative would constrain Sacramento Weir and Bypass flood conveyance capacities to existing levels, and substantially reduce flexibility to implement future flood system improvements to collectively improve public safety for the region. As a result, if a flood event were to occur, the Sacramento area would remain at a higher risk of a possible levee failure due to seepage, slope stability, erosion, or overtopping. Under this alternative, levee failure would be more likely to occur, potentially resulting in the collapse of several miles of levee slopes and alteration of regional and local flows that could result in substantial flooding and widespread inundation of urban, suburban, and agricultural areas around Sacramento. Without the setback levee and weir expansion improvements, the risk of levee failure in the region would remain high. If a levee overtopping or breach were to occur, floodwaters could be pumped back over levees or would eventually recede back through the levee breach into the waterways (though this could take months to occur). These effects could be considered significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore there is no substantial evidence to support a significance determination.

Proposed Action

Effects to Water Surface Elevation

Comparisons to 2008 CEQA Baseline Conditions

Compared to 2008 CEQA Baseline Conditions, the Future Conditions with Project and Future Cumulative scenarios result in WSE reductions of more than 1 foot at most index points throughout the system, during 1/100, 1/200, and the 1/325 AEP events. The largest decrease of WSE occurs during the 1/325 AEP event along the Sacramento and American Rivers and Sacramento Bypass, where reductions of over 2 feet are reported at several index points (Tables 3.4-2 to 3.4-4). These substantial reductions in stage reduce the risk of flooding during events at critical points within the SRFCS, and these impacts would be beneficial**.**

Under the Future Conditions with Project and Future Cumulative scenarios, negligible increases (well below the 0.1-foot threshold) in WSE would occur along the Sacramento River at Rio Vista and at a few lower Yolo Bypass index points. However, these increases are considered within the allowable error for the Central Valley Floodplain Evaluation and Delineation TO34 Sacramento River Basin HEC-RAS model and are considered less than significant**.**

Under the Future Conditions with Project and Future Cumulative scenarios, a stage increase of approximately 0.12 to 0.17 feet would occur at a few lower Yolo Bypass index points during the 1/100 and 1/200 AEP events. Under the Future Conditions with Project, a stage increase of up to approximately 0.3 feet would occur during the 1/325 AEP event. Even with this relatively small increase in WSE, the levees of the Yolo Bypass would still safely pass flood flows, and WSE would not encroach on the design freeboard for the levees. Stage increase would be highest immediately downstream of the project site and decreases slightly as flows move down the Yolo Bypass. The WSE increase at Index Point 43: Yolo Bypass at Sacramento Bypass is due to localized effects as Sacramento

Bypass flows combine with the already inundated Yolo Bypass, immediately downstream of the project site. The WSE increase at Index Points 44, 46, and 48 are likely influenced by other westside Yolo Bypass tributary inflows during regional flood events (Cache Creek, Willow Slough, Putah Creek, etc.) and a gradual narrowing of the Yolo Bypass as flows travel south toward Rio Vista. During a 1/325 AEP event, the slight water surface elevation increase at Index Point 7 (Deep Water Ship Channel at Cache Slough) would be localized due to backwater effects of the already inundated Yolo Bypass.

Stage increases immediately downstream of the project site are a function of normal Yolo Bypass flows, and increased Sacramento Bypass flows due to the weir expansion (which are spread over a wider channel area due to the increased width of the Yolo and Sacramento Bypasses from new setback levees) entering the portion of the Yolo Bypass below the project site where no expansion has occurred. Additionally, the Future Cumulative scenario includes the LEBLS project (which will improve the condition of Yolo Bypass levees in the project vicinity). Lastly, under the 1/325 AEP Cumulative scenario, WSE would decrease in the lower Yolo Bypass below Lisbon gage due to the cumulative effects of all planned flood system improvements that will have been constructed by 2024. Thus, this impact to WSE in the Yolo Bypass would be less than significant.

The stage increases reported in portions of the system would not expose people or structures to a significant risk of flooding onsite or offsite and would redirect flood flows in a way that optimizes the bypass system and substantially reduces flood risk. The Proposed Action would also expand weir capacity and reduce stage throughout most of the system under the Future Conditions with Project and Future Cumulative scenarios, as compared to the 2008 Baseline Conditions. The Proposed Action would also expand weir capacity and replace aging levees, at least along a portion of the Sacramento Bypass, with stronger levees that meet more stringent, modern levee construction and engineering design standards. Stage would also be reduced throughout most of the system under the Future Conditions with Project and Future Cumulative, as compared to the 2008 Baseline Conditions. Consequently, considering the context and intensity of these impacts to stage throughout the SRFCS, overall, the Proposed Action under Future Conditions with Project and Future Cumulative scenarios would substantially reduce the risk of flooding region-wide and in major metropolitan urban areas and would be beneficial**.**

Comparison to 2019 NEPA Existing Conditions

Compared to 2019 NEPA Existing Conditions, the Future Conditions with Project and Future Cumulative scenarios would result in WSE reductions of more than 1 foot at most index points throughout the system, during 1/100, 1/200, and the 1/325 AEP events. The largest decrease of WSE occurs during the 1/325 AEP event along the Sacramento and American Rivers and Sacramento Bypass, where reductions of over 2 feet are reported at several index points (Tables 3.4-5 to 3.4-7). These substantial reductions in stage would reduce the risk of flooding during events at critical points within the SRFCS, and these impacts would be beneficial**.**

Under the Future Conditions with Project and Future Cumulative scenarios, negligible increases (well below the 0.1-foot threshold) in WSE would occur along the Deep Water Ship Cannel, Sacramento River at Rio Vista, and at a few lower Yolo Bypass index points. However, these increases are considered within the allowable error for the Central Valley Floodplain Evaluation and Delineation TO34 Sacramento River Basin HEC-RAS model and are considered less than significant**.**

Although a stage increase above 0.1 foot would occur at a few lower Yolo Bypass index points under the Future with Project scenario, even with this small increase in WSE, the levees of the Yolo Bypass would still safely pass flood flows, and WSE would not encroach on the design freeboard for the levees. Stage increase would be highest immediately downstream of the project site and would decrease slightly as flows move down the Yolo Bypass. The WSE increase at Index Point 43: Yolo Bypass at Sacramento Bypass is due to localized effects as Sacramento Bypass flows combine with the already inundated Yolo Bypass, immediately downstream of the project site. The WSE increases at Index Points 44, 46, and 48 are likely influenced by other westside Yolo Bypass tributary inflows during regional flood events (Cache Creek, Willow Slough, Putah Creek, etc.) and a gradual narrowing of the Yolo Bypass as flows travel south toward Rio Vista. During a 1/325 AEP event, the slight water surface elevation increase at Index Point 7 (Deep Water Ship Channel at Cache Slough) is localized due to backwater effects of the already inundated Yolo Bypass.

Stage increases immediately downstream of the project site are a function of normal Yolo Bypass flows, and increased Sacramento Bypass flows due to the weir expansion (which are spread over a wider channel area due to the increased width of the Yolo and Sacramento Bypasses from new setback levees) entering the portion of the Yolo Bypass below the project site where no expansion has occurred. Additionally, the Future Cumulative scenario includes the LEBLS project (which will improve the condition of Yolo Bypass levees in the project vicinity). Lastly, under the 1/325 AEP Cumulative scenario, WSE decreases in the lower Yolo Bypass below Lisbon gage due to the cumulative effects of all planned flood system improvements that will have been constructed by 2024. Thus, this impact to WSE in the Yolo Bypass would be less than significant**.**

The stage increases reported in portions of the system would not expose people or structures to a significant risk of flooding onsite or offsite and would redirect flood flows in a way that optimizes the bypass system and substantially reduces flood risk. The Proposed Action would also expand weir capacity and reduce stage throughout most of the system under the Future Conditions with Project and Future Cumulative scenarios, as compared to the 2008 Baseline Conditions. The Proposed Action would also expand weir capacity and replace aging levees, at least along a portion of the Sacramento Bypass, with stronger levees that meet more stringent, modern levee construction and engineering design standards. Stage would also be reduced throughout most of the system under the Future Conditions with Project and Future Cumulative, as compared to the 2019 NEPA Existing Conditions. Consequently, considering the context and intensity of these impacts to stage throughout the SRFCS, overall, the Proposed Action under Future Conditions with Project and Future Cumulative scenarios would substantially reduce the risk of flooding region-wide and in major metropolitan urban areas and would be beneficial**.**

Effects to Agricultural Operations

The most important considerations with respect to the potential effect on agricultural operations are whether the Proposed Action would either a) inundate a larger area of the Yolo Bypass than is inundated under existing conditions (or 2008 CEQA Baseline), or b) change the “first or last day wet” by inundating the Yolo Bypass more frequently, or for longer.

As discussed above (Tables 3.4-2 through 3.4-7), the Proposed Action would result in stage increases of approximately 0.1 to 0.15 feet in the Yolo Bypass during the 1/100 and 1/200 AEP events and up to 0.3 feet during the 1/325 AEP event. These increases would not substantially change the area

of the Yolo Bypass that would be inundated or substantially increase inundation depths in the bypass (see Figure 3.4-2 and discussion below).

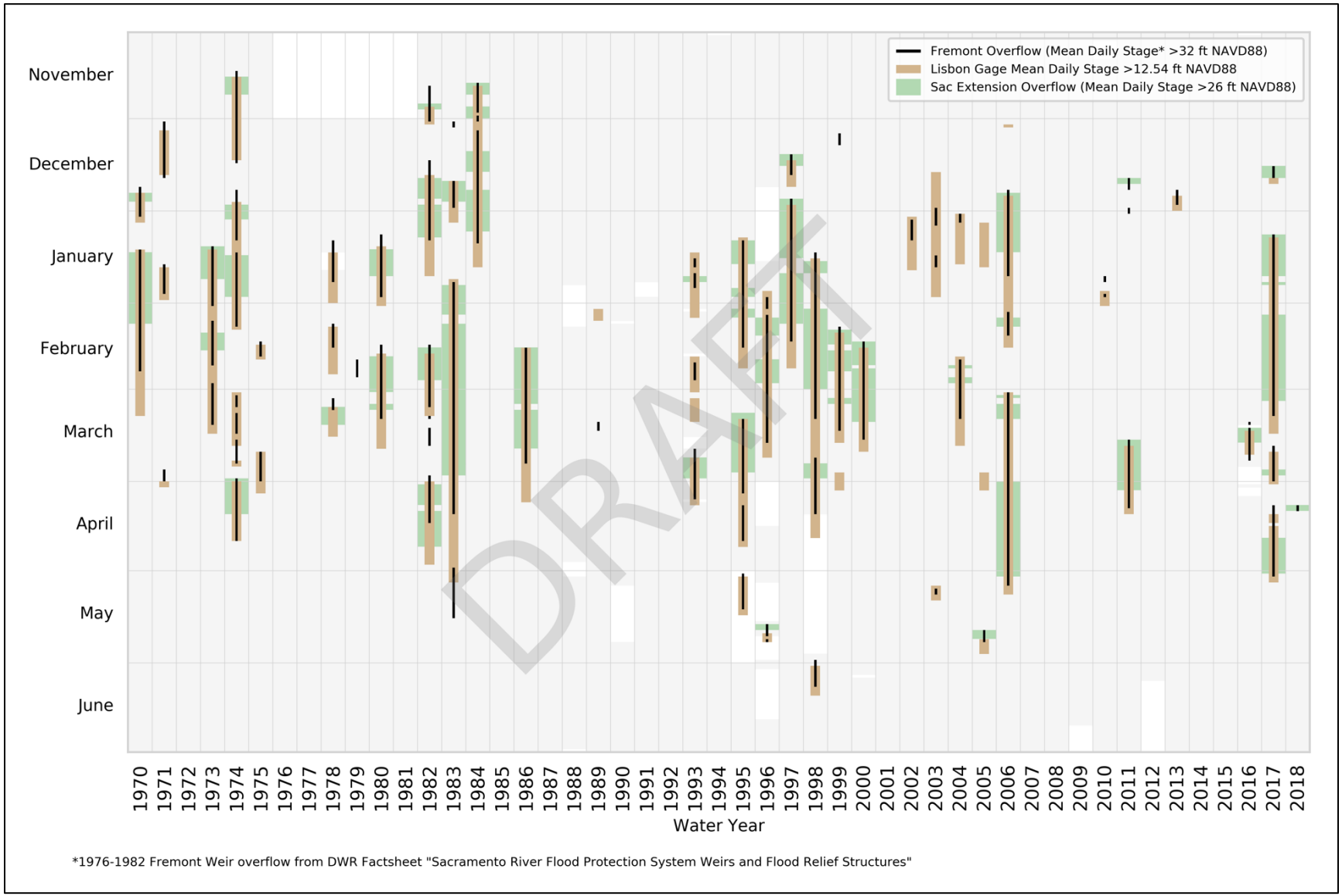
Due to operational criteria and system hydrology, the Sacramento Weir has historically not spilled on occasions when the Fremont Weir was not already overtopping (i.e., the Fremont Weir always spills before the Sacramento Weir). Thus, under current conditions, the Sacramento Bypass has never been inundated by Sacramento Weir flood flows unless the Yolo Bypass was already inundated by flows over Fremont Weir. Due to the volume of water that passes over Fremont Weir, when the Fremont Weir spills and inundates the Yolo Bypass, some of this flow actually backs up and causes inundation of the Sacramento Bypass, under existing conditions, even if the Sacramento Weir has not been opened. Additionally, because it takes an extended period of time for Yolo Bypass flows to drain back into the Sacramento River near Rio Vista, inundation in the Sacramento and Yolo Bypasses may persist for weeks or months after all flood flows have stopped overtopping either weir.

Under the Proposed Action, a change in operations would occur because the widened weir crest would be constructed at a lower elevation than the current weir. The lowered weir crest would result in the widened Sacramento Weir spilling more often, as compared to how often the Sacramento Weir currently spills under existing operations.

As mentioned previously, under existing conditions, the Sacramento Weir would not spill unless the Fremont Weir was already spilling and overtopping of the weirs directly corresponds to inundation of the bypasses. To understand how the lowered Sacramento Weir crest may change the inundation frequency and/or duration of the bypasses, historic flood events since 1970 were analyzed to understand if and when the widened Sacramento Weir (Proposed Action) would have spilled and wetted the Sacramento Bypass had the widened Sacramento Weir (Proposed Action) been in place at that time. The analysis also compares these events with historical occasions when the Fremont Weir was spilling into the Yolo and Sacramento Bypasses (MBK 2019b). Figure 3.4-2 presents results of this comparison, which allows an evaluation of whether the Proposed Action would increase the frequency or duration of inundation in downstream portions of the Yolo Bypass and thus, affect agricultural operations.

On Figure 3.4-2, the thin black lines represent the occurrence and duration of Fremont Weir spills; thick green lines represent the occurrence and duration of times when the widened Sacramento Weir would have spilled (had the project been in place during these historic floodflows); and the thick beige lines represent the presence of inundation flows in the lower Yolo Bypass (stage above 12.54 feet NAVD88 at Lisbon Gage is used to indicate that the Yolo Bypass is still inundated by flood flows at that point in time, regardless of which weir has spilled and caused the inundation). If stage is above 12.54 feet at Lisbon Gage, then any spill of the widened Sacramento Weir would be spilling into an already inundated Yolo Bypass, and not on to dry lands.

As shown in Figure 3.4-2, on one occasion in March 1995, the widened Sacramento Weir would have begun flowing 2 days before Fremont Weir was overtopped; this is illustrated by the small portion of the thick green line (Sacramento Weir flow) on the figure that does not overlap with the thin black line (Fremont Weir flow). There have been two occasions (March 1978 and April 1982) when the widened Sacramento Weir under the Proposed Action would have continued to flow for up to 1 week after the Fremont Weir had stopped flowing (green line extends past black line). However, the Yolo Bypass in the project vicinity would have been inundated regardless of this continued flow from the widened Sacramento Weir, as indicated by the continued presence of water at Lisbon Gage (beige line extends past green and black lines) on these occasions.



Source; MBK Engineers 2019b

Figure 3.4-2. Coincidence of Flow over Fremont Weir and Sacramento Weir Extension, Water Years 1970-2018

Table 3.4-8 presents the total and relative frequency of the last day of Yolo Bypass inundation at Lisbon Gage in each month, and the months containing the last day of weir flow at the Fremont Weir, existing Sacramento Weir gates, and proposed widened Sacramento Weir. This analysis suggests that inundation of the Yolo Bypass most frequently ends in the March through May timeframe, while spill at the proposed widened Sacramento Weir would typically end in March; i.e., the Yolo Bypass is usually still draining from prior flood flows for an additional 2 months after any spills would have occurred over the Sacramento Weir.

Table 3.4-8. Monthly Frequency of Last Day Inundated, 1970-2017

Month in which Last Day of Inundation Occurred	Last Day of Yolo Bypass Inundation (at Lisbon)		Last Day of Weir Flow into Yolo Bypass					
			Fremont Weir		Existing Sacramento Weir		Widened Sacramento Weir	
	No. of Years	Frequency	No. of Years	Frequency	No. of Years	Frequency	No. of Years	Frequency
November	0	0%	0	0%	0	0%	0	0%
December	1	2%	1	2%	0	0%	0	0%
January	2	4%	3	6%	3	6%	1	2%
February	2	4%	3	6%	3	6%	4	8%
March	7	15%	11	23%	2	4%	10	21%
April	8	17%	5	10%	3	6%	3	6%
May	7	15%	6	13%	0	0%	4	8%
June	1	2%	1	2%	0	0%	0	0%
No Inundation/Flow	20	42%	18	38%	37	77%	26	54%

Note: Last day of flow for Fremont Weir and historical Sacramento Weir were tabulated from the California Department of Water Resources factsheet (2017).
Source: MBK Engineers, 2019b

Thus, over the nearly 50-year period of record, the change in inundation that would result from implementing the Proposed Action would not substantially increase the frequency or duration of inundation in the Yolo Bypass, and the impact on agricultural operations in the Yolo Bypass would be less than significant.

Effects of Fish Passage Operation on Sacramento River flows

The fish passage structure would begin operation after the stage in the Sacramento River rises above 27.32 feet NAVD88 and has begun to recede. The structure would operate until stage in the Sacramento River declines to an elevation of 12 NAVD88. Gates also would be closed, and fish passage operation ceased, if operation of the fish passage would cause overtopping of the Tule Canal or if operation would otherwise extend beyond May 31of any given year.

MBK Engineers prepared a draft analysis of flow reduction in the Sacramento River (between the Sacramento Weir and the point where the Toe Drain rejoins the river near Rio Vista) associated with fish passage operation (MBK 2020). This draft analysis used the historical stage record for the

Sacramento River to evaluate how operation of the fish passage structure would have affected historical flows in the Sacramento River at Freeport between 1970 and 2015, which included wet, above normal, below normal, dry, and critical water years. Based on this analysis, the fish passage structure would operate during 7 percent of wet years, 3 percent of above-normal years, less than 1 percent of below-normal years, and would not operate during dry and critical years. During those operations, the maximum reduction in flow in the Sacramento River at Freeport due to fish passage operations would be less than 2 percent of the total flow. In March, flows at Freeport were reduced by 1 to 2 percent on average, during 5 percent of days in March during the analysis period (note that if river stage remains in the operational range of the structure, the structure would potentially operate for the entire month in a given year). In April, flows at Freeport were reduced by 1 to 2 percent on average, during 2 percent of days in April in the analysis period. In May, flows at Freeport were reduced by 1 to 2 percent on average, during 2 percent of May days in the analysis period.

Because the flows associated with the fish passage would occur primarily during wet or above normal years, and because the maximum reduction in flow that would occur would be approximately 2 percent of the total Sacramento River flow, the impact of fish passage operation on Sacramento River flows would be less than significant.

Higher Weir Elevation Alternative

Effects to Water Surface Elevation

Comparison to 2008 CEQA Baseline Conditions

Similar to effects of the Proposed Action, when compared to the 2008 Baseline Conditions, the Future Conditions with Project (Higher Weir Elevation Alternative) and Future Cumulative (Higher Weir Elevation Alternative) scenarios would result in WSE reductions of more than 1 foot at several index points throughout the system, during 1/100, 1/200, and the 1/325 AEP events. The largest decrease of WSE would occur during the 1/325 AEP event under Future Conditions with Project (Higher Weir Elevation Alternative) and Future Cumulative conditions, and would include a reduction of 1.97 foot on the Sacramento River at I Street and reductions of over 2 feet at several index points along the Sacramento and American Rivers, and in the Sacramento Bypass (Tables 3.4-2 to 3.4-4). These reductions in stage substantially reduce the risk of flooding during events at critical points within the SRFCS, and these impacts would be beneficial**.**

Under the Future Conditions with Project (Higher Weir Elevation Alternative) and Future Cumulative (Higher Weir Elevation Alternative) scenarios, negligible increases (at or below 0.1-foot threshold) in WSE would occur along the Deep-Water Ship Channel, Sacramento River at Rio Vista, and a few locations within the lower Yolo Bypass. However, these increases are considered within the allowable error for the Central Valley Floodplain Evaluation and Delineation TO34 Sacramento River Basin HEC-RAS model and are considered less than significant**.**

Although a stage increase above 0.1 foot would occur at a few lower Yolo Bypass index points under the Future Conditions with Project (Higher Weir Elevation Alternative) scenario, even with this small increase in WSE, the Yolo Bypass levees would still safely pass flood flows and WSE would not encroach on the design freeboard for the levees. Similar to the Proposed Action, stage increase would be highest immediately downstream of the project site and would decrease slightly as flows move down the Yolo Bypass. The small WSE increase at Index Point 43: Yolo Bypass at Sacramento Bypass is due to localized effects as Sacramento Bypass flows combine with the already inundated Yolo Bypass,

immediately downstream of the project site. The WSE increase at Index Points 44, 46, and 48 are likely influenced by other westside Yolo Bypass tributary inflows (Cache Creek, Willow Slough, Putah Creek, etc.) and a gradual narrowing of the Yolo Bypass as flows travel south toward Rio Vista. During a 1/325 AEP, the slight water surface elevation increase at Index Point 7 (Deep Water Ship Channel at Cache Slough) is localized due to backwater effects of the already inundated Yolo Bypass.

Similar to the Proposed Action, stage increases immediately downstream of the project site under the Future Conditions With Project (Higher Weir Elevation Alternative) scenario are a function of normal Yolo Bypass flows, and increased Sacramento Bypass flows due to the weir expansion (which are spread over a wider channel area due to the increased width of the Yolo and Sacramento Bypasses from new setback levees) entering the portion of the Yolo Bypass below the project site where no expansion has occurred. Additionally, the Future Cumulative (Higher Weir Elevation Alternative) scenario includes the LEBLS project, which would improve the condition of Yolo Bypass levees in the project vicinity. Lastly, under the 1/325 AEP Cumulative scenario, WSE would decrease in the lower Yolo Bypass below Lisbon Gage due to the cumulative effects of all planned flood system improvements that would have been constructed by 2024. Thus, this impact to WSE in the Yolo Bypass from the Higher Weir Elevation Alternative would be less than significant**.**

The stage increases reported in portions of the system would not expose people or structures to a significant risk of flooding onsite or offsite and would redirect flood flows in a way that optimizes the bypass system and substantially reduces flood risk. The project would also expand weir capacity and replace aging levees, at least along a portion of the Sacramento Bypass, with stronger levees that meet more stringent, modern levee construction and engineering design standards. Stage would also be reduced throughout most of the system under the Future Conditions with Project (Higher Weir Elevation Alternative) and Future Cumulative (Higher Weir Elevation Alternative) scenarios, as compared to the 2008 Baseline Conditions. Consequently, considering the context and intensity of these impacts to stage throughout the SRFCS, overall, the Higher Weir Elevation Alternative under Future Conditions with Project and Future Cumulative scenarios would substantially reduce the risk of flooding region-wide and in major metropolitan urban areas and would be beneficial**.**

Comparison to 2019 NEPA Existing Conditions

Similar to effects of the Proposed Action, when compared to the 2019 NEPA Existing Conditions, the Future Conditions with Project (Higher Weir Elevation Alternative) and Future Cumulative (Higher Weir Elevation Alternative) scenarios would result in WSE reductions of more than 1 foot at several index points throughout the system, during 1/100, 1/200, and the 1/325 AEP events. The largest decrease of WSE would occur during the 1/325 AEP event under Future Conditions with Project (Higher Weir Elevation Alternative) and Future Cumulative conditions which include a reduction of 1.96 foot on the Sacramento River at I Street and reductions of over 2 feet at several index points along the Sacramento and American Rivers, and in the Sacramento Bypass (Tables 3.4-5 to 3.4-7). These reductions in stage would substantially reduce the risk of flooding during events at critical points within the SRFCS, and these impacts would be beneficial**.**

Under the Future Conditions with Project (Higher Weir Elevation Alternative) and Future Cumulative (Higher Weir Elevation Alternative) scenarios, negligible increases (at or below 0.1 foot threshold) in WSE would occur along the Deep-Water Ship Channel, Sacramento River at Rio Vista, and a few locations within the lower Yolo Bypass. However, these increases are considered within the allowable

error for the Central Valley Floodplain Evaluation and Delineation TO34 Sacramento River Basin HEC-RAS model and are considered less than significant.

Although a stage increase above 0.1 foot would occur at a few lower Yolo Bypass index points under the Future Conditions with Project (Higher Weir Elevation Alternative) scenario, even with this small increase in WSE, the Yolo Bypass levees would still safely pass flood flows and WSE would not encroach on the design freeboard for the levees. Similar to the Proposed Action, stage increase would be highest immediately downstream of the project site and would decrease slightly as flows move down the Yolo Bypass. The small WSE increase shown at Index Point 43: Yolo Bypass at Sacramento Bypass is due to localized effects as Sacramento Bypass flows combine with the already inundated Yolo Bypass, immediately downstream of the project site. The WSE increase shown at Index Points 44, 46, and 48 are likely influenced by other westside Yolo Bypass tributary inflows (Cache Creek, Willow Slough, Putah Creek, etc.) and a gradual narrowing of the Yolo Bypass as flows travel south toward Rio Vista. During a 1/325 AEP, the slight water surface elevation increase shown at Index Point 7: Deep Water Ship Channel at Cache Slough is localized due to backwater effects of the already inundated Yolo Bypass.

Similar to the Proposed Action, stage increases shown immediately downstream of the project site under the Future Conditions With Project (Higher Weir Elevation Alternative) scenario are a function of normal Yolo Bypass flows, and increased Sacramento Bypass flows due to the weir expansion (which are spread over a wider channel area due to the increased width of the Yolo and Sacramento Bypasses from new setback levees) entering the portion of the Yolo Bypass below the project site where no expansion has occurred. Additionally, the Future Cumulative (Higher Weir Elevation Alternative) scenario includes the LEBLS project, which would improve the condition of Yolo Bypass levees in the project vicinity. Lastly, under the 1/325 AEP Cumulative scenario, WSE decreases in the lower Yolo Bypass below Lisbon Gage due to the cumulative effects of all planned flood system improvements that would have been constructed by 2024. Thus, this impact to WSE in the Yolo Bypass from the Higher Weir Elevation Alternative would be less than significant**.**

The stage increases reported in portions of the system would not expose people or structures to a significant risk of flooding onsite or offsite and would redirect flood flows in a way that optimizes the bypass system and substantially reduces flood risk. The project would also expand weir capacity and replace aging levees, at least along a portion of the Sacramento Bypass, with stronger levees that meet more stringent, modern levee construction and engineering design standards. Stage would also be reduced throughout most of the system under the Future Conditions with Project (Higher Weir Elevation Alternative) and Future Cumulative (Higher Weir Elevation Alternative) scenarios, as compared to the 2019 NEPA Existing Conditions. Consequently, considering the context and intensity of these impacts to stage throughout the SRFCS, overall, the Higher Weir Elevation Alternative under Future Conditions with Project and Future Cumulative scenarios would substantially reduce the risk of flooding region-wide and in major metropolitan urban areas and would be beneficial**.**

Effects to Agricultural Operations

As discussed above for the Proposed Action, the Higher Weir Elevation Alternative would result in stage increases of approximately 0.1 to 0. 15 feet in the Yolo Bypass during the 1/100 and 1/200 AEP events, respectively, and up to 0.3 feet during the 1/325 AEP event. These increases would not substantially change the area of the Yolo Bypass that would be inundated, or substantially increase inundation depths in the bypass. Because the elevation of the stoplogs on the top of the widened Sacramento Weir would be equal to the top elevation of the needle gates on the existing Sacramento

Weir under this alternative, there would be no change to the frequency or duration of flows over the Sacramento Weir compared to Baseline or Existing Conditions. This impact would be less than significant.

Effects of Fish Passage Operation on Sacramento River flows

Under the Higher Weir Elevation Alternative, the widened weir would spill less frequently, and operation of the fish passage would occur correspondingly less often. Based on the analysis presented above for the Proposed Action, the flows associated with the fish passage operation in the Higher Weir Elevation Alternative would occur primarily during wet or above normal years. As with the Proposed Action, because the maximum reduction in flow that would occur would be approximately 2 percent of the total Sacramento River flow, and these reductions would not occur during dry or critical water years, the impact of fish passage operations on Sacramento River flows would be less than significant.

3.4.3 Avoidance, Minimization, and Mitigation Measures

Effects to hydrology and hydraulics are less than significant and/or beneficial. Therefore, no mitigation measures are proposed.

3.5 Water Quality and Groundwater Resources

3.5.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some updated and site-specific information is presented below.

Regulatory Setting

- Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan) – Describes official designated beneficial uses for specific surface water and groundwater resources.

- Central Valley RWQCB Delta Methylmercury TMDL – Applies to Delta waterways and Yolo Bypass waterways within the Delta and north of the Legal Delta to which the Commercial and Sport Fishing beneficial use, site-specific methylmercury fish tissue objectives, Delta mercury control implementation program, and monitoring provisions apply.

- Central Valley RWQCB General Order for Dewatering and Other Low Threat Discharges to Surface Waters – Applies to various categories of dewatering activities.

- Yolo County 2030 General Plan - Several policies from the Yolo County General Plan regarding water quality and groundwater are relevant to project design, construction, and/or impact analysis.

- Yolo County Improvement Standards – Several policies from the Yolo County Improvement Standards regarding hydrology, hydraulics, and flood risk reduction are relevant to project design, construction, and/or impact analysis as contained in Section 9, Storm Drainage; Section 10, Grading; and Section 11, Stormwater Quality, Erosion, and Sediment Control.

- Yolo County Code – Chapter 9 – Stormwater Management and Discharge Control Code (known as The Stormwater Ordinance).

- Sustainable Groundwater Management Act (SGMA) – Provides a framework for long-term sustainable groundwater management and mandates the formation of Groundwater Sustainability Agencies (GSAs) and Groundwater Sustainability Plans (GSPs).

Water Quality

Surface water quality is monitored, and the quality is maintained to protect beneficial uses as designated by the Central Valley RWQCB. General water quality conditions and beneficial uses for the project site and vicinity are discussed below.

Sacramento Bypass

The Sacramento Bypass is typically dry, except during flood events. As discussed in Section 3.4, "Hydrology and Hydraulics," the Sacramento Bypass is currently inundated approximately once every 5-10 years. Due to the infrequency of inundation, there are no beneficial uses associated with water of the bypass. All water in the Sacramento Bypass consists of local drainage, which eventually drains into the Tule Canal/Toe Drain, and overflow from the Sacramento and American Rivers (during flood events). As a result, water quality conditions in the Sacramento Bypass during high-water events would be consistent with those of the Sacramento and American Rivers.

303(d) Listed Impaired Waters

SWRCB is required to prepare a list of water bodies that do not meet applicable water quality standards and to develop a priority ranking for development of total maximum daily loads (TMDLs) for each water body under CWA Section 303(d). This is also known as the 303[d] list. Section 303(d) requires that the state develop a TMDL for each listed pollutant. The TMDL is the amount of loading that the water body can receive and still be in compliance with water quality objectives. The NPDES permit limits for listed pollutants must be consistent with the waste load allocation prescribed in the TMDL. After implementation of the TMDL, the problems that led to placing a given pollutant on the Section 303(d) list are anticipated to be remediated. Several water bodies at the project site, or immediately downstream of the project site, are currently listed as impaired (Table 3.5-1). The Sacramento Bypass as a whole is not evaluated in the 303(d) program; TMDLs are only developed for tributary waters.

Sacramento-San Joaquin Delta Mercury Control Program and Methylmercury Total Maximum Daily Load

Although the Yolo Bypass is outside of the project site and is outside the Legal Delta, it is subject to site-specific methylmercury fish tissue objectives; the Delta mercury control implementation program; and monitoring provisions that apply to all Delta waterways, Yolo Bypass waterways within the Delta, and also those north of the Legal Delta boundary to which the commercial beneficial use applies (Central Valley RWQCB 2018). The Sacramento River downstream of the Yolo Bypass is also subject to these provisions. Mercury levels in the Sacramento Bypass are driven mainly by the transport of sediment-bound mercury in floodwaters from the Sacramento River. The Delta Methylmercury TMDL was adopted as a Basin Plan Amendment and includes a monitoring and control program to reduce methylmercury and inorganic mercury in the Delta.

Table 3.5-1. Clean Water Act Section 303(d) List of Water Quality Limited Water Bodies

Pollutant	Sacramento Bypass*	Sacramento River (Knights Landing to the Delta)	American River (Nimbus Dam to Sacramento River Confluence)
Mercury	N/A	Yes	Yes
Unknown Toxicity	N/A	Yes	Yes
Dichlorodiphenyltrichloroethane	N/A	Yes	N/A
Bifenthrin	N/A	N/A	Yes
Pyrethrin	N/A	N/A	Yes
Fecal Coliform	N/A	N/A	Yes
Chlordane	N/A	Yes	N/A
Dieldrin	N/A	Yes	N/A
Polychlorinated biphenyl	N/A	Yes	Yes

Source: Central Valley Regional Water Quality Control Board 2014

Groundwater

The groundwater basin underlying the project site is designated by DWR's Bulletin 118 (DWR 2003) as the Yolo Subbasin (Basin Number 5-21.67) of the Sacramento Valley Basin. The Yolo Subbasin boundaries have recently been modified (DWR 2016), but updated descriptions of the hydrogeology of the new basin extents have not been published. This document uses the most recent descriptions in the 2003 Bulletin 118 publication covering the project site.

The Yolo Subbasin is located in the southern portion of the Sacramento Valley Basin, primarily within Yolo County. It is bounded on the east by the Sacramento River, on the west by the Coast Range, on the north by Cache Creek, and on the south by Putah Creek. The basin generally slopes gently from west to east, and elevations range from approximately 400 feet above msl in the west to nearly sea level in the east. Precipitation averages approximately 20 to 24 inches per year in the western portion of the Subbasin and approximately 18 to 20 inches per year in the eastern portion of the Subbasin (DWR 2003).

The project site also lies within a Subbasin defined by the Yolo County Flood Control and Water Conservation District, as the Southern Sacramento River Subbasin in its Groundwater Management Plan (YCFCWCD 2006). This Subbasin designation differs from the boundaries used in DWR's Bulletin 118 and encompasses the eastern part of Yolo County along the Sacramento River and its historic floodplain, including the Sacramento and Yolo Bypasses.

The project site is underlain primarily by: (1) younger sediments of the Red Bluff Formation, floodplain deposits, and stream channel deposits that overlie the Tehama Formation, and (2) older thick alluvial and river sediments of the Tehama Formation. Formations discussed in this section differ from Section 3.2, "Geologic Resources," by referring to the specific physical characteristics of water-bearing formations underlying the project site, rather than the broader geologic context of the region.

Recent stream channel deposits consist of unconsolidated silt, fine- to medium-grained sand, gravel, and occasionally cobbles deposited in and adjacent to active streams in the Subbasin. Floodplain deposits occur along the eastern margin of the Subbasin in the Yolo Bypass area. They consist primarily of silts and clays but may be locally interbedded with stream channel deposits of the Sacramento River. Thickness of the younger alluvium ranges from 0 to 150 feet. The younger alluvium varies from moderately to highly permeable, but often lies above the saturated zone. The saturated zone is the area in an aquifer, below the water table, in which relatively all pores and fractures are saturated with water. Where saturated, the younger alluvium yields significant quantities of water to wells. Adjacent to the Sacramento River, wells completed in ancestral Sacramento River stream channel deposits yield up to 4,000 gallons per minute (gpm).

The Tehama Formation is the thickest water-bearing unit underlying the Yolo Subbasin, ranging in thickness from 1,500 to 2,500 feet. Surface exposures of the Tehama Formation are limited mainly to the Coast Range foothills along the western margin of the Basin, as well as in the Plainfield Ridge. The Tehama Formation consists of moderately compacted silt, clay, and silty fine sand enclosing lenses of sand and gravel, silt and gravel, and cemented conglomerate. Permeability of the Tehama Formation is variable, but generally less than the younger units. Because of its relatively greater thickness, however, wells completed in the unit can yield up to several thousand gpm (Yolo County 2005).

Groundwater Movement

Aquifers are unconfined near the surface and become increasingly confined with depth. There are no regionally continuous barriers to vertical flow, but inter-bedded clays and silts create a cumulative impediment to vertical groundwater flow with increasing depth. Older, deeper sediments also tend to be more compact and therefore less permeable than younger, shallower sediments (DWR 2003). Underlying the Tehama Formation are brackish to saline water-bearing sedimentary units, including brackish sedimentary rocks of volcanic origin underlain by marine sedimentary rocks that are typically of low permeability and contain connate water. The upper contact of these units generally coincides with the fresh/saline water boundary. The contact is found near the Coast Range at depths as shallow as a few hundred feet. Near the eastern margin of the basin it reaches depths of nearly 3,000 feet.

Groundwater-level Trends

Groundwater levels in the Yolo Subbasin are impacted by periods of drought due to increased groundwater pumping and less surface water recharge (e.g., in the late 1970s and early 1990s), but recover quickly in “wet” years. Past studies have concluded that the Yolo Subbasin is subject to overdraft; however, the completion of Indian Valley Reservoir in 1976 provided significant relief in the form of additional available surface water. Developing surface water storage has relieved much of the stress on aquifers beneath Yolo County. Localized groundwater effects are still evident beneath areas dependent on groundwater as a primary water supply. These effects are not found in the project vicinity (YCFCWCD 2006). It is estimated that the area underlying the Yolo Bypass contains over 4 million acre-feet of groundwater in storage (DWR 2003).

Groundwater Quality

Groundwater in the Yolo Subbasin of the Sacramento Valley Basin is characterized by presence of sodium magnesium, calcium magnesium, or magnesium bicarbonate. The quality is generally good for agricultural and municipal uses, though it is “hard” to “very hard” overall. Hardness values

exceeding 180 part per million (ppm) calcium carbonate have been detected in Yolo County groundwater (DWR 2003).

Total dissolved solids (TDS) concentrations give a general sense of water quality. TDS is regulated under a secondary maximum contaminant level (mcl) of 500 milligrams/liter, which is enforceable for delivery to community water systems. Concentrations exceeding 500 ppm have been detected in the Southern Sacramento River Subbasin (Yolo County 2005). (Note: milligrams/liter and ppm are functionally equivalent measures of water quality constituents.)

In general, nitrate concentrations in Yolo County groundwater are less than the California Environmental Protection Agency mcl of 45 ppm. The shallower aquifers in eastern Yolo County have higher nitrate concentrations relative to other locations. Nitrate concentrations averaging over 40 ppm are found in shallower wells located in the Southern Sacramento River Subbasin.

Electrical Conductivity (EC) is generally related to TDS and indicates the number of dissolved ions within the water. EC averages in the shallow aquifer zone are 1,470 micromhos/centimeter (µmoh/cm). EC averages in the intermediate zone are approximately 1,200 µmoh/cm in the Southern Sacramento River Subbasin. EC values decline with depth in this basin (YCFCWCD 2006).

Manganese is a naturally occurring constituent in groundwater and has a secondary mcl of 50 parts per billion (ppb). Within most of Yolo County, manganese concentrations in groundwater are generally below the mcl. Manganese concentrations above 100 ppb have been detected in groundwater on the eastern edge of the county, in the Southern Sacramento River Groundwater Subbasin.

Iron and boron are naturally occurring constituents in groundwater, but boron concentrations can be increased from wastewater, fertilizers, and pesticides. Iron has a secondary mcl of 0.3 ppm for public drinking water systems. Boron is not regulated but is a constituent of concern in agriculture, due to its toxicity to plants at relatively low concentrations. Iron concentrations have exceeded the mcl in some of the groundwater samples taken from wells in the Basin. Notable differences in boron concentrations between zones are also present in the basin, where boron values decline with depth.

3.5.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR concluded construction-related effects to surface water quality would be less than significant and that there would be no impact to groundwater. However, construction contractors would be required to prepare and implement a SWPPP and comply with the conditions of the NPDES general stormwater permit for construction activity. The contractor would be required to obtain a permit from the Central Valley RWQCB detailing a plan to control any spills that could occur during construction. In addition, the contractor would be required to monitor turbidity in the adjacent water bodies, where applicable criteria apply, to determine whether turbidity is being affected by construction and to ensure that construction does not increase turbidity levels above ambient conditions, in accordance with the Central Valley RWQCB Basin Plan turbidity objectives. Finally, an SPCCP would also be prepared and implemented. Surface water quality effects would be reduced to be a less-than-significant level after implementation of avoidance, minimization, and mitigation measures.

Significance Criteria

For this analysis, the Final EIS/EIR identifies significance criteria on p.102.An effect was considered significant if it would:

- Violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality;

- Substantially deplete groundwater supplies or interfere substantially with ground water recharge such that the project may impede sustainable groundwater management of the basin; or

- Alter regional or local flows resulting in substantial increases in erosion or sedimentation.

Two additional significance criteria not included in the ARCF GRR Final EIS/EIR are considered in this analysis. The project could result in a significant effect if it would also:

- 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;

- Risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones; or

- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Issues Not Discussed Further

Methylmercury Impacts— Cache Creek is the major source of mercury to Yolo Bypass and eventually the Delta. The creek has its mouth at the Yolo Bypass several miles upstream of the project site, and mercury from the creek moves through the Yolo Bypass, past the Sacramento Bypass, to reach the Delta. Mercury levels in the Sacramento Bypass are driven mainly by the transport of sediment-bound mercury in floodwaters from the Sacramento and American Rivers. Due to the infrequency of inundation, Sacramento Bypass flows have little influence on overall Delta mercury levels.

Mercury is mainly transported bound to sediment particles, and the amount of sediment in water entering the bypass is a critical determinant of mercury loads. The highest sediment loads typically occur during periods of high runoff when floodwaters are entering the Bypass. When flood conditions are not present, concentrations of sediment-bound contaminants such as mercury would be lower. Although the project would change Sacramento weir operations (i.e., change the volume or timing of floodwaters entering the bypass) it would not change operations of the Cache Creek Settling Basin far upstream, where the majority of mercury in the Yolo Bypass and the Delta originates. Thus, the project would not substantially change the sediment load coming into the bypass, and subsequently would not change the total amount of sediment-bound mercury transported to the Delta.

In the absence of more and higher-quality data (which are being collected as part of the Delta Mercury Control Program), determining the direction and magnitude of changes in methylmercury production in the Sacramento Bypass based solely on the anticipated changes associated with implementation of the project is difficult and highly speculative. Therefore, water quality impacts resulting from mercury are not considered further.

Groundwater Sustainability—The Yolo Subbasin is listed as a high-priority basin according to the Final Statewide Basin Prioritization (DWR 2016i). Under the Sustainable Groundwater Management Act, basins listed as high- or medium-priority must establish Groundwater Sustainability Agencies (GSAs) by June 30, 2017. The GSAs, made up of one or more local agencies overlying a groundwater basin, are required to develop Groundwater Sustainability Plans (GSPs). GSAs responsible for high- and medium-priority basins must adopt GSPs within 5 to 7 years, depending on whether the basin is in critical overdraft. The Yolo Subbasin is not listed as a critically overdrafted basin by DWR (DWR 2016i) thus, a GSP is not required until January 31, 2022. The project would not use groundwater and would have no effect on region-wide groundwater supply or sustainability. Therefore, groundwater supply and sustainability is not discussed further.

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass, and no temporary or short-term construction-related water quality or groundwater effects would occur. As a result, if a flood event were to occur, the Sacramento area would remain at greater risk of a possible levee failure due to seepage, slope stability, erosion, or overtopping, until the future construction of levee improvements. Levee failure could result in the collapse of several miles of levee slopes and alteration of regional and local flows that would result in substantial flooding and widespread inundation of urban, suburban, and agricultural areas around Sacramento. Levee failure also could damage and destroy storm drainage facilities and clog storm drainage pipelines and outfalls within the area of inundation. If a levee overtopping or breach was to occur, floodwaters could be pumped back over levees or would eventually recede back through the levee breach into the waterways (though this could take months to occur). Flooded areas could contain contaminants from stored chemicals, septic systems, and flooded vehicles—all of which would be released into floodwaters and subsequently contaminate the Sacramento River, Delta surface waters, and potentially soil and groundwater. These contaminants would likely exceed acceptable established water quality standards and impair beneficial uses. Substantial increases in erosion and sedimentation would also occur from levee failure. Erosion causing the loss of the levee foundation and eroded topsoil from banks of a river or sloughs would increase turbidity and total dissolved solids in the Sacramento River, and would ultimately affect the environmental resources of the Delta by impairing the beneficial uses of waters of the Delta. All of these effects could be considered significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alternative

Violate Any Water Quality Standards or Waste Discharge Requirements or Otherwise Substantially Degrade Surface or Groundwater Quality, Resulting in Substantial Erosion or Siltation On- or Offsite, or Conflicts with or Obstructing Implementation of a Water Quality Control Plan or Sustainable Groundwater Management Plan

Potential dewatering to facilitate construction activities (e.g., removing groundwater that may fill trenches dug for cutoff wall, road, weir or setback levee construction) could result in erosion and/or release of sediment into surface or groundwater. Excavation could extend to a depth that would expose the water table, creating an immediate and direct path to groundwater that could allow contaminants to enter the groundwater system and indirectly affect water quality. Additionally, earthmoving activities associated with overall project construction could result in erosion or siltation.

Construction activities, including use of staging areas that may be located near the Sacramento River, would involve the use of heavy equipment, cranes, compactors, and other construction equipment that uses potentially harmful products such as fuels, lubricants, hydraulic fluids, and coolants, all of which can be toxic to fish and other aquatic organisms. The use of this equipment could be a direct source of contamination, if proper construction practices are not followed. An accidental spill or inadvertent discharge from construction equipment could directly affect the water quality of the river or other water body in the project area and indirectly affect regional water quality. Therefore, a significant impact on groundwater or surface water quality could result from project construction. Implementation of new Mitigation Measures GEO-1 and HWQ-1 would reduce significant temporary, short-term construction-related erosion impacts and the potential release of contaminants to surface or groundwater during construction to a less-than-significant level by requiring compliance with BMPs to minimize and contain accidental contamination, reduce erosion and sediment transport, and treat dewatering effluent as required by permits.

Substantially Decrease Groundwater Supplies or Interfere Substantially with Groundwater Recharge Such That the Project May Impede Sustainable Groundwater Management of the Basin

No existing groundwater production wells would be used and no new wells would be installed as part of the project. The cutoff wall that would be constructed under the new weir could reduce seepage of Sacramento River water into the shallow aquifer under the Sacramento Bypass. The cutoff wall would cause lower static (non-pumping) groundwater levels on the Sacramento Bypass side of the weir, when the direction of groundwater flow is away from the river (i.e., losing conditions). If a substantial drop in groundwater levels were to occur, that could decrease the yield of nearby wells or increase pumping costs of those wells. Some wells could also experience increased drawdown during pumping periods, because the cutoff walls could partially isolate the wells from the river and reduce the effective volume of the aquifer from which water can be withdrawn. For this to occur, the following conditions would need to be created: 1) the cutoff wall would need to be deep enough to intersect the water-bearing zone tapped by the well, and 2) the cone of depression produced by the well would need to be large enough to reach the cutoff wall. However, because a cutoff wall would only be needed along the new weir alignment and would not be necessary across any other portions of the project site, this relatively short, discontinuous cutoff wall is not expected to reduce local groundwater well water surface elevations. There would be no substantial interruption to existing subsurface flow patterns that currently support groundwater well use on the project site, or to regional groundwater recharge patterns, due to the hydrologic connection to the Sacramento River, upstream and downstream of the new weir location. Therefore, this impact would be less than significant.

Create or Contribute Runoff Water Which Would Exceed the Capacity of Existing or Planned Stormwater Drainage Systems or Provide Substantial Additional Sources of Polluter Runoff

The flood system improvements proposed as part of the project would change the drainage pattern of the project area; however, they would not create substantial new pavement or impervious surfaces. The project would therefore not create new runoff water compared to existing conditions. This impact would be less than significant**.**

The project would place the new setback levee on existing agricultural lands, requiring modifications to any existing agricultural drainage facilities in this small area, including ditches, canals, and pumps. The new setback levee and weir would modify the existing drainage patterns at the project site, but not in a manner that would cause substantial erosion, siltation, or contribute stormflows that

would exceed the capacity of the existing or planned drainage system during project operations. Because one of the project objectives is to expand the overall Sacramento Weir and Bypass conveyance capacity, there would be flooding over the expanded bypass floodplain area during high-flow conditions. The Sacramento Bypass would still receive floodwaters during managed (existing weir) and passive (widened weir) overflow of the Sacramento River and any remaining local agricultural drainages would still receive normal return flows and stormflows. The project design and grading plan minimize erosion- and siltation-related impacts during and after flood flows (which would also include stormwater flows) in the expanded Bypass to less-than-significant levels. Therefore, this impact would be less than significant.

Risk Release of Pollutants Due to Project Inundation in Flood Hazard, Tsunami, or Seiche Zones

The possibility of a seiche (standing wave) occurring at the project site is low, because the geometry of the bypasses and adjacent river, and distance to seismic sources, generally are not conducive to the occurrence of a seiche. Additionally, the project area is not within a mapped tsunami hazard zone (DOC 2019). The project would include improvements to the levee and bypass system to minimize the risk of levee failure, inundation, and associated potential release of pollutants in the region during a flood event. Therefore, this impact would be less than significant.

3.5.3 Avoidance, Minimization, and Mitigation Measures

The following measure is consistent with mitigation identified in the ARCF GRR Final EIS/EIR.

Mitigation Measure: Implement Mitigation Measure GEO-1: Acquire Appropriate Regulatory Permits and Prepare and Implement a Storm Water Pollution Prevention Plan, Spill Prevention Control and Countermeasures Plan.

Please refer to Section 3.2.3 for the full text of this mitigation measure.

The following measure augments the mitigation identified in the ARCF GRR Final EIS/EIR at pages 106 to 108. If the project is constructed, USACE will implement the following measure:

Mitigation Measure HWQ-1: Obtain Appropriate Discharge and Dewatering Permit and Implement Provisions for Dewatering.

Before discharging any dewatered effluent to surface water, USACE shall obtain a Low Threat Discharge and Dewatering NPDES permit or an Individual Permit from the Central Valley RWQCB, if the dewatering is not covered under the RWQCB's NPDES Construction General Permit. The dewatering permit includes extensive water quality monitoring to adhere to the strict effluent and receiving water quality criteria outlined in the permit. As part of the permit, the permittee shall design and implement measures, as necessary, to meet the discharge limits identified in the relevant permit. For example, if dewatering is needed during cutoff wall construction, the dewatering permit would require treatment or proper disposal of contaminated water prior to discharge. These measures shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable.

Implemented measures could include temporary retention of dewatering effluent until particulate matter has settled, use of infiltration areas, and other BMPs. Final selection of water quality control measures would be subject to approval by the Central Valley RWQCB. USACE shall verify that

coverage under the appropriate NPDES permit has been obtained before allowing dewatering activities to begin. USACE, or an authorized agent, shall perform routine inspections of the construction area to verify that the water quality control measures are properly implemented and maintained. USACE shall notify its contractors immediately if there is a non-compliance issue and shall require compliance.

3.6 Vegetation and Wildlife

3.6.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some updated and supplemental information is presented below.

Habitat types on the project site are shown in Figure 3.6-1. The project site is dominated by agricultural lands, primarily English walnut (*Juglans regia*) orchard. The eastern portion of the project site includes the Sacramento River and valley oak (*Quercus lobata*) woodland along the riverbank. This woodland area is dominated by valley oak, California black walnut (*Juglans hindsii*), Fremont's cottonwood (*Populus fremontii*), Oregon ash (*Fraxinus latifolia*), Goodding's black willow (*Salix gooddingii*), and box elder (*Acer negundo*). Nonnative trees, including black locust (*Robinia pseudoacacia*) and northern catalpa (*Catalpa speciosa*), are present in low density along the Sacramento River. A shrub layer is generally absent, but where present, is primarily composed of California wild rose (*Rosa californa*). Numerous California black walnut trees also occur along the Sierra Northern Railway. Riparian woodland occurs adjacent to the Sacramento Bypass North Levee, in the southwestern portion of the project site. This area supports similar species as the oak woodland habitat along the Sacramento River but is not dominated by valley oak. All of these woodland habitats are considered forestland (as defined in California Public Resources Code [PRC] Section 12220[g]). Herbaceous ground cover in grassland and woodland areas on the project site is dominated by non-native annual grasses, including ripgut brome (*Bromus diandrus*), soft chess (*B. hordeacous*), wild oat (*Avena fatua*), and Italian ryegrass (*Festuca perennis*).

Based on the jurisdictional aquatic resource delineation completed for the project site on July 30, 2019, 25.03 acres of open water habitats that are potential jurisdictional waters of the United States occur onsite. These open water habitats include the Sacramento River and Tule Canal. These features are also considered waters of the state, subject to regulation by the Central Valley Regional Water Quality Control Board (RWQCB).

Woodland habitats on the project site provide foraging and nesting habitat for avian species and common mammals, and trees along the river also provide shade for native and non-native fish species. Although habitat value is somewhat diminished by the volume of vehicular traffic associated with Old River Road and the intermittent use of the railway line, woodland habitat adjacent to the Sacramento River provides a critical remnant corridor of riparian vegetation for resident, migratory, and dispersing wildlife.

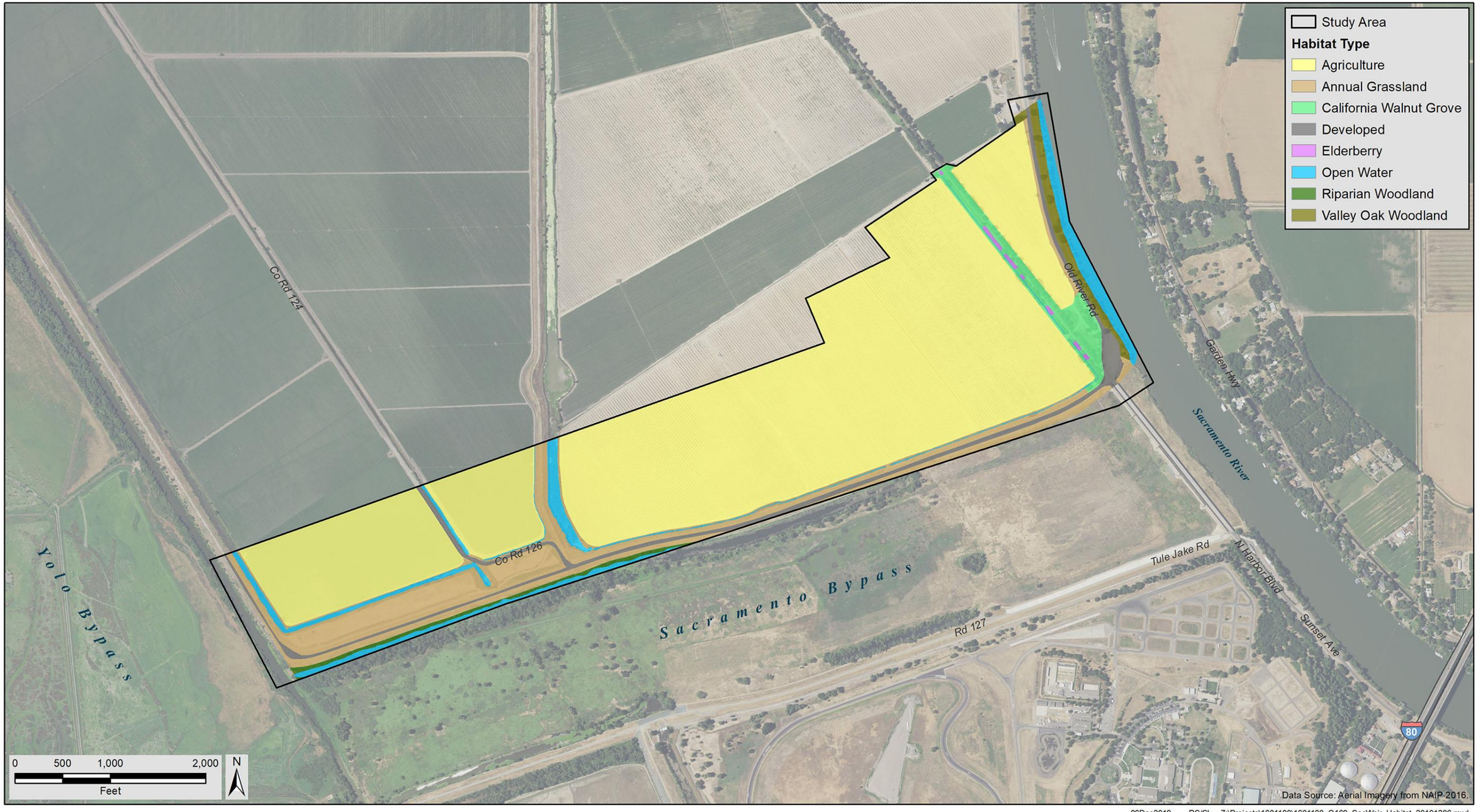


Figure Source: GEI Consultants, Inc. 2019.

Figure 3.6-1. Habitat Types on the Project Site

3.6.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR indicated that habitat within the existing Sacramento Bypass would remain the same as the existing conditions but would be expanded by approximately 300 acres. It was assumed that the additional land would be converted to open space that would provide habitat similar to that of the existing bypass. The existing Sacramento Bypass is waters of the United States, and the bypass expansion area would become waters of the United States. Construction activities would likely cause wildlife within and adjacent to the disturbance areas to temporarily relocate to nearby areas, but because wildlife was expected to return to the Sacramento Bypass following construction, this impact was determined to be less than significant.

The ARCF GRR Final EIS/EIR estimated 8 acres of scattered trees within the footprint of the new weir would be removed, including approximately 2,300 linear feet of vegetation along the Sacramento River, to allow the river to flow freely into the weir. The ARCF GRR Final EIS/EIR did not indicate what species would be removed, but vegetation along this portion of the Sacramento River includes oak woodland dominated by valley oak, California black walnut, Fremont's cottonwood, Oregon ash, Goodding's black willow, and box elder. It was estimated that 16 acres of mitigation plantings would be required to compensate for vegetation removal along the Sacramento River and within the new weir footprint. Because these plantings would take a long time to provide the same value of habitat as those removed, the short-term impact on vegetation and wildlife was determined to be significant and unavoidable.

Significance Criteria

Significance criteria listed below have been updated to reflect the most current CEQA Guidelines. For this analysis, an effect was considered significant if it would result in:

- Substantial loss, degradation, or fragmentation of any natural communities or wildlife habitat;

- Substantial effects on a sensitive natural community, including state or Federally protected waters of the United States, including wetlands;

- Substantial reduction in the quality or quantity of important habitat, or access to such habitat for wildlife species; or

- Substantial conflict with tree preservation policies or ordinances or provisions of an adopted Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP).

Effects Analysis

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass. As a result of this alternative, there would be no construction-related effects on vegetation or wildlife in the project area.

Without improvements to the levee system, the risk of levee failure would remain high. Under this alternative, a catastrophic flood event could cause portions of the levees protecting metropolitan Sacramento to fail, triggering widespread flooding and extensive damage. If flood fighting becomes necessary or a levee failure occurs, there would likely be substantial adverse effects on vegetation, including Sacramento's urban tree canopy, and terrestrial wildlife. Because the potential for such occurrences is uncertain, and the timing, magnitude, and duration of any flood-fighting or flood event are speculative and unpredictable, a precise determination of significance under this alternative is not possible.

Proposed Action and Higher Weir Elevation Alternative

Adverse Effects on Riparian Habitat, Forestland, and Waters of the United States

Based on the tree inventory completed in July 2019, approximately 6 canopy acres of valley oak woodland (288 trees) along the Sacramento River would be removed during project construction. This woodland can be considered riparian habitat, because of its riverside location. The approximately 7.45 acres of riparian woodland located along the Sacramento Bypass North Levee in the southwestern portion of the project site would not be removed or impacted by project construction.

Approximately 12.5 acres (210 trees) of California walnut grove along the railroad also would be removed during project construction. This habitat is also anticipated to be considered riparian habitat by USFWS. The 12.5 acres of California walnut grove and the 6 acres of oak woodland also qualify as forestland, as defined in California PRC Section 12220[g]). Removal of approximately 18.5 acres of riparian forestland would be a significant impact.

Implementing Mitigation Measure VEG-1 would compensate for riparian habitat removal, including the oak woodland habitat and California walnut grove, by planting twice as much replacement habitat as habitat that is removed. In addition, shrubby riparian habitat would likely regenerate naturally in the bypass expansion area. Areas of the existing Sacramento Bypass North Levee in the vicinity of Tule Canal are colonized with valley oak, Oregon ash, Fremont's cottonwood, and willow species. Natural recruitment of tree species within the bypass expansion is also probable. Species likely to colonize the higher elevations of the bypass expansion area include coyote brush (*Baccharis pilularis*), California wild rose, and willow (*Salix* spp.). Low-lying elevations of the bypass expansion area may be more prone to colonization by herbaceous species including annual grasses and sedges, such as tall nut sedge (*Cyperus eragrostis*) and Santa Barbara sedge (*Carex barbarae*), and rushes, including common rush (*Juncus effusus*) and toad rush (*J. bufonius*). As indicated in the ARCF GRR Final EIS/EIR, mitigation could be implemented in the expanded bypass, other nearby available lands, or through the purchase of credits at an approved mitigation bank. Specific lands for compensation have not been identified but would provide similar habitat to that being impacted. However, because it would take many years for compensation habitat to provide the value of habitat that would be removed, the short-term habitat loss would remain significant, as determined in the ARCF GRR Final EIS/EIR.

The LEBLS drainage ditch may require alteration to ensure it functions effectively as a fish passage channel. This feature is subject to state and Federal jurisdiction under section the Clean Water Act. Construction activities also could introduce pollutants into other open water habitats on or adjacent to the project site, including canals, the Sacramento River, and the Sacramento Bypass (e.g., via erosion, sedimentation, or accidental spills of construction materials). Fill and alteration of drainage ditches and potential degradation of additional open water habitat could be a significant impact. Implementing new

Mitigation Measure WATERS-1 and new Mitigation Measure GEO-1 (described in Section 3.2, "Geological Resources") would reduce significant permanent, temporary, and short-term construction-related effects on state and Federally protected waters to a less-than-significant level by avoiding and minimizing the potential for erosion; excess levels of turbidity; and water quality impairment due to spills, leaks, or other sources of toxic substances used during project activities and compensating for unavoidable impacts.

Conflict with Tree Preservation Policies or Ordinances or Provisions of an Adopted Habitat Conservation Plan or Natural Community Conservation Plan.

Yolo County does not have a mandatory tree protection ordinance. However, it promotes oak woodland and riparian preservation through the voluntary Oak Woodland Conservation and Enhancement Plan (Yolo County Parks and Natural Resources Management Division 2007). In addition, the Conservation and Open Space Element of the 2030 General Plan (County of Yolo 2009) includes a policy to protect riparian areas and maintain wildlife values. Removing approximately 6 acres of oak woodland along the Sacramento River would conflict with these preservation efforts. Expanding the Sacramento Bypass is anticipated to enhance overall habitat values for some species, by increasing the amount of natural vegetation, primarily grassland but potentially including shrubby riparian vegetation that may naturally become established at higher elevations in the new bypass area. This natural vegetation would provide higher-quality cover and forage for common wildlife species, compared to the orchards and other agricultural crops currently grown in the area. Species that are dependent on oak woodland could experience a long-term loss of onsite habitat, if similar vegetation does not naturally become established in the new bypass area. However, off-site planting of mitigation habitat of a similar type within the project region would compensate for on-site woodland loss in the long term by ensuring the project does not result in a permanent regional loss of habitat or substantial decline in associated wildlife species populations. Therefore, this impact would be less than significant with implementation of Mitigation Measure VEG-1.

The project site is within the plan area for the Yolo HCP/NCCP (Yolo Habitat Conservancy 2018). The primary purpose of this plan is to provide for the conservation of covered species and the natural and seminatural communities upon which they depend, while accommodating appropriate and compatible economic growth and development. Nearly all of the project site is identified as lower priority for acquisition of conservation lands; the small portion that overlaps the existing Sacramento Bypass is Category 2 Baseline Public and Easement Lands. Project implementation would primarily result in land use conversions rather than loss of habitat (e.g., conversion of orchard to other agricultural crops or grassland habitat). Although some woodland habitat for covered species would be removed, expanding the Sacramento Bypass would enhance overall habitat values, and implementing Mitigation Measure VEG-1 would compensate for woodland loss in the long term. The project site would continue to provide habitat for covered species after project implementation, and habitat values for some species would likely be improved by orchard removal and natural regeneration of wetlands and riparian vegetation in the expanded bypass. In addition, applicable measures to avoid and minimize impacts on covered species would be implemented, as described in Section 3.5.3. Therefore, implementing the project would not jeopardize the implementation or efficacy of the Yolo HCP/NCCP and this impact would be less than significant with mitigation.

3.6.3 Avoidance, Minimization, and Mitigation Measures

The following measures are consistent with and augment mitigation identified in the ARCF GRR Final EIS/EIR.

Mitigation Measure VEG-1: Compensate for Riparian and Woodland Habitat Removal.

If the project is implemented, USACE will compensate for riparian and woodland habitat removal. Replacement habitat shall be created at a 2:1 ratio, in accordance with the ARCF GRR Habitat Mitigation, Monitoring, and Adaptive Management Plan, which includes conceptual mitigation proposals, performance standards, and adaptive management tasks.

Mitigation Measure GEO-1: Acquire Appropriate Regulatory Permits and Prepare and Implement a Storm Water Pollution Prevention Plan, Spill Prevention Control and Countermeasures Plan, and Associated Best Management Practices.

Please refer to Section 3.2.3 for the full text of this mitigation measure.

The following new mitigation measure has been added to compensate for fill and avoid and minimize degradation of state and Federally protected waters.

Mitigation Measure WATERS-1: Compensate for Fill of state and Federally Protected Waters.

If the project is implemented, USACE will compensate for fill of state and Federally protected waters to ensure the project causes no net loss of functions and values, in compliance with the Clean Water Act. Water quality certification pursuant to Section 401 of the Clean Water Act (CWA) shall be obtained from the Central Valley RWQCB before starting project activities. Any measures determined necessary during the permitting processes shall be implemented, such that there is no net loss of functions and values of jurisdictional waters.

Mitigation may be accomplished through habitat replacement, enhancement of degraded habitat, off-site mitigation at an established mitigation bank, contribution of in-lieu fees, or other method acceptable to the regulatory agencies, such that there is no net loss of waters of the United States. If compensation is provided through permittee-responsible mitigation, a mitigation plan shall be developed to detail appropriate compensation measures determined through consultation with USACE and Central Valley RWQCB, methods for implementation, success criteria, monitoring and reporting protocols, and contingency measures to be implemented if the initial mitigation fails.

3.7 Fisheries

3.7.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Sections 3.7 “Fisheries” and 3.8 “Special Status-Species” of the ARCF GRR Final EIS/EIR contain existing conditions information for the Sacramento Bypass and Sacramento River and detailed descriptions of the life history and habitat requirements of fish species considered in this analysis. Some updated and supplemental information is presented below.

The aquatic resources and fisheries study area for the project includes the Sacramento River in the vicinity of the Sacramento Weir, the Sacramento Bypass, and the Yolo Bypass. Although the Sacramento Bypass is the primary region expected to be affected by the project, changes in the frequency, duration, and volume of water spilling into the Sacramento and Yolo Bypass from the Sacramento River could affect conditions in adjacent areas.

The Yolo Bypass is an engineered floodplain. Floodwater from the Sacramento River passing over Fremont Weir initially flows through the Toe Drain (Tule Canal) before overflowing onto the floodplain. The Tule Canal is a perennial, tidally influenced riparian channel running along the eastern edge of the Yolo Bypass and is the primary source of perennial water in the bypass during drier periods. Floodwaters from the Yolo Bypass re-enter the Sacramento River through Cache Slough.

Flow over the Fremont Weir is the primary flow input to the Yolo Bypass in the north, conveying floodwaters from the Sacramento River, Feather River, and the Sutter Bypass. During major storms, when Sacramento River stage rises above 27.5 feet above msl (29.9 feet NAVD88) at I Street, additional water enters the Yolo Bypass from the east via Sacramento Weir, including water from the Sacramento and American Rivers (DWR 2010).

Flow also enters the Yolo Bypass from several west-side streams, including Cache Creek, the Willow Slough Bypass, and Putah Creek. During high-flow conditions, flow also enters the Yolo Bypass through the Knights Landing Ridge Cut, which is a manmade canal that drains agricultural water and ephemeral streams in the Colusa Basin (CDFW 2016). These tributaries can add substantial flow to floodwaters in the Yolo Bypass and provide localized floodplain inundation prior to Fremont Weir spilling. During periods when no flow enters the Yolo Bypass from the Fremont Weir, substantial short-term (e.g., 1 to 3 weeks) flooding can occur from these tributaries (Sommer et al. 2014).

The Yolo Bypass supports multiple aquatic habitats, including stream and slough channels, as well as flooded shallow water. These diverse habitats provide opportunities for fish migration, spawning, and rearing (CALFED 2014). The Yolo Bypass is inundated to some extent about 70 percent of all years when total flow in the Sacramento River exceeds about 56,270 cfs (Yolo Bypass Working Group et al. 2001). The Yolo Bypass has inundated as early as October and as late as June (Yolo Bypass Working Group et al. 2001), but the typical period of inundation has been between January and March (Sommer et al. 2001).

The Yolo Bypass ranges from approximately 1.2 to 6 miles wide over its approximately 40 miles length. When flooded, the entire Yolo Bypass is considered to be floodplain habitat, providing up to approximately 59,300 acres of shallow floodplain habitat, at a typical mean depth of 6.5 feet or less (Sommer et al. 2008).

The Yolo Bypass is an important migratory pathway for downstream migrating Chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), and other native, anadromous fish during wet years (Sommer et al 2001). Although many species are presumed to spawn in the Yolo Bypass (Harrell and Sommer 2003; Sommer et al. 2004), most of these are thought to spawn in deeper channels, such as the Toe Drain/Tule Canal or in upstream tributaries to the Yolo Bypass. However, within the Sacramento River Basin, the Yolo Bypass is one of the most important known spawning areas, along with the Sutter Bypass, for Sacramento splittail (*Pogonichthys macrolepidotus*) (Moyle et al. 2004).

Sommer et al. (2001a) found that seasonal floodplain habitat within the Yolo Bypass also provided better rearing conditions for outmigrating anadromous salmonids than nearby Sacramento River sites, because of the increased area, complexity of suitable habitat, and increased food resources. This study concluded that these conditions allowed juvenile Chinook salmon to grow substantially faster in the Yolo Bypass, primarily because of a greater abundance of invertebrate prey in the inundated floodplain under certain conditions (Sommer et al. 2001a).

Analysis of beach seine fish catch data in the Yolo Bypass during a wet year (2011) and a dry year (2012) indicates that although non-native fish species dominate the fish assemblage in the Yolo Bypass, native fishes were more widely distributed during the wet year (Frantzich et al. 2013).

Special-status fish species and populations potentially occurring in the study area were identified based on the online NMFS species list (NMFS 2019) and existing information on fish populations in the study area. The biological resources assessment provided in Appendix B includes the NMFS species list and a table with information on special-status fish species evaluated in this Supplemental EIS/EIR. Additional fish species considered in this Supplemental EIS/EIR include non-native fish species that are known to inhabit the study area and that could affect special-status species through predation, competition for food resources, or ecosystem alteration.

3.7.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIR/EIS concluded there would be no significant or adverse impact on native fish populations associated with long-term O&M because these activities would be consistent with current O&M actions in the existing weir and bypass. It also concluded there would be no significant direct or indirect effects to native fish populations during construction, because construction would occur during the dry season, when no water would be flowing through the project site from the Sacramento River and fish would not be present.

The ARCF GRR Final EIS/EIR determined that widening the weir and bypass would increase entrainment and stranding exposure of juvenile green sturgeon (*Acipenser medirostris*) and increase the attraction rate of sturgeon, salmon, and steelhead. When the weir is overtopping and water is flowing down the bypass, adult fish are attracted to the flow and follow it upstream in an attempt to reach their holding and spawning habitat. There is no evidence of sturgeon being present in the bypass. However, there is potential that widening the weir and bypass would increase the amount of water going over the weir and increase the attraction rate of sturgeon, salmon, and steelhead. Population viability modeling concluded that without the fish rescue that was conducted in 2012 during a period of flooding at the Fremont and Tisdale weirs, the loss of the green sturgeon stranded behind the weirs would have significantly reduced species viability and increased extinction risk (Thomas et al, 2013). The Sacramento Weir poses a similar risk and widening the weir would add to the risk. Without fish passage in place, stranding rates at the Sacramento Weir would increase. This impact was determined to be significant, especially for sturgeon, but the ARCF GRR Final EIS/EIR concluded that implementing mitigation measures, including ensuring fish passage and positive drainage through the Sacramento Bypass, would reduce these effects to less than significant.

Non-native species may exploit the warm water temperature in the expanded shallow bypass habitat and prey on special-status species; however, the ARCF GRR Final EIS/EIR determined that despite the risk of predation, the additional inundation of shallow water habitat would result in a net benefit. Although floodplain habitat carries risks from avian predation when water levels drop, the ARCF GRR Final EIS/EIR concluded predation by wading birds such as egrets and herons is unlikely to have a major population effect, because the densities of wading birds are typically low relative to the amount of available fish rearing habitat.

Significance Criteria

For this analysis, an effect was considered significant if it would:

- 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;
- Have an adverse effect on a species' designated critical habitat;
- Substantially reduce the habitat of a fish population; and/or
- Cause a fish population to drop below self-sustaining levels.

Effects Analysis

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass. As a result of this alternative, there would be no project-related effects on fish species in the project area.

Without improvements to the levee system, the risk of levee failure would remain high. Under this alternative, a catastrophic flood event could cause portions of the levees to fail, triggering widespread flooding and extensive damage in central Sacramento. If flood fighting becomes necessary or a levee failure occurs, there would likely be substantial adverse effects on special-status and other native fish species. Because the potential for such occurrences is uncertain, and the timing, magnitude, and duration of any flood-fighting or flood event are speculative and unpredictable, a precise determination of significance under this alternative is not possible.

Proposed Action and Higher Weir Elevation Alternative

Potential Impacts to Fish Passage

The project would include construction and O&M of a fish passage structure at the new weir, and a fish passage channel connecting to the Tule Canal as water levels drop. When the new weir begins to spill, the automated fish passage structure would be operated on the descending limb of the hydrograph, attracting fish to the passage structure and allowing them to return to the Sacramento River. Even with the inclusion of a fish passage structure, migration delays to listed species could occur; however, migration delays and stranding would improve with the fish passage structure at the new weir, compared to existing conditions, under which fish currently become stranded at the existing weir. The fish passage structure would allow some fish that could have otherwise been stranded at the existing weir to find passage through the new weir. This would be a beneficial impact. Mitigation Measure FISH-3 would further improve operations by requiring development and implementation of a fish rescue plan.

Operation and Maintenance for Fish Passage

Following completion of the fish passage structure and channel, a suite of O&M activities would be required to ensure that the structure and channel continue to function as intended. These activities

would occur on an as-needed basis but would primarily focus on times surrounding overtopping/inundation events. Specific O&M activities to support adequate operation of the fish passage structure and channel are not known at this time, but would be developed in consultation with NMFS, USFWS, and CDFW, and could include sediment, debris, and vegetation removal, and fish rescue. Removal of debris and sediment may be necessary following each inundation event to ensure optimum functionality. Potential impacts associated with the long-term O&M of the fish passage structure and channels would be significant and could include water quality degradation, habitat disturbance and alteration (including designated critical habitat), and other direct and indirect impacts. Incorporation of Mitigation Measures FISH-1, and GEO-1 would reduce these impacts to a less-than-significant level.

Potential Increase in Stranding

Widening of the weir does not increase the number of times the Sacramento Bypass would inundate in a given year, but under some circumstances, the project may prolong an inundation event. Section 3.4, "Hydrology and Hydraulics," provides an analysis of how inundation of the Sacramento Bypass would change with the Proposed Action or Higher Weir Elevation Alternative; based on this analysis, prolonged inundation events as a result of the project are anticipated to be rare.

Although grading of the existing Sacramento Bypass is not part of the project, the fish passage channel in the expanded bypass would provide a route for fish to directly reach the Tule Canal. The potential increase in stranding exposure is primarily related to the increase in the quantity and expanse of water coming over the widened Sacramento Weir and subsequent increase in attraction flow. This increase in attraction flows may result in an increase in the number of individual salmonids or sturgeon present in the Sacramento Bypass at risk of becoming stranded when waters recede. The increase in overtopping flows is anticipated to most commonly affect out-migrating juvenile salmonids and green sturgeon. However, the increased attraction flows are more likely to impact adult migratory species. The additional entrainment of juveniles into the Sacramento and Yolo Bypasses is generally considered to be a beneficial impact as a result of increased growth rate and access to rearing habitats, as described in the ARCF GRR Final EIS/EIR. However, the potential for more individuals to enter the bypass system significantly increases the risk of strandings. Nevertheless, the fish passage channel would be designed, monitored, and maintained to have positive drainage and decrease stranding potential. Additionally, the expanded portion of the bypass would be graded so that there are no depressions where fish could become stranded. Implementing Mitigation Measures FISH-1 and FISH-3 would further reduce this impact to a less-than-significant level by limiting in-water work to specified windows and specifying fish rescue actions in a fish rescue plan.

Impacts of River Stage on Critical Habitat

Effects of river stage changes in the Sacramento Bypass and Sacramento and American Rivers are discussed quantitatively in Section 3.4, "Hydrology and Hydraulics." The Sacramento Bypass is designated critical habitat for spring-run Chinook salmon and Central Valley steelhead, and the adjacent Yolo Bypass and Sacramento River are critical habitat for green sturgeon and winter-run Chinook salmon. Changes in stage only occur during flood conditions, when the Fremont and Sacramento weirs are operating. In these circumstances, a slight reduction in stage occurs in the Sacramento and American Rivers, and there is a slight increase in stage in the Sacramento Bypass. These reductions occur while the rivers are at or near flood stage and would not impact habitat quantity, quality, or accessibility. These increases and reductions divert more water onto the floodplains of the Yolo and

Sacramento Bypasses, which more closely resembles historic conditions and is widely accepted to be beneficial to special-status fish species. The diversion of water into the expanded Sacramento Bypass would be beneficial to special-status fish species and habitat.

Impact of Construction and Erosion Control Measures on Critical Habitat

Construction of the project would impact 6.2 acres of aquatic critical habitat, including Shaded Riverine Aquatic (SRA) habitat.

Erosion control measures would be used to stabilize the bank, protect the weir structure, and avoid future impacts to critical habitat. The placement of riprap or other stabilizing materials would take place upstream of and along the waterside of the new weir (See Figure 2-1 in Chapter 2, "Alternatives,") within designated critical habitat for spring-run Chinook salmon, winter-run Chinook salmon, Central Valley steelhead, and green sturgeon. Quarry stone riprap, or another acceptable alternative (e.g., buried rock, articulated concrete blocks, pyramat) would be applied to protect against erosion. Excavators would be used to place the embankment protection material from the levee crown or the waterside of the levee as per design. For waterside erosion protection on the bank of the Sacramento River, embankment protection material could be placed from barge-mounted equipment, and construction areas below the OHWM of the Sacramento River could be dewatered during construction. Erosion protection material may also be placed at the connection from the fish passage channel to the Tule Canal. The exact quantities and location of material to be placed will be determined in coordination with regulatory agencies during the permitting process. Implementing Mitigation Measures FISH-1, FISH-3, HWQ-1, and GEO-1 would reduce this impact to a less-than-significant level by limiting in-water work windows, identifying actions to avoid dewatering and construction impacts to individual fish and requiring measures to prevent introduction of sediment or contaminants into the waterway.

Bank armament is used to reduce riverbank erosion in developed riparian corridors. Although commonly used to armor banks, riprap affects native fishes and stream function. Riprap may provide habitat for juvenile salmonids and bolster densities on reaches of streams that have been severely degraded. However, riprap does not provide the intricate habitat requirements for multiple age classes or species provided by natural vegetated banks. Armored streambanks have fewer undercut banks, less low-overhead cover, and are less likely than natural stream banks to contribute large woody materials to the stream. The placement of erosion control measures within designated critical habitat would be a significant impact. Implementing Mitigation Measure FISH-2 would reduce this impact to a less-than-significant level by ensuring compensation for habitat loss.

The waterside vegetation on the Sacramento River is valuable SRA habitat for special-status fish species, primarily in the juvenile and rearing life stages. SRA habitat is defined as the near shore aquatic area occurring at the interface between a river and adjacent woody riparian habitat. The principal attributes of this valuable cover type include: (1) the adjacent bank being composed of natural, eroding substrates supporting riparian vegetation that either overhangs or protrudes into the water; and (2) the water containing variable amounts of woody debris, such as leaves, logs, branches, and roots, as well as variable depths, velocities, and currents. This impact would be significant. Implementing Mitigation Measure FISH-2 would reduce the impact on SRA to a less-than-significant level by ensuring compensation for habitat loss.

3.7.3 Avoidance, Minimization, and Mitigation Measures

The following mitigation measures specific to special-status fish species are consistent with those presented in the ARCF GRR Final EIS/EIR.

Mitigation Measure FISH-1: In-water Work Window.

If the project is implemented, in-water construction will be restricted to a work window of August 1 through November 30 or as otherwise specified by NMFS in the revised Biological Opinion. The work window may be adjusted on a site-specific basis with concurrence by NMFS, taking into account periods of low fish abundance and in-water construction outside the principal spawning and migration season. The typical construction season generally corresponds to the dry season, but construction may occur outside the limits of the dry season, only as allowed by applicable permit conditions.

Mitigation Measure FISH-2: Shaded Riverine Aquatic and Aquatic Habitat.

If the project is implemented, resource agencies will be consulted during the Section 7 process to identify suitable habitat mitigation for SRA and aquatic habitat. If habitat replacement is defined as the desired mitigation during the Section 7 process, habitat would be replaced at a minimum 1:1 ratio, either onsite, offsite, or at a mitigation bank, as deemed appropriate. Habitat mitigation could consist of other actions to improve conditions for affected fish species as agreed to by USACE and NMFS during Section 7 consultation.

For critical habitat impacted by construction, the measures set forth in the Final EIS/EIR (pp. 193-194) remain appropriate and would be implemented

- Compensation timing refers to the time between the initiation of construction at a particular site and the attainment of the habitat benefits to protected species from designated compensation sites. In general, compensation time is the time required for on-site plantings to provide significant amounts of shade or structural complexity. Significant long-term benefits have often been considered by resource agencies, such as NMFS, as appropriate to offset small short-term losses in habitat for listed species in the past, as long as the overall action contributes to recovery of the listed species. The authority to compensate prior to or concurrent with project construction is given under WRDA 1986 (33 United States Code [USC] §§ 2201–2330).

- For identified designated critical habitat, where feasible, all efforts will be made to compensate for impacts where they have occurred or in close proximity. Impacts to designated critical habitat, SRA habitat, and in stream components combined and the compensation value of replacement habitat will be based on a methodology approved by the resource agencies, including NMFS.

Compensation sites would be monitored, and vegetation would be replaced as necessary based on performance standards in the Habitat Mitigation and Monitoring Plan (HMMP), as detailed in Appendix I of the ARCF GRR Final EIS/EIR or based on other performance standards agreed to by USACE and NFMS. The Sacramento Weir Widening project would impact up to 6.2 acres of SRA and critical aquatic habitat in the Sacramento River, which is designated as critical habitat for green sturgeon and winter-run Chinook salmon.

The ARCF GRR Final EIS/EIR includes mitigation measures related to a Habitat Mitigation and Monitoring Plan (HMMP). Those HMMP-related actions which have not already been completed by USACE (including the purchase of critical habitat mitigation credits for green sturgeon) have been removed and replaced by Mitigation Measure FISH-2 for the Sacramento Weir widening, which calls for actions to be taken in accordance with the results of the Section 7 consultation between USACE and NMFS.

The following is a new mitigation measure not included in the ARCF GRR Final EIS/EIR.

Mitigation Measure FISH-3: Fish Rescue Plan.

USACE and CVFPB will consult with NMFS, USFWS, and CDFW during the project permitting process to develop and approve a fish rescue plan for construction and operation of the project. At a minimum, the plan will identify monitoring scenarios, action triggers, capture/handling methodologies, relocation procedures, and reporting. Methods for capture may include but are not limited to electrofishing and seining. The plan shall specify when a trained biologist will be onsite, and in the event of any project-related special-status fish stranding events, the biologist will stop work and immediately contact resource agencies.

3.8 Special-status Plant and Terrestrial Wildlife Species

This section addresses special-status plant and wildlife species. Special-status fish are addressed in Section 3.7, “Fisheries.”

3.8.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some updated and supplemental information is presented below.

Special-status species evaluated for potential to occur on or adjacent to the project site were identified based on review of a current USFWS species list (USFWS 2019); information available from the California Natural Diversity Database (CNDDB) (CDFW 2019) and California Native Plant Society online inventory (CNPS 2019); and results of focused surveys conducted in recent years to support project planning and implementation for the LEBLS and Bryte Landfill Remediation projects. The biological resources assessment provided as Appendix B includes the USFWS species list, database and inventory search results, tables providing updated information on each special-status plant and wildlife species that was evaluated, and a figure showing CNDDB occurrences in the project vicinity.

Based on the review of existing documentation and observations made during the field survey, habitat for most of the special-status plant species that were evaluated is absent from the project site. Three vascular plants were determined to have potential to occur on the project site: woolly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis*) has potential to occur along the Sacramento River, and Suisun marsh aster (*Symphyotrichum lentum*) and Sanford’s arrowhead (*Sagittaria sanfordii*) have potential to occur in the Sacramento Bypass. These species were not observed during special-status plant reconnaissance surveys conducted in LEBLS project area during the relevant blooming periods in 2017. However, these surveys did not cover all portions of the project site, including the eastern portion of the project site along the Sacramento River or the Sacramento Bypass. Therefore, potential for these species to occur onsite cannot be dismissed.

Mapping of elderberry shrubs on the project site was conducted in July, September, and October 2019 to facilitate evaluation of potential impacts on valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). Multiple areas of elderberry shrub thicket occur along the railroad; these areas are very densely vegetated and support an unknown number of elderberry shrubs interspersed with Himalayan blackberry (*Rubus armeniacus*) and California rose (*Rosa californica*). Additional wildlife species that have potential to occur on or adjacent to the project site include giant garter snake (*Thamnophis gigas*) and several special-status bird and bat species. The project site does not support suitable nesting habitat for western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), but the species could use the area as stop over habitat during migration. Surveys conducted for the LEBLS and Bryte Landfill Remediation projects in 2017-2019 documented active Swainson's hawk (*Buteo swainsonii*) nests immediately adjacent to the project site, and the CNDDB includes a recently active nest in oak woodland on the project site. No other special-status species or evidence of their occurrence were documented, although the LEBLS and Bryte Landfill Remediation project surveys did not include the eastern portion of the project site along the Sacramento River.

3.8.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR concluded up to 15 acres of agricultural ditches and canals that provide aquatic habitat for giant garter snake would be permanently removed when the area in which they occur is incorporated into the Sacramento Bypass. Aquatic habitat currently in the existing bypass was not expected to be impacted by construction of the project, and potential for additional wetlands to develop in the expanded bypass was identified. The ARCF GRR Final EIS/EIR concluded that although the loss of the existing irrigation canals could have a short-term negative effect on the giant garter snake, conversion of agricultural land to a more natural state once incorporated into an expanded bypass would have long-term ecological benefits to giant garter snake and other wildlife, because wetlands and shrubby riparian habitat would naturally regenerate. It was indicated that bird nesting surveys would be conducted, and construction would be delayed, if necessary, until Swainson's hawk nests are no longer active. In addition, operation of the weir was not expected to adversely affect any species currently listed as threatened or endangered, because the intermittent flooding of the expanded bypass would support the natural processes associated with floodplain habitat. Therefore, effects to special-status species were determined to be less than significant, with implementation of identified mitigation measures.

Significance Criteria

For this analysis, an effect was considered significant if it would result in:

- Substantial direct or indirect reduction in growth, survival, or reproductive success of species listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (ESA) or California Endangered Species Act (CESA);

- Substantial direct mortality, long-term habitat loss, or lowered reproductive success of Federally or state-listed threatened or endangered animal or plant species or candidates for Federal listing;

- Direct or indirect reduction in the growth, survival, or reproductive success of substantial populations of Federal species of concern, state-listed endangered or threatened species, plant species

listed by the California Native Plant Society, or species of special concern or regionally important commercial or game species; or

- Have an adverse effect on a species' designated critical habitat.

Effects Analysis

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass. As a result of this alternative, there would be no construction-related effects on special-status species in the project area.

Without improvements to the levee system, the risk of levee failure would remain high. Under this alternative, a catastrophic flood event could cause portions of the levees to fail within the metropolitan Sacramento area, triggering widespread flooding and extensive damage. If flood fighting becomes necessary or a levee failure occurs, there would likely be substantial adverse effects on special-status species. Because the potential for such occurrences is uncertain, and the timing, magnitude, and duration of any flood-fighting or flood event are speculative and unpredictable, a precise determination of significance under this alternative is not possible.

Proposed Action and Higher Weir Elevation Alternative

Adverse Effect on Special-status Species: Plants

Special-status plants could be removed or indirectly impacted by construction activities, if present in or near areas where ground disturbance could occur along the Sacramento River or Sacramento Bypass (no special-status plants were found during focused surveys of agricultural ditches and canals on the project site). Implementing Mitigation Measure PLANT-1 would minimize potential impacts and mitigate for unavoidable impacts, if necessary.

Adverse Effect on Special-status Species: Valley Elderberry Longhorn Beetle

There are several documented occurrences of valley elderberry longhorn beetle along the Sacramento River in the project vicinity, and numerous elderberry shrubs that provide suitable habitat for the beetle occur in multiple areas of thicket along the railroad. The exact number of elderberry shrubs on the project site could not be determined, because of the circumstances in which they occur (i.e., steep, inaccessible railroad berm densely vegetated with rose and blackberry), but it is estimated approximately 0.75 acre of elderberry canopy is present. Based on discussions with USFWS regarding this project, USFWS considers riparian habitat within 25 meters of an elderberry shrub to be suitable valley elderberry longhorn beetle habitat. The total amount of riparian vegetation on the project site that is considered to be suitable valley elderberry longhorn beetle habitat is 6.02 acres.

These elderberry shrubs would be removed when vegetation along the railroad is cleared, reducing available habitat for and potentially resulting in direct mortality of valley elderberry longhorn beetles. Elderberry shrubs would not be transplanted as the shrubs are rooted in the railroad embankment that is potentially contaminated with chemicals including creosote, poly aromatic hydrocarbons, gasoline, and/or cleaning solvents. Vegetation rooted in the railroad embankment would be disposed of at an appropriate landfill. In addition, construction activities in close proximity to shrubs

could impact valley elderberry longhorn beetles that may be present on the affected shrubs. Implementing Mitigation Measure VELB-1 would reduce significant effects to a less-than-significant level by minimizing impacts on elderberry shrubs, transplanting elderberry shrubs that cannot be left in place (if it is determined that the soils do not contain contaminants), and compensating for unavoidable impacts at an off-site mitigation bank.

Adverse Effect on Special-status Species: Giant Garter Snake

No permanent loss of aquatic habitat for giant garter snake is anticipated to occur. The ditch along the western toe of the railroad grade that may be filled is dry most of the year and does not provide suitable aquatic habitat for giant garter snake. The drainage ditch that would be created by the LEBLS project may provide suitable habitat for giant garter snake, depending on the configuration and hydrology. This ditch may require alteration to ensure it functions effectively as a fish passage channel. Alteration of the LEBLS drainage ditch and other construction activities could introduce pollutants into potentially suitable aquatic habitat for giant garter snake (e.g., via erosion, sedimentation, or accidental spills of construction materials). This could be a significant impact. Implementing Mitigation Measure GEO-1 (described in Section 3.2, "Geological Resources") would reduce significant temporary and short-term construction-related effects on aquatic habitat to a less-than-significant level by avoiding and minimizing the potential for erosion; excess levels of turbidity; and water quality impairment due to spills, leaks, or other sources of toxic substances used during project activities. Implementing new Mitigation Measure GGS-1 would reduce significant direct effects on giant garter snake to a less-than-significant level by minimizing impacts and compensating for unavoidable impacts, if necessary. Moreover, conversion of agricultural land to a more natural state, once incorporated into an expanded bypass, may have long-term ecological benefits to giant garter snake.

Adverse Effect on Special-status Species: Swainson's Hawk and Other Special-status Birds

Trees along the Sacramento River and in the western portion of the Sacramento Bypass provide suitable nesting habitat for and have supported active Swainson's hawk nest sites. These areas also provide suitable nesting and/or foraging habitat for other special-status birds, such as western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), white-tailed kite (*Elanus leucurus*), purple martin (*Progne subis*), and Modesto song sparrow (*Melospiza melodia*). The project site is outside the nesting range of yellow-billed cuckoo, which includes the Sacramento River between Red Bluff and Colusa and a very small potential remnant population along the lower Feather River (Dettling and Seavy 2012). Therefore, potential occurrence of this species in the project area is limited to transient individuals during migration. The portion of the Sacramento River on the project site does not provide suitable nesting habitat for bank swallow (*Riparia riparia*), but individuals from nearby nesting colonies could forage over the project site. The Sacramento Bypass provides potentially suitable nesting habitat for northern harrier (*Circus cyaneus*) and foraging habitat for this and other special-status raptors. Vegetation removal would reduce the amount of nesting habitat and could destroy active nests, resulting in loss of eggs and young. In addition, noise and visual disturbance from construction activities could disturb nearby active nests, potentially resulting in nest failure. Implementing Mitigation Measure BIRD-1 would reduce significant effects on special-status and other migratory birds to a less-than-significant level by minimizing potential for removal of vegetation with active nests, implementing protective buffers around active nests, monitoring to ensure that birds and their young are not adversely affected by project activities, and compensating for riparian habitat removal.

Adverse Effect on Special-status Species: Special-status Bats

Several species of bat are identified by CDFW as species of special concern; therefore, impacts on these species are analyzed under CEQA only. Mature trees that may provide suitable roost cavities for pallid bat (*Antrozous pallidus*) and other trees with suitable foliage for roosting by western red bat (*Lasiurus blossevillii*) occur in woodland areas in the eastern portion of the project site and the western portion of the Sacramento Bypass. Most of the trees that would be removed are likely to provide few, if any, cavities for roosting pallid bats. However, mature valley oak trees that may provide high-quality pallid bat roosting habitat and some tree species that are typically favored by roosting red bats would be removed. Although the likelihood is relatively low, it is possible this habitat would support a maternity colony; removal of a maternity colony could result in loss of a large number of individuals of special-status bats, potentially having a substantial adverse impact on the local population under CEQA. Implementing Mitigation Measure BAT-1 would reduce significant effects on roosting special-status bats under CEQA to a less-than-significant level by implementing appropriate buffers around active roosts that could be affected by project activities.

3.8.3 Avoidance, Minimization, and Mitigation Measures

Mitigation identified in the ARCF GRR EIS/EIR has been augmented in Mitigation Measure PLANT-1 to include Suisun marsh aster and provide options to mitigate unavoidable impacts, if necessary.

Mitigation Measure PLANT-1: Implement Measures to Minimize Impacts on Special-status Plants.

If the project is implemented, USACE will implement the following measures to minimize potential effects on woolly rose-mallow, Suisun marsh aster, and Sanford's arrowhead:

- Preconstruction surveys would be conducted by a qualified botanist in suitable habitat to determine the presence of any special-status plants. Surveys would be conducted at an appropriate time of year during which the species are likely to be detected, which would likely be during the blooming period.

- If special-status plant species are found during preconstruction surveys, the habitat would be marked or fenced as an avoidance area during construction. A buffer of 25 feet would be established. If a buffer of 25 feet is not possible, the next maximum possible distance would be fenced off as a buffer.

- If special-status plant species cannot be avoided during construction, USACE and CVFPB would coordinate with CDFW to determine additional appropriate mitigation measures, and identify implementation methods, success criteria, monitoring and reporting protocols, and contingency measures, if necessary. Such measures may include salvaging and transplanting individual plants, collecting the seeds of affected plants, and collecting and translocating seed- and rhizome-containing mud. If compensatory mitigation is required, it may include preserving in perpetuity other known populations of these species in the project vicinity.

Mitigation identified in the ARCF GRR Final EIS/EIR has been updated in Mitigation Measure VELB-1 for consistency with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (2017).

Mitigation Measure VELB-1: Implement Current U.S. Fish and Wildlife Service Avoidance, Minimization, and Compensation Measures for Valley Elderberry Longhorn Beetle.

If the project is implemented, USACE will implement the following measures in accordance with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (USFWS 2017), to reduce effects on valley elderberry longhorn beetle:

- Fencing. All areas to be avoided during construction activities shall be fenced and/or flagged as close to construction limits as feasible.

- Avoidance area. To the extent feasible, activities that may damage or kill an elderberry shrub (e.g., trenching, paving, etc.) shall be avoided within 20 feet from the drip-line of the shrub.

- Worker education. A qualified biologist shall provide training for all contractors, work crews, and any onsite personnel on the status of valley elderberry longhorn beetle, its host plant and habitat, the need to avoid damaging elderberry shrubs, and the possible penalties for noncompliance.

- Construction monitoring. A qualified biologist shall monitor the work area at appropriate intervals to assure that all avoidance and minimization measures are implemented.

- Timing. To the extent feasible, activities within 165 feet of an elderberry shrub shall be conducted outside of the valley elderberry longhorn beetle flight season (March–July).

- Trimming. To the extent feasible, elderberry shrub trimming shall occur between November and February and avoid the removal of any branches or stems greater than or equal to 1 inch in diameter.

- Chemical Usage. Herbicides shall not be used within the drip-line, and insecticides shall not be used within 100 feet of an elderberry shrub. All chemicals shall be applied using a backpack sprayer or similar direct application method.

- Mowing. Mechanical weed removal within the drip-line of elderberry shrubs shall be limited to the season when adults are not active (August–February) and shall avoid damaging the shrub.

- Transplanting. To the extent feasible, elderberry shrubs shall be transplanted when the shrubs are dormant (November through the first 2 weeks in February) and after they have lost their leaves. Exit-hole surveys will be completed immediately before transplanting. A qualified biologist shall be on-site for the duration of transplanting activities to assure compliance with avoidance and minimization measures and other conservation measures.

Compensation

Mitigation identified in the ARCF GRR Final EIS/EIR for giant garter snake would be implemented:

Mitigation Measure GGS-1: Implement Measures to Avoid, Minimize and Compensate Impacts on Giant Garter Snake.

If the project is implemented, USACE will implement the following measures to minimize effects on giant garter snakes and habitat that occurs within 200 feet of any construction activity. These

measures are based on USFWS guidelines for restoration and standard avoidance measures included as appendices in USFWS (1997).

- Unless approved otherwise by USFWS, construction will be initiated only during the giant garter snakes' active period (May 1–October 1, when they are able to move away from disturbance).

- Construction personnel will participate in USFWS-approved worker environmental awareness program.

- Giant garter snake survey would be conducted 24 hours prior to construction in potential habitat. Should there be any interruption in work for greater than two weeks, a biologist would survey the project area again no later than 24 hours prior to the restart of work.

- Giant garter snakes encountered during construction activities will be allowed to move away from construction activities on their own.

- Movement of heavy equipment to and from the construction site will be restricted to established roadways. Stockpiling of construction materials will be restricted to designated staging areas, which will be located more than 200 feet away from giant garter snake aquatic habitat.

- Giant garter snake habitat within 200 feet of construction activities will be designated as an environmentally sensitive area and delineated with signs or appropriate fencing. This area will be avoided by all construction personnel.

- Habitat temporarily affected for more than three or more seasons will be restored and twice as much habitat will be created.

- Habitat permanently affected in the Sacramento Bypass will be compensated for through the purchase of credits at an USFWS-approved conservation bank prior to permanent disturbance of giant garter snake habitat. Due to the spatial and temporal loss of habitat, and the lack of permanent on-site replacement, the ecological value associated with doing all mitigation at an off-site location was reduced to an overall 70% habitat value. This reduction is offset by the increase of mitigation credits at ratios specified by USFWS in the ARCF GRR Biological Opinion.

- One year of monitoring will be conducted for habitat that is temporarily affected.

Mitigation Measure BIRD-1 is consistent with but slightly modifies mitigation identified in the ARCF GRR Final EIS/EIR to address concerns regarding the feasibility of surveying for all active migratory bird nests within 500 feet of project disturbance and implementing a 0.25-mile buffer around all active migratory bird nests. Implementing a 0.25-mile buffer would likely preclude construction during the nesting season, severely shortening the construction window. In addition, extensive monitoring conducted during recent major levee improvement projects in the region has demonstrated that construction activities can often occur within 0.25 mile of active nests without adversely affecting nesting activities.

Mitigation Measure BIRD-1: Implement Measures to Protect Nesting Migratory Birds.

If the project is implemented, USACE will undertake the following measures to minimize potential effects on active nests of Swainson's hawk, white-tailed kite, northern harrier, Modesto song sparrow, and other migratory birds:

- Before on-site project activities begin, all construction personnel shall participate in a worker environmental awareness program. A qualified biologist shall inform all construction personnel about the life history of Swainson's hawk and the importance of nest sites.

- A breeding season survey shall be conducted for active Swainson's hawk nests within 0.5 mile of construction activities, including grading. A survey shall also be conducted for active nests of white-tailed kite and purple martin within 500 feet of construction activities and active nests of other migratory birds within 100 feet of construction activities. Swainson's hawk surveys shall be completed during at least two of the following survey periods: January 1 to March 20, March 20 to April 5, April 5 to April 20, and June 10 to July 30 with no fewer than three surveys completed in at least two survey periods, and with at least one survey occurring immediately prior to project initiation (Swainson's Hawk Technical Advisory Committee 2000). Other bird nest surveys could be conducted concurrent with Swainson's hawk surveys, with at least one survey to be conducted no more than 48 hours from the initiation of project activities. If the biologist determines that the area surveyed does not contain any active nests, construction activities, including removal or pruning of trees and shrubs, could commence without any further mitigation.

- A breeding season survey shall be conducted for any active nests of birds protected under the Migratory Bird Treaty Act (MBTA), which essentially includes all native birds. If active nests are found, a protective buffer shall be established and implemented until the nest is no longer active. The size of the buffer shall be determined based on the species, nest stage, type, and intensity of project disturbance in the nest vicinity; presence of visual buffers; and other variables that may affect susceptibility of the nest to disturbance. A qualified biologist shall monitor the nest during project activities to confirm effectiveness of the buffer and adjust the buffer as needed to ensure project activities do not adversely affect behavior of adults or young.

- Tree and shrub removal and other clearing, grading, and construction activities that remove vegetation shall not be conducted during the nesting season (generally February 15–August 31, depending on the species and environmental conditions for any given year), to the extent feasible.

The ARCF GRR Final EIS/EIR did not identify a significant impact associated with special-status bats. Therefore, the following is a new mitigation measure specific to CEQA compliance.

Mitigation Measure BAT-1: Implement Measures to Protect Maternity Roosts of Special-status Bats.

If the project is implemented, CVFPB will implement the following measures to minimize potential for loss of special-status bat maternity roosts:

- Wherever feasible, the USACE would conduct construction activities outside of the pupping season for bats (generally April 1 to August 31).

- If removal of trees must occur during the bat pupping season, within 30 days of tree removal activities, all trees to be removed will be surveyed by a qualified biologist for the presence of features that may function as special status bat maternity roosting habitat. Trees that do not contain potential special status maternity roosting habitat may be removed. For trees that contain suitable special status bat maternity roosting habitat, surveys for active maternity roosts shall be conducted by a qualified biologist in trees designated for removal. The surveys shall be conducted from dusk until dark.

- If a special-status bat maternity roost is located, appropriate buffers around the roost sites shall be determined by a qualified biologist and implemented to avoid destruction or abandonment of the roost resulting from tree removal or other project activities. The size of the buffer shall depend on the species, roost location, and specific construction activities to be performed in the vicinity. No project activity shall commence within the buffer areas until the end of the pupping season (September 1) or until a qualified biologist confirms the maternity roost is no longer active. If construction activities must occur within the buffer, a qualified biologist would monitor activities either continuously or periodically during the work, as determined by the qualified biologist. The qualified biologist would be empowered to stop activities that, in the biologist's opinion, threaten to cause unanticipated adverse effects on specials status bats. If construction activities are stopped, CDFW would be consulted to determine appropriate measures to implement to avoid adverse effects.

- For trees containing cavities, cracks, crevices, or deep bark fissures that are planned for removal or trimming (irrespective of time of year), such trees must be trimmed and/or removed in a two-phase removal system conducted over two consecutive days. The first day (in the afternoon), limbs and branches would be removed, using chainsaws only. Removal activities must avoid limbs with cavities, cracks, crevices, or deep bark fissures, and remove only branches and limbs without those features. On the second day, the entire tree would be removed. A qualified biologist would monitor removal of these trees.

3.9 Cultural Resources

3.9.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some updated and site-specific conditions are described below.

The area in which cultural resources are identified and in which potential effects on historic properties (those cultural resources determined to be eligible for listing in the National Register of Historic Places [NRHP]) are analyzed is called the Area of Potential Effects (APE). The project APE includes the project footprint (the area where any ground-disturbance would occur), such as the area where the new weir and setback levee would be constructed; the area within which the existing levee and railroad embankment would be degraded; and other areas in the expanded bypass where additional vegetation removal, grading, or other ground-disturbing activities could occur. An additional surrounding area (typically extending about 20–40 feet beyond the project footprint) is included in the APE to account for buried resources that may extend outside the project footprint. The APE also includes the area in which built-environment resources could be affected physically, including through vibration, and visually through the introduction of new structures. No permanent substantial visual or auditory changes would occur as a result of project implementation; therefore, no area of indirect effect (the area in which changes in the visual or auditory setting may occur) has been identified. The vertical extent of the project APE is variable but would have a maximum depth of up to 100 feet below ground

surface, for the cutoff wall under the new weir. The APE is the same for the Proposed Action and Alternative 2.

The project APE contains known cultural resources, including flood control structures and transportation structures. Although no Native American archaeological resources are known to be present in the APE, it is possible that additional studies or construction could reveal such resources. Due to its proximity adjacent to the Sacramento River, the project APE is considered to be sensitive for the presence of buried Native American archaeological sites. USACE has consulted with the state Historic Preservation Officer (SHPO), Native American Tribes, and other parties and has executed a Programmatic Agreement (PA) that establishes the process USACE shall follow for compliance with Section 106 of the National Historic Preservation Act (NHPA) for the project. The PA stipulates time frames and document review procedures; delineation of project APEs; development of a Historic Properties Management Plan (HPMP) to guide identification, evaluation, and Section 106 findings of effect; development of Historic Property Treatment Plans (HPTPs) to identify treatment for Historic Properties that would be adversely affected by project activities; a process to guide limited geotechnical investigations; Native American consultation procedures; and other processes and implementation procedures.

Recent Surveys and Investigations

Efforts to identify Historic Properties and potential Historic Properties in the project APE that have been conducted since the ARCF GRR Final EIS/EIR was prepared include records searches, archival research, archaeological pedestrian surveys and surveys by historians, and geoarchaeological investigations. Some of these investigations were conducted for the LEBLS project which encompassed a majority of the Sacramento Weir Widening Project APE, which is approximately 465 acres (all but approximately 45 acres of the Sacramento Weir Widening Project APE is within the LEBLS project APE). Additional investigations in areas not within the LEBLS project area were conducted in the Sacramento Weir Widening project APE.

Records Search

The initial records search at the Northwestern Information Center (NWIC) was conducted in February 2016 by DWR (NWIC File No. 15-1004). DWR requested a records search by the Northwest Information Center of the California Historical Resources Information System on February 9, 2016 for the LEBLS project. The records search area included the Sacramento Weir Widening project APE. Referenced documents included base maps, reports from previous projects, California Department of Parks and Recreation site records, and California Historic Landmarks documentation. The records searches included the sources listed below:

- NRHP-listed properties (NPS 1996) and updates
- California Inventory of Historic Resources (DPR 1976 and updates)
- California Points of Historical Interest (DPR 1992 and updates)
- Caltrans Bridge Inventory (Caltrans 1989, 2000, and 2004)
- Historic Maps

- California Historical Landmarks (OHP 1996 and updates)
- Directory of Properties in the Historic Resources Inventory (OHP 2006)
- Gold Districts of California (Clark 1970)
- California Gold Camps (Gudde 1975)
- California Place Names (Gudde 1969)
- *Historic Spots in California* (Hoover et al. 1966, 1990)

In January 2020, GEI Consultants, Inc. (GEI) conducted an updated search with the NWIC and a supplemental record search at the North Central Information Center (NCIC) (NCIC File No. SAC-20-24). The update search with the NWIC identified one additional resource (not identified during the initial records search) which extends from Sacramento County in the APE and vicinity (P-34-005225 Sacramento River Traditional Cultural Landscape).

The search consisted of an electronic search of the NWIC's and NCIC's Geographic Information System containing reported resources and previous investigations organized by base U.S. Geological Survey (USGS) 7.5' quadrangle maps. The USGS 7.5' Sacramento West quadrangle map was search for Yolo and Sacramento counties for resources and reports in and within 0.25-mile of the APE.

GEI conducted archival research at the California History Room and the Government Publications Section of the California State Library, Sacramento; California Digital Newspaper Collection; Yolo County Offices; and the GEI cultural resource library in an effort to identify important historic people, events, and trends that may have been associated with both the Sacramento Weir Widening project vicinity. Archival research conducted by GEI addressed the entirety of the Weir Widening APE.

Field Surveys

A pedestrian survey, conducted for the LEBLS project and covering all but approximately 45 acres of the Sacramento Weir Widening Project APE, was conducted to identify archaeological and historical cultural resources visible on the ground surface. This archaeological pedestrian survey was conducted on December 21–22, 2016; January 5, 2017; April 5–7 and 25–27, 2017; and May 31, 2017 by GEI archaeologists under the supervision of James Mayer, Ph.D., Registered Professional Archaeologist. The survey was conducted to intensive standards (pedestrian transects spaced no more than 15 meters apart). A Trimble 7 Series GPS unit capable of sub-meter accuracy was carried to record the location of any identified resources. An archaeological pedestrian survey of all portions of the APE not surveyed during the previous surveys conducted for the LEBLS project was conducted on April 23-24, 2020 by GEI archaeologists. The surveys were conducted to intensive standards (pedestrian transects spaced no more than 15 meters apart).

Two historic-period archaeological sites, the Old Bryte Landfill and CA-YOL-224H, were identified during the field surveys. No prehistoric archaeological sites have been identified in the APE.

A supplemental built environment survey of the project APE was conducted by a GEI historian on August 28, 2019, to inspect portions of the APE that had not been included in the investigations conducted for the LEBLS project.

Geoarchaeological Investigations

Geoarchaeological Desktop Sensitivity Study

A desktop study of the geoarchaeological potential (i.e., sensitivity for buried cultural resources) of most of the project APE (excluding about 45 acres of the Sacramento Weir Widening project APE that is not in the LEBLS project APE) was carried out for the LEBLS project. A complete cultural resources investigation, including the 45-acres not already subject to investigation (rights of entry for archaeological survey have not yet been secured) , will be conducted in accordance with Mitigation Measure CR-1, and the requirements of the ARCF PA, described below. The sensitivity study relied primarily on available geologic, soils, and topographic mapping. Preliminary geologic mapping is available at the 1:100,000 scale (Gutierrez 2011). Online U.S. Natural Resources Conservation Service (NRCS) soils data are useful for gaining an initial understanding of archaeological potential at the landscape scale. The NRCS data include descriptions of soil morphology, as well as information about parent material origin, lithology, and landform associations. The utility of the NRCS soil mapping data is augmented by Meyer and Rosenthal (2008), who provide radiocarbon age estimates for soil orders in the Sacramento Valley, including those occurring in the Sacramento Weir Widening project APE.

Geoarchaeological Fieldwork

A subsurface geoarchaeological field program, which consisted entirely of mechanical trenching, was conducted for the LEBLS project. Trenching was carried out on November 16 through 18, December 1 and 2, and December 5 and 6, 2016. All trenches were excavated to a depth of 5 feet and are described by the geoarchaeologist, James Meyer, Ph.D., RPA in the *Cultural Resources Inventory and Evaluation Report for the Lower Elkhorn Basin Levee Setback Project* (GEI 2017). Nine trenches were excavated in the Sacramento Weir Widening project APE. Trenches were excavated by a backhoe equipped with a 24-inch toothed bucket. Approximately 0.5–1.0 gallon (0.07–0.13 cubic feet) of each backhoe bucket was screened through 1/4-inch hardware mesh. A Native American monitor from United Auburn Indian Community of the Auburn Rancheria was present for all geoarchaeological trenching. The trenches were photographed, measured, and the soil profile analyzed by the geoarchaeologist. Soils were described using standard geoarchaeological terminology (Holliday 2004; Goldberg and MacPhail 2006; Schoenberger et al. 2012). Trench locations were recorded with a Trimble GPS device with sub-meter accuracy. Once the analysis was complete, the trench was backfilled, and the surface returned to its original condition.

Geoarchaeology Results

The current APE includes variations of four soil mapping units. In sum, all of these mapping units show little horizon development and are young soils on recently formed geomorphic surfaces comprising relatively thick alluvium that are considered to have high archaeological sensitivity. This is substantiated by radiocarbon ages summarized by Meyer and Rosenthall (2008), suggesting that all the soil mapping units in the project APE are latest Holocene in age. All of the soil mapping units display characteristics that indicate formation during periodically saturated conditions, consistent with a floodplain environment. This does not preclude prehistoric use of the area, however, as these were probably also settings that were at least dry during summer and could have been used seasonally.

Based on the review of available soils and geologic mapping, the entire project APE is considered to have an elevated sensitivity for the potential presence of buried cultural resources; however, neither the historic topographic maps nor field survey revealed any subtle landforms that might have sensitivity for buried resources, and no archaeological resources were identified in the APE as a result of geoarchaeological trenching.

It should be noted that this assessment refers only to the native soils and geologic deposits mapped in the project APE, not the fill composing the levees. Information used for this sensitivity assessment did not address the levees themselves because the source of the material used to construct the existing levees is uncertain. Because the entire project APE is considered to have an elevated sensitivity for buried cultural resources, the existing levees are also considered to have an elevated sensitivity for archaeological materials either encapsulated within the levee fill or buried beneath the levees.

Native American Consultation

USACE is the lead Federal agency responsible for compliance with Section 106 of the NHPA and will conduct all consultations with Native American Tribes and interested parties according to the PA and HPMP developed for the ARCF 2016 Project. Several Native American Tribes and interested parties were contacted while developing the PA and provided with general information about the ARCF 2016 Project. All Native American Tribes identified in the PA will be contacted and provided an updated description of the project and requested to provide information on resources important to Native Americans. USACE will initiate Native American consultation for compliance with Section 106 of the NHPA concurrently with additional Section 106 cultural resources inventory and evaluation activities, which are expected to be conducted in early 2020.

CVFPB is the state lead agency responsible for CEQA compliance. The California Natural Resources Agency adopted the California Natural Resource Agency Final Tribal Coordination Policy on November 20, 2012, which was developed in response to Governor Brown's September 19, 2011 Executive Order B-10-11. CVFPB has adopted this Policy. As such, Native American consultation will be conducted in accordance with the Policy adopted by CVFPB. The purpose of the Policy is to ensure effective, meaningful, and mutually beneficial government-to-government consultation, communication, and coordination between CVFPB and tribal entities relative to activities under CVFPB's jurisdiction that may affect tribal communities. CVFPB will contact the Native American contacts, including those already identified by the Native American Heritage Commission (NAHC), in an effort to identify cultural resources important to Native Americans, including Tribal Cultural Resources as defined in California Public Resources Code 21074, that may be present in the project area.

Identified Cultural Resources

Based on the results of the records search, field investigations, and archival research, the following cultural resources have been identified within the APE for the Proposed Action.

Archaeological Resources

Old Bryte Landfill

The Old Bryte Landfill (a.k.a. West Sacramento Landfill) is located immediately north of the Sacramento Bypass North Levee, in the project APE. The site was used as landfill for the City of West Sacramento and neighboring unincorporated communities of Bryte and Broderick (now part of present-

day City of West Sacramento). The Old Bryte Landfill Site covers approximately 17 acres. The western and southern sides are bordered by Levee Unit 122. Materials deposited at the former landfill consisted of residential and commercial solid wastes. Wastes were piled, burned, and then leveled. Non-archaeological test pit logs describe the waste as buried 5-12 feet below the ground surface and consisting of dark gray silt and ash, with abundant glass fragments, bottles, bricks, concrete, and metal debris. Test pits were excavated by non-archaeologists to assess the potential of the deposit to contain toxic substances.

This resource was evaluated for NRHP eligibility and determined to be ineligible for listing because of a lack of historical significance. The SHPO concurred in this determination in a letter dated December 21, 2017.

CA-YOL-224H (P-57-000610)

P-57-000610, consists of the remains of at least five buildings, associated structures, and an associated scatter of historic-era to modern-era cultural materials. P-57-000610 is situated on a terrace along the western bank of the Sacramento River, in the southeastern corner of the APE, and covers approximately 720 feet along a northwest-southeast alignment, with a width of approximately 300 feet.

This resource was evaluated for NRHP eligibility and determined to be ineligible for listing because of a lack of historical significance and a lack of integrity. The SHPO concurred in this determination in a letter dated September 15, 2020

Traditional Cultural Landscape

One Traditional Cultural Landscape (TCL) (P-34-005225 Sacramento River Traditional Cultural Landscape) extends into the APE. The Sacramento River TCL encompasses both banks of the lower Sacramento River from just south of Knights Landing in Sutter and Yolo counties in the north to Sherman Island in the Delta in the south. The character defining elements of this landscape, according to the site record form are the waterways, tule habitat, fisheries, and other wildlife.

This site has previously been recommended to be eligible for listing on the NRHP, however the identified resource attributes of this site consist entirely of natural resources such as waterways and natural habit. Formal evaluation of this resource was not conducted due to the vast geographic area it encompasses. For the purpose of the impact analysis, the resource is considered eligible for the NRHP. Because the project will not significantly affect the natural environment composing this resource and is not changing the environment, setting, or integrity of this resource; GEI recommended that P-34-005225 would not be adversely affected by implementation of this project.

In a letter dated September 15, 2020, SHPO specified that there was no comment on this approach.

Built-environment Resources

Levee Unit 122

Levee Unit 122 is an earthen levee that is comprised of the Yolo Bypass East Levee, the Sacramento Bypass North Levee, and the Sacramento River West Levee north of the Sacramento Weir. This levee ring is approximately 15.8 miles long. The levee's character-defining features include the compacted earth, slope, and crown. Levee Unit 122 is a Federal project levee, but it also serves as the eastern boundary of the Yolo Bypass, an approximately 69,000-acre system that includes weirs, levees, and leveed bypasses that are outside the project APE. Portions of Levee Unit 122 that are within the APE include a portion of the Sacramento Bypass North Levee and a portion of the Sacramento River West Levee.

This resource was evaluated for NRHP eligibility and was determined eligible under NRHP Criterion A, within the context of flood management, for its association with the SRFCP. Its period of significance begins in 1917, when the U.S. Congress approved the Flood Control Act, marking the first comprehensive plan for flood management in California, and ends in 1967. An arbitrary 50-year cutoff was used, because the National Park Service Bulletin *How to Complete the National Register Registration Form* states that the significance period can continue when a resource has been in existence and continues to have importance, and no specific date can be defined to end the period of significance (NPS 1997:42). The SHPO concurred with the determination that Levee Unit 122 is eligible for listing in the NRHP in a letter dated December 21, 2017.

As a result of construction of the LEBLS project, planned for 2020, a large portion (approximately 50%) of Levee Unit 122 would be degraded. Under post-degrade circumstances, it is recommended by a GEI architectural historian who meets the Secretary of the Interior's Qualification Standards for History that Levee Unit 122 would no longer meet NRHP eligibility criteria. The levee unit was originally designed to work in tandem with the Yolo Bypass to control flooding and protect regional farmland. Although segments of the levee would remain in place and continue to contribute to flood management in the area, several miles of the levee would be removed through implementation of the LEBLS project. With essentially half the resource gone, the levee would not retain its original design and workmanship and would no longer maintain adequate integrity to convey its association with the 20th century SRFCP and the Yolo Bypass, a significant engineering feature to which Levee Unit 122 is directly related.

In a letter dated September 15, 2020, the SHPO concurred in the determination that demolition of a large part of Levee Unit 122 during construction of the LEBLS project would result in Levee Unit 122 no longer being considered a Historic Property.

Sacramento Bypass and Sacramento Weir

The Sacramento Bypass is a leveed overflow channel approximately 1,800 feet wide. The levees on each side of the channel are lined with concrete on the water side for approximately half the levee distance extending from the associated Sacramento Weir. The Sacramento Bypass and Sacramento Weir were constructed between 1916 and 1918 by the City of Sacramento. The Sacramento Bypass carries excess flood waters from the Sacramento River to the Yolo Bypass. In 1986, Les-Thomas Associates inventoried and evaluated the Sacramento Bypass and the Sacramento Weir as one resource and recommended it as eligible for the NRHP under Criterion A for the structures' association with flood control projects and the impact the structures have had on the agricultural and economic

development of Yolo County (Les-Thomas Associates 1986:2). The 1986 documentation incorrectly referred to the resource as the Sacramento Weir and Yolo Bypass. In 2007, Jones & Stokes (now ICF International, Inc. [ICF]) revisited the resource and updated the name of the resource to correctly identify it as the Sacramento Bypass and Sacramento Weir. The 2007 update did not identify any changes to the resource and concurred with the original 1986 evaluation (Jones & Stokes 2007:1). In 2009, ICF revisited the resource again and concurred with previous findings that the Sacramento Bypass and Sacramento Weir continued to convey its significance under NRHP Criterion A and California Register of Historical Resources (CRHR) Criterion 1 (ICF 2009:1). In 2011, as part of a USACE consultation for the West Sacramento Levee Improvements Early Implementation Project, the SHPO concurred that the structures were eligible for the NRHP under Criterion A (Donaldson 2011:2). However, the Office of Historic Preservation did not update the Directory of Properties, and the resource is still identified as the Sacramento Weir and Yolo Bypass (OHP 2012:15). None of the previous documentation provided a discussion of the aspects of integrity that the Sacramento Bypass and Sacramento Weir retain in order to convey its significance.

As part of the LEBLS project, GEI's architectural historians revisited the Sacramento Bypass and Sacramento Weir and did not identify any changes to the resource and concurred with the previous determinations that the Sacramento Bypass and Sacramento Weir is eligible for the NRHP. GEI has identified location, design, materials, setting, feeling, and association as the necessary aspects of integrity needed to convey its significance. At this time, all these aspects of integrity are retained.

The SHPO confirmed its previous concurrence of NRHP eligibility of the Sacramento Bypass and the Sacramento Weir in a letter dated December 21, 2017.

GEI recommended that the introduction of the new approximately 1,500-foot long weir in close vicinity to the Sacramento Weir detracts from the original character of the surrounding environment and represents a substantial change. Its construction also alters the intended purpose of the Sacramento Weir, from the primary weir in the immediate area, to a secondary water control feature working in tandem with the new weir. The integrity of setting and feeling of the Sacramento Weir which help convey its historical significance would be altered. Therefore, the project would have an Adverse Effect.

The SHPO concurred in the finding that the Sacramento Weir would be adversely affected in a letter dated September 15, 2020.

Lower Elkhorn South Cross Levee

The Lower Elkhorn South Cross Levee is an earthen levee that was constructed to contain irrigation tailwater drainage canals. The levee was historically known as the Lovdal Levee. It extends in a north/south direction, beginning at the Sacramento Bypass North Levee and ending at Old River Road, near the east river bend.

This resource was evaluated for NRHP eligibility and recommended as ineligible for listing. The SHPO concurred with this determination in a letter dated December 21, 2017.

Sierra Northern Railway

The recorded segment of the Sierra Northern Railway extends in a north/south direction adjacent to Old River Road and the Sacramento River. A portion of the railroad track extends along the Sacramento Weir and is elevated and supported by a wood timber trestle with steel siding.

The Sierra Northern Railway segment was originally built by Sacramento & Woodland Railroad circa 1912 and was historically part of a vast 183-mile network of interurban rail operated by Sacramento Northern Railroad that extended as far north as Chico and as far south as the San Francisco Bay Area, with branches operating to smaller communities such as Woodland and Clarksburg. Over time, the line suffered economically, and railroad officials removed the electric rails and abandoned or removed other parts of the alignment.

Segments of the Sierra Northern Railway alignment have been evaluated in the past, including part of the alignment in the project APE. Evaluations prepared by ICF in 2010 and Dr. Scott Crull, PhD in 2014 found that the railroad segments lacked integrity and therefore did not meet NRHP significance criteria (ICF 2010; Crull 2014). The period of significance for this railroad alignment is circa 1912, the period of track installation. A possible argument for eligibility under Criterion A/1 could be an association with events that made a significant contribution to the patterns of history in the Sacramento Valley, in the area of interurban rail transportation. Under Criteria B/2 and C/3, the feature is not known to have any direct association with significant persons, nor as a typical railroad alignment, does it appear to represent a distinctive method of construction. Under Criterion D/4, it also is unlikely to yield information important to history. Overall, the railroad segment lacks integrity. The original track was interurban and included an electrified third rail that made the alignment unique as a rail line. Portions of this alignment have been abandoned and the track has been removed. The segment also does not retain any of its original engineering features or materials. In summary, because of a lack of integrity, the Sierra Northern Railway segment does not appear to meet NRHP eligibility requirements.

The SHPO concurred in this determination in a letter dated September 15, 2020.

Under Section 106, to be implemented under the ARCF PA, confirmation of NRHP eligibility determinations will be made through consultation between USACE, SHPO and other ARCF PA consulting parties. If SHPO does not concur with NRHP eligibility findings, USACE would re-assess the evaluation and if determined to be eligible, then the ARCF PA requirements for a Finding of Effect would be conducted. Potential additional steps, such as resolution of Adverse Effects, would be conducted in accordance with the ARCF PA.

3.9.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR identified Historic Properties and potential Historic Properties through records searches and a sensitivity analysis. The inventory of Historic Properties in the ARCF GRR Final EIS/EIR did not include intensive pedestrian surveys or archaeological excavation, identify locations of importance to Native Americans, or define an APE for the Proposed Action.

Based on the programmatic nature of analysis that was conducted to assess effects to cultural resources, the ARCF GRR Final EIS/EIR concluded that the Sacramento Weir widening would result in adverse effects to Historic Properties, which was considered a significant effect. The ARCF GRR Final EIS/EIR also concluded that the significant effects to cultural resources would be reduced to a less-than-significant level under NEPA through implementation of the Stipulations in the ARCF PA but would remain significant and unavoidable under CEQA.

Significance Criteria

Any adverse effects on cultural resources that are listed or eligible for listing in the NRHP (i.e., historic properties) are considered to be significant. Effects are considered to be adverse if they:

- Alter, directly or indirectly, any of the characteristics of a cultural resource that qualify that resource for the NRHP, so that the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association is diminished.

- Cause a substantial adverse change in the significance of a historic property through the physical demolition, destruction, relocation, or alteration of the historic property or its immediate surroundings such that the significance of the resource would be materially impaired.

Under California law, effects to a historical resource or unique archaeological resource are considered to be adverse if they:

- Materially impair the significance of a historical resource or unique archaeological resource.

- Require the demolition of a historical resource.

Under CEQA, two additional significance thresholds not included in the ARCF GRR Final EIS/EIR are considered in this analysis. The project was also determined to result in a significant effect if it would:

- Disturb any human remains, including those interred outside of formal cemeteries; or

- Result in a substantially adverse change in the significance of a Tribal Cultural Resource (as defined in California PRC Section 21074 and above) when compared against existing conditions.

Methodology

For those resources recommended or determined to be eligible for listing in the NRHP/CRHR (Sacramento Bypass and Sacramento Weir), analysis of the effects, or likely effects, of the Proposed Action was based on an evaluation of the changes to the existing Historic Properties that would result from project implementation. In making a determination of the effects to Historic Properties, consideration was given to:

- Specific changes in the characteristics of Historic Properties in the APE,

- The temporary or permanent nature of changes to Historic Properties and the viewshed of the Historic Properties, and

- Consideration of the integrity of Historic Properties in the APE and how the integrity was related to the specific criterion that makes a Historic Property eligible for listing in the NRHP.

An assessment of effects for the purposes of this Supplemental EIS/EIR and a determination of effect under Section 106 of the NHPA is made only for those resources determined or recommended to be eligible for listing in the NRHP/CRHR. Resources that have been determined to be eligible for listing in the NRHP or are listed in the NRHP are referred to as Historic Properties. Resources that have

been found or recommended to be ineligible for listing in the NRHP/CRHR are not considered further in this Supplemental EIS/EIR.

This evaluation of potential effects on cultural resources is based on additional information compiled since the ARCF GRR Final EIS/EIR was prepared. The effects analysis considered the following factors related to the Proposed Action and Alternative 2 project elements, including construction of the setback levee and new weir structure; potential effect mechanisms; the extent of area that would be temporarily and permanently disturbed; and known or potential locations of cultural resources, including locations identified by Native Americans as cultural landscapes, Traditional Cultural Properties, sacred sites, or other sensitive resources. In particular, the significance of each effect was considered in terms of its potential impacts on significant cultural resources. For the purpose of this analysis, significant cultural resources are resources that are listed on the NRHP/CRHR or that are eligible for listing on the NRHP/CRHR. The mitigation identified in the ARCF GRR Final EIS/EIR for potential impacts to cultural resources included implementing stipulations of the ARCF PA. Where feasible, more specific measures are identified below to reduce adverse effects. Where investigations are incomplete or there are uncertainties about resource boundaries, eligibility for NRHP listing, or project effects, processes stipulated in the PA and associated HPMP would be implemented.

USACE has completed consultation with SHPO and other ARCF PA consulting parties regarding the NRHP eligibility of the cultural resources identified in the APE and effects on those resources that are considered Historic Properties. Therefore, the impact analysis presented in this document reflects consensus findings under Section 106 of the NHPA as implemented through the ARCF PA.

Effects Analysis and Mitigation Measures

No-Action Alternative

Under the No-Action Alternative, USACE would not construct the proposed improvements. It is assumed that the Sacramento Weir would not be widened by the Federal Government or by local interests to achieve the project purpose. Because the project would not be constructed, there would be no direct impacts or effects to Historic Properties from project construction.

As a result of not constructing the project, the Sacramento area would remain at higher risk of levee failure and resulting flooding which could alter existing conditions by burying, destroying, or revealing cultural resources. Flooding could result in significant damage to cultural resources in a large geographic area through erosion and inundation. Post-failure emergency repairs could have a large footprint, and the urgent need to immediately repair the levee would preclude extensive planning or environmental protection. This effect could be considered significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alternative

Damage to or Destruction of Built-Environment Historic Properties

Four historic-era built-environment resources in the APE have been identified and evaluated for historical significance: Levee Unit 122 (including the Sacramento River West Levee and a small portion of the Sacramento Bypass North Levee), the Sacramento Weir and Bypass, the Lower Elkhorn South

Cross Levee, and the Sierra Northern Railway. Two of these resources —Levee Unit 122 and the Sacramento Weir and Bypass are considered Historic Properties and have been determined to be eligible for listing in the NRHP. The Lower Elkhorn South Cross Levee has been determined to be ineligible for listing in the NRHP, and the Sierra Northern Railway is recommended as ineligible for listing in the NRHP. The NRHP eligibility recommendation for the Sierra Northern Railway and the reevaluation of Levee Unit 122 (based on conditions of post-Lower Elkhorn Basin Levee Setback Project implementation) presented in this document constitute NRHP eligibility determination by USACE, and NHPA Section 106 consultation with SHPO concerning the NRHP eligibility of these resources and findings of effect on Historic Properties. NHPA Section 106 consultation with SHPO concerning NRHP eligibility of these resources has been conducted and SHPO has concurred with USACE's findings in a letter dated September 15, 2020, therefore the NRHP eligibility recommendations used in this analysis reflect consensus findings under Section 106 of the NHPA.

Based on these findings under Section 106 of the NHPA, one Historic Property, the Sacramento Weir and Bypass would be adversely affected by the Proposed Action and Higher Weir Alternative. Implementing new Mitigation Measure CR-1 would reduce this impact to a less-than-significant level because this measure requires completion of a Historic Properties Treatment Plan that identifies specific treatment measures to resolve the adverse effect under Section 106 of the NHPA.

Potential Damage to or Destruction of Previously Undiscovered Archaeological Sites or Tribal Cultural Resources

To date, cultural resources investigations have not identified archaeological resources or Tribal Cultural Resources (Tribal Cultural Resources are a type of resource recognized under CEQA but not Section 106 of the NHPA) in the APE. Because Native American consultation is on-going , it is possible that unknown archaeological resources and Tribal Cultural Resources could be identified in the APE during additional consultation conducted in compliance with the PA and HPMP and CEQA mitigation measures. Unknown archaeological resources also could be discovered and inadvertently damaged during project construction. Implementing new Mitigation Measures CR-1, CR-2, CR-3, CR-4, and CR-5 detailed below would reduce the potential for a significant effect resulting from inadvertent damage to or destruction of presently undocumented archaeological resources and Tribal Cultural Resources to a less-than-significant level. Because these measures would require that if archaeological resources or Tribal Cultural Resources are discovered prior to or during project-related construction activities, appropriate treatment and protection measures must be implemented.

Damage to or Destruction of Human Remains during Construction

Although no Native American human remains have been discovered in or near the APE, they could be encountered during earthmoving activities associated with the project. This would be a potentially significant effect. Implementing new Mitigation Measure CR- 6 would reduce the potential for a significant effect resulting from inadvertent damage to or destruction of presently undocumented human remains to a less-than-significant level because it requires that if human remains are discovered during project-related construction activities, disturbances in the area of the find must be halted and appropriate treatment and protection measures must be implemented, all in consultation with the California Native American Heritage Commission (NAHC), Most Likely Descendant (MLD), and landowners, in compliance with California Health and Safety Code Section 7050 et seq. and California PRC Section 5097.9 et seq.

Potential Damage to or Destruction of Traditional Cultural Landscape

Site P-34-005225, the Sacramento River Traditional Cultural Landscape was identified as a result of the updated records search conducted for this investigation. The resource encompasses both banks of the lower Sacramento River from just south of Knights Landing in Sutter and Yolo counties in the north to Sherman Island in the Delta in the south. The character defining elements of this landscape, according to the site record form are the waterways, tule habitat, fisheries, and other wildlife. This site has previously been *recommended* to be eligible for listing on the NRHP (SHPO has not concurred in this finding), however the identified resource attributes of this site consist entirely of natural resources such as waterways and natural habit. Formal NRHP evaluation of this resource was not conducted due to the vast geographic area it encompasses. Because the project will not significantly affect the natural environment composing this resource and is not changing the environment, setting, or integrity of this resource there would be less-than-significant impact to P-34-005225 and no mitigation is necessary.

3.9.3 Avoidance, Minimization, and Mitigation Measures

The following measures augment the mitigation identified in the ARCF GRR Final EIS/EIR by including actions to address Tribal Cultural Resources under CEQA and specifically address discovery of archaeological resources and human remains. If the project is implemented, USACE and CVFPB will implement the measures as described.

Mitigation Measure CR-1: Prepare a Historic Properties Treatment Plan and Continue Consultation in Accordance with the Programmatic Agreement and the Historic Properties Management Plan.

In accordance with the requirements of the ARCF PA and the procedures described in Section 8.2 of the ARCF HPMP, a Historic Properties Treatment Plan (HPTP) shall be prepared to address treatment of adverse effects to the Sacramento Weir and Bypass Historic Property. The ARCF HPMP specifies the content, procedures and consultation requirements for the HPTP.

CVFPB shall contact the Native American contacts, including those already identified by the Native American Heritage Commission (NAHC), in an effort to identify cultural resources important to Native Americans, including Tribal Cultural Resources as defined in California Public Resources Code 21074, that may be present in the project area. If Tribal Cultural Resources are identified in the APE, then the requirements of Mitigation Measure CR-5 shall be implemented by the CVFPB.

Mitigation Measure CR-2: Prepare an Archaeological Discovery Plan and an Archaeological Monitoring Plan.

In accordance with the procedures described in Section 9.2 of the ARCF HPMP, a discovery plan shall be prepared and included in the construction contractor's specifications. The discovery plan shall specify what actions are required to be taken by the contractor in the event of an archaeological discovery and describe what actions USACE may take in the event of a discovery.

In accordance with the procedures described in Section 9.3.9 of the ARCF HPMP, an archaeological monitoring plan shall be developed. This plan shall identify the locations of known Historic Properties, as well as sensitive areas designated for archaeological monitoring, and shall include methods and procedures for monitoring and the procedures to be followed in the event of a discovery of archaeological materials.

Mitigation Measure CR-3: Conduct Cultural Resources Awareness Training.

In accordance with the procedures described in Section 9.1 of the ARCF HPMP, USACE shall require the contractor to provide a cultural resources and tribal cultural resources sensitivity and awareness training program for all personnel involved in project construction, including field consultants and construction workers. The training shall be developed in coordination with an archaeologist meeting Secretary of the Interior Professional Qualifications Standards for Archaeology, as well as culturally affiliated Native American tribes. USACE may invite Native American representatives from interested culturally affiliated Native American tribes to participate. The training shall be conducted before any project-related construction activities begin in the APE and shall include relevant information regarding sensitive cultural resources and Tribal Cultural Resources, including applicable regulations, protocols for avoidance, and consequences of violating Federal and state laws and regulations.

The training shall also describe appropriate avoidance and impact minimization measures for cultural resources and Tribal Cultural Resources that could be located in the APE and shall outline what to do and who to contact if any potential cultural resources or Tribal Cultural Resources are encountered. The training shall emphasize the requirement for confidentiality and culturally appropriate treatment of any discovery of significance to Native Americans and shall discuss appropriate behaviors and responsive actions, consistent with Native American tribal values.

Mitigation Measure CR-4: Implement Procedures for Discovery of Cultural Material.

If cultural materials (e.g., unusual amounts of shell, animal bone, bottle glass, ceramics, building remains,) are discovered during project-related construction activities or if any of these types of resources are identified prior to construction, USACE in consultation with CVFPB and other interested parties, shall develop appropriate protection and avoidance measures where feasible (where avoidance is possible through re-design, revised construction methods, or other means which do not cause construction of the project to become impractical). These procedures shall be developed in accordance with the ARCF PA and ARCF HPMP, which specifies procedures for post-review discoveries. Additional measures, such as development of Historic Property Treatment Plans prepared in accordance with the PA and HPMP, may be necessary if avoidance or protection is not possible.

Mitigation Measure CR-5: In the Event that Tribal Cultural Resources are Discovered Prior to or During Construction, Implement Procedures to Evaluate Tribal Cultural Resources and Implement Avoidance and Minimization Measures to Avoid Significant Adverse Effects.

California Native American Tribes that are traditionally and culturally affiliated with the geographic area in which the project is located may have expertise concerning their Tribal Cultural Resources (California PRC Section 21080.3.1). Consistent with the California Natural Resources Agency Tribal Consultation Policy, CVFPB will consult with culturally affiliated Tribes concerning the identification and evaluation of Tribal Cultural Resources and the treatment of any Tribal Cultural Resources that may be impacted, if these types of resources are discovered prior to or during construction. Consultation with culturally affiliated Tribes shall focus on identifying measures to avoid or minimize impacts on any such resources discovered during construction. If Tribal Cultural Resources are identified in the APE prior to or during construction, the following performance standards shall be met before proceeding with construction and associated activities that may result in damage to or destruction of Tribal Cultural Resources:

- Each identified Tribal Cultural Resource will be evaluated for CRHR eligibility through application of established eligibility criteria (CCR 15064.636), in consultation with interested Native American Tribes.

- If a Tribal Cultural Resource is determined to be eligible for listing in the CRHR, USACE, in consultation with CVFPB, will avoid damaging the Tribal Cultural Resource in accordance with California PRC Section 21084.3, if feasible. If CVFPB determines that the project may cause a substantial adverse change to a Tribal Cultural Resource, and measures are not otherwise identified in the consultation process, the following are examples of mitigation steps capable of avoiding or substantially lessening potential significant impacts to a Tribal Cultural Resource or alternatives that would avoid significant impacts to a Tribal Cultural Resource. These measures may be considered to avoid or minimize significant adverse impacts and constitute the standard by which an impact specifically address inadvertent discovery of human remains:

i. Avoid and preserve resources in place, including, but not limited to, planning construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

ii. Treat the resource with culturally appropriate dignity, taking into account the Tribal cultural values and meaning of the resource, including, but not limited to, the following:

a. Protect the cultural character and integrity of the resource.

b. Protect the traditional use of the resource.

c. Protect the confidentiality of the resource.

d. Establish permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or using the resources or places.

e. Protect the resource.

Mitigation Measure CR-6: Implement Procedures for Discovery of Human Remains.

To minimize adverse effects from encountering human remains during construction, USACE and CVFPB shall implement the following measures:

- In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, CVFPB shall consult with USACE, and USACE shall immediately halt potentially damaging excavation in the area of the burial and notify the Sacramento County Coroner and a professional archaeologist to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (California Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (California Health and Safety Code Section 7050[c]). After the coroner's findings have been made, the archaeologist and the NAHC-designated MLD, in consultation with the landowner, shall determine the ultimate treatment and disposition of the remains.

- Upon the discovery of Native American human remains, USACE, in coordination with CVFPB, shall require that all construction work must stop within 100 feet of the discovery until consultation with the MLD has taken place. The MLD shall have 48 hours to complete a site inspection and make recommendations to the landowner after being granted access to the site. A range of possible treatments for the remains, including nondestructive removal and analysis, preservation in place, relinquishment of the remains and associated items to the descendants, or other culturally appropriate treatment may be discussed. California PRC Section 5097.98(b)(2) suggests that the concerned parties may mutually agree to extend discussions beyond the initial 48 hours to allow for the discovery of additional remains. The following is a list of site protection measures that CVFPB shall employ:

    i. Record the site with the NAHC or the appropriate Information Center.

    ii. Record a document with the county in which the property is located.

    iii. If agreed to by the MLD and the landowner, CVFPB or CVFPB's authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. If the NAHC is unable to identify an MLD, or if the MLD fails to make a recommendation within 48 hours after being granted access to the site, CVFPB or CVFPB's authorized representative may reinter the remains in a location not subject to further disturbance. If CVFPB rejects the recommendation of the MLD and mediation by the NAHC fails to provide measures acceptable to CVFPB, CVFPB shall implement mitigation to protect the burial remains. Construction work in the vicinity of the burials shall not resume until the mitigation is completed.

3.10 Transportation and Circulation

3.10.1 Existing Conditions

Environmental and regulatory settings in the GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some site-specific conditions are described below.

The key roadways that would be used by project-related traffic include I-5, I-80, North Harbor Boulevard, Old River Road, and Reed Avenue.

Existing daily traffic volumes and peak-hour volumes for these roadways are provided in Tables 3.10-1 through 3.10-3. These roadways currently operate acceptably based on Caltrans, Yolo County, and City of West Sacramento standards. Regional access to the project site is provided by I-5 and I-80.

The City of West Sacramento no longer uses level of service (LOS) standards for roadway segments. Instead, the City of West Sacramento identifies Average Daily Trips (ADT) thresholds that may be used to determine whether intersection LOS analysis or roadway expansion is required (City of West Sacramento 2016). For two-lane arterial roadways with low access control (such as North Harbor Boulevard), the Maximum Desirable Daily Volume is 12,000 ADT. For four-lane arterial roadways (such as Reed Avenue) with medium access control, the Maximum Desirable Daily Volume is 28,800 ADT.

Although Old River Road is not currently marked with signage for a Class II Bike Lane, this roadway has paved shoulders and is identified as a future Class II Bike Lane in the Yolo County Bicycle Transportation Plan (Yolo County 2013).

Table 3.10-1. Peak-Hour Volumes for Limited Access Highways

Roadway	Location	Number of Lanes	A.M. Peak-Hour Volume (P.M. Peak-Hour Volume)
I-5 Northbound	Sacramento County Line to County Road 102	2	1,820 (1,710)
I-5 Southbound	County Road 102 to Sacramento County Line	2	1,690 (2,110)
I-80 Eastbound	U.S. 50 to Reed Avenue	3	2,576 (3,817)
I-80 Eastbound	Reed Avenue to West El Camino Avenue	3	2,257 (4,081)
I-80 Westbound	West El Camino Avenue to Reed Avenue	3	4,315 (2,725)
I-80 Westbound	Reed Avenue to U.S. 50	3	2,576 (3,817)

Note: Data are for 2014.
Sources: West Sacramento 2016b, Yolo County 2009

Table 3.10-2. Average Daily Traffic Counts and Peak-Hour Trips for Roadways in West Sacramento

Roadway	Location	Classification	Average Daily Traffic	A.M. Peak Hour Trips (P.M. Peak Hour Trips)
North Harbor Boulevard	Reed Avenue to Riverbank Road	Arterial (2 Lanes)	4,529	467 (484)
Reed Avenue	I-80 Off-ramp to Harbor Boulevard	Arterial (4 Lanes)	15,930	1,036 (1,229)
I-80 Eastbound Entrance	Reed Avenue	One Lane Merge	N/A	368 (789)
I-80 Westbound Entrance	Reed Avenue	One Lane Merge	N/A	281 (772)
I-80 Eastbound Exit	Reed Avenue	One Lane Diverge	N/A	660 (520)
I-80 Westbound Exit	Reed Avenue	One Lane Diverge	N/A	872 (549)

Notes: LOS = Level of Service; N/A = not available
West Sacramento no longer calculates LOS for local roadway segments. Although the West Sacramento General Plan Environmental Impact Report (EIR) includes traffic counts for local roadway segments (North Harbor Boulevard and Reed Avenue), earlier traffic counts from 2005 (Reed Avenue) and 2007 (North Harbor Boulevard) are presented here and used in the analysis; these numbers are more conservative than the West Sacramento General Plan EIR and include peak-hour trips, as well as average daily traffic.
Sources: City of West Sacramento 2016a, City of West Sacramento 2016b

Table 3.10-3. Traffic Data for Roadways in Yolo County

Roadway	Location	Classification	P.M. Peak-Hour Trips
Old River Road	County Road 118 to County Road 126	Major Two-Lane County Road	390

Source: Yolo County 2009

3.10.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR stated that the project would cause a substantial increase in traffic on local roadways associated with truck haul trips during construction activities. In addition, traffic controls would cause or contribute to temporary substantial increases in traffic levels on several roadways, as traffic is detoured or slowed. Traffic controls could cause delays during the morning and evening peak commute hours. Pedestrian and bicycle trails would require detours and/or temporary closures. These effects were determined to be significant. Mitigation measures, such as a Traffic Control and Road Maintenance Plan and notifications regarding roadway lane and pedestrian/bicycle path closures and detours, were identified. However, it was determined that the temporary increase in construction traffic on public roadways would be a significant and unavoidable effect.

Significance Criteria

For this analysis, the 7 criteria for determining a significant project effect that are listed at p.224 of the Final EIR/EIS are repeated below:

- Substantially increase traffic in relation to existing traffic load and capacity of the roadway system;
- Substantially disrupt the flow of traffic;
- Expose people to significant public safety hazards resulting from construction activities on or near the public road system;
- Reduce the supply of parking spaces sufficiently to increase demand above supply;
- Cause substantial deterioration of the physical condition of nearby roadways;
- Result in inadequate emergency access; or
- Disrupt railroad services for a significant amount of time.

One additional significance criterion not included in the ARCF GRR Final EIS/EIR is considered in this analysis, based on 2018 changes to the CEQA Guidelines. The project was also determined to result in a significant effect if it would:

- Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b) related to increases to vehicle miles traveled (VMT).

Effects Analysis

No-Action Alternative

Under the No-Action Alternative, USACE would not construct the proposed improvements. As a result, the Sacramento area would remain at a greater risk of a possible levee failure during a flood due to seepage, slope stability, erosion, or overtopping. Traffic would be expected to remain generally the same in the Sacramento metropolitan area, with a gradual increase associated with urban population growth.

In the event of a flood, roadways could be inundated with floodwaters, possibly including emergency evacuation routes, and inundation could strand some of the population. Roadways could also be damaged by floodwaters and would require repairs once waters have receded. Floodwaters could also damage the Sacramento Regional Transit Light Rail infrastructure. These impacts would likely be significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable. Because of this uncertainty, there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alterative

Conflict with a Program, Plan, or Ordinance: Exceed Level of Service or Conflict with Vehicle-Miles-Traveled Standards

LOS and VMT standards are typically used to evaluate long-term (operational) traffic effects resulting from residential, employment-generating, industrial, and institutional development projects. However, the project does not involve land use development, and long-term operation of the project would require a similar level of maintenance and monitoring as under current conditions. Therefore, LOS standards and VMT thresholds were not used in this analysis. Instead, this analysis focuses on construction-related traffic effects and the effects of implementing the project on existing roadways. Because the project would not result in substantial changes to operations as compared to current conditions, the project would have little to no effect on long-term operational LOS or VMT.

Increase in Traffic Volumes or Decrease in Capacity along Designated Roadways in the Project Area

The number of trucks active during project construction would vary from hour to hour, depending on project activities and access and restrictions onsite. Nevertheless this analysis assumes that construction trucks would operate throughout the day for a total of 10 hours, exporting and importing materials to and from the project area, with truck trips evenly distributed during the 10-hour construction work window to obtain the hourly haul truck volumes for each assigned route segments. Construction worker commute trips were only applied to peak hours in the morning and in the afternoon, assuming worker trips would occur once in the morning to get to the project area and once in the afternoon to leave the project area. Roadway segments were evaluated by comparing existing roadway segment volumes with existing plus project construction volumes for each roadway segment.

This analysis used the recommended screening criterion from the Institute of Transportation Engineers (ITE) (1988) for assessing the effects of construction projects that create temporary traffic increases. To account for the large percentage of heavy trucks associated with typical construction projects, ITE recommends a threshold level of 50 or more new peak-direction trips during the peak hour.

Therefore, a project would cause a substantial increase in traffic, in relation to the existing traffic load and capacity of the street system, and a significant effect related to traffic if it would result in 50 or more new truck trips during the a.m. or p.m. peak hours. This is considered an "industry standard" and is the most current guidance.

To assess the effect of truck trips generated by project construction, a heavy-vehicle factor known as a passenger car equivalent (PCE) value was applied to the project-generated truck traffic. This heavy-vehicle factor was used to account for the additional space occupied, reduced speed, and reduced maneuverability associated with having these vehicles, rather than standard automobiles, on the roadway. A PCE value of 2.0 was applied to the construction equipment truck trip generation estimates, as recommended by the Highway Capacity Manual 2000 (Transportation Research Board 2000). Therefore, the project would cause a substantial increase in traffic in relation to the existing traffic load and capacity of the street system, and result in a significant effect related to traffic, if it would result in 100 or more new vehicle trips during the a.m. or p.m. peak hours.

Implementing the project would require hauling of construction equipment/materials and transporting construction workers to and from the project area along major highways and over local surface streets. Many of the construction-generated trips would involve slow-moving trucks, which would further affect highway traffic. Construction-generated traffic would temporarily increase the daily and peak-hour traffic along specified routes. Staging areas would be located within the project site to maximize the efficient use and distribution of materials and equipment. Borrow material and spoils would be obtained and disposed of locally, within 50 miles of the project site.

Construction trucks that would be used for activities associated with the project, including transporting material offsite borrow locations, transport of construction materials to the project site, and soil disposal or a commercially available disposal site, would result a total of up to 42,000 truck trips over the 3-year construction period. This would conservatively result in up to 1,000 truck trips per day both directions (i.e., approximately 2,000 equivalent vehicle trips per day, assuming a PCE value of 2.0) to import or remove the required materials. Additionally, construction activities would require a maximum of 75 construction workers per day during the most active construction periods. Thus, commuting by construction workers would result in a worst-case scenario of approximately 150 total daily trips (assuming two trips per day by each worker: one trip inbound to the project site in the morning and one trip outbound at the end of the day) to area roadways.

In total, levee reconstruction activities (during the peak construction month in which most phases overlap) may result in as many as approximately 2,150 equivalent vehicle trips per day distributed over area roadways. The project-related increase in traffic volumes along the affected roadways could be up to 215 vehicles per hour. This level of traffic increase would potentially degrade traffic operations below the applicable thresholds.

Construction-related traffic could also delay or temporarily obstruct the movement of emergency vehicles. Furthermore, construction would also require temporary lane closures on some project area roadways, with up to half of the available roadway being closed at one time. Implementing new Mitigation Measure TR-1 would reduce the significant effect associated with an increase in traffic volumes and reduction in roadway capacity, because a traffic control plan that includes measures to minimize traffic congestion and provide acceptable traffic flow to the maximum extent feasible would be prepared and implemented. However, as described in the ARCF GRR Final EIS/EIR, this temporary construction impact would remain significant and unavoidable. Additionally, USACE and CVFPB

would provide public notice in advance of closures and detours/routes and would require the provision of detour signs indicating the location of alternate routes that could be used by bicyclists or pedestrians.

Conflict with a Program, Plan, or Ordinance: Decreased Performance or Safety of Alternative Modes of Transportation

Although most of the project activities would occur within the project footprint, temporary road closures would be needed on Old River Road and Road 126, which could interfere with pedestrian and bicycle travel. Implementing Mitigation Measure TR-1 would reduce the significant effect associated with alternative modes of transportation to a less-than-significant level because USACE and CVFPB would provide public notice in advance of closures and detours/routes and would require the provision of detour signs indicating the location of alternate routes that could be used by bicyclists or pedestrians.

Increased Hazards Due to a Design Feature or Incompatible Uses

The realigned Old River Road and Road 124 would be designed in accordance with Yolo County standards and would not increase hazards. However, the combination of the high volume of slow-moving, heavy-duty truck traffic on local roadways in the project area; workers entering and existing construction sites; periodic road and lane closures associated with construction traffic; and potential damage to pavement would increase traffic hazards on local roadways during the construction period. Implementing Mitigation Measure TR-1 would reduce the significant effect associated with increased hazards due to a design feature or incompatible uses to a less-than-significant level, because a construction traffic control and road maintenance plan would be prepared and implemented.

Disrupt Railroad Services

Under Scenario 1, railroad services would not be disrupted for a significant amount of time, because the existing railroad embankment would be reconstructed as a bridge, with only temporary closures scheduled to minimize effects on rail traffic, especially weekend excursion traffic. Implementing Mitigation Measure TR-2 would reduce this impact to a less-than-significant level by requiring alternative routing for rail traffic where available.

Under Scenario 2, an approximately 1-mile-long segment of the Sierra Northern Railway line would be abandoned and taken out of service prior to project construction. This option would permanently remove freight and recreational rail traffic from an approximately 1-mile-long segment of the railroad.

Approximately 507 freight cars were hauled between Woodland and West Sacramento along the Railroad Corridor in 2018, using a 1952 GP-7 Tier 0 locomotive. Scenario 2 would require these trips to be replaced either with truck trips or with equivalent trips on a freight train between Woodland and West Sacramento via Davis. If on-road trucks are used, up to approximately 4-5 trucks could be required to transport the freight carried by each freight car, resulting in up to 2,535 truck trips per year, approximately seven trips per day. If the alternative freight alignment is used, the freight would be hauled using a Tier 3 Railpower Ultra Low Emission Diesel engine. Regardless of whether the small amount of freight traffic that currently uses the Sierra Northern Railway would be replaced with on-road truck trips or with trips on a train with a more efficient freight locomotive, effects on traffic would be less than significant.

Excursion trains currently operate on the railway approximately 3 days per week, traveling between the Bryte area of West Sacramento and Woodland. Implementing Scenario 2 would shorten the distance traveled by these excursion trains by approximately 1.5 miles and change the location where excursion tours would begin, but it would not otherwise affect the excursion train operations. Scenario 2 would have a less-than-significant impact on this mode of transportation. Therefore, all direct and indirect impacts of the abandonment of the railway under Scenario 2 would be less than significant.

3.10.3 Avoidance, Minimization, and Mitigation Measures

The following measures are consistent with mitigation identified in the ARCF GRR Final EIS/EIR. Mitigation Measure TR-2 has been slightly modified to address temporary railroad closure during construction and potential permanent closure under Option 2. The following mitigation measures would be implemented if the project is implemented:

Mitigation Measure TR-1: Prepare and Implement a Traffic Control and Road Maintenance Plan.

Before the start of project-related construction activities, USACE shall require the contractor to prepare and implement a Traffic Control and Road Maintenance Plan. This plan will describe the methods of traffic control to be used during construction. All on-street construction traffic will be required to comply with the local jurisdiction's standard construction specifications. The items listed below shall be included in the plan and as terms of the construction contracts:

- Follow the standard construction specifications of affected jurisdictions with regard to use and repair of the roads and incorporate those conditions into the construction contract.

- Provide adequate parking for construction trucks, equipment, and construction workers within the designated staging areas throughout the construction period. If inadequate space for parking is available at a given work site, the construction contractor shall provide an off-site staging area and, as needed, coordinate the daily transport of construction vehicles, equipment, and personnel to and from the work site.

- Proposed lane closures shall be coordinated with the appropriate jurisdiction and be minimized to the extent possible during the morning and evening peak traffic periods. Construction specifications shall limit lane closures during commuting hours where feasible, and lane closures will be kept as short as possible. If a road must be closed, detour routes and/or temporary roads shall be made to accommodate traffic flows. Signs shall be provided to direct traffic through detours.

- Post signs providing advance notice of upcoming construction activities at least 1 week in advance, so that motorists are able to avoid traveling through affected areas during these times.

- Provide bicycle detours to allow for continued use by bicycle commuters. Maintain safe pedestrian and bicyclist access around the construction areas at all times. Construction areas shall be secured as required by the applicable jurisdiction to prevent pedestrians and bicyclists from entering the work site, and all stationary equipment should be located as far away as possible from areas where bicyclists and pedestrians are present.

- Notify (by means such as physical signage, internet postings, letters, or telephone calls) and consult with emergency service providers to inform them of construction activities, maintain emergency

access, and facilitate the passage of emergency vehicles during construction activities. Emergency vehicle access shall be made available at all times.

- The construction contractor shall document pre- and post- construction conditions on roadways used during construction. This information will be used to assess damage to roadways used during construction. The contractor shall repair all potholes, fractures, or other damages attributed to the project's construction activities.

- Comply with Caltrans requirements by submitting this Traffic Control and Road Maintenance Plan to Caltrans for review to cover points of access from the state highway system (I-5 and I-80) for haul trucks and other construction equipment.

Mitigation Measure TR-2: Adjust Rail Traffic.

USACE and CVFPB shall implement the following measure to reduce effects on rail transportation in the project area:

- Trains using the Yolo Shortline Railroad would be detoured to a different rail line when required. If an alternative rail line is not available, railroad services would be continued by transporting goods on public roads using cargo trucks during the extent of closures required by the project.

3.11 Air Quality

3.11.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some updated information is presented below.

Table 3.11-1 provides current Sacramento Valley Air Basin (SVAB) attainment status designated by U.S. Environmental Protection Agency (EPA) for six air pollutants of nationwide concern: particulate matter (PM), ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. PM is divided into two classes, based on particle size: PM equal to or less than 10 micrometers in diameter (PM_{10}) and PM equal to or less than 2.5 micrometers in diameter ($PM_{2.5}$). An "attainment" designation for an area signifies that pollutant concentrations did not exceed the established standard. A "nonattainment" designation indicates that a pollutant concentration has exceeded the established standard. Nonattainment may differ in severity.

Table 3.11-1. Sacramento Valley Air Basin Attainment Status

Pollutant	Federal Attainment Status	State Attainment Status
1-hour Ozone	**Severe Non-attainment**	**Serious Non-attainment**
8-hour Ozone	**Severe Non-attainment**	**Serious Non-attainment**
24-hour PM_{10}	Attainment	**Non-Attainment**
Annual PM_{10}	Not Applicable	**Non-Attainment**
24-hour $PM_{2.5}$	**Non-attainment**	Not Applicable
Annual $PM_{2.5}$	Not Applicable	**Non-attainment**

Table 3.11-1. Sacramento Valley Air Basin Attainment Status

Pollutant	Federal Attainment Status	State Attainment Status
1-hour Carbon Monoxide	Attainment	Attainment
8-hour Carbon Monoxide	Attainment	Attainment
1-hour Nitrogen Dioxide	Not Applicable	Attainment
Annual Nitrogen Dioxide	Attainment	Not Applicable
3-hour Sulfur Dioxide	Attainment	Not Applicable
24-hour Sulfur Dioxide	Attainment	Attainment
Annual Sulfur Dioxide	Attainment	Not Applicable
30-day Lead	Not Applicable	Attainment
Quarter Lead	Attainment	Not Applicable

Notes: PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less
Source: Sacramento Metropolitan Air Quality Management District 2017

To identify the severity of the problem and the extent of planning and actions required to meet the standard, nonattainment areas are classified depending on the severity of their air quality problem (e.g., moderate, serious, severe, extreme).

3.11.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR determined that construction emissions could exceed Sacramento Metropolitan Air Quality Management District (SMAQMD) and Yolo-Solano Air Quality Management District (YSAQMD) emission thresholds for oxides of nitrogen (NO_x), depending on the method of material delivery, and that exceeding this threshold would be a significant effect. After accounting for a 20 percent reduction in NO_x from implementing mitigation in the form of SMAQMD Basic Construction Emissions Control Practices, construction-related emissions still could exceed the emission thresholds for NO_x. Therefore, USACE would be required to pay an off-site mitigation fee for NO_x emissions in the SVAB, which would reduce the effect to a less-than-significant level.

Nearby sensitive receptors could be exposed to dust generated during construction activities and temporary and short-term diesel particulate emissions (i.e., toxic air contaminants [TACs]) from on-site heavy-duty equipment and on-road haul trucks, which was determined to be a significant effect. Mitigation would be implemented in the form of PM_{10} and $PM_{2.5}$ dust modeling, measures to control fugitive dust emissions, and weekly and monthly surveys to ensure that emissions from all off-road diesel-powered equipment used on the project site do not exceed 40 percent opacity for more than 3 minutes in any 1 hour. These measures would reduce the effect to less than significant.

It was determined that although odors associated with diesel exhaust emissions from the use of on-site construction equipment may be noticeable from time to time by adjacent receptors, the odors would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. Furthermore, as required by California Air Resources Board (ARB) Regulation 13 CCR 2449(d)(3), no in-use off-road diesel vehicles may idle for more than 5 consecutive minutes. Therefore,

this effect was determined to be less than significant, and implementation of the other air quality mitigation measures would further reduce odorous exhaust emissions.

Significance Criteria

For this analysis, an effect was considered significant if it would:

- Conflict with, or obstruct implementation of, the applicable air quality plan;
- Violate any air quality standard or substantial contribution to existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area under National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The applicable General Conformity *de minimis* thresholds for the SVAB are shown in Table 3.11-2. The analysis presented below compares the project's construction emissions, including the new components, with the applicable *de minimis* thresholds. Construction of the new Sacramento Weir would occur in 2021, 2022, and 2023, concurrent with other activities authorized under the ARCF 2016 Project. For purposes of General Conformity with the Clean Air Act (CAA), all ARCF 2016 Project emissions occurring in a given calendar year are considered together.

Table 3.11-2. General Conformity de minimis Thresholds

Pollutant	Sacramento Valley Air Basin Emissions Thresholds (tons per year)
Carbon Monoxide	100
Oxides of Nitrogen	25
Volatile Organic Compounds/Reactive Organic Gases	25
Respirable Particulate Matter (PM_{10})	100
Fine Particulate Matter ($PM_{2.5}$)	100

Sources: 40 CFR 93 Section 153

YSAQMD has identified specific criteria pollutant thresholds to assist lead agencies in determining air quality impacts under CEQA. These thresholds are shown in Table 3.11-3.

Table 3.11-3. Yolo-Solano Air Quality Management District Thresholds of Significance for Construction

Pollutant	Threshold
Oxides of Nitrogen	10 tons per year
Respirable Particulate Matter (PM_{10})	80 pounds per day
Reactive Organic Gases	10 tons/year

Source: Yolo-Solano Air Quality Management District 2007

The project includes transport of riprap by barge from the Bay Area. The Bay Area Air Quality Management District's (BAAQMD's) thresholds for construction emissions are presented in Table 3.11-4.

Table 3.11-4. Bay Area Air Quality Management District Thresholds of Significance for Construction

Pollutant	Threshold (average pounds per day)
Oxides of Nitrogen	54
Fine Particulate Matter ($PM_{2.5}$)	54 (construction exhaust emissions only)
Respirable Particulate Matter (PM_{10})	82 (construction exhaust emissions only)
Reactive Organic Gases	54

Source: Bay Area Air Quality Management District 2017

There are no substantial stationary sources of TACs on or in the project vicinity, including the project components evaluated in this Supplemental EIS/EIR. The only TACs that would be present on a regular basis in significant quantities on or near the project area would be PM associated with diesel exhaust from trucks on local streets and highways and construction equipment associated with this project and others in the region.

Methodology

Project construction was conservatively modeled over the period from April 15, 2021 through November 30, 2023 (as described in the description of the Proposed Action in Chapter 2, "Alternatives"). Multiple construction phases would occur simultaneously, as described in Chapter 2. Air emissions were modeled using Road Construction Emissions Model 8.1.0, and model data are presented in Appendix C. The construction emissions estimates shown in Table 3.11-5 indicate the maximum daily and annual emissions that would occur.

Daily emissions from barge transport while traveling within BAAQMD jurisdiction underway from the proposed quarry in San Rafael to the Sacramento Weir Widening project site in the Sacramento region are presented in Table 3.11-6.

Table 3.11-7 presents the estimated annual emissions in each calendar year for all ARCF 2016 Project elements in 2019 through 2023, in comparison to the General Conformity *de minimis* threshold.

Table 3.11-5. Air Emissions Estimates for the Proposed Action and Higher Weir Elevation Alternative in the Sacramento Federal Nonattainment Area

	ROG (tons/year)	CO (tons/year)	NO_x (tons/year)	PM_{10} (tons/year)	PM_{10} (pounds/day)	$PM_{2.5}$ (tons/year)
2021 Unmitigated	1.31	9.50	**17.01**	39.44	**427.08**	8.56
2021 Mitigated	0.91	11.94	7.21	39.15	**423.87**	8.34
2022 Unmitigated	1.76	15.15	**16.98**	53.59	**406.00**	11.67
2022 Mitigated	1.22	18.71	6.41	53.15	**402.63**	11.26
2023 Unmitigated	1.51	12.66	**14.16**	44.71	**424.60**	9.78
2023 Mitigated	1.17	15.48	7.59	44.41	**421.90**	9.51
CEQA Significance Threshold	10	Violation of CAAQS	10	N/A	80	N/A
General Conformity *de minimis* Thresholds	25	100	25	100	N/A	100

Notes: Bold numbers indicate concentrations above thresholds
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with aerodynamic diameter less than 10 microns; $PM_{2.5}$ = particulate matter with aerodynamic diameter less than 2.5 microns; ROG = reactive organic gases; CAAQS = California Ambient Air Quality Standard
Source: Moore Noise 2019, adapted by GEI Consultants, Inc.

Table 3.11-6. Daily Emissions Estimates for Barge Transport in the Bay Area Air Quality Management District

	NO_x	$PM_{2.5}$	PM_{10}	ROG
Average Emissions (pounds/day)	**357.1**	14.4	16.1	20.9
Threshold (pounds/day)	54	54	82	54

Source: Moore Noise 2019, adapted by GEI Consultants, Inc.

Table 3.11-7. Air Emissions for All ARCF 2016 Project Elements and Comparison to General Conformity *de minimis* Standards

	Tons/year (Unmitigated)				*Tons/year (Mitigated)*	
	ROG	NO_x	PM_{10}	$PM_{2.5}$	ROG	NO_x
2019						
Reach D Contract 1 (SREL Seepage Berm)	0.02	0.15	0.07	0.02	0.02	0.15
Reach D Contract 1 (Beach Stone Lake Mitigation Site)	0.02	0.32	3.21	0.68	0.02	0.32
Total 2019 Emissions (Sum)	0.0	0.5	3.3	0.7	0.0	0.5
2020						
American River Erosion Contract 1	0.26	2.34	0.49	0.14	0.20	0.90

Table 3.11-7. Air Emissions for All ARCF 2016 Project Elements and Comparison to General Conformity *de minimis* Standards

	Tons/year (Unmitigated)			*Tons/year (Mitigated)*		
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**ROG**	**NO_x**
Sacramento River Erosion Contract 1	0.19	0.74	0.32	0.09	0.19	0.74
Sacramento River Erosion Contract 1 - Barge Emissions	0.08	1.24	0.05	0.05	0.08	1.24
Sacramento River Seepage/ Stability Contract 1 - Berm and Wells	0.63	6.60	2.53	0.75	0.26	0.83
Sacramento River Seepage/ Stability Contract 1 - Cutoff Wall	2.82	**31.60**	5.77	2.18	1.3	4.27
Total 2020 Emissions (Sum)	4.0	**42.5**	9.2	3.2	2.0	7.8
2021						
American River Erosion Contract 2	1.34	24.78	1.91	0.81	0.76	8.21
Sacramento River Erosion Contract 2	0.61	5.95	1.34	0.48	0.32	1.50
Sacramento River Erosion Contract 2 - Barge Emissions	0.43	5.61	0.30	0.27	0.43	5.61
Sacramento Weir	1.22	15.78	39.37	8.56	0.76	4.78
Sacramento Weir - Barge Emissions	0.09	1.23	0.07	0.06	0.09	1.23
Sacramento River Seepage/ Stability Contract 2 - Berm and Wells	0.51	5.17	1.59	0.51	0.22	1.13
Sacramento River Seepage/ Stability Contract 2 - Cutoff Wall	2.39	**26.13**	5.18	1.89	1.30	5.90
Total 2021 Emissions (Sum)	6.6	**84.6**	49.8	12.6	3.9	**28.4**
2022						
American River Erosion Contract 2	1.24	21.82	1.85	0.75	0.75	7.93
Sacramento River Erosion Contract 2	0.56	5.22	1.30	0.45	0.31	1.43
Sacramento River Erosion Contract 2 - Barge Emissions	0.43	5.61	0.30	0.27	0.43	5.61
Sacramento River Erosion Contract 3	0.56	5.22	1.30	0.45	0.31	1.43
Sacramento River Erosion Contract 3 - Barge Emissions	0.43	5.61	0.30	0.27	0.43	5.61
Sacramento Weir	1.76	16.98	53.59	11.67	1.11	4.47
Sacramento River Seepage/ Stability Contract 3 - Cutoff Wall	1.93	20.21	4.70	1.61	1.12	4.89
Magpie Creek	0.52	8.34	0.67	0.30	0.33	3.03
Total 2022 Emissions (Sum)	7.4	**89.0**	64.0	15.8	4.8	**34.4**
2023						
Mitigation	0.22	1.90	33.11	6.96	0.13	0.52
Sacramento River Erosion Contract 3	0.52	4.71	1.28	0.43	0.31	1.37

Table 3.11-7. Air Emissions for All ARCF 2016 Project Elements and Comparison to General Conformity *de minimis* Standards

	Tons/year (Unmitigated)			***Tons/year (Mitigated)***		
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**ROG**	**NO_x**
Sacramento River Erosion Contract 3 - Barge Emissions	0.43	5.61	0.30	0.27	0.43	5.61
Sacramento Weir	1.24	10.75	44.52	9.61	0.83	2.87
Sacramento Weir - Barge Emissions	0.27	3.41	0.19	0.17	0.27	3.41
Sacramento River Seepage/ Stability Contract 4 - Berm and Wells	0.43	4.09	2.41	0.65	0.22	1.02
Sacramento River Seepage/ Stability Contract 4 - Cutoff Wall	0.40	3.85	1.29	0.40	0.25	1.04
Total 2023 Emissions (Sum)	3.5	**34.3**	83.1	18.5	2.4	15.8
General Conformity *de minimis* Thresholds	**25**	**25**	**100**	**100**	**25**	**25**

Notes: Orange cells indicate emissions above the General Conformity *de minimis* threshold.
Source: Moore Noise 2019

Effects Analysis

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass. As a result of this alternative, there would be no construction-related air quality effects in the project area.

Without improvements to the levee system, the risk of levee failure would remain high. Under this alternative, a catastrophic flood event could cause portions of the levees protecting metropolitan Sacramento to fail, triggering widespread flooding and extensive damage. Emergency flood fighting and clean-up actions would require the use of a considerable amount of heavy construction equipment. Timing and duration of use would directly correlate with flood fighting needs, but it is likely that pollutants emitted during related activities would violate air quality standards for pollutants (including those for which the area is already considered non-attainment), expose sensitive receptors to toxic air emissions, and expose sensitive receptors to objectionable odors. Depending on the magnitude of the flood, flood-fighting could last for weeks or even months. Furthermore, because of the unpredictable nature of an emergency response, no BMPs to manage emissions would be in place. All of these effects could be considered significant for air quality. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alternative

Potential Conflict with Air Quality Plan or Contribute Substantially to Air Quality Violation – Yolo-Solano Air Quality Management District Standards

As shown in Table 3.11-5, unmitigated emissions would exceed local air district standards for NO_x and PM_{10}. However, implementing Mitigation Measures AIR-1, AIR-2, AIR-3, and AIR-4

described below would reduce NO_x and PM_{10} emissions to a less-than-significant level by requiring use of more efficient construction equipment, imposing BMPs to reduce airborne dust, and requiring payment of mitigation fees to offset emissions in excess of standards.

Potential Conflict with Air Quality Plan or Contribute Substantially to Air Quality Violation – Bay Area Air Quality Management District Standards

As shown in Table 3.11-6, daily emissions from barge transport of riprap would exceed BAAQMD construction standards for NO_x during any days when barges travel within BAAQMD jurisdiction. For the Proposed Action and the Higher Weir Elevation Alternative, this impact would occur in 2021 and 2023. Implementing Mitigation Measures AIR-4 and AIR-5 would reduce this impact to a less-than-significant level by requiring more efficient marine engines where feasible, and payment of fees to the BAAQMD to offset NO_x emissions.

Potential Conflict with Air Quality Plan or Contribute Substantially to Air Quality Violation – General Conformity with the Clean Air Act

Construction of ARCF 2016 Project components would occur during calendar years 2019-2023, including construction of the Proposed Action or the Higher Weir Elevation Alternative in 2021-2023. As shown in Table 3.11-7, emissions of NO_x would potentially exceed the General Conformity *de minimis* threshold in 2021, 2022, and 2023.

USACE has made a draft conformity determination and has entered into agreements with the YSAQMD and SMAQMD to fully offset the ARCF 2016 Project's NO_x emissions to zero in 2021, 2022, and 2023. Implementing Mitigation Measure AIR-4 would require purchase of offsets for all NO_x emissions in years when the ARCF 2016 Project would exceed the *de minimis* standard of 25 tons per year, resulting in a less-than-significant impact.

3.11.3 Avoidance, Minimization, and Mitigation Measures

The following measures are consistent with mitigation identified in the ARCF GRR Final EIS/EIR. Exhaust emission mitigation has been adjusted to reflect mitigation and offset requirements associated with the General Conformity determination for the ARCF 2016 Project. Although the project would be implemented within the jurisdiction of the YSAQMD, SMAQMD standard mitigation measures described in the ARCF GRR Final EIS/EIR and this Supplemental EIS/EIR would be effective to address local emissions in Yolo County. (Mitigated construction-related emissions are shown in Table 3.11-4.)

Mitigation Measure AIR-1: Implement the Sacramento Metropolitan Air Quality Management District's Basic Construction Emission Control Practices.

If the project is implemented, USACE shall require its contractors to comply with the basic construction emission control practices listed in the Final EIS/EIR (see Section 3.11.6 of the Final EIR/EIS, p. 251) and presented below for all construction-related activities:

- Water all exposed surfaces two times daily or more, as needed. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads.

- Cover, or suitably wet soils and other materials on haul trucks transporting soil, sand, or other loose material on the site. Cover any haul trucks that travel along freeways or major roadways.

- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.

- Limit vehicle speed on unpaved roads to 15 miles per hour (mph).

- Complete pavement of all roadways, driveways, sidewalks, parking lots to be paved as soon as possible. In addition, lay building pads as soon as possible after grading unless seeding or soil binders are used.

- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes (required by CCR, Title 13, Sections 2449[d][3] and 2485). Provide clear signage that posts this requirement for workers at the entrances to the site.

- Maintain all construction equipment in proper working condition according to manufacturer's specifications. Have the equipment checked by a certified mechanic and determined to be running in proper condition before it is operated.

Mitigation Measure AIR-2: Implement the Sacramento Metropolitan Air Quality Management District's Enhanced Fugitive PM Dust Control Practices.

Because the construction activities would involve substantial material movement activities and would be located in proximity of residential receptors, USACE shall require its construction contractors to implement the Enhanced Fugitive PM Dust Control Practices listed in the Final EIS/EIR (at page 251) below to help reduce potential fugitive PM dust emissions if the project is implemented.

Soil Disturbance Areas

- Water exposed soil with adequate frequency for continued moist soil. However, do not overwater to the extent that sediment flows off the site.

- Suspend excavation, grading, and/or demolition activity when wind speeds exceed 20 mph.

- Install wind breaks (e.g., plant trees, solid fencing) on windward side(s) of construction areas.

- Plant vegetative ground cover (fast germinating native grass seed) in disturbed areas as soon as possible. Water appropriately until vegetation is established.

Unpaved Roads (Entrained Road Dust)

- Install wheel washers for all exiting trucks or wash off all trucks and equipment leaving the site.

- Treat site accesses to a distance of 100 feet from the paved road with a 6- to 12-inch layer of wood chips, mulch, or gravel to reduce generation of road dust and road dust carryout onto public roads.

- Post a publicly visible sign with the telephone number and person to contact at USACE regarding dust complaints. This person will respond and take corrective action within 48 hours. The phone number of YSAQMD also will be visible to ensure compliance.

Mitigation Measure AIR-3: Require Lower Exhaust Emissions for Construction Equipment.

If the project is implemented, USACE shall require its contractors to use a fleet-wide average of 90 percent Tier 4 emissions vehicles for off-road construction equipment, and on-road haul trucks must be equipped with 2010 or newer engines. In order to demonstrate compliance with this requirement:

- The construction contractor shall submit to USACE and YSAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used an aggregate of 40 or more hours during any portion of the construction project.

- The inventory shall include the horsepower rating, engine model year, and projected hours of use for each piece of equipment. The construction contractor shall provide the anticipated construction timeline including start date, and name and phone number of the project manager, and on-site foreman. This information shall be submitted at least 4 business days prior to the use of subject heavy-duty off-road equipment. The SMAQMD Construction Mitigation Tool can be used to submit this information. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs.

- The construction contractor shall provide a plan for approval by USACE and YSAQMD demonstrating that the heavy-duty off-road vehicles (50 horsepower or more) to be used in the construction project, including owned, leased, and subcontractor vehicles, will achieve a project-wide fleet average of 90 percent Tier 4 emissions vehicles. This plan shall be submitted in conjunction with the equipment inventory. Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available.

- SMAQMD's Construction Mitigation Tool can be used to identify an equipment fleet that achieves this reduction.

- Use the Construction Mitigation Tool to track PM10 emissions and mileage traveled by on-road trucks, reporting results to USACE on a monthly basis.

Mitigation Measure AIR-4: Pay Mitigation Fees to Reduce and Offset NO_x Emissions.

If the project is implemented, USACE shall implement measures to reduce NO_x construction-related emissions. Pursuant to air district thresholds of significance, if the projected construction-related emissions exceed the NO_x threshold of significance based on the equipment inventory, USACE and CVFPB shall contribute to SMAQMD's, BAAQMD's, or YSAQMD's off-site mitigation fee program sufficiently to offset the amount by which the project's NO_x emissions exceed the threshold. If emissions for the ARCF 2016 Project in any given year would exceed the *de minimis* threshold of 25 tons per year, USACE and CVFPB would enter into an agreement with SMAQMD and/or YSAQMD to purchase offsets for all NO_x emissions in any year that projected emissions would exceed the threshold. The determination of the estimated mitigation fees shall be conducted in coordination with SMAQMD and/or YSAQMD before any ground disturbance occurs for any phase of project

construction. (Estimated fees for the Sacramento Weir Widening project are $163,485 in 2021, $189,000 in 2022, and $251,605 in 2023.) All mitigation fees shall be paid prior to the start of construction activity in each year to allow air districts to obtain emissions reductions for the project. If there are changes to construction activities (e.g., equipment lists, increased equipment usage or schedules), USACE and CVFPB shall work with SMAQMD, BAAQMD, and YSAQMD to ensure emission calculations and fees are adjusted appropriately.

Mitigation Measure AIR-5: Implement Marine Engine Standards.

If the project is implemented, USACE shall encourage the use of U.S. Environmental Protection Agency (EPA) adopted Tier 3 and Tier 4 standards for newly built marine engines in 2008 under the barge delivery scenario. The Tier 3 standards reflect the application of technologies to reduce engine PM and NO_X emission rates. Tier 4 standards reflect application of high-efficiency catalytic after-treatment technology enabled by the availability of ultra-low sulfur diesel.

USACE will use Tier 2 and 3 marine engines standards where available to reduce marine exhaust emissions. Due to uncertainty as to the availability of Tier 4 marine engines within the required project timeline, this mitigation measure does not require the use of Tier 4 marine engines. However, should they become available during the appropriate construction periods, the use of these engines would further lower project emissions.

3.12 Climate Change

3.12.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated.

3.12.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR determined that ARCF project-related greenhouse gas (GHG) emissions would exceed significance thresholds. This effect was determined to be less than significant after implementation of a suite of various mitigation measures to reduce and offset construction related GHG emissions. Furthermore, the ARCF Final EIS/EIR determined that the project would not conflict with or obstruct the implementation of GHG emission reduction plans. Furthermore, project implementation would increase the likelihood that the flood management system could accommodate most future flood events as a result of climate change, and therefore the project would improve the resiliency of the levee system with respect to changing climatic conditions, reducing exposure of property or persons to the effects of climate change.

Significance Criteria

Impact significance was evaluated based on the updated significance criteria (thresholds) described below.

An effect was considered significant if it would:

- Conflict with an applicable plan adopted for the purpose of reducing GHG emissions.

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency

YSAQMD has local jurisdiction over the project area but has not set thresholds for GHG emissions. Barge emissions would also occur in BAAQMD jurisdiction. BAAQMD does not have an adopted significance threshold for construction related GHG emissions, but recommends that lead agencies quantify and disclose GHG emissions that would occur during construction, and make a significance conclusion related to state GHG reduction goals.

In October 2014, SMAQMD (which regulates air quality in the same air basin and Federal non-attainment area) adopted a resolution that recommends the following GHG significance thresholds:

- Construction phase of projects: 1,100 metric tons of carbon dioxide equivalent (CO2e) per year;

- Operational phase of land development projects: 1,100 metric tons of CO2e per year; and

- Stationary source projects: 10,000 direct metric tons of CO2e per year.

SMAQMD recommends that GHG emissions from construction activities be quantified and disclosed, a determination regarding the significance of these GHG emissions be made based on a threshold determined by the lead agency, and BMPs be incorporated to reduce GHG emissions during construction, as feasible and applicable. USACE is applying the SMAQMD construction threshold for this analysis.

Effects Analysis

No-Action Alternative

Global climate change could increase rainfall runoff and flood flows in the Sacramento River. The effects of increased flood flows could be most severe for the No-Action Alternative because the flood stage in the Sacramento River would not be reduced in the project area by a widened Sacramento Weir and Bypass, leaving the risk of levee failure within the metropolitan area of Sacramento in its presently high level. Under these conditions, portions of the levees could fail, triggering widespread flooding and extensive damage. If a catastrophic flood were to occur, emergency flood-fighting and clean-up actions would require the use of a considerable amount of heavy construction equipment. Timing and duration of use would directly correlate with flood-fighting needs, but it is assumed that pollutants emitted would increase GHG emissions. Depending on the magnitude of the flood, flood-fighting could last for weeks or even months. Furthermore, because of the unpredictable nature of an emergency response, no BMPs to manage emissions would be in place. All of these effects could be considered significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore there is no substantial evidence to support a significance determination. Although the potential for substantial GHG emissions associated with catastrophic flooding would be higher under the No Action Alternative, the No Action Alternative would avoid the short-term construction emissions of GHGs associated with the Proposed Action or Higher Weir Elevation Alternative.

Proposed Action and Higher Weir Elevation Alternative

Temporary, Short-term Generation of Greenhouse Gas Emissions

The project's estimated CO_{2e} emissions for 2021, 2022, and 2023 are presented in Table 3.12-1. These emissions would exceed the significance threshold of 1,000 metric tons of CO_{2e} recommended by SMAQMD for construction phases and applied by USACE to this analysis during all years. Implementing new Mitigation Measure GHG-1 would reduce construction-related GHG emissions to a less-than-significant level through efficient operation of construction equipment engines, enhanced emissions reductions for equipment used during construction, minimization of equipment idling when not in use, and offset credits. Therefore, with implementation of Mitigation Measure GHG-1 to reduce GHG emissions and the purchase of offset credits, the project would not make a considerable contribution to cumulative GHG emissions and global climate change.

Table 3.12-1. CO_2e Emissions by Year

	2021	**2022**	**2023**
YSAQMD	4278	3722	2535
BAAQMD	52	N/A	131
Total	**4330**	**3722**	**2666**

Source: Moore Noise 2019

Conflict with an Applicable GHG Emissions Reduction Plan and Effects of Climate Change

The project intent, purpose, and function align with the goals of the Assembly Bill (AB) 32 Scoping Plan to protect California from the detrimental effects of climate change. It is not anticipated that climate change would have an adverse effect on the project, rather, the project would improve the function of the flood control system on the Sacramento River and provide improved flood risk reduction to the densely populated City of Sacramento, City of West Sacramento, and some unincorporated Sacramento County areas. Therefore, the project is an adaptive measure against the potential adverse effects of climate change. The climate change assessment contained in the 2018 Safeguarding California Plan, California's Climate Adaptation Strategy (CAS) identified floods (among heat waves, wildfires, and droughts) as one of the most likely early climate change effects in California (CNRA 2018). The Updated AB 32 Scoping Plan cites the need to buffer from the increasing effects of climate change, including more frequent and higher magnitude flood events (ARB 2017). Therefore, in addition to reducing GHG emissions, which is the primary goal of the Scoping Plan, it is also critical to implement actions and projects that would prevent, avoid, and minimize the detrimental effects of climate change. These types of projects would also help avoid rebuild and repair expenditures, losses and disruptions to economic activities, and effects on local residents from a flood event. Therefore, the project is consistent with the goals of the 2018 CAS and the AB 32 Scoping Plan to protect against the detrimental effects of climate change without impeding current economic growth, and the project would have a less-than-significant effect.

Involve Wasteful Energy Consumption or Conflict with Energy Efficiency Plans

The project would be constructed using typical construction methods and would not include any activities identified as wasteful or having unusually high energy consumption. Operational energy use

would be low, with a passive weir structure, and energy use limited to operations and maintenance activities on the new weir, fish passage structure and channel; other operations and maintenance activities on roadways and levees would be similar to existing activities. This impact would be less than significant. Implementing Mitigation Measure AIR-3 (Require Lower Exhaust Emissions for Construction Equipment) would further reduce this effect.

3.12.3 Avoidance, Minimization, and Mitigation Measures

The following mitigation measure is consistent with mitigation identified in the ARCF GRR Final EIS/EIR.

Mitigation Measure GHG-1: Implement GHG Reduction Measures.

If the project is constructed, measures that will be implemented to further reduce the project's contribution from generation of GHGs are specified in the Final EIS/EIR at pp. 265-266 and include the following:

- Encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes.

- Recycle at least 75% of construction waste and demolition debris.

- Purchase at least 20% of the building materials and imported soil from sources within 100 miles of the project site.

- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 3 minutes (5-minute limit is required by the state airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the CCR]).

- Provide clear signage that posts this requirement for workers at the entrances to the site.

- Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.

- Use equipment with new technologies (repowered engines, electric drive trains).

- Perform on-site material hauling with trucks equipped with on-road engines (if determined to be less emissive than the off-road engines).

- Use an ARB-approved low carbon fuel for construction equipment. NOx emissions from the use of low carbon fuel must be reviewed and any increases mitigated.

- Purchase GHG offset for program-wide GHG emissions (direct emissions plus indirect emissions from on-road haul trucks plus commute vehicles) exceeding SMAQMD significance thresholds applicable at the time of construction. Carbon offset credits shall be purchased from programs that have been approved by YSAQMD.

3.13 Noise

3.13.1 Existing Conditions

Environmental and regulatory settings in the GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some site-specific conditions are described below.

Land uses adjacent to the project site are primarily agricultural and industrial. Land uses as defined by Federal, state, and local regulations as noise-sensitive vary slightly but typically include schools, hospitals, rest homes, places of worship, long-term care facilities, mental care facilities, residences, convalescent (nursing) homes, hotels, certain parks, and other similar land uses. The closest noise-sensitive land uses are residential properties. One residence is approximately 450 feet north of the project site, and additional residences are approximately 750 feet from the site, on the opposite bank of the Sacramento River. The primary existing noise source in these residential areas is vehicular traffic on adjacent roadways.

The primary existing noise sources at the project site and vicinity are on-road mobile sources (automobile and truck traffic), aircraft over flights, and agricultural activities. Although it may be audible, the existing train line is not expected to contribute substantially to existing sound levels, because the Sierra Northern Railway line is infrequently used. Agricultural activities can generate sound levels similar to construction equipment but are typically dispersed and intermittent in nature. Typical noise levels from tractors, measured at a distance of 50 feet, range from approximately 78 A-weighted decibels (dBA) maximum sound level (L_{max}) to 106 dBA L_{max}, with an average of approximately 84 dBA L_{max} (Yolo County 2009).

The primary roads that would be used by project-related traffic to enter the regional roadway network (i.e., haul truck routes) include:

- I-80
- I-5
- Old River Road
- North Harbor Boulevard
- Reed Avenue

Average Daily Traffic (ADT) volumes for these roads are shown in Table 3.13-1.

Sacramento International Airport is a large, commercial airport located approximately 2 miles northeast of the project site in Sacramento County. The airport serves hundreds of daily aircraft departures. Noise contours for the airport show the 60 dB Community Noise Equivalent Level (CNEL) noise contour reaching to the intersection of Power Line Road and the Sacramento River, east of the project site (Sacramento County Airport System 2004). Noise contours lower than 60 dB CNEL are not modeled for land use planning purposes. However, the 55 and 50 dB CNEL contours are likely to extend well into the project site and are also likely to be a dominant existing sound source.

The primary existing vibration sources in the area of the project site are locally operated agricultural equipment and the movement of trucks and equipment on adjacent roads and highways. Existing vibration levels are expected to be low, with infrequent noticeable vibration sources.

Table 3.13-1. Traffic Noise Contours under Existing Conditions at the Project Site

			Distance to Ldn Contours, feet		
Roadway	**Roadway Segment**	**ADT**	**70 dB**	**65 dB**	**60 dB**
Interstate 80	U.S. 50 to County Road 32A	55,400	189	402	864
Interstate 5	Sacramento County Line to County Road 102	21,100	101	212	455
Old River Road	County Road 127 to County Road 118	3,900	<50	<50	80
North Harbor Boulevard	Reed Ave to Riverbank Road/Riverbank to County Line	3,800/ 3,500	<50	<50	55
Reed Avenue	I-80 Ramps to Sunset Avenue	6,400	<50	<50	<50

Notes: dB = A-weighted decibels; L_{dn} = day-night average sound level; ADT = Average Daily Traffic
Sources: Yolo County 2009; West Sacramento 2016

3.13.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR found that ground vibration could cause a significant effect if construction is required within 40 feet of a vibration-sensitive building (defined as a building with either plaster or wallboard for internal walls and ceilings). Mitigation will be achieved by preparation of a vibration control plan and its implementation during construction. Noise levels above 55 dBA are generally considered to have a significant effect on sensitive receptors. Noise levels could range from 83 to 95 dBA at 50 feet from the source. Therefore, based on anticipated construction equipment noise estimates (including haul trucks), the ARCF GRR Final EIS/EIR found effects to sensitive receptors to be significant during construction of the Sacramento Weir improvements. A suite of mitigation measures to reduce construction noise would be implemented where construction would occur within 500 feet of any sensitive receptor to reduce the impact to less than significant.

Significance Criteria

For this analysis, an effect was considered significant if it would result in:

- A substantial temporary or permanent increase in ambient noise levels in the study area above the existing levels;
- Exposure of sensitive receptors to excessive noise levels; or
- Exposure of sensitive receptors or structures to groundborne vibration.

Effects Analysis

No-Action Alternative

Under the No-Action Alternative, USACE would not construct the proposed improvements. As a result, if a flood event were to occur, the Sacramento area would remain at greater risk of a possible levee failure due to seepage, slope stability, erosion, or overtopping, until the future construction of levee improvements. Under this alternative, there would be no construction-related effects to the acoustic environment, including the generation of groundborne vibration. The noise levels in the project area would remain consistent with the existing ambient noise levels present under current conditions.

If the project is not constructed, the future risk of a catastrophic flood event would be greater than if the project is constructed. The amount of noise or ground borne vibration that would be generated by activities to repair damaged levees and remove debris from the inundation area would likely exceed the relevant standards. This effect could be considered significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alternative

Potential Increase in Ambient Noise Levels or Exposure of Sensitive Receptors to Excessive Noise or Vibration

The project would generate construction noise from equipment operating at each work location, and from the transport of construction workers, construction materials, and equipment to and from each work location. The construction noise impact discussion in the ARCF GRR Final EIS/EIR adequately addresses the noise impacts that would occur from construction activities to degrade levees and construct new levees, construct a new weir and associated bridges, roadways, and fish passage channel. The analysis in this Supplemental EIS/EIR discusses the noise effects related to haul truck traffic, which would reach the site from I-5 or I-80, via Old River Road, Reed Avenue, and Harbor Boulevard, as well as on-site use of construction equipment. Haul truck traffic on these roadways could cause maximum sound levels of approximately 65 to 66 dBA, conservatively assuming approximately 100 to 150 haul trucks per hour. The West Sacramento Noise Ordinance maximum allowable level of 60 dBA is a day-night average sound level (L_{dn}) value, which applies different weights to noises during the day, compared to evening and nighttime hours. For all operations during daytime hours, the L_{dn} could be expected to be approximately 65 dBA. Implementing Mitigation Measure NOI-1 would reduce significant impacts related to construction noise to a less-than-significant level by requiring a noise control plan and actions to reduce the effects of construction. These actions could include scheduling louder activities for daytime hours, using less noisy equipment where available, and locating and routing activities to minimize effects on sensitive receptors.

Haul-related vibration levels were calculated using the Federal Transit Administration (FTA) guideline, based on the 50-foot distance of the nearest sensitive land use. For purposes of this analysis, movement of loaded haul trucks was conservatively considered to produce a vibration level of approximately 86 vibration decibels (VdB) (0.076-inch per second peak particle velocity [PPV] at a distance of 25 feet [FTA 2006; Caltrans 2004]). Assuming a maximum construction vibration level of 86 VdB at 25 feet, with an attenuation rate of 9 VdB per doubling of distance, the construction vibration level at the closest sensitive uses would be approximately 77 VdB (0.02 inch per second PPV). This vibration level is below the FTA threshold of 0.2-inch per second PPV for structural damage. However,

this vibration level is above the FTA threshold of 72 VdB for human annoyance and would be perceptible. Implementing new Mitigation Measure NOI-1 would reduce significant impacts related to construction traffic noise to a less-than-significant level by requiring a noise control plan and actions to reduce the effects of construction. These actions could include scheduling louder activities for daytime hours, using less noisy equipment where available, and locating and routing activities to minimize effects on sensitive receptors.

3.13.3 Avoidance, Minimization, and Mitigation Measures

The following measure is consistent with mitigation identified in the ARCF GRR Final EIS/EIR.

Mitigation Measure NOI-1: Implement Measures to Reduce Construction Noise and Vibration Effects.

If the project is implemented, USACE shall require that construction contractors implement measures at each work site to avoid and minimize construction noise and vibration effects on sensitive receptors. Prior to the start of construction, a noise control plan will be prepared to identify feasible measures to reduce construction noise, when necessary. The measures in the plan will apply to construction activities within 500 feet of a sensitive receptor, including, but not limited to, residences. These measures may include, but are not limited to, the following:

- Provide written notice to residents within 1,000 feet of the construction zone, advising them of the estimated construction schedule. This written notice would be provided within 1 week to 1 month of the start of construction at that location and updated with any substantial changes to the schedule.

- Display notices with information including, but not limited to, contractor contact telephone number(s) and proposed construction dates and times. Notices shall be displayed in a conspicuous manner, such as on construction site fences.

- Schedule the loudest and most intrusive construction activities during daytime hours (7:00 a.m. to 7:00 p.m.), when feasible.

- Require that construction equipment include factory-installed muffling devices and that all equipment be operated and maintained in good working order to minimize noise generation.

- Locate stationary noise-generating equipment as far as practicable from sensitive receptors.

- Limit unnecessary engine idling (i.e., more than 5 minutes) as required by state air quality regulations.

- Employ equipment that is specifically designed for low noise emission levels, when feasible.

- Employ equipment that is powered by electric or natural gas engines, as opposed to those powered by gasoline fuel or diesel, when feasible.

- If the construction zone is within 500 feet of a sensitive receptor, place temporary barriers between stationary noise equipment and noise sensitive receptors to block noise transmission, when feasible, or take advantage of existing barrier features, such as existing terrain or structures, when feasible.

- If the construction zone is within 500 feet of a sensitive receptor, prohibit use of backup alarms and provide an alternate warning system, such as a flagman or radar-based alarm that is compliant with Federal and state worker safety regulations.

- Locate construction staging areas as far as practicable from sensitive receptors.

- Design haul routes to avoid sensitive receptors, to the extent practical.

- To the extent feasible and practicable, employ vibration-reducing construction practices such that vibration from construction complies with applicable noise-level rules and regulations that apply to the work, including the vibration standards established for construction vibration-sources by the applicable agencies, depending on the jurisdictional location of the affected receptor(s). Project construction specifications shall require the contractor to limit vibrations to less than 0.2-inch per second PPV, and less than 72 VdB within 50 feet at any building. If construction would occur within 50 feet of any occupied building, the contractor will prepare a vibration control plan prior to construction. The plan will include measures to limit vibration, including but not limited to the following:

- Avoid vibratory rollers and packers near sensitive areas.

- Route heavily loaded trucks away from residential streets, when possible. If no reasonable alternatives are available, select streets with the fewest homes.

3.14 Recreation

3.14.1 Existing Conditions

Environmental and regulatory settings in the GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some site-specific conditions are described below.

Old River Road

As described in Section 3.15, "Visual Resources," this two-lane rural roadway provides motorists and bicyclists with scenic views of the Sacramento River to the east, and open agricultural land to the west. The road is lined with mature shade trees for most of its length. Old River Road has a wide, paved shoulder on both sides of the road, separated from the main roadway by white striping. Old River Road is frequently used by recreational cyclists.

County Road 126

As described in Section 3.15, "Visual Resources," access to the Sacramento Bypass Wildlife Area is provided informally along County Road 126. County Road 126 travels along the top of Sacramento Bypass North Levee; it is paved for 1 mile before encountering a gate, which restricts further vehicle access along the levee to the west, although pedestrian and bicycle travel are allowed beyond the gate. There is no officially designed parking area for recreationists using the wildlife area; rather, parking occurs informally in the vicinity, generally along the gravel shoulders of County Road 126. Access is limited to foot traffic within the wildlife area. (CDFW 2016). Although the levee crown along County Road 126 does not contain an officially designated trails, it is used as a pedestrian and bicycle path.

Sierra Northern Railway

A portion of the Sierra Northern Railway railroad tracks are located on top of the Sacramento Weir, on the west side of Old River Road. The Sierra Northern Railway operates the Sacramento River Train, which offers dinner excursion trips along the 16-mile-long "Woodland Branch Line" between Woodland and West Sacramento. The excursion ride begins at North Harbor Boulevard in West Sacramento, immediately north of the I-80 Bridge overcrossing (across the river from Sand Cove Park), and travels north at slow speeds along the Sacramento River, through the Sacramento Bypass and across the existing Sacramento Weir, then through the Lower Elkhorn Basin north to the Fremont Bridge (north of I-5), where it turns west towards Woodland. (Sierra Northern Railway 2016.)

Sacramento Bypass Wildlife Area

The approximately 360-acre Sacramento Bypass Wildlife Area, which is immediately adjacent to and south of the project site, is an important cover and feeding area for wildlife during late fall, winter, and early spring. Vegetation varies throughout the area from mature cottonwood trees, willows, and valley oaks in some locations to a sparsely covered sandy soil area on the eastern end. Game birds, raptors, songbirds, and native mammals are present. Recreational activities include fishing; wildlife viewing; birding; and hunting for waterfowl (when the area is flooded), ring-necked pheasant, mourning dove, California quail, wild turkey, cottontail rabbit, tree squirrel, and jackrabbit. Hunting activities are permitted from September 1 through January 31. The wildlife area is administered by CDFW. Access to the Sacramento Bypass Wildlife Area is along CR 126 on the north side of the existing Sacramento Bypass, and CR 127 on the south side of the bypass.

3.14.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR stated that construction activities and vehicles would be present in the project area, and certain areas would be closed to the public for safety reasons during construction. Activities such as bird watching, walking, running, and jogging along the Sacramento Bypass levee crown and nearby roads would be restricted. In addition, there may be temporary effects to Sierra Northern Railway operation. Construction activities would have a significant effect on the railway, as portions could be shut down or relocated during construction activities.

The ARCF GRR Final EIS/EIR indicated construction activities could overlap with hunting season in the Sacramento Bypass Wildlife Area (September 1 through January 31), restricting hunting activities for a limited period of time. Hunting activities would likely be prohibited in the areas undergoing active construction for the safety of the construction workers; however, there would likely be a conflict only during degrading of the existing levee and construction of the new Sacramento Bypass north levee. Construction of the new Sacramento Weir would not conflict with any existing hunting activities in the Bypass because the existing levee would remain in place during construction of the new weir, creating a barrier between hunting activities and the construction area. A potential reduction in the overall experience of the wildlife area due to disturbed soil and the presence of construction equipment was also identified. The ARCF GRR Final EIS/EIR concluded there would be no long-term effects on recreation in the Sacramento Bypass because the area would be returned to the pre-construction conditions once construction is complete. Additionally, the expanded bypass would create additional recreation acreage, which would be a long-term benefit to recreation. However, it was determined that

short-term impacts would be significant after mitigation, because of the duration of construction and the inability to provide similar quality recreation nearby during construction.

Significance Criteria

For this analysis, an effect was considered significant if it would:

- Eliminate or substantially restrict or reduce the availability, access, or quality of existing recreational sites or opportunities in the project area;
- Cause substantial long-term disruption in the use of an existing recreation facility or activity;
- Result in inconsistencies or non-compliance with regional planning documents; or
- Result in inconsistencies with the Rivers and Harbors Act or the Federal or state Wild and Scenic Rivers Act.

Two additional significance criteria not included in the ARCF GRR Final EIS/EIR are considered in this analysis. The project was also determined to result in a significant effect if it would:

- 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; or
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Effects Analysis

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass, and there would be no construction-related effects to recreation in the project area. The potential would exist, however, for recreation to be adversely affected by the increased risk of a future flood event or levee failure. Such an event could cause inundation from high flows and destruction or damage to recreational opportunities at parks and parkways within the Sacramento metropolitan area. These potential impacts would likely be significant, though the potential for such an occurrence is uncertain, and the magnitude and duration of any related risks cannot be predicted. Because the effects of a levee failure are unpredictable, there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alternative

Temporary and Short-term Changes in Recreational Opportunities during Project Construction Activities

As described above, access to Old River Road, County Road 126, and informal trails within the Sacramento Bypass and along the surrounding levees would be restricted during construction activities to ensure the safety of recreationists and construction workers. On-road bicycle routes would require temporary closures and/or detours to accommodate material transport along haul routes and construction. Access to the Sacramento Bypass Wildlife Area from County Road 126 would be limited

during construction, and noise, dust, traffic, and visual disturbance during construction could cause a short-term reduction in the quality of recreation in the Sacramento Bypass Wildlife Area. Additionally, Sierra Northern Railway service would be interrupted during railroad bridge construction. Barge traffic would potentially affect recreational boaters on the Sacramento River. Implementing new Mitigation Measures REC-1 and REC-2 would reduce significant temporary, short-term effects on bicycle, boating, and recreational access resulting from construction activities by preparing and implementing bicycle and pedestrian detours, providing public information regarding detours and alternative access routes, where possible, and repairing or reconstructing construction-related damage to pre-project conditions. However, as disclosed in the ARCF GRR Final EIS/EIR, this short-term construction impact would remain significant and unavoidable.

Permanent Changes to Recreational Opportunities

As detailed in Section 2.4, "Alternative 1: Proposed Action," the existing rail embankment would be removed under project Scenario 2. Excursion trains currently operate on the Sierra Northern Railway approximately 3 days per week, traveling between the Bryte area of West Sacramento and Woodland. Implementing Scenario 2 under either the Proposed Action or the Higher Weir Elevation Alternative would shorten the distance traveled by these excursion trains by approximately 1.5 miles and change the location where excursion tours would begin, but it would not otherwise affect the excursion train operations. These minor changes would not substantially degrade the recreational opportunities offered by the excursion trains, and this impact would be less than significant.

As described in Section 3.4, "Hydrology and Hydraulics," implementing the project would not substantially change downstream hydraulic conditions in the Yolo Bypass, and impacts to recreation and environmental education related to changes in the duration or depths of inundation in the Yolo Bypass Wildlife Area would be less than significant.

3.14.3 Avoidance, Minimization, and Mitigation Measures

The following measures include modifications to mitigation identified in the ARCF GRR Final EIS/EIR. The modifications are intended to provide clear communication of detours for pedestrians and bicyclists in the project area.

Mitigation Measure REC-1: Implement Bicycle and Pedestrian Detours, Provide Construction Period Information on Facility Closures, and Coordinate with Yolo County and California Department of Fish and Wildlife to Repair Damaged Facilities.

If the project is implemented, USACE and CVFPB shall implement the following measures to reduce temporary, short-term construction effects on recreational facilities in the project area:

- Provide marked detours for areas, informal trails, and on-street bicycle routes that are temporarily closed during construction. Detours should be developed in consultation with Yolo County at least 10 days before the start of construction activities, as applicable. Post signs that clearly indicate closure routes at major entry points for bicycle trails, post information signs to notify motorists to share the road with bicyclists where necessary and provide a contact number to call for questions or concerns.

- Post signs at major entry points for parks and recreation facilities. Information signs will notify the public of alternate parks and recreation sites and provide a contact number to call for questions or concerns.

- Upon completion of levee improvements, coordinate with Yolo County and CDFW to restore access and repair any construction-related damage to pre-project conditions.

Mitigation Measure REC-2: Implement Water Safety Measures for Barges.

If the project is constructed, USACE and CVFPB shall implement the following measure to reduce temporary, short-term construction effects on recreational boating in the project area:

- If rock or other materials are transported by barge on the Sacramento River, appropriate water safety measures would be used to reduce impacts to recreational boaters.

3.15 Visual Resources

3.15.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated.

The Sacramento International Airport Land Use Compatibility Plan (SACOG 2003) includes nighttime lighting referral requirements that apply to the project, which is located in Referral Area 2 as designated by the plan.

Old River Road (County Road 22) is a Yolo County-designated scenic highway. Immediately opposite the Sacramento Bypass, on the east side of the river, are private residences with boat docks. Garden Highway (a Sacramento County-designated scenic highway) is located immediately east of these residences.

3.15.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR determined that expansion of the Sacramento Weir and Bypass and associated vegetation removal and earthwork would result in short-term impairment and degradation to visual quality, during construction. However, because this impairment and degradation would be temporary, the impact was determined to be less than significant. The loss of trees and shrubs along the bank of the Sacramento River due to weir extension would be a long-term impact, although it would not have a substantial effect on the overall scenic value of the area, because the visual quality of this area is already disrupted by the existing weir. Earthwork within the existing bypass would require tree and shrub removal, but it is probable that the existing visual quality of the bypass would be restored on a long-term basis as vegetation matures. Therefore, permanent impacts to visual resources were determined to be less than significant. It was also determined that conversion of agricultural fields to open space bypass lands would not significantly affect visual resources, because a large expanse of similar agricultural fields (row crops and orchards) would remain north of the new levee.

Significance Criteria

For this analysis, an effect was considered significant if it would:

- Have a substantial adverse effect on a scenic vista;

- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings;

- Substantially degrade the existing visual character or quality of the site and its surroundings; or

- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Effects Analysis

No-Action Alternative

Under the No-Action Alternative, USACE would not construct the Proposed Action or Alternative 2. As a result, if a flood event were to occur, the Sacramento area would remain at higher risk of a possible levee failure due to seepage, slope stability, erosion, or overtopping. Under the No-Action Alternative, there would be no construction-related effects to visual resources or county-designated scenic highways, and construction-related effects to visual resources or the existing visual character of the project area would not occur. If the project is not constructed, and a levee failure were to occur, there would be a significant amount of flooding, downed utility poles and trees, inundated housing and agricultural fields, and potential damage to roadways and railways. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any scenic and visual character-related risks cannot be predicted. Because the effects of a levee failure are unpredictable, there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alternative

Damage to Scenic Vistas or Resources along State- or County-Designated Scenic Highways

As a county-designated scenic highway, Old River Road is traveled by both residents and recreationists, highly sensitive viewer groups. The existing visual quality along Old River Road is high. Old River Road and County Road 126 would be temporarily rerouted for up to 3 years during project construction. Total closures of these roads might occur intermittently for a total of up to 3 months of closure during project construction. The completed project would relocate portions of both roads, and County Road 126 would be renumbered to County Road 124. Additionally, the Sierra Northern Railway would not operate excursion trains through the project site during railroad bridge construction.

The exact project construction sequence has not been determined, but construction would be visible from Old River Road, County Road 126, and the Sierra Northern Railway during construction of other project elements that may take place before the roads are relocated and rail use either resumes over a new railroad bridge or ceases altogether (see additional discussion in Section 3.14, “Recreation.” The reconstructed Old River Road and County Road 124 would appear the same: two lanes of asphalt paving with striping in the middle. The Sierra Northern Railway would be reconstructed with similar materials but would travel over a bridge rather than the existing embankment and would match the pre-project visual character. Any effects to visual quality along the roads and railroad would be short-term and temporary in nature. If rail service is discontinued, under Scenario 2 (described in Section 2.4, “Alternative 1: Proposed Action”), the existing rail embankment would be removed and the railroad bridge across the existing weir would be left in place. The existing view of the railroad from the nearby scenic-designated Old River Road would be similar to current conditions. Additionally, none of the

project components would be visible from Garden Highway, which is a Sacramento County-designated scenic highway on the east side of the Sacramento River, because of the intervening structures, vegetation, and topography. Therefore, these project effects on designated scenic highways would be less than significant.

During the project's operational phase, the southeastern portion of the Sacramento Bypass North Levee setback and relocated County Road 124 would be visible to motorists on Old River Road and from the Sierra Northern Railway. Although the study area already contains several levees for flood control and existing county roads, the presence of the new weir, changes to the vegetation along the Sacramento River, and the new Old River Road bridge would all represent substantial changes to existing view from the scenic highway. Therefore, this impact would be significant. The ARCF GRR Final EIS/EIR identified planting of riparian vegetation, including trees and shrubs, in the expanded bypass as mitigation for this significant impact. However, because the LEBLS project is now construction most of the levee setback for the expanded bypass, and due to hydraulic conditions in the portion of the bypass, which would be constructed by the project, planting woody vegetation in the bypass is considered not to be feasible. No further feasible mitigation is available to address this impact, and long-term operational impacts to scenic vistas along a county-designated scenic highway would be significant and unavoidable.

Changes in Existing Visual Character

Temporary impacts on visual character during construction would be significant due to the presence of equipment and activities including levee degrade, weir construction, road relocation, addition of the railroad bridge, and vegetation removal. Haul trucks and equipment would operate near one residence located at the northern terminus of the realigned Old River Road. Views of the project site from the residence are partially blocked by mature trees planted to the south of the residence. Significant effects to the visual character related to this sensitive receptor and to recreationalists along the Sacramento River and in the Sacramento Bypass Wildlife Area would be short-term and temporary during construction. No feasible mitigation is available to reduce this impact, which would remain significant and unavoidable.

The area between the residence and the levee would remain in agricultural land uses and partially vegetated with native trees, with the brownish-green levee slope in the background, which is similar to the current visual character of the area. This long-term operational impact related to this sensitive receptor would thus be less than significant.

After construction, the new weir would be traversed by Old River Road on a new bridge. Although the new weir would be visually similar to the existing weir, the presence of a new, approximately 1,500-foot-long concrete structure and associated bridge nevertheless represents a substantial change in the visual character compared to existing conditions. Up to approximately 20 acres of woodland (including oak woodland along the bank of the Sacramento River and walnut orchard) would be removed from within the footprint of the setback levee, new weir, and road/rail relocation locations. Loss of approximately 6 acres of oak woodland on the waterside bank of the Sacramento River and construction of the new weir would have a long-term impact for recreationists along the river and residents on the east side of the river. Removal of approximately 14 acres of walnut grove vegetation along the railroad also would alter the viewshed for motorists, railway passengers, and recreationists. The ARCF GRR Final EIS/EIR identified planting of riparian vegetation, including trees and shrubs, in the expanded bypass as mitigation for this significant impact. However, because the

LEBLS project is now construction most of the levee setback for the expanded bypass, and due to hydraulic conditions in the portion of the bypass which would be constructed by the project, planting woody vegetation in the bypass is considered not to be feasible. No further feasible mitigation is available to address this impact, and long-term operational impacts on visual character would be significant and unavoidable.

Create New Sources of Substantial Light or Glare

The project does not include buildings or other facilities that would require permanent lighting and, therefore, no impact from new long-term sources of light or glare would occur.

Projects within Sacramento International Airport's Referral Area 2 that include lighting that could be mistaken for airport lighting and/or could cause glare in the eyes of pilots of aircraft using the airport require review by the Airport Land Use Commission. The project site lies within the transitional and approach surfaces for runways at Sacramento International Airport and is included in Referral Area 2 (SACOG 2013: Map 4b), and nighttime construction may be required. In addition, nighttime lighting could also be used within 0.5–2 miles of the California Highway Patrol (CHP) Academy Airport, which is located immediately south of the Sacramento Bypass Wildlife Area. Because nighttime lighting may be required, the action alternatives could result in lighting which could be mistaken for airport lighting, and/or could cause glare in the eyes of pilots or aircraft using these airports.

Nighttime lighting for setback levee construction and Old River Road relocation would be located near a residence along Old River Road adjacent the project site to the north. There are only a few tall trees that could block views of the nighttime construction lighting, and the land is flat. Therefore, nighttime construction would result in nighttime lighting and glare that could disturb sleep of occupants of this residence. Nighttime lighting associated with setback levee and weir construction would result in glare effects for motorists on Old River Road and County Road 126, if these roads are open during these construction phases. Finally, nighttime lighting associated with project construction would create a new source of nighttime light and glare that would adversely affect views of the night sky during periods of nighttime construction.

Impacts resulting from light and glare, if nighttime construction and lighting is required, would be significant. Mitigation Measure VIS-1 and VIS-2 would reduce the significant impacts associated with creation of nighttime light and glare effects to a less-than-significant level because all nighttime lighting would be shielded and directed downward, USACE would coordinate with the Sacramento County Airport System (SCAS) and the CHP Academy Airport to provide notification and include safety measures during project design and construction, and an on-site safety meeting would be held prior to the start of nighttime construction. In addition, nighttime construction activities would either be screened from affected residences, or USACE would offer to temporarily relocate affected residents while nighttime construction is occurring within 300 feet.

3.15.3 Avoidance, Minimization, and Mitigation Measures

To reduce short-term, temporary effects of nighttime light and glare, the following two new mitigation measures would be implemented.

Mitigation Measure VIS-1: Coordinate Nighttime Lighting with Sacramento International Airport Operations and Restrict Night Lighting within and Near Airport Runway Approaches and Near CHP Academy Airport.

If the project is implemented, USACE will implement the following measures for construction in proximity to airports to reduce airport safety hazards associated with project-related nighttime lighting.

- All project-related nighttime lighting that would be located within Sacramento International Airport's runway approach zones, as well as all nighttime lighting that would be located within 2 miles of the CHP Academy Airport, will be shielded and directed downward to reduce interference with nighttime airport operations and aircraft flight paths.

- SCAS and the CHP Academy Airport will be notified at least 10 days prior the start of nighttime lighting operations within the Sacramento International Airport runway approach zones or within 2 miles of the CHP Academy Airport. USACE and CVFPB will coordinate with SCAS and the CHP Academy Airport during final project design to ensure that all appropriate safety precautions are incorporated into the construction plans.

- Prior to the start of nighttime construction activities that would be located within Sacramento International Airport runway approach zones, as well as all nighttime lighting that would be located within 2 miles of the CHP Academy Airport, USACE's construction contractor will hold a safety meeting for all nighttime construction personnel, informing construction personnel of the need to ensure all lighting is shielded and directed downward at all times, along with other safety measures that may be required by SCAS or the CHP Academy Airport. The safety briefing will include emergency contact information for SCAS and the CHP Academy Airport. If nighttime lighting activities are necessary throughout the course of the construction season (i.e., April–October), at least two safety meetings will be held by the construction contractor, at evenly spaced intervals over the course of the construction season.

Mitigation Measure VIS-2: Provide Shielding from Nighttime Construction Activities or Offer to Temporarily Relocate Affected Residents.

To reduce nighttime light and glare effects on residents and motorists, USACE will ensure that the following measures are implemented if the project is constructed.

- All nighttime lighting will be shielded and directed downward.

- If nighttime construction would occur within 300 feet of residences, solid screened temporary construction fencing at least 6 feet high will be provided along the boundary of the construction site where nighttime lighting would occur, between the construction site and the residence. A minimum of 200 linear feet of shielded construction fencing will be provided. The shielded fencing will be proximate to the location of the lighting (e.g., if lighting is required on top of the levee, then the fencing will also be placed on top of the levee).

- In lieu of screened construction fencing, USACE and CVFPB may offer to temporarily relocate affected residents to a local hotel during the period when nighttime lighting would occur. Reimbursement of hotel accommodations will be limited to reasonable expenses and will be limited to the duration of nighttime lighting activities within 300 feet of the residence.

3.16 Public Utilities and Service Systems

3.16.1 Existing Conditions

No additional information on existing conditions or regulations beyond that provided in the ARCF GRR Final EIS/EIR is required to support the analysis in this Supplemental EIS/EIR.

3.16.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR stated that the project could result in construction-related damage to infrastructure and disruption of service during construction and/or utility relocation activities. The timing of utility replacements would be planned, to the extent feasible, to prevent disruption of service. However, disruptions to utility services might still occur, and this effect was determined to be significant. Implementation of mitigation measures to reduce service disruptions would reduce this effect to a less-than-significant level.

The ARCF GRR Final EIS/EIR stated the location of the landfill used for disposal of construction-related waste would be determined by the construction contractor prior to initiation of construction activity and would be approved by USACE. This disposal site would be selected based on capacity, type of waste, and other factors. Only those landfills determined to have the ability to accommodate the construction disposal needs of the project would be used. Project construction would not cause existing regional landfill capacity to be exceeded; therefore, this effect was determined to be less than significant.

Significance Criteria

For this analysis, an effect was considered significant if it would:

- Require the construction or expansion of any utility systems due to project implementation;
- Disrupt or significantly diminish the quality of the public utilities and services for an extended period of time;
- Create an increased need for new fire protection, police protection, or ambulance services or significantly affect existing emergency response times or facilities;
- Create damage to public utility and service facilities, pipelines, conduits, or power lines; or
- Create inconsistencies or non-compliance with regional planning documents?

Effects Analysis

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass, and there would be no construction-related effects to public utilities and services in the project area. The potential would exist, however, for public utilities and services to be adversely affected by a future flood event or levee failure. Such an event could cause inundation from high flows and destruction or damage

to utility lines, natural gas supply lines, and water or wastewater piping or facilities, all of which could lead to widespread contamination, temporary power outages, and interruptions of other utilities in the project area and surrounding areas. Under this alternative there would be no construction-related generation of solid waste. However, widening the Sacramento Weir and Bypass is integral to the plan to modernize the regional flood management system, and if a levee failure were to occur, a significant amount of debris from flooded properties would need to be accommodated in area landfills. This could include vegetation, construction materials, white goods (appliances), and hazardous and toxic waste. The quantity of debris is unknown, because the size of flood and extent of damage is unpredictable, but it is likely that the debris caused by a flood would be far more than the debris generated by the construction of this project. These potential impacts would likely be significant, though the potential for such an occurrence is uncertain, and the magnitude and duration of any related risks cannot be predicted. Because the effects of a levee failure are unpredictable, there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alterative

Potential Disruption of Utility Service

Coordination with utility owners and providers would be required in advance of construction to identify infrastructure locations in the weir construction and bypass widening area, including staging areas, and appropriate protection measures. Temporary bypasses may be required for some utilities. Any required utility relocation would be conducted concurrent with the proposed construction activities. Although steps would be taken to minimize potential effects to utilities, project construction activities, including grading and excavation, could inadvertently damage identified and unidentified utility infrastructure and facilities. Required relocation of existing utilities could also interrupt service. Furthermore, the extent and intensity of proposed construction activities could affect service providers' abilities to quickly repair damage and/or restore interrupted service, due to possible restrictions on site access during relocation of Road 126 or other construction activities. Implementation of new Mitigation Measure UTL-1 would reduce the significant effect associated with potential disruption of utility service to a less-than-significant level because USACE and CVFPB would coordinate with utility service providers and consumers to minimize utility interruptions to the maximum extent feasible, and a response plan to address service interruptions would be prepared and implemented.

Exceed Solid Waste Disposal Capacity or Waste Reduction Standards

As detailed in Section 2.4, "Alternative 1: Proposed Action," waste material generated from the realignment of Road 126 would be transported to a disposal site with a permitted capacity sufficient for project construction waste disposal within 50 miles of the project site. The location of the landfill used for off-site disposal of construction-related waste would be determined by the construction contractor at the time of construction activity based on capacity, type of waste, and other factors. However, based on the project location, the Yolo County Central Landfill would be the likely destination for non-organic solid waste. The Yolo County Central Landfill is located at the intersection of County Road 28H and County Road 104 in Davis, approximately 5 miles southwest of the project site. The landfill is permitted to accept 1,800 maximum tons per day of solid waste and has capacity until its scheduled closure on January 1, 2080. Additionally, any fill resulting from road realignment, levee setback, or other site construction would be reused onsite, to the extent possible. The project would therefore not exceed the capacity of regional solid waste facilities or impair the attainment of solid waste reduction goals and this impact would be less than significant.

3.16.3 Avoidance, Minimization, and Mitigation Measures

The following measure is consistent with mitigation identified in the ARCF GRR Final EIS/EIR.

Mitigation Measure UTL-1: Verify Utility Locations, Coordinate with Affected Utility Owners/Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage.

If the project is implemented, USACE shall implement the measures listed below before construction begins to avoid and minimize potential damage to utilities, infrastructure, and service disruptions during construction:

- Coordinate with applicable utility and service providers to implement orderly relocation of utilities that need to be removed or relocated.

- Provide notification of any potential interruptions in service to the appropriate agencies and affected landowners.

- Verify through field surveys and the use of the Underground Service Alert services the locations of buried utilities in the project area, including natural gas, petroleum, and sewer pipelines. Any buried utility lines shall be clearly marked in the area of construction (e.g., in the field) and on the construction specifications in advance of any earthmoving activities.

- Before the start of construction, prepare and implement a response plan that addresses potential accidental damage to a utility line. The plan shall identify chain-of-command rules for notification of authorities and appropriate actions and responsibilities regarding the safety of the public and workers. A component of the response plan will include worker education training in response to such situations.

- Stage utility relocations during project construction to minimize interruptions in service.

- Communicate construction activities with first responders to avoid response delays due to construction detours.

3.17 Hazardous Wastes and Materials

3.17.1 Existing Conditions

Environmental and regulatory settings in the ARCF GRR Final EIS/EIR are generally applicable to the analysis in this Supplemental EIS/EIR and are not repeated. Some updated information is presented below.

A Phase I Environmental Site Assessment (Phase I ESA) (GEI 2019) was conducted for the project site. The Phase I ESA included a visual inspection of the project site, a review of environmental data bases and regulatory agency records, and a review of historical data sources. The Phase I ESA identified the presence of the Recognized Environmental Conditions (RECs) related to the Old Bryte Landfill located on the project site (currently undergoing remediation) and the potential for pesticide contamination in soils along the railroad corridor due to historical treatment with herbicides to prevent plant growth in and adjacent to active railroad tracks.

Hazardous Material Sites

Remediation of the Bryte Landfill, in the western portion of the project site, is ongoing to meet California Department of Toxic Substances Control (DTSC) requirements, independent of the Proposed Action.

Airports and Airstrips

Sacramento International Airport is located approximately 5 miles north of the project site. The project site is located in Referral Area 2, Runway Approach and Transitional Surface areas, and the Traffic Pattern Area (SACOG 2013: Maps 2, 4a, and 6).

The CHP Academy Airport is located less than 1 mile to the south of the project site. This airport is publicly owned by the CHP but is intended for CHP use only. Project construction activities would occur approximately 4,000 feet northeast of the CHP Academy Airport.

Wildland Fire Hazards

The project site is located in a generally undeveloped and rural area. However, riparian and ruderal vegetation is present within the Sacramento Bypass and agricultural row crops and orchards occur elsewhere on the project site. According to the California Department of Forestry and Fire Protection, the entire project site is located within a local responsibility area and portions of the Sacramento Bypass are designated as a moderate fire hazard severity zone. There are no state responsibility areas associated with the project site (CALFIRE 2007, 2008).

3.17.2 Environmental Consequences

Summary of ARCF GRR Final EIS/EIR Effects

The ARCF GRR Final EIS/EIR determined that construction contractors would be required to use, store, and transport hazardous materials in compliance with Federal, state, and local regulations during project construction and operation. Any hazardous substance encountered during construction would be removed and properly disposed of by a licensed contractor in accordance with Federal, state, and local regulations. It was determined that work would not occur in locations where known hazardous materials sites are listed with DTSC or SWRCB. Therefore, these impacts were determined to be less than significant for the ARCF 2016 Project. Furthermore, the construction contractor would also be required to prepare a SWPPP and implement BMPs to prevent discharge from the construction site into drainage systems, lakes, or rivers, which would further reduce effects from hazardous materials.

Significance Criteria

For this analysis, the Final EIS/EIR named four significance criteria at pp. 325-236, which, if found to apply to the project, would result in a significant environmental impact related to hazardous materials:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

- Emit hazardous emissions or involve the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment; or

- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Two additional hazardous materials significance criteria not mentioned in the ARCF GRR Final EIS/EIR are considered in this analysis:

- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the project area; or

- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Effects Analysis

Potential effects from interference with emergency access and emergency evacuation plans are addressed in Section 3.10, "Transportation and Circulation." Airport safety hazards associated with nighttime lighting are addressed in Section 3.15, "Visual Resources."

No-Action Alternative

Under the No-Action Alternative, USACE would not widen the Sacramento Weir or Bypass; no construction would occur, and there would be no potential for hazardous spills due to construction activities. However, the Sacramento Weir and Bypass are integral to the function of the regional flood management system and under this alternative, increased frequency and magnitude of levee failure could occur. Levee failure would require immediate flood-fighting efforts that would not include BMPs to reduce the potential spill of hazardous materials. A catastrophic flood event could cause widespread flooding, exposing people throughout the Sacramento area to existing hazardous materials (i.e. gasoline, and oils that are stored above ground), and contaminants associated with sites and elsewhere in the inundation area would likely be dispersed, posing direct and indirect risk of exposure throughout the Sacramento area. A catastrophic flood event would result in large tracts of land inundated with water most likely during the winter, which is the peak period when large numbers of migratory waterfowl are present in the region. Therefore, on a temporary basis (until the floodwaters subsided), the No-Action Alternative could increase the number of birds and bird species in the vicinity of nearby airports, increasing potential for bird strikes. A catastrophic flood event also could result in downed power poles, which could ignite widespread fires. These effects could be considered significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore there is no substantial evidence to support a significance determination.

Proposed Action and Higher Weir Elevation Alternative

Potential Accidental Spills of Hazardous Materials Used During Construction

The Phase I ESA identified a REC associated with the former Bryte Landfill and possible historic use of pesticides along the railroad corridor. Thus, there is a potential that earthmoving activities associated with project activities could encounter contaminated soil or groundwater, and/or underground utility infrastructure containing hazardous substances, which could result in possible exposure of people or the environment to hazardous materials. Implementation of new Mitigation Measure HAZ-1 would reduce the effect associated with possible exposure to hazardous materials to a less-than-significant level because USACE would require testing and investigation to identify and address contaminated sites prior to construction.

Possible Creation of Wildland Fire Hazards

CALFIRE (2007, 2008) has determined that the areas where project-related activities would occur are not within a high fire hazard severity zone or a state Responsibility Area. Thus, the project would have a less-than-significant effect.

3.17.3 Avoidance, Minimization, and Mitigation Measures

The following measure is consistent with mitigation identified in the ARCF GRR Final EIS/EIR.

Mitigation Measure HAZ-1: Conduct Phase II Investigations as Needed.

If the project is implemented, USACE will require that project areas be tested for contaminants prior to construction. Any hazardous materials found would be disposed of in accordance with all Federal, state, and local regulations at an approved disposal site. Where construction activities would occur in close proximity to sites identified as RECs in the Phase I ESA (HDR 2019), a Phase II site investigation should also be conducted.

4.0 CUMULATIVE AND GROWTH-INDUCING EFFECTS

NEPA and CEQA require the consideration of cumulative effects of the proposed action, combined with the effects of other projects. NEPA defines a cumulative effect as an effect on the environment that results from the incremental effect of an action when combined with other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR § 1508.7). The CEQA Guidelines define cumulative effects as "two or more individual effects which, when considered together, compound or increase other environmental impacts" (CCR Section 15355).

The cumulative effects of the overall ARCF 2016 Project were covered in the ARCF GRR Final EIS/EIR (USACE 2016). The thorough cumulative analysis in the ARCF GRR Final EIS/EIR is incorporated by reference. Because the temporal scope of the analysis was necessarily vague in the ARCF GRR Final EIS/EIR, for the purposes of the project, the temporal scope of the cumulative effects analysis in this Supplemental EIS/EIR considers past projects that would continue to affect the project area in 2021 through 2023 and projects expected to be under construction in 2021 through 2023.

4.1 Projects Contributing to Significant Cumulative Effects

This section briefly describes other similar or related projects, focusing on flood-risk reduction and habitat restoration projects that have similar effect mechanisms and affect similar resources as would the Proposed Action or Higher Weir Elevation Alternative. Although the ARCF GRR Final EIS/EIR identified several of these projects in the cumulative scenario, the descriptions in this section include updated timing and schedule information, as well as additional reasonably foreseeable projects.

Past and present projects and activities have contributed on a cumulative basis to the existing environment within the project area via various mechanisms, such as the following:

- population growth and associated development of socioeconomic resources and infrastructure;

- conversion of natural vegetation to agricultural and developed land uses, and subsequent conversion or restoration of some agricultural lands to developed or natural lands;

- alteration of riverine hydrologic and geomorphic processes by flood management, water supply management, and other activities; and

- introduction of nonnative plant and animal species.

Several major past, present, and reasonably foreseeable probable future projects are considered in this cumulative effects analysis, including regional projects for which USACE has provided approval or is in the process of considering Section 408 permission. For elements of these projects proposed for future implementation, the construction timing and sequencing is highly variable and may depend on uncertain funding sources. However, each of these past, present, and reasonably foreseeable probable future projects must be considered in the context of environmental effects from the Proposed Action or Higher Weir Elevation Alternative to properly evaluate the cumulative effects of this action and these other similar projects on the environment.

Lower American River Common Features Project

Congressional authorizations in WRDA 1996 and WRDA 1999 enabled USACE, CVFPB, and SAFCA to undertake various improvements to the levees along the north and south banks of the lower American River, as well as the east bank of the Sacramento River. Under WRDA 1996, this involved the construction of 26 miles of slurry walls along the left and right banks of the lower American River. The WRDA 1999 authorization included a variety of additional levee improvements, such as levee raises and levee widening improvements, to ensure that the levees could pass an emergency release of 160,000 cfs. Construction of the WRDA 1996 and 1999 projects were completed in 2016; mitigation site monitoring is ongoing.

American River Common Features 2016 Project

The greater ARCF 2016 Project is scheduled for construction from 2019 through 2024. The project would involve construction of levee improvements along the lower American and Sacramento River levees as well as proposed improvements to the Natomas East Main Drainage Canal (NEMDC) east levee and Magpie Creek (SAFCA previously completed improvements as an early implementation action in 2018). The levee improvements scheduled for implementation include cutoff walls, erosion

protection, seepage and stability berms, relief wells, levee raises, and a small stretch of new levee. The project would also involve constructing a number of mitigation sites in the area.

In addition to the improvements that are part of the Proposed Action, the ARCF 2016 Project includes:

- construction of a seepage and stability berm along Front Street in the City of Sacramento (currently under construction);
- improvements to the Sacramento River East Levee between downtown Sacramento and Freeport (planned for 2020-2023);
- erosion protection on the American River (planned for 2021-2023);
- erosion protection on the Sacramento River (planned for 2020-2023); and
- improvements to the East Side Tributaries, including the Magpie Creek Diversion Channel; the east bank of the NEMDC/Steelhead Creek; Pleasant Grove Creek Canal; and Dry, Robla, and Arcade Creeks (planned for 2023)

American River Common Features Natomas Basin Project

In 2007, the Natomas Levee Improvement Project was authorized as an early-implementation project initiated by SAFCA to provide flood protection to the Natomas Basin as quickly as possible. This project consists of improvements to the perimeter levee system of the Natomas Basin in Sutter and Sacramento Counties, as well as associated landscape and irrigation/drainage infrastructure modifications. SAFCA, DWR, CVFPB, and USACE have initiated this effort with the aim of incorporating the Landside Improvements Project components of the Natomas Levee Improvement Project into the Federally authorized American River Common Features Project. Construction of this early implementation project was completed in 2013. In 2014, the Natomas Basin Project was authorized by Section 7002 of Water Resources Reform and Development Act of 2014 (Public Law 113-121). Construction on Reach I and Reach D began in 2018, and Reach H began in 2019. Reaches A, B, E, F, and G are still in design. Construction on Reaches D, H, and I is expected to continue in 2020, and construction in Reach B is planned to begin in 2020 and continue into 2021. Construction on the I-5 window is anticipated in 2022. Reach A construction is anticipated in 2022 and 2023, and Reaches F and G are anticipated for 2023. Construction and construction traffic effects of this project have the potential to contribute to cumulative impacts with the Proposed Action.

Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area

SAFCA created a new assessment district ("CCAD2") to replace the existing Consolidated Capital Assessment District and updated the existing development impact fee to provide the local share of the cost of constructing and maintaining flood-risk reduction improvements and related environmental mitigation and floodplain habitat restoration along the American and Sacramento Rivers and their tributaries in the Sacramento metropolitan area. The program includes the projects necessary to provide at least a 100-year level of flood protection for developed areas in Sacramento's major floodplains as quickly as possible; achieve the state's 200-year flood protection standard for these areas within the timeframe mandated by the Legislature; and improve the resiliency, robustness, and structural

integrity of the flood control system over time, so the system can safely contain flood events larger than a 200-year flood. The program includes Yolo and Sacramento Bypass system improvements, levee modernization, and Lower Sacramento River erosion control. The Updated Local Funding Mechanisms Final Subsequent Program EIR was certified and the project was adopted in 2016 (SAFCA 2016b).

Sacramento River Bank Protection Project

The Sacramento River Bank Protection Project (SRBPP) was authorized to protect existing levees and flood control facilities of the SRFCP. The SRBPP was instituted in 1960 to be constructed in phases. Bank protection has generally been constructed on an annual basis. Phase I was constructed from 1963 to 1975 and consisted of 436,397 linear feet of bank protection. Phase II was authorized in 1974 and provided 405,000 linear feet of bank protection. The SRBPP directs USACE to provide bank protection along the Sacramento River and its tributaries, including the portion of the lower American River that is bordered by Federal flood control project levees. Since 1965, erosion control projects at twelve sites covering 16,141 linear feet of the south and north banks of the lower American River have been implemented. This is an ongoing project, and additional sites requiring maintenance would continue to be identified indefinitely, until the remaining authority of 4,966 linear feet is exhausted over the next 3 years. WRDA 2007 authorized an additional 80,000 linear feet of bank protection to Phase II, which would be initiated upon approval of the SRBPP Post Authorization Change Report.

West Sacramento General Reevaluation Report

The West Sacramento GRR study determined the Federal interest in reducing the flood risk within the West Sacramento project area. The purpose of the West Sacramento GRR is to bring the 50 miles of perimeter levees surrounding West Sacramento into compliance with applicable Federal and state standards for levees protecting urban areas. Proposed levee improvements would address seepage, stability, levee height, and erosion concerns along the West Sacramento levee system. Measures to address these concerns would include seepage cutoff walls, stability berms, seepage berms, levee raises, flood walls, relief wells, sheet pile walls, jet grouting, and bank protection. The GRR was authorized in WRDA 2016 and received initial funding to begin preconstruction design in the Fiscal Year 2019 work plan. However, under the West Sacramento Area Flood Control Agency Early Implementation Program, three levee segments have already been completed: a small segment along the Sacramento River adjacent to the I Street Bridge, a stretch along Sacramento River in the northern portion of the city near the neighborhood of Bryte, and the south levee of the Sacramento Bypass. In addition, the Southport setback levee is currently in the final construction stages, as part of a local effort that includes all of the proposed levee improvements under the study to the Sacramento River on the West Sacramento south basin. Construction and construction traffic effects of this project have the potential to contribute to cumulative impacts with the Sacramento Weir Widening project.

Central Valley Flood Protection Plan of 2017

The Central Valley Flood Management Planning (CVFMP) Program is one of several programs managed by DWR under FloodSAFE California, a multifaceted initiative launched in 2006 to improve integrated flood management in the Central Valley, including the Sacramento Weir Widening project (Proposed Action) area. The CVFMP Program addresses state flood management planning activities in the Central Valley. The Central Valley Flood Protection Plan (CVFPP) is one of several documents adopted by CVFPB to meet the requirements of flood legislation passed in 2007 and, specifically, the Central Valley Flood Protection Act of 2008. DWR adopted the updated CVFPP in 2017, with a focus

on Sacramento and San Joaquin Watershed Basin-Wide Feasibility Studies (BWFS), Regional Flood Management Planning, and the Central Valley Flood System Conservation Strategy. Results of these efforts would support implementation of future CVFPP actions. The CVFPP contains a broad plan for flood management system improvements, ongoing planning studies, engineering, feasibility studies, designs, funding, and partnering required to better define, and incrementally fund and implement, these elements over the next 20 to 25 years. Although most CVFPP projects are not well-defined and would be implemented substantially later than the Sacramento Weir Widening project, it is important to consider the long-term aspects of the CVFPP in conjunction with this action.

The Sacramento BWFS indicates that the following improvements to the Yolo Bypass flood control system (in addition to the proposed Sacramento Weir widening) could be made and therefore are considered as future projects: constructing a setback levee in the Lower Elkhorn Basin on the east side of the Upper Yolo Bypass and on the north side of the Sacramento Bypass (discussed separately in further detail below); widening the Fremont Weir; widening the Upper Yolo Bypass by constructing setback levees along the east side of the Bypass in the Upper Elkhorn Basin; constructing fix-in-place improvements to the existing levees in various locations along the west and east sides of the Upper Yolo Bypass; widening the Upper Yolo Bypass by constructing setback levees north of Willow Slough and north of Putah Creek on the west side of the Bypass; adding a tie-in to the Stockton Deep Water Ship Channel and channel closure gates; and constructing a floodwall on the west side of the Sacramento River at Rio Vista. Additional actions being considered under the Sacramento BWFS include the following: extending the life of the Cache Creek Settling Basin by expanding it to the north; degrading the step levees at the north end of Liberty Island; widening the Lower Yolo Bypass by constructing a setback levee on the west side of the Bypass near the north end of Little Egbert Tract; degrading the existing levees along the Stockton Deep Water Ship Channel on the west side of Prospect Island; degrading the existing levees on the northern and southern ends of Little Egbert Tract; removing the Yolo Shortline Railroad tracks and crossing over the Yolo Bypass near the I-80 overcrossing; and raising and strengthening the levees along the entire west side of the Lower Yolo Bypass (DWR 2016).

Lower Elkhorn Basin Levee Setback Project

The LEBLS project encompasses a portion of the Phase I implementation of Yolo Bypass System Improvements, pursuant to DWR's Sacramento BWFS and therefore is focused on levees in the Lower Elkhorn Basin and the Sacramento Bypass. Consistent with the Sacramento BWFS, the LEBLS project is intended to reduce flooding in the Lower Sacramento River Basin by increasing the capacity of the Yolo Bypass. This increased capacity would be accomplished by constructing a setback levee on the north side of the Sacramento Bypass as an early implementation action for the ARCF 2016 Project and constructing a setback levee in the Lower Elkhorn Basin on the east side of the Yolo Bypass.

The LEBLS project also includes implementing a project mitigation strategy designed to avoid, minimize, reduce, and mitigate impacts on sensitive habitats and special-status species caused by the project, in a manner that optimally protects the natural environment, especially riparian habitat and stream channels suitable for native plants, wildlife habitat, agricultural lands, and public recreation. LEBLS project construction is planned for 2020 and 2021. Construction effects have the potential to contribute to cumulative impacts of the Sacramento Weir Widening project.

Folsom Dam Safety and Flood Damage Reduction Project

The Folsom Dam Safety and Flood Damage Reduction Project (JFP) addressed the dam safety hydrologic risk at Folsom Dam and improved flood protection to the Sacramento area. The project included construction of the Folsom Dam Auxiliary Spillway. The project was completed in 2017.

Folsom Dam Water Control Manual Update

The Folsom Dam Water Control Manual (WCM) has been updated to reflect authorized changes to flood management and dam safety operations at Folsom Dam to reduce flood risk in the Sacramento area. The WCM Update used existing and authorized physical features of the dam and reservoir, specifically the recently completed auxiliary spillway. Along with evaluating operational changes made possible by the auxiliary spillway, the WCM Update developed new operational rules for dam safety and flood risk management and ensured compliance with Federal authorizations to reduce the creditable flood storage space allocation from the current operating range of 400,000 to 670,000 acre-feet to 400,000 to 600,000 acre-feet. The Final Supplemental EA/EIR for the Water Control Manual Update was released in January 2019 and the revised WCM was signed by USACE and the Bureau of Reclamation in June 2019.

Folsom Dam Raise

Construction of the Folsom Dam Raise project would likely follow completion of the JFP and the WCM projects. The Dam Raise project includes raising the right- and left-wing dams, MIAD, and dikes 1-8 around Folsom Reservoir by 3.5 feet. The Dam Raise project also includes modifications to the five existing main spillway gates, the three emergency spillway gates and three ecosystem restoration projects (automation of the temperature control shutters at Folsom Dam and restoration of the Bushy and Woodlake sites downstream). Similar to the ARCF 2016 Project, the Folsom Dam Raise was fully funded by the Bipartisan Budget Act of 2018. Construction is scheduled to begin in 2019 with Dike 8 construction, followed by Dike 7 in 2020; MIAD, the Left and Right wing of Folsom Dam, and Dikes 1-3 in 2021; and Dikes 4-6 in 2022. The ecosystem restoration projects are not scheduled at this time.

Yolo Bypass Salmonid Habitat Restoration and Fish Passage

The Yolo Bypass Salmonid Habitat Restoration Project is intended to improve connectivity within the bypass and to the Sacramento River. The project primarily consists of a new Fremont Weir headworks structure, a new outlet channel, and downstream channel improvements to allow flows of up to 6,000 cfs through a new gated notch, depending on Sacramento River elevation. The structure could operate between November 1 and May 31, with 6,000 cfs flows permitted between November 1 and March 15. Flows would be limited to 300 cfs from March 15 until May 31 to avoid inundating areas outside Tule Canal. The EIS/EIR estimated construction in late 2020 or early 2021.

4.2 Cumulative Effects

4.2.1 Geological Resources

Construction activities associated with the Sacramento Weir Widening project and most of the related projects would involve extensive grading and earthmoving activities, thereby exposing soil to erosion from wind in summer and from rainfall during storm events. If uncontrolled, suspended

sediment from stormwater runoff could enter adjacent water bodies and result in increased turbidity. However, the Sacramento Weir Widening project along with each related project that would disturb 1 acre of land or more are required by law to comply with NPDES discharge permits from the Central Valley RWQCB, which require preparation of a SWPPP and implementation of erosion control BMPs that would result in minimal adverse effect to geological resources. Therefore, there would be no significant cumulative effect related to construction-related erosion, and the project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect.

If not addressed, seepage-related levee failures could contribute significant volumes of sediment and material to the stream channels, which could alter flow patterns and potentially destabilize other levees outside the project area. However, the Sacramento Weir Widening project and most of the related projects would implement seepage control measures that would reduce the risk of levee failure. Several projects also construct new levees with existing engineering standards and contribute to reducing levee failures or modify facilities such as the Proposed Action that also further minimize levee failures. Therefore, the project would not make a cumulatively considerable incremental contribution to a significant cumulative impact related to the risk of levee failure. To the contrary, the Proposed Action and related projects reduce the risk of levee failure in the system are considered to be cumulatively beneficial.

All Sacramento Weir Widening project improvements, as well as improvements proposed as part of the related flood-risk reduction projects, would be designed based on the results of detailed geotechnical engineering studies and required to comply with standard engineering practices for levee design. In addition to compliance with CVFPB standards, levee design and construction must be in accordance with EM 1110-2-1913 *Design and Construction of Levees* (USACE 2000), the primary Federal standards applicable to levee improvements. ER 1110-2-806 *Earthquake Design and Evaluation for Civil Works Projects* (USACE 2016), would also apply to project design and construction. Therefore, the design and construction of all flood-risk reduction project would meet or exceed applicable design standards for static and dynamic stability, seismic ground shaking, liquefaction, subsidence, seepage, and expansive soils. Therefore, the project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to seismicity and soils.

The Sacramento Weir Widening project and most of the related projects, would entail earthmoving activities in the Riverbank and/or Modesto Formations, which are considered paleontologically sensitive. While some of the related projects, such as the CVFPP and NLIP projects, contain mitigation measures to protect paleontological resources, the other related projects may not. Therefore, some of the related projects may result in significant effects to unique paleontological resources. Other future components of the ARCF 2016 Project would also take place in the Riverbank Formation. However, the presence of unique paleontological resources is site-specific, and a low probability exists that any project, including the project, would encounter unique, scientifically important fossils. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to damage to or destruction of unique paleontological resources.

4.2.2 Land Use

The ARCF GRR Final EIS/EIR stated that approximately 335.5 acres of actively farmed lands designated as prime farmland would be converted to non-agricultural use as a result of constructing the widened weir and bypass. The LEBLS project also separately identified the conversion of

approximately 494 acres of prime and unique farmland. This cumulative impact would be significant, and the Sacramento Weir Widening project would make a cumulatively considerable incremental contribution to this significant cumulative impact on loss of prime farmland.

4.2.3 Water Quality and Groundwater Resources

Construction activities associated with the Sacramento Weir Widening project and most of the related projects, would involve extensive grading and earthmoving activities, thereby exposing soil to erosion from wind in summer and from rainfall during storm events. If uncontrolled, suspended sediment from stormwater runoff could enter adjacent water bodies and result in increased turbidity. Some projects, such as the West Sacramento GRR and the SRBPP, include levee raises, flood walls, and bank protection. The West Sacramento GRR and LEBLS project include construction of new setback levees. Dewatering of the construction area (e.g., removing groundwater that may fill trenches dug for cutoff wall construction) could result in the release of contaminants to surface or groundwater. The related projects considered in this cumulative analysis could also result in adverse water quality effects from construction dewatering. However, the project and the related projects are required by law to comply with Central Valley RWQCB provisions that require a dewatering permit and to implement Central Valley RWQCB measures designed to reduce adverse water quality effects from construction dewatering. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution related to degradation of water quality or groundwater recharge or sustainability from construction dewatering or construction of the project components.

4.2.4 Hydrology and Hydraulics

Cumulative effects on water surface elevation related to operation of the widened weir are incorporated into the scenarios analyzed in Section 3.4.2.

The Yolo Bypass Salmonid Habitat Restoration and Fish Passage project would put flows of 6,000 cfs into the Tule Canal during flood season, with flows reduced to 300 cfs after March 15 in any given year to avoid potential overtopping of the Tule Canal.

The Sacramento Weir fish passage structure could potentially operate after floodwaters have receded from the Yolo and Sacramento Bypasses. The anticipated maximum discharge would be 882 cfs at a Sacramento River stage of 17 feet NAVD88. As stated in the project description, the fish passage structure would not operate if flows through the structure would cause overtopping of the Tule Canal, and flows through the structure would not continue past May 31. Because operation of both the Yolo Bypass Salmonid Habitat Restoration and Fish Passage project and the Sacramento Weir Widening project are limited to avoid overtopping of the Tule Canal, this cumulative hydrology and hydraulic impact would be less than significant.

4.2.5 Vegetation and Wildlife

Project implementation has the potential to contribute to the loss or degradation of sensitive habitats, including riparian, waters of the United States, waters of the state, and forestland. Similar potential for adverse effects on habitats would be associated with the other flood-risk reduction projects, including future components of the ARCF 2016 Project proposed along the Sacramento River East Levee and the American River, and removal of high-hazard vegetation by LMAs in the Sacramento area and surrounding region. Such projects would generally continue to contribute to the loss or degradation of sensitive habitats and forestland. Most potential adverse effects of the Sacramento Weir Widening project and the related levee projects would be associated with construction disturbances of habitats, but

permanent loss of habitat would also result from some of the individual flood-risk reduction projects. Implementation of mitigation measures described in Section 3.6.3, "Vegetation and Wildlife," would substantially reduce or avoid the effects of the project in accordance with the requirements of regulatory programs that protect habitats, such as CWA Sections 401 and 404. Ultimately, impacts to vegetation and wildlife are expected to be minor with mitigation and not considered to cumulatively considerable. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to significant cumulative effects related to the loss or degradation of sensitive habitats or loss of forestland.

4.2.6 Fisheries

Potential cumulative effects on fish would include effects associated with other projects proposed to occur on the Sacramento and American Rivers. USACE's SRBPP and West Sacramento GRR would both result in direct loss of fish habitat from construction. Direct loss of habitats would still result because of the construction of bank protection measures; however, both of these projects are expected to implement mitigation measures, including onsite plantings that would improve long-term fish habitat on the Sacramento River. In addition, the completion of the Folsom JFP and the new Water Control Manual Update for Folsom Dam would likely benefit downstream fish species on the lower American River. The new spillway at Folsom Dam will enable better control of outflows from Folsom Dam, including the ability to release colder water from deeper in the lake, which would improve conditions on the American River for fish species. While short-term cumulative effects would be significant from the direct effects associated with construction, the implementation of these projects would in time result in a net benefit to fish from the construction of setback levees, planting berms, and other aquatic-based restoration programs being implemented as part of multi-benefit projects. The Sacramento Weir Widening project along with many other projects being considered for the region could result in limited opportunities for future SRA habitat mitigation. However, there are currently sufficient SRA habitat mitigation sites and planting areas to mitigate the known reasonably foreseeable projects in the region. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to significant cumulative adverse effects fish and aquatic habitats.

Implementation of the project would make a considerable contribution to a significant cumulative effect related to the loss or degradation of sensitive habitats and to adverse effects on salmonids and green sturgeon. These effects could contribute to the species declines and habitat losses that have led to the need to protect these species under the Federal ESA and CESA. In particular, the combination of the ARCF 2016 Project, SRBPP, and West Sacramento projects could combine to contribute to adverse effects to green sturgeon in the study area. These projects involve the placement of bank protection to address erosion in the study area, and in doing so could adversely impact the food source of the green sturgeon by covering benthic substrate with rock. However, the extent of impact to this species is not easily defined due to the lack of scientific knowledge in this area of the Sacramento River system. These projects are working to adaptively manage their implementation to minimize impacts on these species through modeling efforts during the design phase and monitoring during the construction phase of the projects. With the implementation of USACE's proposed mitigation and compensation efforts for both the West Sacramento and ARCF 2016 Project, including the Proposed Action, significant cumulative effects on salmonids and green sturgeon would be minimized and replacement habitat compensation would be created for the remaining unavoidable impacts. Furthermore, USACE and NMFS are working closely to design adaptable fish passage components to improve fish passage and therefore fish survival. Therefore, the Sacramento Weir Widening project

would not result in a cumulatively considerable incremental contribution to significant cumulative adverse effects on salmonids and green sturgeon.

4.2.7 Special-status Plants and Terrestrial Wildlife Species

Project implementation has the potential to adversely affect special-status species (woolly rose-mallow, Suisun marsh aster, valley elderberry longhorn beetle host plants, giant garter snake, Swainson's hawk, other nesting birds, and bats). Similar potential for adverse effects on special-status species and their habitats would be associated with the other flood-risk reduction projects, including future components of the ARCF 2016 Project proposed along the Sacramento River East Levee and the American River, and removal of high-hazard vegetation by LMAs in the Sacramento area and surrounding region. Such projects would generally continue to adversely affect special-status species. Most potential adverse effects of the project and the other flood-risk reduction projects related to plants and terrestrial special-status species would be associated with construction disturbances of wildlife and habitats, but permanent loss of habitat would also result from the footprints of some of the individual levee improvement projects and the development projects. These adverse effects could contribute to species declines and losses of habitat that have led to the need to protect these species under the Federal ESA and CESA. Implementation of mitigation measures described in Section 3.8.3, "Special-status Plants and Terrestrial Wildlife Species," would substantially reduce or avoid the effects of the project in accordance with the requirements of the Federal ESA, CESA, and other regulatory programs that protect special-status species. Ultimately, impacts to special-status plants and terrestrial wildlife species are expected to be minor with mitigation and not considered to be cumulatively considerable. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to significant cumulative adverse effects to special-status species.

4.2.8 Cultural Resources

Implementation of the Sacramento Weir Widening project, other flood-risk reduction projects, including other components of the ARCF 2016 Project, have the potential to contribute to the loss or degradation of known and unrecorded archaeological resources, known prehistoric-period Cultural Landscapes, known and unknown human remains, and known and unknown historic-period archaeological resources. Most potential effects of the Sacramento Weir Widening project and other related projects to cultural resources would be associated with construction disturbances of archaeological sites, prehistoric Cultural Landscapes, and human remains. These effects could contribute to the loss of intact cultural resources and human remains in the Sacramento region. Implementing mitigation measures presented in Section 3.9, "Cultural Resources," would substantially reduce or avoid project effects on known resources and on unknown archaeological resources and human remains that could potentially be discovered during project construction. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a cumulatively significant effect.

4.2.9 Transportation and Circulation

The majority of traffic effects related to the Sacramento Weir Widening project would occur on Old River Road, Reed Avenue, Harbor Boulevard, I-5, and I-80. The LEBLS project and other construction projects in the Sacramento metropolitan area would also affect traffic volumes and capacity on these roadways in the vicinity of the project area. Other flood-risk reduction projects would occur at locations that are relatively distant. Mitigation described in Section 3.10, "Transportation and Circulation," includes a traffic control and road maintenance plan to reduce the Sacramento Weir Widening project's impact, but when combined with the LEBLS project, the Sacramento Weir

Widening project would still make a cumulatively considerable contribution to a significant cumulative impact related to traffic congestion. This impact is significant and unavoidable.

Mitigation measures would require emergency service providers to be notified in advance of road closures and detours and emergency access to be maintained. Because other major construction projects would also implement traffic control plans specifically designed to provide appropriate emergency access, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to emergency vehicle access or response times.

The project would temporarily affect bicycle circulation through the closure of Old River Road during project construction in 2022-2024. The LEBLS project would also adversely affect bicycle circulation due to the presence of haul trucks on this roadway during its construction in 2020 and 2021. Therefore, bicycle circulation would be adversely affected for 5 consecutive years of project construction in the area. The Sacramento Weir Widening project's contribution to this significant cumulative impact would be considerable. This impact is significant and unavoidable.

4.2.10 Air Quality

Air quality is inherently a cumulative effect because existing air quality is a result of past and present projects. No single project would be sufficient in size, by itself, to result in nonattainment of the regional air quality standards (SMAQMD 2014). The Federal attainment status in the SVAB for pollutants of concern is shown in Table 3.11-1. Several other construction projects are expected to occur simultaneously in the SVAB during the planned construction period for the Sacramento Weir Widening project. The related projects have the potential to generate construction-related emissions that individually exceed SMAQMD's threshold of significance. However, all construction projects in the SMAQMD, including the Sacramento Weir Widening project, are required to offset emissions that have the potential to negatively affect air quality in the SVAB, through implementation of SMAQMD emissions reductions practices. In addition, many offset projects create long-term, permanent emissions reductions (which result in a benefit). Furthermore, the project is part of the larger ARCF 2016 Project, which has been determined to meet the requirements of general conformity with the provisions of the CAA through payment of fees to offset NO_x emissions. As discussed in Section 3.11, "Air Quality," the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to regional air quality, and this contribution would be mitigated through implementation of mitigation measures described in Section 3.3.

With respect to localized air pollutants such as CO, TACs, and odors, the Sacramento Weir Widening project and the related projects would generate these pollutants only during construction, and they would be temporary and short term. Some of the related projects may generate concentrations of these pollutants at levels that exceed relevant thresholds. However, the related projects include CEQA/NEPA documents containing mitigation measures that must be implemented to reduce individual project emissions. As discussed in Section 3.11, the project would not generate CO, TACs, or odors at levels that would represent a health hazard. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to generation of CO or TACs during construction.

4.2.11 Climate Change

Climate change as related to GHG emissions is inherently cumulative. Though significance criteria can be developed by air districts and Federal and state regulatory agencies, these criteria and their related goals are ultimately designed to affect change at a global level. Therefore, the analysis presented in Section 3.12, "Climate Change," includes both the project's direct and indirect effects, as well as cumulative effects. The Sacramento Weir Widening project and the related projects would generate GHGs in proportion to the size of each individual project, amount and time of operation of construction equipment, and distances traveled. However, the Sacramento Weir Widening project and the related projects that would generate GHG emissions in excess of threshold levels would implement the mitigation measures set forth in their respective CEQA/NEPA documents to reduce emissions and/or purchase carbon offsets. Furthermore, the project would not exceed CEQ GHG threshold guidance levels, and it would be consistent with Statewide climate change adaptation strategies. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to climate change.

4.2.12 Noise

A cumulative effect might occur if construction activities associated with any of the related project(s) were to occur within 500 feet of the Sacramento Weir Widening project construction activities, and also, if the construction activities of other projects were to occur at the same time or overlap at some point during the construction activities of the project. None of the related projects, except the LEBLS project, is located within 500 feet of the project site, and construction of the LEBLS project in 2021 would likely be farther north (more than 500 feet from the project site). Therefore, any construction-related noise effects of the LEBLS project are unlikely to have a cumulative effect, in combination with construction of the project. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to construction equipment or traffic noise levels in excess of standards established in the local general plan or noise ordinance; in other applicable local, state, or Federal standards; or exceeding the ambient background.

4.2.13 Recreation

The Sacramento Weir Widening project, along with the related projects, may result in temporary closure of formal and informal recreational facilities, potential damage to recreational facilities, and temporary diminishment of recreational experiences in the project vicinity during construction. Implementation of mitigation measures described in Section 3.14, "Recreation," would reduce the project's effects to a less-than-significant level. Because of the temporary nature of the construction effects, the project's effects on local recreation are not anticipated to overlap with effects of other related projects. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to short-term temporary changes in recreational opportunities during project construction activities.

4.2.14 Visual Resources

Project-related activities would not be visible from any state-designated scenic highways, but they would be visible from Old River Road, a Yolo County-designated scenic highway. However, effects to views from the scenic highway would be temporary, and short-term in nature, and the post-construction visual character would be similar to pre-project conditions. Therefore, there would be no significant cumulative impact related to damage to scenic resources within a state- or county-designated

scenic highway, and the project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect.

Construction crews, equipment, and haul trucks would be visible to residents adjacent to local streets and to residences near the work sites. In addition, construction would be visible to recreationists along the Sacramento River and the Sacramento Bypass. However, construction would be temporary in nature, and views of construction crews, equipment, and haul trucks would be of short duration. At the completion of construction activities, the work areas for both the project and the related projects would look the same or substantially similar to existing conditions. Therefore, there would be a no significant cumulative effect related to short-term temporary or long-term permanent degradation of visual character or adverse changes to scenic vistas, and the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect.

4.2.15 Public Utilities and Service Systems

The Sacramento Weir Widening project, other components of the ARCF 2016 Project, and all of the other related flood-risk reduction projects could temporarily disrupt utility service as a result of inadvertent damage to existing utility equipment, facilities, and infrastructure during construction. However, any utility and service system effects would be geographically isolated, short in duration, and would occur on a project-by-project basis. Thus, these disruptions would not combine to create significant cumulative effects. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to potential disruption of utility services.

Temporary construction activities associated with the Sacramento Weir Widening project and related projects in the Sacramento region would generate organic and non-organic solid waste. Waste material that is not suitable for disposal onsite would likely be disposed of in the Kiefer or the L and D Landfills in Sacramento County or the Yolo County Central Landfill. These landfills currently provide solid waste disposal services to municipal and commercial customers and provide construction demolition and debris disposal. The landfills have sufficient permitted capacity to accommodate solid waste disposal needs for Sacramento and Yolo Counties, including the disposal needs of the project and the related projects. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to increases in solid waste generation.

4.2.16 Hazardous Wastes and Materials

Implementation of the Sacramento Weir Widening project and the related projects would include handling small quantities of hazardous materials used in construction equipment (e.g., fuels, oils, lubricants) and during construction activities. The storage, use, disposal, and transport of hazardous materials are extensively regulated by various Federal, state, and local agencies. Permits are required for the use, handling, and storage of these materials, and compliance with appropriate regulatory agency standards is also required to avoid releases of hazardous waste. Construction companies that handle hazardous substances for the Sacramento Weir Widening project and all of the related projects are required by law to implement and comply with these existing regulations. Furthermore, any effect that might occur would be localized to the area where the materials are being used and would not be additive to other hazardous materials-related effects associated with the project area. None of the materials would be acutely hazardous, and they would not be used in quantities that pose a hazard to schools within 0.25 mile of construction sites. Thus, the project would not result in a cumulatively considerable

incremental contribution to a significant cumulative effect related to the potential for accidental spills of materials used during construction activities or handling of hazardous materials within 0.25 mile of a school.

It is unknown whether any of the related project sites contain existing hazards materials. However, mitigation measures identified in Section 3.17, "Hazardous Wastes and Materials," would minimize potential exposure to unknown hazards and hazardous materials during implementation of the Proposed Action. Therefore, the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to existing hazardous materials.

Wildland fire represents a hazard, particularly during the hot, dry summer and fall in the Central Valley. Most of the related projects, including the Proposed Action, would be implemented in areas with a relatively low risk of wildland fire. Therefore, there would be no significant cumulative impact related to wildland fire risk, and the Sacramento Weir Widening project would not result in a cumulatively considerable incremental contribution to a significant cumulative effect related to wildland fire hazards.

4.3 Growth-inducing Effects

Because the Sacramento Weir Widening project would not involve construction of housing, the action would not directly induce growth. Project-related construction activities would generate temporary and short-term employment, but these construction jobs are anticipated to be filled from the existing local employment pool and would not indirectly result in a population increase or induce growth by creating permanent new jobs. Furthermore, the project would not involve constructing businesses or extending roadways or other infrastructure that could indirectly induce population growth. Consequently, the Sacramento Weir Widening project would not induce growth leading to changes in land use patterns, population densities, or related impacts on environmental resources.

Flood-risk reduction improvements would benefit areas identified for future growth anticipated in the vicinity of the project site in the City of Sacramento, Sacramento County, and West Sacramento. Local land use decisions are within the jurisdiction of various local governments, each of which provides an overall framework for growth and development in a General Plan. Growth throughout the project area has already been planned for as part of these General Plans. Phase I Implementation of the Proposed Action is unlikely to affect current and/or projected population growth patterns within the City of Sacramento, as already evaluated and planned for in the City General Plan and, therefore, would not be growth-inducing. The Proposed Action would mitigate flood risks by improving levees to meet engineering standards associated with the National Flood Insurance Program; it would not alter protection for the 100-year event nor does it transfer any such risk to other areas. The Proposed Action would not directly or indirectly support development in the base floodplain.

5.0 COMPLIANCE WITH FEDERAL AND STATE LAWS AND REGULATIONS

Certain Federal and state laws and regulations require issuance of permits before project implementation; other laws and regulations require agency consultation but may not require issuance of any authorization or entitlements before project implementation. For each law and regulation addressed

in this section, the text indicates full or partial compliance; if partial compliance is indicated, full compliance would be achieved prior to issuance of a NEPA decision document.

5.1 Federal Laws and Regulations

5.1.1 Clean Air Act of 1963, as amended, 42 USC 7401, et seq.

Partial Compliance. The Federal CAA requires EPA to establish NAAQS. EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2, and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also requires each state to prepare an air quality control plan, referred to as a state Implementation Plan.

An analysis of air quality effects of the project is presented in Section 3.11, "Air Quality." The project is not expected to violate any Federal air quality standards. Although the NO_x emissions of the project and the ARCF 2016 Project as a whole are expected to exceed the EPA's General Conformity *de minimis* thresholds during the project's construction years (2021, 2022, and 2023), USACE expects to purchase offsets for NO_x emissions from SMAQMD and/or YSAQMD. USACE expects to release a conformity determination for public notice in October 2019, and USACE would be in compliance with the General Conformity requirements prior to construction of the Sacramento Weir Widening project.

5.1.2 Endangered Species Act of 1973, as amended, 16 USC 1531, et seq.

Partial Compliance. Pursuant to the Federal ESA, USFWS and NMFS have regulatory authority over Federally listed species. Under the ESA, a permit to "take" a listed species is required for any Federal action that may harm an individual of that species. Take is defined under ESA Section 9 as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under Federal regulation, take is further defined to include habitat modification or degradation where it would be expected to result in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. ESA Section 7 outlines procedures for Federal interagency cooperation to conserve Federally listed species and designated critical habitat. Section 7(a)(2) requires Federal agencies to consult with USFWS and NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species.

A list of threatened and endangered species that may be affected by the Sacramento Weir Widening project was obtained from USFWS in 2019 (Appendix B). USACE formally consulted with USFWS on the ARCF 2016 Project and received a Biological Opinion on September 11, 2015 (08ESMF00-2014-F-0518). USACE formally consulted with NMFS on the ARCF 2016 Project and received a Biological Opinion on September 15, 2015 (WCR-2014-1377). The project is an element of the ARCF 2016 Project.

USACE is required to reinitiate formal consultation with USFWS and/or NMFS if effects to listed species would vary from what was provided at the time of formal consultation. USACE continues to update USFWS and NMFS on impacts and mitigation for covered species associated with implementing ARCF 2016 Project actions, and USACE will reinitiate consultation with USFWS and/or NMFS, if needed, when design of the project is advanced enough to provide detailed quantification of impacts on listed species and determine if such impacts exceed or vary substantially from those authorized in the ARCF 2016 Project Biological Opinions.

5.1.3 Executive Order 11988, Floodplain Management.

Partial Compliance. This Executive Order (EO) directs all Federal agencies approving or implementing a project to avoid, to the extent possible, the long- and short-term adverse effects associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Guidelines for implementing the EO include an eight-step process that agencies should carry out as part of their decision-making on projects that have potential effects to or within the floodplain. The decision-making process required in Section 2(a) of the EO is reflected in the eight steps that are listed below, along with information on how each step is being addressed for the project.

1. Determine if a proposed action is in the base floodplain (that area which has a 1 percent or greater chance of flooding in any given year (i.e., the 100-year floodplain). The project includes weir and levee improvements, some of which are within the base (Federal Emergency Management Agency 100-year) floodplain.

2. Conduct early public review, including public notice. Public review is being accomplished through the NEPA Supplemental EIS and the CEQA Supplemental EIR process.

3. Identify and evaluate practicable alternatives to locating in the base floodplain, including alternative sites outside of the floodplain. Alternatives to the Proposed Action are discussed in Chapter 2, "Alternatives."

4. Identify effects of the proposed action. This Supplemental EIS/EIR analyzes the environmental effects potentially resulting from the project, per NEPA requirements. Effects of the Proposed Action are described in Chapter 3, "Affected Environment and Environmental Consequences," and Chapter 4, "Cumulative and Growth-inducing Effects." Effects are also being evaluated in compliance with CWA, and other Federal and state environmental regulations.

5. Minimize threats to life and property and restore and preserve natural and beneficial floodplain values. The project would reduce flood risk to life and property by lowering stage in the Sacramento River. The project includes mitigation to maintain or improve habitat values in the Sacramento Bypass and along the Sacramento and American Rivers.

6. Reevaluate alternatives. USACE is conducting an extensive engineering review of the initial designs for a widened weir and Sacramento Bypass to address Sacramento River stage. The project includes several modifications that were developed as a result of USACE's reevaluation of the alternatives. The alternatives are also evaluated and may be refined through consultation with the resource agencies for compliance with CWA and other project authorizations.

7. Present the findings and a public explanation. As part of the NEPA and CEQA processes, the public would be able to review and comment on this Supplemental EIS/EIR.

8. Implement the action. USACE intends to implement the project in 2021-2023, assuming receipt of all necessary approvals, clearances, permits, and permissions.

The project would mitigate flood risks by lowering stage in the Sacramento River; but it would not alter protection for the 100-year event, nor does it transfer any such risk to other areas. Because the

project would not directly or indirectly support development in the base floodplain, it would comply with EO 11988.

5.1.4 Executive Order 11990, Protection of Wetlands.

Partial Compliance. The purpose of EO 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." To meet these objectives, EO 11990 requires Federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. EO 11990 applies to:

- acquisition, management, and disposition of Federal lands and facilities construction;
- improvement projects which are undertaken, financed, or assisted by Federal agencies; and
- Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

As discussed in Section 3.6, "Vegetation and Wildlife," the project's impact to waters would not include permanent fill of wetlands. In addition, reasonable effort would be taken in the detailed design of the project to avoid disturbance to existing wetlands and implementation of environmentally sustainable designs. Any unavoidable destruction, loss, or degradation of wetlands would be compensated through creation of new wetland habitat.

5.1.5 Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Compliance. The purpose of EO 12898 is to identify and address the disproportionate placement of adverse environmental, economic, social, or health effects from Federal actions and policies on minority and/or low-income communities. EO 12898 requires that adverse effects on minority or low-income populations be taken into account during preparation of environmental and socioeconomic analyses of projects or programs that are proposed, funded, or licensed by Federal agencies.

Section 2-2 of EO 12898 requires all Federal agencies to conduct programs, policies, and activities that substantially affect human health or the environment in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin. Section 1-101 of EO 12898 requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of programs on minority and low-income populations.

The project would reduce the risk of flooding to existing residential, commercial, and industrial development in the Sacramento metropolitan area. This benefit would accrue to all segments of the population in the project area and would have no disproportionately high adverse environmental effect on any minority or low-income population.

5.1.6 Executive Order 13112, Invasive Species.

Partial Compliance. EO 13112 directs Federal agencies to take actions to prevent the introduction of invasive species; provide for control of invasive species; and minimize the economic,

ecological, and human health impacts that invasive species cause. EO 13112 also calls for the restoration of native plants and tree species. Project construction activities have potential to introduce new invasive plants or spread existing invasive plants on the project site, but an Invasive Plant Management Plan would be prepared and implemented to minimize this potential. In addition, temporarily disturbed areas would be hydroseeded with a native seed mix for erosion protection and to prevent colonization of exotic vegetation and mitigation measures would include planting of native riparian species.

5.1.7 Farmland Protection Policy Act 7 USC 4201 et seq.

Compliance. The Farmland Protection Policy Act (FPPA) is intended to minimize the effect of Federal programs with respect to the conversion of farmland to nonagricultural uses. It ensures that, to the extent possible, Federal programs are administered to be compatible with state, local, and private programs and policies to protect farmland. NRCS is the agency primarily responsible for implementing the FPPA. Approximately 335 acres of Prime Farmland adjacent to the Sacramento Bypass would be removed from production. The effects of farmland loss were discussed in the ARCF GRR Final EIS/EIR. The small amount of land that would be converted from agricultural land to open space was found to be less than significant because it is less than 1% of the total Prime Farmland in Yolo County. USACE completed NRCS Form DA 1006 concurrent with the publication of the ARCF GRR Final EIS/EIR. As a result, the ARCF 2016 Project, which includes the Proposed Action, is in full compliance with this Act.

5.1.8 Federal Clean Water Act as amended, 33 USC 1251, et seq.

Partial Compliance. The CWA is the primary Federal law governing water pollution. It established the basic structure for regulating discharges of pollutants into waters of the United States and gives EPA the authority to implement pollution control programs, such as setting wastewater standards for industries (EPA 2002). In some states, such as California, EPA has delegated authority to regulate the CWA to state agencies.

Section 401 of the CWA regulates the water quality for any activity that may result in any in-water work or discharge into navigable waters. These actions must not violate Federal water quality standards. The Central Valley RWQCB administers Section 401 of the CWA in California and either issues or denies water quality certifications. Water quality certifications typically include project-specific requirements established by RWQCB to ensure attainment of water quality standards. USACE will apply for a Section 401 water quality certification from the Central Valley RWQCB upon certification of the Supplemental EIS/EIR by CVFPB.

Section 404 of the CWA requires that a permit be obtained from USACE when an action will result in the discharge of dredged or fill material into wetlands and waters of the United States. Under Section 404, USACE regulates such discharges and issues individual and/or general permits for these activities. Before USACE can issue a permit under Section 404, it must determine that the project complies with CWA Section 404(b)(1) Guidelines. The 404(b)(1) guidelines specify that “no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences” (40 CFR Section 230.10[a]).

When conducting its own civil works projects, as is the case with the project, USACE does not issue permits to itself. Rather, USACE complies with the guidelines and substantive requirements of the CWA, including Section 404 and Section 401.

The Sacramento Weir Widening project includes constructing a 1,500-foot-long passive weir, with associated levee, roadway, rail, and fish passage improvements. This project is a component of the ARCF GRR. The passive weir structure would have a crest elevation at 26 feet on the North American Vertical Datum of 1988 (NAVD88). The approximately 375-acre project site is located along the west bank of the Sacramento River situated at Latitude 38.60901°, Longitude -121.56004° in Yolo County, California. The purpose of the project is to provide flood control to the city of Sacramento and surrounding communities.

The discharge and dredging of fill material is anticipated to occur in both the Sacramento River and Tule Canal. Excavation would consist of earthen material and existing previous rip rap levee angular rock. Excavation would occur with excavators and tractors. Approximately 0.25 acre of permanent fill would be placed, consisting of earthen materials and some angular rock. Placement of fill material would occur by excavator or potentially barges. Majority of the fill material will be placed within the excavated area. It is anticipated there will be approximately no more than 0.10 acre loss of waters. This loss is anticipated to occur in Tule Canal. The project would result in expansion of floodplain habitat by expanding the Sacramento Bypass. Due to the projects impacts consisting of like for like dredging and fill replacement with minimal loss of waters, with a potential net gain of seasonal flood plain habitat, mitigation is not required under the Clean Water Act. There will be an additional 0.15 acre of temporary dredge and fill impacts. All temporary impacts will be restored to pre-disturbance conditions following construction of the activity. The project would result in approximately 0.25 acre of permanent excavation within the Sacramento River and Tule Canal. A general Section 401 Water Quality Control certification will be issued for the project in 2021. The activity will result in no more than minimal individual and cumulative adverse effects on the aquatic environment and will not be contrary to the public interest.

The project would require a Construction General Permit (CWA 402 NPDES permit) because it would disturb 1 acre or more of land and involve possible storm water discharges to surface waters. Prior to construction, the contractor would prepare a SWPPP and submit a Notice of Intent form to the California State Water Resources Control Board, requesting approval of the proposed work. This storm water plan would identify BMPs to avoid or minimize any adverse effects of construction on surface waters. When work is completed, the contractor would submit a Notice of Termination to end coverage by the permit.

5.1.9 Fish and Wildlife Coordination Act of 1958, as amended, 16 USC 661, et seq.

Compliance. The Fish and Wildlife Coordination Act ensures that fish and wildlife receive consideration equal to that of other project features for projects that are constructed, licensed, or permitted by Federal agencies. It requires that the views of USFWS, NMFS, and the applicable state fish and wildlife agency (CDFW) be considered when effects are evaluated and mitigation needs are determined.

In 2015, during preparation of the ARCF GRR Final EIS/EIR, USACE coordinated with USFWS to consider potential effects to vegetation and wildlife from implementation of the overall ARCF 2016 Project. On October 5, 2015, the USFWS issued a final Coordination Act Report that provided mitigation recommendations (USFWS File # 08ESMF00-20 13-CPA-0020). USACE

considered all recommendations and responded to them in the Final ARCF GRR Final EIS/EIR. The project would therefore comply with this Act.

5.1.10 Magnuson-Stevens Fishery Conservation and Management Act.

Compliance. The Magnuson-Stevens Act requires that all Federal agencies consult with NMFS regarding actions or proposed actions permitted, funded, or undertaken that may adversely affect essential fish habitat (EFH). EFH is defined as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Both the Yolo Bypass and Sacramento River are designated as EFH for Pacific coast salmon, specifically, Chinook salmon. Project impacts to and location(s) of EFH are further described in the ARCF GRR and associated Biological Assessment and subsequent Biological Opinion as part of the Section 7 ESA consultation process. The project and its potential effects to EFH have been coordinated with the NMFS under the Magnuson-Stevens Act, and USACE received EFH conservation recommendations from NMFS on September 9, 2015 as part of the final Biological Opinion for the ARCF 2016 Project. On September 24, 2015, USACE transmitted a letter to NMFS responding to and adopting the recommendations from NMFS to sufficiently avoid or minimize impacts to EFH. As a result, the ARCF 2016 Project is in full compliance with the Magnuson-Stevens Act.

5.1.11 Migratory Bird Treaty Act of 1936, as amended, 16 USC 703 et seq.

Partial Compliance. The MBTA implements domestically a series of international treaties that provide for migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds; the Act provides that it shall be unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird …" (USC Title 16, Section 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA includes several hundred species and essentially includes all native birds. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and personal property.

The project incorporates mitigation measures that minimize potential for construction activities to result in take of migratory birds, as discussed in Section 3.8, "Special-status Plants and Terrestrial Wildlife." The project would therefore comply with this Act.

5.1.12 National Environmental Policy Act, 42 USC 4321 et seq.

Partial Compliance. NEPA applies to all Federal agencies and most of the activities they manage, regulate, or fund that affect the environment. This act requires full disclosure of the environmental effects, alternatives, potential mitigation, and environmental compliance procedures of proposed actions. NEPA requires the preparation of an appropriate document to ensure that Federal agencies accomplish the law's purposes. Full compliance will be achieved when the final Supplemental EIS/EIR and Record of Decision are filed with the USEPA.

5.1.13 National Historic Preservation Act of 1966, as amended.

Partial Compliance Section 106 of the NHPA and its implementing regulations (36 CFR Part 800) require Federal agencies to consider the potential effects of their proposed undertakings on historic properties. Historic properties are cultural resources that are listed on, or are eligible for listing in, the NRHP (36 CFR 800.16[l]). Undertakings include activities directly carried out, funded, or

permitted by Federal agencies. Federal agencies must also allow the Advisory Council on Historic Preservation to comment on the proposed undertaking and its potential effects on historic properties.

Because the ARCF 2016 Project is being implemented in phases, and because implementation of phases of the ARCF 2016 Project may have an effect on Historic Properties, USACE has consulted with the SHPO and other parties and has executed a PA. The PA establishes the process USACE shall follow for compliance with Section 106, taking into consideration the views of the signatory and concurring parties and interested Native American Tribes.

The project incorporates treatment measures to consider resources listed on or eligible for listing in the NRHP, as discussed in Section 3.9, "Cultural Resources." Determinations of the specific mitigation measures to be implemented to reduce impacts on known Historic Properties would be made by USACE, in consultation with SHPO and other PA parties, as required by the PA and as described in detail in the HPMP for the ARCF 2016 Project.

In accordance with the PA and HPMP procedures, USACE has consulted with Native Americans who attach religious or cultural significance to Historic Properties that may be affected by the proposed undertaking. A summary of consultations with Native Americans is provided under "Native American Consultation" in Section 3.9.1. In accordance with the PA, USACE has consulted with the SHPO to request concurrence on the delineation of the APE, adequacy of inventory methods, findings of cultural resources investigations, evaluation of cultural resources for National Register of Historic Places eligibility and findings of effects from the project.

In a letter dated September 15, 2020 the SHPO concurred in the finding that one Historic Property, the Sacramento Weir and Bypass, would be adversely affected by the Proposed Action and Higher Weir Alternative. In accordance with the PA and Mitigation Measure CR-1 USACE, in consultation with SHPO, will prepare a Historic Properties Treatment Plan that identifies specific treatment measures to resolve the adverse effect under Section 106 of the NHPA.

5.1.14 Rivers and Harbors Act of 1899, 33 USC 403

Compliance. The project location and activity is located within jurisdictional navigable waters under Section 10 of the Rivers and Harbors Act. It is anticipated that dredging, placement of fill material and temporary construction of coffer dams would occur in Section 10 navigable waters. Construction activities will not limit navigation. The work is not anticipated to affect the course, location or condition of the water body to the extent that navigation will be limited.

5.1.15 Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, 42 USC 4601 et seq.

Partial Compliance. Federal, state, regional, and local government agencies, and others receiving Federal financial assistance for public programs and projects that require the acquisition of real property, must comply with the policies and provisions set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended in 1987 (Uniform Act), and implementing regulation, 49 CFR Part 24. Relocation advisory services, moving costs reimbursement, replacement housing, and reimbursement for related expenses and rights of appeal are provided in the Uniform Act. All or portions of some parcels within the project footprint would need to be acquired for project construction. All property acquisition would be made in compliance with the Uniform Act.

5.2 State Laws, Regulations, and Policies

5.2.1 California Clean Air Act of 1988.

Partial Compliance. Section 3.11, "Air Quality," of this document discusses the effects of the project on local and regional air quality. ARB is responsible for developing, implementing, and enforcing California's motor vehicle pollution control program, GHG Statewide emissions and goals, and developing and enforcing GHG emission reduction rules. Section 202(a) of the CAA requires projects to determine whether emission sources and emission levels significantly affect air quality, based on Federal standards established by EPA and state standards set by ARB. YSAQMD has local jurisdiction over the project site. The analysis in Section 3.11 shows that expected short-term project-related emissions would exceed local thresholds administered by YSAQMD and annual general conformity thresholds. Additionally, SMAQMD recommends that a CEQA lead agency consider a GHG emissions threshold of 1,100 metric tons/year; the project would exceed this GHG emissions threshold. Additional BMPs would be incorporated to reduce GHG emissions during construction, to the maximum extent feasible.

5.2.2 California Environmental Quality Act of 1970.

Partial Compliance. The CVFPB, as the non-Federal sponsor and CEQA lead agency, would undertake activities to ensure compliance with the requirements of this Act. CEQA requires the full disclosure of the environmental effects and potential mitigation of the project. Certification of the Final Supplemental EIR by CVFPB, adoption of a project-specific MMRP, and approval of project modifications would culminate substantial compliance with CEQA requirements.

5.2.3 California Endangered Species Act.

Partial Compliance. This Act requires non-Federal agencies to consider the potential adverse effects to state-listed species. With implementation of mitigation measures presented in Section 3.8, "Special-status Plant and Terrestrial Wildlife Species," of this document, activities associated with the project are not anticipated to result in take of any state-listed plant or wildlife species not covered by Federal listing and take authorization. After detailed design and the O&M plan for the fish passage structure and channel are completed, USACE and CVFPB will determine if take authorization for state-listed species is required and will obtain such authorization, if necessary.

5.2.4 California Fish and Game Code §3503.

Partial Compliance. Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nests of eggs of any bird. Section 3503.3 states that it is unlawful to take, possess, or destroy any raptors, including nests or eggs. With implementation of mitigation measures described in Section 3.6, "Vegetation and Wildlife," activities associated with the project are not anticipated to adversely impact nesting birds, raptors, or their eggs.

5.2.5 Porter-Cologne Water Quality Control Act of 1970.

Partial Compliance. This Act requires that each of the state's nine RWQCBs prepare and periodically update basin plans for water quality control. Basin plans offer an opportunity to protect wetlands through the establishment of water quality objectives. The RWQCB's jurisdiction includes Federally protected waters as well as areas that meet the definition of "Waters of the State," which are defined as any surface water or groundwater, including saline waters, within the state's boundaries.

With implementation of mitigation measures described in Section 3.6, "Vegetation and Wildlife," potential adverse effects of the project on waters of the state would be minimized.

6.0 COORDINATION AND REVIEW OF THE DRAFT SUPPLEMENTAL EIS/EIR

This Draft Supplemental EIS/EIR is being publicly circulated for 45 days to agencies, organizations, and individuals known to have a special interest in the project. Copies of the Draft Supplemental EIS/EIR will be posted on the USACE and CVFPB websites, made available for viewing at local public libraries, or provided by mail upon request. Release of the Draft Supplemental EIS/EIR will also be posted in the public notice section of the Sacramento Bee. This project will be coordinated with all appropriate Federal, state, and local governmental agencies including NMFS, USFWS, CDFW, SHPO, DWR, and SAFCA prior to finalizing this document.

7.0 REPORT PREPARERS AND REVIEWERS

This Supplemental EIS/EIR was prepared by GEI at the direction of USACE, Sacramento District, and CVFPB, with assistance from SAFCA.

The following is a list of the individuals who prepared the Supplemental EIS/EIR, provided important background materials, or provided project description engineering clarifications.

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Jessica Phelps	Archaeologist	7 years

California Department of Water Resources

Name	Title	Experience
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Sacramento Area Flood Control Agency

Name	Title	Experience
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Name	Qualifications and Experience	Participation
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Name	Qualifications and Experience	Participation
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Anne King	B.A., Anthropology; 18 years' experience	Document Review and CEQA/NEPA Compliance
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