

DRAFT
ENVIRONMENTAL ASSESSMENT/INITIAL STUDY
SACRAMENTO RIVER FLOOD CONTROL SYSTEM EVALUATION
PHASE III, MID-VALLEY, CONTRACT AREA 3

YOLO COUNTY, CALIFORNIA

August 2012



**US Army Corps
of Engineers**®
Sacramento District



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FINDING OF NO SIGNIFICANT IMPACT
Sacramento River Flood Control System Evaluation
Phase III, Mid-Valley, Contract Area 3, Yolo County, California

I have reviewed and evaluated the information in this Environmental Assessment/Initial Study (EA/IS) for the Sacramento River Flood Control System Evaluation, Phase III, Mid-Valley, Contract Area 3, in Yolo County, California. This EA/IS tiers off the Programmatic Environmental Impact Statement/Environmental Impact Report for the System Evaluation completed by the Corps in May 1992.

This project would involve (1) installing slurry cutoff walls on the existing levee at three sites along the west side of the Sacramento River between river miles 70 and 118 and (2) remediating the existing levee at three sites along the east side of the Knights Landing Ridge Cut (KLRC). These levees are features of the Sacramento River Flood Control Project (SRFCP), and the work would help to maintain the integrity of the SRFCP by reducing the potential for erosion and failure due to seepage under or through the levees (at Sites 9, 10, and 11) and levee instability (at Sites 12, 12A, and 13).

The possible consequences of the work described in the EA/IS have been evaluated with consideration given to environmental, social, economic, and cultural resources. Potential adverse effects would be avoided, minimized, or reduced to less than significant by implementing best management practices and mitigation measures as discussed in the EA/IS. The loss of riparian vegetation would be compensated onsite by planting similar vegetation, and potential take of the Federally listed valley elderberry longhorn beetle and giant garter snake would be avoided by complying with all Terms and Conditions in the U.S. Fish and Wildlife Service's Biological Opinion.

Based on my review of the EA/IS and my knowledge of the project area, I am convinced that the proposed project is a logical and desirable alternative. Furthermore, I have determined that the project would have no significant effects on the environment. All construction will be implemented in compliance with applicable Federal, State, and local laws and regulations. Based on the results of the environmental evaluation and completion of interagency coordination, I have determined that the EA and Finding of No Significant Impact provide adequate documentation and that no further environmental document is required.

Date

William J. Leady, P.E.
Colonel, U.S. Army
District Commander

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Proposed Mitigated Negative Declaration
Sacramento River Flood Control System Evaluation-Phase III
Mid-Valley Contract Area 3
Yolo County, California

The Central Valley Flood Protection Board (Board) is the State of California non-Federal sponsor and is acting as lead agency under the California Environmental Quality Act, (CEQA) pursuant to Public Resources Code sections 21000 *et seq.*, for the Sacramento River Flood Control System Evaluation – Phase III – Mid-Valley Contract Area 3 Project. The Board and the U.S. Army Corps of Engineers (USACE), the Federal sponsor, have jointly prepared an Environmental Assessment/Initial Study (EA/IS) for the Project pursuant to CEQA guidelines Sections 15070-15075. The USACE proposes to issue a Finding of No Significant Impact in accordance with the National Environmental Policy Act.

Project Background

After flooding and levee failures during the winter of 1986, USACE was directed by Congress to conduct a system-wide evaluation of the Sacramento River and its tributaries to determine if the structures met original USACE design in the features and functioning of the Sacramento River Flood Control Project (SRFCP). Because of the size and complexity of the SRFCP area, the evaluation and subsequent proposed remediation work were divided into five phases to be completed based on available funding and local support.

Phase I, Sacramento Urban Area, and Phase II, Marysville/Yuba City, were completed first because of the higher risk of property damage and potential loss of life in these highly populated areas. Phase III is Mid-Valley, which is the focus of this EA/IS. The remaining phases are Phase IV, Lower Sacramento River, and Phase V, Upper Sacramento River north of Knights Landing. Work on Phase III began with the Initial Appraisal Report – Mid-Valley Area completed by the USACE in 1991.

In June 1996, USACE completed the *Sacramento Flood Control Project, California, Mid-Valley Area, Phase III, Design Memorandum (DM) (USACE1996a)*, which proposed remediation work along various levee locations in the Phase III area. These locations included portions of the Sacramento River (RM 70 to 118), Feather River (RM 0 to 3), Knights Landing Ridge Cut (KLRC), Sutter Bypass (Tisdale Bypass to the Feather River), and Yolo Bypass (Fremont Weir to the Sacramento Bypass).

The 1996 DM separated the designs for the Phase III remediation work into four construction contract areas. Contract Area 1 (Reclamation District 1500) on the Sutter Bypass and Sacramento River from RM 85.2 to 117.2 was completed in 1998. Contract Area 2 (Reclamation District 1001) is on the Feather River and Sacramento River from RM 79 to 79.5. Contract Area 3 (Knights Landing) is the subject of this Environmental Assessment/Initial Study (EA/IS). Contract Area 4 (Elkhorn) is on the Yolo Bypass and Sacramento River from RM 80.8 to 81.5.

Because of local soil conditions, the six remediation sites in the Contract 3 area are at risk of erosion and failure during flooding or even normal flow conditions. Due to hydraulic pressure, high water in the Sacramento River and KLRC can cause water to slowly flow (seep) through pervious sandy soils, as well as under areas of impervious soils. This seepage weakens the levees, increasing the risk of erosion, levee failure, and flooding into adjacent and downstream areas.

These levees in the Contract 3 area are integral to the system-wide performance of the SRFCP. They provide direct flood protection to the towns of Knights Landing, Verona, and Nicholas, as well as indirect flood protection to the cities of Sacramento and West Sacramento. In addition, these levees allow 93,000

acres of farmland and associated infrastructure to remain in production year-round. These six sites must be remediated before their condition degrades further and emergency repair is required to avoid or minimize property damage and potential loss of life.

Previous Environmental Documents

The following previous documents are relevant to the proposed Phase III work. This EA/IS for Contract 3 tiers off the 1992 programmatic EIS/EIR, while the 1996 and 1999 EA/ISs are incorporated by reference into the EA/IS.

- The Sacramento River Flood Control System Evaluation, Phase II-V, Programmatic Environmental Impact Statement/Environmental Impact Report, dated May 1992 (USACE 1992), included a general discussion of potential alternative plans, existing environmental resources, types of effects of the alternatives on those resources, and types of mitigation measures. Alternative plans considered were drainage improvements, levee height increases, cutoff walls, and stabilizing berms. Detailed designs and additional environmental documentation are needed for each phase.
- The Sacramento River Flood Control System Evaluation, Phase III, Mid-Valley Area, Environmental Assessment/Initial Study, dated March 1996 (USACE 1996b), described the project, which then consisted of 30 levee restoration sites; analyzed the effects of the project on environmental resources; and proposed mitigation measures to reduce any effects to less than significant. This document includes the most recent Habitat Evaluation Procedure (HEP) for the Mid-Valley area.
- The Supplemental Environmental Assessment/Initial Study, Sacramento River Flood Control System Evaluation, Phase III - Mid-Valley Area, dated November 1999 (USACE 1999), described proposed project changes at 12 of the 30 restoration sites. The environmental consequences of the changes were then analyzed, and mitigation measures were proposed to reduce any additional effects on resources to less than significant.

Project Location

The project area for this levee work is located downstream of Knights Landing in east Yolo County, approximately 26 miles northwest of Sacramento. The project area includes sections of SRFCP levees, easements, and right-of-way areas along the Sacramento River and Knights Landing Ridge Cut (KLRC), which flow roughly north to south through this rural agricultural area. The following are the specific locations of activities that will take place on the Sacramento River and the Knights Landing Ridge Cut sites.

Sacramento River

Work on the Sacramento River levee would be conducted at Sites 9, 10, and 11 between river miles 70 and 113 southeast of Knights Landing. These sites are located on the gravel maintenance road on top of the levee between the river and Yolo County Road 116B.

- Site 9 starts approximately 1 mile east of Knights Landing at river mile (RM) 87.2 and extends 793 feet downstream to RM 87.1.
- Site 10 starts approximately 1,584 feet downstream of Site 9 at RM 86.8 and extends 878 feet downstream to RM 86.7.
- Site 11 starts approximately 1.5 miles downstream of Site 10 at RM 85.2 and extends 1.05 miles (5,555 feet) downstream to RM 84.1 along County Road 116B just down river from Sites 9 and 10.

Knights Landing Ridge Cut

Work on the KLRC levee would be conducted on the landside at Sites 12, 12A, and 13. These sites are located on the east bank of the levee south of Knights Landing. The project area also includes the landside easement area alongside the levee.

- Site 12 starts approximately 0.75 mile south of the Town of Knights Landing at cut mile (CM) 5.0 and extends 14,100 feet downstream to CM 2.3.
- Site 12A is contiguous with the south end of Site 12 and extends 2,100 feet downstream to CM 1.9.
- Site 13 is contiguous with the south end of Site 12A and extends 2,000 feet downstream to CM 1.5.

Project Description

The Proposed Alternative would include (1) installing slurry cutoff walls on the existing levee at Sites 9, 10, and 11 along the west side of the Sacramento River and (2) remediating the existing levee at Sites 12, 12A, and 13 along the east side of the KLRC.

Remediation work at Sites 9, 10, and 11 would consist of installing a soil/bentonite cutoff wall of various lengths and depths. The work would involve (1) degrading the existing top of the levee down 4 to 5 feet to create a level working surface to install the cutoff wall and (2) excavating a trench 3 feet wide and at least 21 feet deep down through the crown of the levee, as follows:

- Site 9 cutoff wall depth would vary from 26.27 feet to 31.08 feet deep.
- Site 10 cutoff wall depth would vary from 23.04 feet to 26.38 feet deep.
- Site 11 cutoff wall depth would vary from 21.00 feet to 116.75 feet deep, as follows:
 - 900 feet (Stations 0+00 to 9+00) will be 21.00 feet to 27.04 feet deep.
 - 700 feet (Stations 9+00 to 16+00) will be 24.95 feet to 26.15 feet deep.
 - 800 feet (Stations 16+00 to 24+00) will be 23.52 to 25.3 feet deep.
 - 3155 feet (Stations 24+00 to 55+57) will be 113.48 feet to 116.75 feet deep.

At Sites 12, 12A and 13, levee rehabilitation will consist of actions that reinforce the land side of the levee, including reconstructing the landside to make it less pervious, constructing land side toe slope spoil berms made from waste sediment from the land side reconstruction, relocating and rehabilitating irrigation ditches/drains, and elevating three pump discharge pipes above the KLRC channel design water surface elevation, which is above the ordinary high water lines of the adjacent waterway. Two existing pump stations would also be relocated, but the third pump station, at Site 13, will not need to be relocated. Utility lines, including a natural gas pipeline and overhead power lines, would also need to be relocated away from the reconstructed levee.

Potentially Significant Impacts and Mitigation Measures

Air Quality

Best management practices (BMP) will be implemented by the USACE construction contractor at each repair site. These include dust and PM₁₀ abatement by watering, limiting on-site idling time of heavy equipment, and ensuring that all internal combustion engine equipment is properly tuned to the manufacturer's specification. These practices would result in limiting emissions during the construction period and would be sufficiently effective to avoid exceeding significance thresholds.

To help protect ambient air quality conditions, standard construction practices at the erosion sites would ensure that exhaust emissions from all off-road diesel-powered equipment used on the sites do not exceed 40% opacity for more than three minutes in any one hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0) would be repaired immediately. USACE and/or the appropriate local air quality agency would be notified within 48 hours of identification of non-compliant equipment.

Additional BMPs would be implemented for O₃ and PM₁₀ to help protect ambient air quality conditions. To reduce O₃ and PM₁₀ levels, the contractor would perform routine tuning and maintenance of construction equipment to ensure that the equipment is in proper running order. The contractor would also monitor dust conditions along access roads and within the construction area to ensure that the generation of fugitive dust, which includes PM₁₀ and PM_{2.5}, is minimized below the 50 ug/m³ 24-hour threshold. Water sprays would be periodically applied to disturbed areas and soil stockpiles for dust control (at least three times per day during hot weather). Minimum freeboard for all haul vehicles would be two-feet or greater. Lastly, soil-disturbing activities would be suspended during periods with winds over 25 miles per hour.

Best management practices will be implemented by the USACE construction contractor at each repair site. These include dust and PM₁₀ abatement by watering, limiting on-site idling time of heavy equipment, and ensuring that all internal combustion engine equipment is properly tuned to the manufacturer's specification. These practices would result in limiting emissions during the construction period and would be sufficiently effective to avoid exceeding significance thresholds.

The project could have a potentially significant impact on air quality from NO_x emissions.

Mitigation Measures

To reduce NO_x emissions for this project, the applicant may employ one or more of the following measures:

- Require injection timing retard of two degrees on all diesel vehicles, where applicable.
- Install high pressure injectors on all vehicles, where feasible.
- Encourage the use of reformulated diesel fuel.
- Electrify equipment, where feasible.
- Maintain equipment in tune with manufacturer's specifications.
- Install catalytic converters on gasoline-powered equipment.
- Substitute gasoline-powered for diesel-powered equipment where feasible.
- Use compressed natural gas or on-site propane mobile equipment instead of diesel-powered equipment, where feasible.

In addition, the contractor shall submit to USACE, CVFPB, 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 production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory shall be updated and submitted monthly throughout the duration of construction activities, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the contractor shall provide the YSAQMD with the anticipated construction timeline, including start date and the name and phone number of the project manager and on-site foreman. The local air quality district and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this section would supersede YSAQMD or State rules or regulations.

Implementation of the mitigation described above would reduce potential impacts from the proposed action to a less-than-significant level.

Vegetation and Wildlife

The project could have a significant impact to vegetation and wildlife habitat. Adoption of the proposed mitigation measures would reduce these impacts to a less than significant level.

Mitigation Measures

- The loss of riparian habitat would be mitigated for on-site with the creation of 4.8 acres of riparian woodland habitat. At least 675 of the riparian plantings/seedlings covering 4.47 acres are expected to be planted at Site 12 along and to the east of the new or existing wetland ditch.
- Affected emergent marsh habitat would be mitigated on-site with the creation of 7.33 acres of new emergent marsh habitat. A new agricultural drainage ditch at Sites 12 and 13 would be relocated within 50 feet of the existing one. Riparian trees and scrub-shrub species will be planted along both sides of the newly relocated ditch in order to establish a wildlife corridor. Mitigation for grasslands would be accomplished on-site by planting new native grasses on the constructed levees and spoil berms.
- Mitigation for grasslands would be accomplished on-site by planting new native grasses on the constructed levees and spoil berms.
- In addition, the USACE will provide and incorporate the following mitigation/design measures recommended by the USFWS in their *Draft Coordination Act Report for the Sacramento River Flood Control System Evaluation Phase III* (USFWS 1995) (Appendix B will have a revised Report):
 - Avoid impacts to migratory birds nesting in trees along the access routes and adjacent to the proposed repair sites by conducting pre-construction surveys for active nests along proposed haul roads, staging areas, and construction sites. Work activity around active nests should be avoided until the young have fledged. The following protocol from the California Department of Fish and Game for Swainson's Hawk would suffice for the pre-construction survey for raptors.

A focused survey for Swainson's hawk nests will be conducted by a qualified biologist during the nesting season (February 1 to August 31) to identify active nests within 0.50 mile of the project area. The survey will be conducted no less than 14 days and no more than 30 days prior to the beginning of construction. If nesting Swainson's hawks are found within 0.25 mile of the project area, no construction will occur during the active nesting season of February 1 to August 31. Or until the young have fledged (as determined by a qualified biologist), unless otherwise negotiated with the California Department of Fish and Game. If work is begun and completed between September 1 and February 28, a survey is not required.
 - Avoid future impacts to the site by ensuring all fill material is free of contaminants.
 - Minimize project impacts by reseeding all disturbed areas at the completion of construction with forbs and grasses.
 - Minimize the impact of removal and trimming of all trees and shrubs by having these activities supervised and/or completed by a certified arborist.
 - Compensate for the loss of 1.93 acres of riparian woodland by acquiring a minimum of 9.65 acres at the Schreiner's mitigation site for the adverse impacts on wildlife from project construction activities affecting riparian woodland and riparian scrub-shrub cover

types. If the Schreiner's site will not be used, inform the Service of current plans for mitigation.

- Compensate for the loss of 2.43 acres of emergent marsh along the existing landside toe ditch by relocating or replacing the toe ditch and replanting it with emergent marsh cover. The new ditch would create 7.33 acres of emergent marsh.
- Implement at least a 20-year monitoring and remediation period to determine the success of the plantings and correct any failures of the mitigation effort. Monitoring and reporting to the Service should be required every year for the first 5 years of the 20-year period, and every 5 years afterward. If, within the monitoring period, revegetation efforts are unsuccessful, corrective actions would be required until mitigation goals are met. Funding sources for monitoring and remediation should be appropriated prior to project construction.
- Complete consultation with the Service on project effects on the valley elderberry longhorn beetle, its critical habitat, and the giant garter snake.
- Contact the California Department of Fish and Game (CDFG) regarding possible effects of the project on State-listed species.
- Contact NOAA Fisheries regarding possible effects of the project on the anadromous fish species of the Sacramento River.

Special Status Species

The project could have a significant impact to special status species. Adoption of the proposed mitigation measures would reduce these impacts to a less than significant level.

Mitigation Measures

Giant Garter Snake

- Construction activity within or near potential habitat would be limited in time to between May 1 and October 1.
- Prior to construction activities, a qualified biologist would provide construction personnel with worker awareness training to recognize the giant garter snake and its habitat.
- Prior to construction activities, the site would be inspected by a qualified biologist, who has been approved by the Sacramento Field Office of the USFWS, so that the killing and harassing of giant garter snakes can be minimized or avoided.
- Nearby habitat designated as environmentally sensitive to the snake would be flagged and avoided by all construction personnel.
- Movement of heavy equipment to and from the project site or borrow site would be confined to existing roadways to minimize habitat disturbance. Equipment would stay at least 200 feet from the banks of giant garter snake aquatic habitat, wherever feasible.
- Drainage/wetland ditches and ponds would be pumped dry and would remain dry for at least 15 consecutive days prior to construction/fill.
- If a giant garter snake is encountered during construction, activities would cease until capture and relocation have been completed by the USFWS-approved biologist.
- Any incidental take would be reported to the USFWS immediately by telephone at (916) 414-

6600/6601.

- If construction were to extend into October at a site, a USFWS-approved biologist would be onsite to monitor construction activities.
- New irrigation or drainage ditches would be excavated prior to filling the existing ditches.
- Mitigation for giant garter snake habitat would take place on-site. Both upland and emergent wetland habitat would be created to offset effects to their habitat during construction of the spoil berms and realignment of the ditches.

Valley Elderberry Longhorn Beetle

- Approximately 7.46 acres of elderberry mitigation habitat will be planted onsite. This acreage includes the establishment of associated native plantings. It is expected that 2.24 acres of this would be planted in the near future to mitigate for elderberry impacts at Sites 12, 12A, and 13 and the rest would be planted at a later time.
- Avoidance and mitigation measures outlined in the *Mitigation Guidelines for the Valley Elderberry Longhorn Beetle, July 9, 1999* (USFWS 1999) would be followed in addition to any other terms and conditions issued by the USFWS. They are listed below:

Protective Measures

- Fence and flag all areas to be avoided. Provide a minimum setback of at least 20 feet from the drip line of any elderberry plants.
- Provide worker awareness training to contractors and work crews on the need to avoid damaging the elderberry plants and possible penalties for not complying with these requirements.
- Place signs every 50 feet along the edge of the avoidance areas with the following information: “This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment.” The signs would be clearly readable from a distance of 20 feet, and would be maintained for the duration of construction.

Restoration and Maintenance

- Restore any damage done to the buffer area during construction. Provide erosion control and revegetate with appropriate native plants.
- No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant would be used in the core and buffer avoidance areas, or within 100 feet of any elderberry plant with a stem measuring 1.0 inch or greater in diameter at ground level.
- The construction contractor would be required to provide a written description of how the core and buffer avoidance areas are to be restored and protected.

Swainson’s Hawk

- Conduct surveys for Swainson’s Hawks in the vicinity of the Contract Area 3 in accordance with CDFG (2000) guidelines prior to the start of construction. These surveys would occur within one-half mile of all six levee construction sites, including staging areas, and borrow sites.

- If hawks with active nests are found within the one-half mile radius of the worksite, USACE would implement appropriate mitigation measures to be defined by CDFG. Measures could include a moratorium on construction in the area where the nest(s) is/are located until the newly hatched young have exited the nest (usually May through August 31 depending upon how early nesting activity started).

Water Quality

The project could have a significant impact to water quality. Adoption of the proposed mitigation measures would reduce these impacts to a less than significant level.

Mitigation Measures

Project areas (Sites 9, 10 and 11 and Sites 12, 12A, and 13) would be subject to Clean Water Act (CWA) regulations, such as the National Pollutant Discharge Elimination System (NPDES) pursuant to Section 402 of the CWA. Similar to previous work on the flood control project, the Section 401 and 402 approvals would require the implementation of numerous BMPs to reduce any potential adverse effects to water quality. Implementation of these BMPs would reduce any adverse effects to water quality to less than significant.

Erosion control and sediment detention devices such as using straw bales, fencing, sandbags, and/or similar devices would be incorporated into the project and implemented at the time of the project action. These devices would be in place during the project action, and after if necessary, for the purpose of minimizing fine sediment/water slurry input to flowing water. The devices would be placed at all locations where the likelihood of sediment input exists.

The contractor would prepare and implement (1) an erosion and sediment control plan for minimizing the potential for sediment input into the river or KLRC; (2) a toxic material control and spill response plan for preventing toxic material spills; (3) a soil management plan that provides criteria for classifying wastes in soil and managing soils possibly contaminated by toxics; and (4) a hazardous and toxic materials contingency plan in the event that unlisted hazardous and toxic sites are uncovered during construction.

Dewatering of work areas, such as pumping the wetland ditches dry, would be conducted in accordance with all regulatory requirements to avoid or minimize any effects on water quality.

All fill and rock materials would be non-toxic. Any combination of wood, plastic, concrete, or steel is acceptable, provided that there are no toxic coatings, chemical anti-fouling products, or other treatments that could leach into the surrounding environment.

Traffic and Transportation

The project could have a significant impact to traffic and transportation. Adoption of the proposed mitigation measures would reduce these impacts to a less than significant level.

Mitigation Measures

- Traffic Control Plan
 - The construction contractor would prepare and implement a traffic control plan (or plans) that address conditions at each site. The plan(s) would be approved by Yolo County Department of Public Works, the Town of Knights Landing if their city streets would be used, and Caltrans, as applicable, prior to the initiation of construction activities. The plan(s) would include measures to (1) reduce, to the extent practicable, the number of vehicles (construction-related and other) on the roadways adjacent to the sites; (2) reduce,

to the extent practicable, the interaction between construction equipment and other vehicles; and (3) promote public safety through actions aimed at driver and road safety.

- Prior to implementation of construction activities, the contractor would verify that all roads, bridges, culverts, and other infrastructure along the access routes can support expected vehicle loads.
- The plan(s) would identify all intended haul routes, locations of signage, locations of flaggers, approved permits, documentation of coordination with local and State agencies, and locations of potential delays to vehicle and pedestrian traffic. Construction vehicles would follow established truck routes to the greatest extent practicable.
- Travel Flow and Access Measures
 - The contractor would maintain travel traffic on all roads adjacent to the site and on all affected public roads during the construction period. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, would be as required by State and local authorities having jurisdiction.
 - The traveling public would be protected from construction and work damage to person and property. The contractor's traffic on roads selected for hauling material to and from the site would interfere as little as possible with public traffic.
 - Traffic controls on major roads and collectors would include flag-persons wearing safety vests and using “stop/slow” paddles to direct drivers.
 - Through access for emergency vehicles would be provided at all times.
 - Access to public transit would be maintained, and movement of public transit vehicles would not be impeded as a result of construction activities.
 - Access to driveways and private roads would be maintained.
- Construction-Related Traffic Measures
 - Construction parking would be restricted to the designated staging areas.
 - During peak periods, construction-generated traffic would avoid roadway segments or intersections that are at, or approaching, a level of service that exceeds local standards.
 - The speed of all construction vehicles would be limited to a maximum of 10 miles per hour on the levee access roads. The contractor would provide a minimum of four construction speed limit signs large enough to be visible by the passing traffic. The speed limit signs would be in English units and posted on the levee and on each of the access roads. Signs would be posted for both incoming and outgoing traffic.
 - Construction warning signs would be posted in accordance with the local standards or those set forth in the *Manual on Uniform Traffic Control Devices* (FHWA 2012) in advance of the construction area and at any intersection that provides access to the construction area.
 - A sign, at least one square yard in size, would be posted at all active construction sites that gives the name and telephone number or email address to contact with complaints regarding construction traffic.
 - Measures would be implemented as needed to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. The construction contractor would

- minimize the amount of mud transported onto paved public roads by vehicles or runoff.
- Rock, dirt, and/or other fill materials would be prevented from being accidentally dropped from trucks traveling on highways to and from the erosion sites.
- Any damage to roads caused by construction operations would be repaired to pre-project conditions.

Cultural Resources

The proposed action may have a potentially significant affect on a pump house that may be a historic resource. The pump house will be evaluated to determine if it is a historical resource. If the pump house is determined to be a historical resource it will be evaluated to determine eligibility for the National Register for Historic Resources. If it is determined to be eligible for the NRHP, and it would be adversely affected, mitigation will be required.

Mitigation Measures

The level of mitigation would be determined by the potential uniqueness of the pump house. Minimally, Historic America Engineering Record documentation would be required and the level of documentation and the photographic standard would be set by the National Park Service. If the pump is NRHP eligible as a historic object, donating it to a local historical society or museum would be appropriate mitigation

Findings

Based on the information in the Environmental Assessment and Initial Study for the Sacramento River Flood Control System Evaluation-Phase III Mid-Valley Contract Area 3 and the entire record, the Central Valley Flood Protection Board finds that although the Project could have a significant impact on the environment, mitigation measures have been incorporated into the Project that reduce these impacts to less than significant.

By: _____ Date: _____
William Edgar
President

By: _____ Date: _____
Jane Dolan
Secretary

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APPENDICES

- A. Section 404(b)(1) Clean Water Act Analysis
- B. U.S. Fish and Wildlife draft Coordination Act Report
- C. Correspondence Regarding Special Status Species
- D. Air Quality Analysis
- E. Correspondence Regarding Cultural Resources (to be included in Final EA/IS)

LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|------------------|--|
| APE | area of potential effect |
| BMP | best management practices |
| CAR | Fish & Wildlife Coordination Act Report |
| CARB | California Air Resources Board |
| CDFG | California Department of Fish and Game |
| CDOC | California Department of Conservation |
| CEQA | California Environmental Quality Act |
| CH ₄ | methane |
| CM | channel mile |
| CO | carbon monoxide |
| CO ₂ | carbon dioxide |
| Corps | U.S. Army Corps of Engineers |
| CVFPB | Central Valley Flood Protection Board |
| CWA | Clean Water Act |
| DWR | California Department of Water Resources |
| EA/IS | Environmental Assessment/Initial Study |
| EIP | State of California Early Implementation Program |
| EIS/EIR | Environmental Impact Statement / Environmental Impact Report |
| EPA | U.S. Environmental Protection Agency |
| ESA | Environmental Site Assessment |
| FHWA | Federal Highway Administration |
| FONSI | Finding of No Significant Impact |
| HFC | hydrofluorocarbons |
| KLRC | Knights Landing Ridge Cut |
| LF | linear foot/feet |
| N ₂ O | nitrous oxide |
| NAAQ | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NO _x | Nitrogen Oxides |
| NPDES | National Pollution Discharge Elimination System |
| NPS | National Park Service |
| NRCS | Natural Resources Conservation Service (a USDA agency) |

| | |
|-------------------|---|
| O ₃ | ozone |
| PFC | perfluorocarbons |
| PM ₁₀ | particulate matter 10 micrometers in diameter |
| PM _{2.5} | particulate matter 2.5 micrometers in diameter |
| RD | Reclamation District |
| RECs | Recognized Environmental Conditions |
| RM | river mile |
| ROG | Reactive Organic Matter |
| SF ₆ | sulfur hexafluoride |
| SHPO | California State Historic Preservation Officer |
| SMAQMD | Sacramento Metropolitan Air Quality Management District |
| SRA | shaded riverine aquatic (habitat) |
| SRBPP | Sacramento River Bank Protection Project |
| SRFCP | Sacramento River Flood Control Project |
| SVAB | Sacramento Valley Air Basin |
| TAC | Technical Advisory Committee |
| USACE | U.S. Army Corps of Engineers |
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Fish and Wildlife Service |
| YSAQMD | Yolo-Solano Air Quality Management District |

1.0 PURPOSE AND NEED

1.1 Proposed Action

The U.S. Army Corps of Engineers (Corps) and the Central Valley Flood Protection Board (CVFPB) propose to (1) install slurry cutoff walls on the existing levee at three sites between river miles (RM) 70 and 118 along the west side of the Sacramento River and (2) remediate the existing levee at three sites between channel miles (CM) 1.6 and 5.0 along the east side of the Knights Landing Ridge Cut (KLRC). Design and construction details of the proposed action are included in Section 2.3.

These levees are features of the Sacramento River Flood Control Project (SRFCP), which includes over 1,000 miles of levees, overflow weirs, relief structures, and bypass channels designed to reduce the risk of flooding in the Sacramento Valley and San Joaquin Delta. The work would help to maintain the integrity of the SRFCP by reducing the potential for erosion and levee failure due to seepage under or through the levees and levee instability at these six sites.

1.2 Location of Project Area

The project area for this levee work is just downstream of the small town of Knights Landing in east Yolo County, approximately 26 miles northwest of Sacramento (Plate 1). The project area includes sections of SRFCP levees, easements, and right-of-way areas along the Sacramento River and KLRC, which flow roughly north to south through this rural agricultural area (Plate 2). Plate 2 shows the locations and assigned numbers of these sites along each water course as described below.

1.2.1 Sacramento River

Work on the Sacramento River levee would be conducted at Sites 9, 10, and 11 between river miles 70 and 118 southeast of Knights Landing. These sites are located on the gravel maintenance road on top of the levee between the river and Yolo County Road 116B.

- Site 9 starts approximately 1 mile east of Knights Landing at river mile (RM) 87.2 and extends 793 feet downstream to RM 87.1.
- Site 10 starts approximately 1,584 feet downstream of Site 9 at RM 86.8 and extends 878 feet downstream to RM 86.7.
- Site 11 starts approximately 1.5 miles downstream of Site 10 at RM 85.2 and extends 1.05 miles (5,555 feet) downstream to RM 84.1 along County Road 116B just down river from Sites 9 and 10.

1.2.2 Knights Landing Ridge Cut

Work on the KLRC levee would be conducted on the landside at Sites 12, 12A, and 13. These sites are located on the east bank of the levee south of Knights Landing. The project area also includes the landside easement area alongside the levee.

- Site 12 starts approximately 0.75 mile south of the Town of Knights Landing at CM 5.0 and extends 14,100 feet downstream to CM 2.3
- Site 12A is contiguous with the south end of site 12 and extends 2,100 feet downstream to CM 1.9
- Site 13 is contiguous with the south end of site 12A and extends 2,000 feet downstream to CM 1.5.

1.3 Need for Proposed Action

1.3.1 Background

After flooding and levee failures during the winter of 1986, the Corps was directed by Congress to conduct a system-wide evaluation of the Sacramento River and its tributaries to determine if the structures and features were functioning in accordance with the original design of the SRFCP. Because of the size and complexity of the SRFCP area, the evaluation and subsequent proposed remediation work were divided into five phases to be completed based on available funding and local support.

Phase I, Sacramento Urban Area, and Phase II, Marysville/Yuba City, were (partially) completed first because of the higher risk of property damage and potential loss of life in these highly populated areas. Phase III is Mid-Valley, which is the focus of this EA/IS. The remaining phases are Phase IV, Lower Sacramento River, and Phase V, Upper Sacramento River north of Knights Landing. Work on Phase III began with the Initial Appraisal Report – Mid-Valley Area completed by the Corps in December 1991.

1.3.2 Phase III, Mid-Valley, Contract 3

In June 1996, the Corps completed the *Sacramento Flood Control Project, California, Mid-Valley Area, Phase III, Design Memorandum* (DM) (USACE 1996a), which proposed remediation work along various levee locations in the Phase III area. These locations included portions of the Sacramento River (RM 70 to 118), Feather River (RM 0 to 3), KLRC, Sutter Bypass (Tisdale Bypass to the Feather River), and Yolo Bypass (Fremont Weir to the Sacramento Bypass).

The 1996 DM separated the designs for the Phase III remediation work into four construction contract areas. Contract Area 1 (Reclamation District 1500) on the Sutter Bypass and Sacramento River from RM 85.2 to 117.2 was completed in 1998. Contract Area 2 (Reclamation District 1001) is on the Feather River and Sacramento River from RM 79 to 79.5. Contract Area 3 (Knights Landing) is the subject of this Environmental Assessment/Initial Study (EA/IS). Contract Area 4 (Elkhorn) is on the Yolo Bypass and Sacramento River from RM 80.8 to 81.5.

Because of local soil conditions, the six remediation sites in the Contract 3 area are at risk of erosion and failure during flooding or even normal flow conditions. Due to hydraulic pressure, high water in the Sacramento River can cause water to slowly flow (seep) through pervious sandy soils, as well as under areas of impervious soils. This seepage weakens the levees, increasing the risk of erosion, levee failure, and flooding into adjacent and downstream areas. According to the 1996 DM, the KLRC levees have a long history of stability problems. Records dating to 1951 have described levee deformation, slippage, and partial collapse. Many of the failures have been on the landside slope and are often shallow, involving approximately the upper 5 feet of the levee. Deeper slides, sometimes resulting in significant slumping of the crown, have also occurred. Past repairs have included removal and recompaction of the failed material with flatter slopes and inclusion of a stabilizing berm to counterbalance the tendency for rotational failures of the levee fill. A total of 67 levee repair and reconstruction sites have been noted in USACE documents since 1956. USACE has previously evaluated the levees and developed a rehabilitation scheme that consists of replacing a portion of the landside slope with lean clay, constructing a toe berm at the landside toe, and relocating the drain ditch further from the levee.

These levees in the Contract 3 area are integral to the system-wide performance of the SRFCP. They provide direct flood protection to the towns of Knights Landing, Verona, and Nicholas, as well as indirect flood protection to the cities of Sacramento and West Sacramento. In addition, these levees allow 93,000 acres of farmland and associated infrastructure to remain in production year-round. These six sites must be remediated before their condition degrades further and emergency repair is required to avoid or minimize property damage and potential loss of life.

1.4 Authorization

The SRFCP was originally authorized by the Flood Control Act of 1917 (Public Law 64-367). Subsequent modifications to the project were authorized by the Flood Control Acts of 1928, 1936, 1941, 1944, and 1950, as well as the Rivers and Harbors Act of 1937. The Corps completed construction of the SRFCP in 1955 and turned the project over to the State of California in 1958 for maintenance.

After flooding and levee failures during the winter of 1986, the Corps was directed by Congress to conduct a system-wide evaluation of the Sacramento River and its tributaries. The authority for this system evaluation was the Conference Report accompanying the Energy and Water Development Act for 1987 (Public Law 99-591).

1.5 Purpose of Environmental Assessment/Initial Study

This EA/IS describes the environmental resources in the Contract Area 3 project area; evaluates the effects of the alternatives (including the proposed action) on these resources; and proposes measures to avoid, minimize, or mitigate/compensate any adverse effects to a less-than-significant level. This EA/IS is a joint document that has been prepared in accordance with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). The Corps is the Federal lead agency, and the CVFPB is the State lead agency and non-Federal sponsor.

Based on the results of the EA/IS and public/agency comments, the District Engineer, the commander of the Sacramento District of the Corps, will determine whether the proposed levee work qualifies for a Finding of No Significant Impact (FONSI) or whether a supplemental Environmental Impact Statement (EIS) must be prepared. Similarly, the CVFPB will decide whether the proposed levee work qualifies for a Negative Declaration (ND) or whether a supplemental Environmental Impact Report (EIR) must be prepared.

1.6 Previous Environmental Documents

The following previous documents are relevant to the proposed Phase III work. This EA/IS for Contract 3 tiers off the 1992 programmatic EIS/EIR, while the 1996 and 1999 EA/IS's are incorporated by reference into the EA/IS.

- *The Sacramento River Flood Control System Evaluation, Phase II-V, Programmatic Environmental Impact Statement/Environmental Impact Report*, dated May 1992 (USACE 1992), included a general discussion of potential alternative plans, existing environmental resources, types of effects of the alternatives on those resources, and types of mitigation measures. Alternative plans considered were drainage improvements, levee height increases, cutoff walls, and stabilizing berms. Detailed designs and additional environmental documentation are needed for each phase.
- *The Sacramento River Flood Control System Evaluation, Phase III, Mid-Valley Area, Environmental Assessment/Initial Study*, dated March 1996 (USACE 1996b), described the project, which then consisted of 30 levee restoration sites; analyzed the effects of the project on environmental resources; and proposed mitigation measures to reduce any effects to less than significant. This document includes the most recent Habitat Evaluation Procedure (HEP) for the Mid-Valley area.
- *The Supplemental Environmental Assessment/Initial Study, Sacramento River Flood Control System Evaluation, Phase III - Mid-Valley Area*, dated November 1999 (USACE 1999), described proposed project changes at 12 of the 30 restoration sites. The environmental consequences of the changes were then analyzed, and mitigation measures were proposed to reduce any additional effects on resources to less than significant

2.0 ALTERNATIVES

2.1 Alternatives Not Considered Further

Initially, the Corps considered other methods to reduce the potential for through- and under-seepage at the six levee sites. These methods included the proposed alternatives in the 1996 and 1999 EA/ISs (Table 1). However, subsequent geotechnical data and unanticipated problems at some of the sites indicated that the originally proposed alternatives would not be effective in reducing seepage. The geotechnical data showed that a seepage stability berm would not protect the levee at Sites 9 and 10 as it would not prevent underseepage from occurring. In addition, it was determined that lime treatment could adversely affect water quality and vegetation. As a result, these alternatives were not considered further.

Table 1 Alternatives Proposed in the 1996 and 1999 EA/ISs

| Site No. | November 1999 EA/IS | March 1996 EA/IS |
|----------|--|--|
| 9 | Seepage/stability berm Toe drain | Seepage/stability berm Toe drain |
| 10 | Levee crown slurry wall | Seepage/stability berm Toe drain |
| 11 | Seepage/stability berm Toe drain | Seepage/stability berm Toe drain |
| 12 | Replace top soil Reshape levee Relocate drainage ditch | Lime treatment Reshape levee Relocate drainage ditch |
| 12A | Replace top soil Reshape levee | Lime treatment |
| 13 | Replace top soil Reshape levee Relocate drainage ditch | Lime treatment Relocate drainage ditch |

2.2 No-Action Alternative

Under the No-Action Alternative, the Corps and the CVFPB would not implement the proposed remediation work at the six levee sites in the Contract 3 area. As a result, these levees would continue to be at risk of erosion and failure due to seepage during flooding or even under normal flow conditions. High water in the Sacramento River and KLRC could cause water to seep through pervious sandy soils, as well as under areas of impervious clay soils. This seepage could weaken the levees, increasing the risk of erosion, levee failure, and flooding into adjacent and downstream areas. The flooding could damage or destroy public and private property, infrastructure, and farmland; and a sudden levee break near the town of Knights Landing could also result in injury or loss of life.

Without improvements to the levee system, the risk of levee failure would remain high. Under these conditions, any of the levees not meeting original Corps design could cause portions of the levee to 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 likely that pollutants emitted would violate air quality standards for pollutants (including those for which the area is already considered non-attainment), increase air pollutant emissions, and expose sensitive receptors to toxic air 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 best management practices (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 a precise determination of significance is not possible.

2.3 Proposed Alternative (Levee Remediation Work)

The Proposed Alternative would include (1) installing slurry cutoff walls on the existing levee at Sites 9, 10, and 11 along the west side of the Sacramento River and (2) remediating the existing levee at Sites 12, 12A, and 13 along the east side of the KLRC. Design and construction details of the proposed remediation work are provided below (see also Plates 3 through 13).

2.3.1 Pre-construction Activities

2.3.1.1 Permits, Approvals, and Utilities

Prior to initiation of work in Contract Area 3, the construction contractor would be required to obtain all Federal, State, and local permits and approvals necessary to perform the work, including those related to storm water discharge, groundwater, fugitive dust, and traffic. A Clean Water Act Section 404 permit from the Corps Regulatory Division would also be required for the wetland fill at Sites 12 and 13, if the sponsor proposes to do the work under an approved Early Implementation Program. Specific permits and approvals are identified and discussed under each applicable resource in Section 3.0.

The contractor would also be required to verify the depths and locations of all existing utilities in the project area. Potentially affected utility companies and suppliers would be notified and coordinated with directly concerning the timing and degree of the levee work, including proposed relocation of any electric, gas, or water lines. The sponsor would be responsible for ensuring that the utility relocations are completed to the satisfaction of the utility companies and suppliers, which includes Pacific Gas and Electric, and Yolo County.

2.3.1.2 Groundwater Dewatering

The depth to groundwater at Sites 9, 10, and 11 is approximately 30 feet. Although the depth of the new cutoff walls would vary from 21.00 to 116.75 feet, groundwater dewatering would not be needed since the bentonite would provide the stability needed to construct the cutoff walls. At Sites 12, 12A, and 13, the depth to ground water is approximately 15 feet. Since the levee remediation work at these sites would not involve any excavation below the existing ground level, no groundwater dewatering would be needed.

2.3.1.3 Surface Water Dewatering

There will be no surface water dewatering for the project from the project area. The project specifications prohibit the contractor from performing any in-water work, including no taking of water from the Sacramento River or KLRC for project purposes, such as for water trucks.

2.3.1.4 Staging Area

The Corps expects the main staging area for Sites 9 to 11 would be located on private property on the southwest side of Site 11 on the Sacramento River. The staging area would encompass approximately 1 acre of previously disturbed area now covered with gravel. Prior to initiation of work, the CVFPB would

either acquire the private property in fee or obtain an easement from the current landowner to use the property for staging. The main staging area at the KLRC for Sites 12, 12A, and 13 would be limited to highly disturbed areas within the project footprint. Protective fencing would be placed along the east edge of the primary staging area at Site 12 to ensure that construction activities do not impact the adjacent elderberry bushes.

2.3.1.5 Mobilization

During mobilization, construction equipment would be moved to the main staging area, along with bentonite, cement, clean soil, and other construction materials. Types of equipment would include a hydraulic excavator, front end loaders, compactor, dump trucks, haul trucks, and water trucks. In addition, areas would be provided for an administrative trailer and parking of worker vehicles. Access to the main staging areas would be via Yolo County Road 116B for Sites 9 to 11 and Yolo County Road 16 for Sites 12, 12A, and 13.

2.3.2 Construction Details

Proximity and similarity of treatment allow the construction to be broken into two groups, or “projects”: one project consists of Sites 9, 10 and 11; the other project consists of Sites 12, 12A, and 13.

2.3.2.1 Sites 9, 10, and 11

Remediation work at Sites 9, 10, and 11 would consist of installing a soil/bentonite cutoff wall of various lengths and depths. The work would involve (1) degrading the existing top of the levee down 4 to 5 feet to create a level working surface to install the cutoff wall and (2) excavating a trench 3 feet wide and at least 21 feet deep down through the crown of the levee, as follows:

- Site 9 cutoff wall depth would vary from 26.27 feet to 31.08 feet deep.
- Site 10 cutoff wall depth would vary from 23.04 feet to 26.38 feet deep.
- Site 11 cutoff wall depth would vary from 21.00 feet to 116.75 feet deep, as follows:
 - 900 feet (Stations 0+00 to 9+00) will be 21.00 feet to 27.04 feet deep.
 - 700 feet (Stations 9+00 to 16+00) will be 24.95 feet to 26.15 feet deep.
 - 800 feet (Stations 16+00 to 24+00) will be 23.52 feet to 25.3 feet deep.
 - 3155 feet (Stations 24+00 to 55+55) will be 113.48 feet to 116.75 feet deep.

The material excavated from the top of the levee would be temporarily sidecast in an approximately 30-foot wide pile parallel to the levee. The Corps expects the temporary sidecast pile at Sites 9 and 10 to be placed along the east toe of the levee in a ruderal grassland area that is about 25 feet from the top of the bank of the Sacramento River. A riparian forest that would not be disturbed is located between the ruderal grassland and the top of the river bank. The Corps expects the temporary sidecast pile at Site 11, which is adjacent to Yolo County Road 116B, to be placed along the west toe of the levee in a previously disturbed area, including an access road.

The trench would then be backfilled with the slurry mixture of bentonite, soil, and water; cement may also be included in portions of the Site 11 cutoff wall. The top of the levee would then be restored with the material that was removed originally, and the slope returned to natural contours on the water (east) side of the levee. On the water (east) side, the level cut forming the new levee top would extend just past (water ward) the proposed edge of the patrol road (or County Road) running along the levee top. At Sites 9 and 10, the reconstructed water side of the levee would be sloped 2H:1V to a point in the existing levee bank in an upland area at least 25 feet from the river bank along the Sacramento River. On the landside, the reconstructed levee side would extend almost horizontally to the point where it intersects the bank slope on the upland side. All excavated material would be placed on grassy upland levee slopes, such as

the upland water (east) side toe at Sites 9 and 10, or other upland non-woody areas. The cutoff wall would be 793 feet long at Site 9; 878 feet long at Site 10; and 5,555 feet long at Site 11.

The area would be restored to its pre-project condition after construction is completed. Exposed soils would be hydroseeded with a native hybrid herbaceous vegetation mix similar to what has been used in the past for the flood control project.

2.3.2.2 Sites 12, 12A, and 13

At Sites 12, 12A and 13, levee rehabilitation will consist of actions that reinforce the land side of the levee, including reconstructing the landside to make it less pervious, constructing land side toe slope spoil berms made from the land side reconstruction, relocating and rehabilitating irrigation ditches/drains, and elevating three pump discharge pipes above the KLRC channel design water surface elevation, which is above the ordinary high water lines of the adjacent waterway. Two existing pump stations would also be relocated, but the third pump station, at Site 13, will not need to be relocated. Utility lines, including a natural gas pipeline and overhead power lines, would also need to be relocated away from the reconstructed levee. The spoil berm and the maintenance easement road that would be constructed on top of it would extend 28 feet from the toe of the new levee and would be 4 feet thick. A portion (2,675 linear feet (LF)) of a wetland drainage ditch at Site 12 will be avoided because there is enough land space to construct the berm and maintain the ditch. However, 1.93 miles of this drainage ditch at Site 12 and 1,850 LF of existing wetland ditch at Site 13 would need to be relocated since it lies adjacent to the levee and is unavoidable. Therefore, the ditch will be realigned 15 feet away from the toe of the new spoil berm into the agricultural field and connect back to the existing ditch. In cross section, the total distance affected from the toe of the existing levee out to the new ditch would be 43 feet. An additional 700 LF of existing pond and/or wider ditch area would need to be partially filled and excavated to accommodate the spoil berms at this location in Site 12. The existing wetland ditch and pond area would be pumped dry prior to filling them. The 150 feet of wetland ditch along Site 12A north of CR 16 would be avoided and the remaining 1,850 feet of levee in Site 12A south of CR 16 has no ditch along it. The existing patrol road on top of the levees would be replaced with a 20-foot wide aggregate based road that would be closed or gated from public use. The levee is 2.67 miles (14,100 LF) long at Site 12; Site 12A is 2,100 LF and Site 13 is 2,000 LF.

Native riparian and marsh plants would be planted in the new wetland ditches and along the edge of the new pond. Other exposed soils would be hydroseeded with a native hybrid herbaceous vegetation mix similar to what has been used in the past for the flood control project.

2.3.3 Borrow, Stockpiling, and Disposal

2.3.3.1 Borrow Materials and Sources

Material for work would most likely come from a commercial source within 30 miles of the project site. A total of 188,558 cubic yards (CY) of material would be needed for the embankment with 132,800 CY at Sites 9, 10, and 11 and 55,758 CY for Sites 12, 12A, and 13. Aggregate, drainage material, and slurry materials for the slurry walls would be supplied from commercial quarries.

2.3.3.2 Stockpiling Areas

Because of the distances between the main staging area and remediation sites, most imported soils, excavated material, and waste would be stockpiled on or near the work sites. Excavated soil at Sites 9, 10, and 11 would be temporarily stockpiled onto adjacent ruderal grassland or previously disturbed areas. At Sites 12, 12A, and 13, both excavated and imported soil would be stockpiled within the construction footprint, which includes approximately 10.76 acres of existing agricultural land. Prior to initiation of

work, the CVFPB would either acquire the agricultural land in fee or obtain an easement from the current landowner to use the property for stockpiling.

2.3.3.3 Disposal Areas

The work at Sites 9, 10 and 11 would result in the excavation of approximately 116,807 cubic yards of the existing levee, but it is expected that most of this material would be used to backfill the levee to pre-construction contours. Work at Sites 12, 12A, and 13 would result in the excavation of approximately 180,900 cubic yards of the existing levees, with most of the excavated material being sidecast along the land (east) side of the levee to construct the new spoil berms. Excess excavated material or material determined to be unsuitable for onsite disposal would be hauled to an existing landfill site capable of handling such material.

2.3.4 Construction Schedule

Due to funding restrictions, the Corps does not expect the work at Sites 9, 10, and 11 to begin until 2015. It is expected the local sponsor (CVFPB or Yolo County) would notify affected landowners just prior to construction.

Likewise, the Corps does not expect construction for Sites 12, 12A, and 13 to commence until 2016. However, on February 15, 2011, the local levee maintaining agency, the Knights Landing Ridge Drainage District, applied to the California Department of Water Resources (DWR) to obtain funding for construction through DWR's Early Implementation Program (EIP). If approved, the CVFPB and Knights Landing Ridge Drainage District could start construction in 2013 by following the Corps approved design and the construction schedule. The EIP application and additional information regarding this project can be found on the Knights Landing Ridge Drainage District website at: <http://rd108.org/images/stories/knights%20landing%202011%20eip%20application.pdf>. The Knights Landing Ridge Drainage District and DWR are currently negotiating how EIP funds might be used to fund construction. A final decision on EIP funding is expected in late summer 2012.

Prior to the start of construction, environmental mitigation measures, such as transplanting mature elderberries, would be completed in the period from November 1 to February 15. Ground disturbance work at the sites would commence on the following May 1 and would typically end October 1 in order to minimize effects on the threatened giant garter snake. In addition, construction within 0.25 mile of active migratory bird nests would not occur until September 1 or until the chicks have fledged (left the nest) as confirmed by a qualified biologist or ornithologist. Of particular concern is the State endangered Swainson's hawk, which returns to its traditional nesting territories by April 1 (CDFG 2000). Extension of the ground disturbance window of operations may be possible with the concurrence of USFWS. The Corps anticipates that the two projects (Sites 9, 10, and 11, and Sites 12, 12A, and 13) will each require 10 months to complete; therefore, to avoid environmental harm, each project will need two 5-month-long construction years to complete.

2.3.5 Post-Construction Activities

2.3.5.1 Demobilization and Clean Up

Once construction is completed at a site, all construction equipment would be removed from the site and the staging areas would be restored to previous conditions. In addition, the protective fencing at the Site 12 staging area would be removed and all sites would be inspected to ensure that no hazardous or toxic waste or other trash remains at the staging and construction sites.

2.3.5.2 Operation and Maintenance

Local levee maintaining agencies, in cooperation with the CVFPB, are responsible for the operation and maintenance (O&M) of this Corps project. The local levee maintaining agency for Sites 9, 10, and 11 is Yolo County Service Area No. 6 and the local levee maintaining agency for Sites 12, 12A, and 13 is Knights Landing Ridge Drainage District.

The Corps of Engineers May 1955 (Corps 1955) *Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project* (SRFCP) governs O&M procedures at these project sites and the rest of the SRFCP sites. Supplements to this O&M manual further define the O&M procedures for each of the SRFCP sites, including the six sites subject of this EA/IS. The June 1953 (Corps 1953) supplement for Yolo County Service Area No. 6 further defined the O&M work at all six sites, including Sites 12, 12A, and 13 along the Knights Landing Ridge Cut (KLRC) and other sites. This 1953 manual superseded the Corps supplemental manual designated as Unit No. 7 of the SRFCP entitled, *West Levee of the Sacramento River and the South Levee of Sycamore Slough at Knights Landing*. However, the October 1959 supplement (Corps 1959) for Knights Landing Ridge Drainage District superseded the June 1953 for work along the KLRC, including sites 12, 12A, and 13. The Corps July 17, 2011, *Design Documentation Report (DDR) for Sites 12, 12A, and 13* states, “Once construction is completed, the O&M manual [supplement] for the KLRC channel will need to be updated to reflect the new project conditions such as the new pump stations and pipe penetrations, and relocation of the PG&E [Pacific Gas and Electric] overhead electrical lines” (USACE 2011:13).

3.0 AFFECTED RESOURCES AND ENVIRONMENTAL EFFECTS

The resources not considered in detail are discussed in Section 3.1. Sections 3.2 to 3.9 describe the significant resources in the project area, as well as any effects of the alternatives on those resources. When necessary, mitigation measures are also proposed to avoid, reduce, minimize, or compensate for any effects determined to be significant.

3.1 Resources Not Considered in Detail

Because of the nature and location of Contract Area 3, the remediation work would have no effects on climate, geology, seismicity, topography, water rights, and environmental justice. The project could have minimal to no effect on soils; fisheries; socioeconomics; noise; recreation; aesthetics and visual resources; hazardous, toxic, and radiological waste; and water resources.

3.1.1 Soils

Soils in the area are predominantly unconsolidated sandy loam, clay loam, silt loam, silty clay loam, clay, and all are hydric (USDA, 2012). Appendix A, Section II.e.(5(b)) presents a more thorough description of the soils in the project area. These drained hydric soils are used for producing a wide variety of irrigated crops including rice, tomatoes, grain sorghum, corn, and sugar beets (USDA 1972). The sedimentary deposits within this area are classified as either channel deposits, natural levees, or basin deposits (alluvium).

The proposed construction alternatives would disturb soils in and around the levees, and the borrow and staging areas at the six repair sites. Additional soils trucked in from borrow sites would be used to construct the cutoff walls and backfill the levees. The soils for the spoil berms would be taken from the levee in the contract areas and would not introduce new soil types not already found in the Central Valley floor.

3.1.2 Fisheries

The Sacramento River in the project area supports a wide array of anadromous and resident fish species, including several that are on the Federal Endangered Species Act (ESA) list. These include the endangered winter-run Chinook salmon (*Oncorhynchus tshawytscha*), and the threatened spring-run Chinook salmon, the threatened steelhead trout *Oncorhynchus mykiss*, and the threatened green sturgeon (*Acipenser medirostris*). Other anadromous fish inhabiting these waters include the striped bass (*Morone saxatilis*), American shad (*Alosa sapidissima*), and white sturgeon (*Acipenser transmontanus*). Resident warm water fish include largemouth bass, catfish, bluegill, tule perch, and sunfish (USFWS 1995).

The KLRC seasonally supports many of the same species as the Sacramento River because these fish use the KLRC when it sustains flows during high water stages in the Sacramento River. The KLRC is directly connected to the Sacramento River upstream through the Colusa Basin Drainage canal and downstream through the Yolo Bypass. However, during low flows in summer and early fall, only the waterside canals near the levees contain water and suitable habitat to support various fish species.

The proposed construction at the six repair sites would not involve in-water work or the clearing of near-bank vegetation that serves as shaded riverine aquatic (SRA) habitat. Construction of the spoil berms would be entirely on the landside of the levees. Material from degrading the top of the levee where the two bentonite cutoff walls (at Sites 9 and 10) are proposed would likely be temporarily stockpiled on the waterside of the levees, but the use of best management practices (BMPs) would ensure no material enters the Sacramento River. No waterside staging areas would be allowed in order to prevent accidental leaks of oils or fuels into the waterways. Therefore, Federally or State-listed anadromous fishes and their critical habitat are not likely to be adversely affected.

3.1.3 Socioeconomics

The project sites are located in Yolo County. Land use and the economy are largely based on agriculture, although rapidly growing residential and commercial areas are located in some parts of the county. Most of the area in and around Sites 9, 10, 11, 12, 12A and 13 is rural. According to www.city-data.com, the Town of Knights Landing had a population of 4,319 in July 2007. The town is approximately 1 mile north of the northern-most Knights Landing Ridge Cut site.

The work along the levees and trips to and from the borrow sites would temporarily disrupt farming operations as haul trucks may impede the movement of some farm machinery. Some crop production will be lost when the wetland ditches at Sites 12 and 13 are relocated farther away from the landside of the levee. Additional farm land is expected to be used for environmental mitigation plantings.

Knights Landing, a small community within 1 to 2 miles of levee sites in Contract Area 3, consists primarily of lower income housing, according to www.city-data.com. The site shows an estimated median house or condo value in town at \$258,410 for 2009, while the median for the State of California was \$384,200 for the same time period. This housing would not be affected by construction of the spoil berms or slurry walls since no haul trucks would be routed through the town. A few residences in Contract Area 3 are close to the levee sites, but any effects would be temporary and would consist primarily of increased traffic and noise from the construction during working hours.

Levee improvements would provide increased flood protection for farmlands on the landside of the levees. This would have a beneficial effect since farmers and farm workers would be less likely to suffer economic setbacks from crop losses.

Any potential short-term effects on existing utilities in the project area would be coordinated with the utility companies to ensure that there would be no interruption in electric or gas supply to nearby buildings or businesses. In addition, any potentially affected users in the area would be kept informed and encouraged to comment.

3.1.4 Noise

Yolo County does not have established noise standards, but construction noise remains a project concern. Significant noise effects are defined as a significant increase in noise levels audible to people living in the vicinity of a project site. Typical examples of noise standards for non-transportation noise in residential areas are 70 dBA daytime between the hours of 7 a.m. and 10 p.m. and 65 dBA between the hours of 10 p.m. and 7 a.m. in *2002 Zone 40 Water Supply Master Plan EIR, Sacramento County Water Agency* (Sacramento County 2012).

Construction equipment noise varies with the type of equipment. The typical noise output by equipment, as measured at a standard of 50 feet, for the Mid-Valley project would be 86-90 dBA for front loaders, 85-90 dBA for dozers, 72-92 dBA for backhoes, and 82-97 dBA for large trucks. Attenuation of sound by the atmosphere is typically 6 dBA per doubling of the distance from the source if no other sound barriers are used.

Construction effects on noise in and around the six levee repair sites would be temporary and minimal because there are few receptors in the area: most noise would be attenuated to near background levels prior to reaching receptors in the area. Nonetheless, several measures will be implemented to reduce the project's short-term noise effects. First, construction equipment would be limited to daylight hours, starting no earlier than 7 a.m. Mufflers would be installed on all equipment. Any stationary noise generating construction equipment would be located at least 400 feet away from any residences. Finally, no haul routes would go through towns such as Knights Landing thus there would be no increase in noise due to vehicular construction equipment.

There are no nearby residences at Sites 9, 11, 12, 12A, or 13 so excess noise is not considered an issue. There is a nearby residence at Site 10, but noise impacts should be minimal since the work would be limited to day time hours and the other measures described above would be implemented.

3.1.5 Recreation

Few recreational activities would be affected because most of the construction sites in the area have restricted access with the exception of Site 11. Since this site is on a public road, casual recreationists could be temporarily disrupted on their way to the rivers by trucks or other construction vehicles on the roads.

3.1.6 Aesthetics and Visual Resources

Aesthetics, including the views along the rivers, will be temporarily disrupted by construction. There are no designated visual resources in or near the construction sites. There would be no long-term adverse effects on recreation, aesthetics, or visual resources due to the levee repair work.

3.1.7 Hazardous, Toxic, and Radiological Waste

Hazardous, toxic, and radiological waste (HTRW) Phase I Environmental Site Assessment (ESA) surveys were performed at the Mid-Valley sites in 1994 and 1999. No HTRW was found.

Another survey was conducted in May 2012. The guidelines used were from USACE ER 1165-2-132, *Hazardous, Toxic and Radioactive Waste Guidance (HTRW) for Civil Works Projects*, ASTM E 1527-05, *Standard Practice for Environmental Site Assessment: Phase I Environmental Site Assessment Process*, and the EPA *All Appropriate Inquiries (AAI)* standards. The purpose of this survey was to identify any Recognized Environmental Conditions (RECs) at the sites and surrounding areas.

The 2012 survey consisted of three parts: (1) a review of the regulatory list of REC sites, historical literatures, aerial photographs, and websites; (2) interviews with people who were knowledgeable about the current and past uses of the sites and surrounding areas; and (3) a site reconnaissance.

The 2012 survey yielded three conclusions:

1. Five RECs were identified. Two were privately owned natural gas well facilities that contain volatile organic compounds and three were PG&E pole-mounted electrical transformers that may contain polychlorinated biphenyls. Since these RECs are physically secured and under active management control, CESPCK determined that these RECs will not impact the reconstruction activities.
2. The levees that are located next to farming areas and orchards may have been exposed to pesticide and herbicide spraying. However, since the pesticides and herbicides were historically and routinely applied, CESPCK determined they are *de minimis* and not RECs.
3. CESPCK determined that no further environmental site assessments are warranted for the sites.

The complete 2012 HTRW Phase I ESA Report is available by request to the Corps. During construction, precautions will be followed to avoid oil or fuel spills at the work sites. They include having a spill control plan, not having any staging areas near water, and properly storing and disposing of hazardous waste generated at the site. No other HTRW issues are expected.

3.1.8 Water Resources

It is expected that the deep cutoff wall in Site 11 could have a slight effect on groundwater movement, but the groundwater would move along the cutoff wall until it gets around the end of the deeper cutoff wall in Site 11. Hence, no mitigation measures are needed. The cutoff walls at Sites 9 and 10 would have no effect on groundwater movement as they are located above the groundwater table.

3.2 Vegetation and Wildlife

3.2.1 Existing Conditions

Grassland, agricultural, woody riparian, emergent marsh (wetland ditch/pond), and elderberry shrub habitat acreages for the design at the six levee reconstruction sites have been calculated (Table 2). Since the project footprints, including the extent of the berms and/or slurry walls, and the permanent and temporary construction easements are known, the engineered drawings served as the basis for field observations to determine actual losses of habitat. No woody vegetation losses were identified at construction staging areas or borrow sites since effects to woody vegetation at these locations will be avoided by fencing prior to construction.

Table 2 Habitat impacts (in approximate acres except as noted)

| Site | Woody Riparian ¹ Habitat (acres/# of trees) | Giant Garter Snake Habitat (emergent marsh or wetland ditch/pond) | Agricultural Habitat (all Prime Farmland) | Elderberry Shrub Habitat (>1" stems) (# of shrubs; ² stems with exit holes; stems w/o exit holes) | Grassland (GL) Habitat Total Levee Area ³ / Total Grassland Impacted |
|--------------------|--|---|---|--|---|
| 9 | 0 | 0 | 0 | 0 | 1.1/1.29 ⁴ |
| 10 | 0 | 0 | 0 | 1; 0; 6 | 0.84/1.05 ⁴ |
| 11 | 0.11/17 | 0 | 0 | 13; 8; 185 | 5.78/2.37 |
| Sub-total | 0.11/17 | 0 | 0 | 14; 8; 191 | 7.72/4.71 |
| 12 | 1.69/256 | 2.39 | 12.39 (mitigation for Sites 9-11: 5.68 Sites 12-13: 6.71) | 21; 2; 52 | 38.03/36.32 (GGS GL habitat) |
| 12A | Included in Site 12 | 0 | 1.99 | Included in Site 12 | Included in Site 12 |
| 13 | 0.02/3 | 0.04 | 2.06 | 1; 0; 4 | Included in Site 12 |
| Sub-total | 1.82/259 | 2.43 | 16.44 | 22; 2; 56 | 38.03/36.32 (GGS GL habitat) |
| Grand Total | 1.93/276 | 2.43 | 16.44 | 36; 10; 247 | 45.75/41.03 |

¹-Excluding elderberry (valley elderberry longhorn beetle habitat), as it is covered in fifth column.

²-One elderberry shrub can and often does have more than one stem protruding from the ground.

³-Consists of roadway (patrol road or County Road 116B for site 13) and levee slopes

⁴-Includes expected temporary sidecast grassland area, unless material is hauled offsite.

All six sites have waterside corridors of riparian vegetation. Sites 9, 10, and 11 are located adjacent to the riparian corridor along the Sacramento River; Sites 12, 12A, and 13 lie adjacent to Knights Landing Ridge Cut. Vegetation at each site consists of common species typically observed within the Central Valley riverine system, including tall trees as well as scrub-shrub species. The majority of trees at these sites include: Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), alder (*Alnus* spp.), box elder (*Acer negundo*), a variety of willows (*Salix* spp.), California sycamore (*Platanus racemosa*), walnut (*Juglans hindsii*), Oregon ash (*Fraxinus latifolia*), elm (*Ulmus americana*), and a few nonnative trees. Scrub-shrub species include coyote brush (*Baccharis pilularis*), blackberry (*Rubus* spp.), elderberry (*Sambucus* spp.), wild rose (*Rosa californica*), wild grape (*Vitis californica*), poison oak (*Toxicodendron diversilobum*), and fennel species (*Foeniculum* sp.). Both native and nonnative grasses as well as herbaceous forbs dominate the understory and levee slopes at each site. Sites 12 and 13 are located next to farm drainage ditches used to convey runoff from adjacent fields. At the time of the Corps survey these ditches were observed to have emergent marsh vegetation such as cattails (*Typha* spp.), tules (bulrush) (*Scirpus* spp.), sedges (*Carex* spp.), rushes, and other facultative/obligate wetland species.

The riparian corridors at each site provide suitable habitat for many native mammal species. Black-tailed jackrabbit (*Lepus californicus*), western gray squirrel (*Sciurus griseus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale gracilis*), badger (*Taxidea taxus*), muskrat (*Ondatra zibethicus*), river otter (*Lontra canadensis*), and beaver (*Castor canadensis*) are all found in the Mid-Valley project area. Riparian areas also provide nesting and feeding habitat for resident birds. The Sacramento River system is part of the Pacific Flyway and provides important resting and feeding areas for migratory waterfowl, shorebirds, and other water associated birds. Common bird species found in the Mid-Valley project area include California quail (*Callipepla californica*), ring-necked pheasant (*Phasianus colchicus*), mourning dove (*Zenaida macroura*), band-tailed pigeon (*Patagioenas fasciata*), common merganser (*Mergus merganser*), mallard (*Anas platyrhynchos*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), belted kingfisher (*Megaceryle alcyon*), marsh wren (*Cistothorus palustris*), song sparrow (*Melospiza melodia*) owls, woodpeckers, red-tailed hawk (*Buteo jamaicensis*) and Swainson's hawk (*Buteo swainsoni*). Amphibians and reptiles found in the area include the gopher snake (*Pituophis catenifer catenifer*), western fence lizard (*Sceloporus occidentalis*), several species of garter snake (*Thamnophis* spp.), and Pacific tree frog (*Pseudacris regilla*).

3.2.2 Effects

3.2.2.1 Significance Criteria

Effects on vegetation and wildlife are considered significant if construction or maintenance of the Proposed Alternative:

- Interferes with the movement of any resident or migratory wildlife species;
- Results in the substantial loss, degradation, or fragmentation of any natural plant communities and wildlife habitat; or
- Substantially diminishes habitat for any fish life stage or results in displacement of spawning fish such that year-class strength is substantially reduced.

3.2.2.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Alternative would not be constructed. Continued seepage at these levee sites would increase the risk of levee failure and flooding of surrounding areas. Levee failure and flooding could result in significant effects to surrounding biological resources, including the transport of fish out of the Sacramento River into areas where they are likely to become stranded, the loss of terrestrial habitat, and increased sedimentation. In addition, floodwaters have the potential to entrain toxic substances into the water, including gasoline, lubricants, insecticides, pesticides, sewage, and other petroleum-based products. Floodwaters could carry these substances into the Sacramento River where they could kill aquatic organisms through exposure to lethal concentrations. Even exposure to non-lethal levels could cause physiological stress and increased susceptibility to other sources of mortality. Although unlikely, direct mortality of aquatic species could also occur as a result of flood fighting, such as in-water construction activities involving the placement of rock revetment during repair of any breached levees.

3.2.2.3 Proposed Alternative

The Corps has determined that the Proposed Alternative would affect a total of 61.83 acres of habitat during construction at the six levee repair sites. Permanent impacts would occur to approximately 16.44 acres of agricultural lands, 1.93 acres of woody riparian, and 2.43 acres of emergent marsh habitat, but the

riparian and wetland impacts would be mitigated onsite by the creation of new similar habitats. An additional 41.03 acres of ruderal grassland would be temporarily disturbed and replaced with native grassland as the grassy levee slopes are excavated and resloped and approximately 1.16 acres of grassland would be used for temporary disposal at Sites 9 and 10. All of the construction will occur adjacent to existing levees and open space areas, such as the new levee berms, and these areas will be reseeded with native grasses and other native plants.

The affected area at Site 9 would be 1.29 acres of grassland with 0.55 acres of this adjacent to the waterside (east) upland toe of the levee that would be used as a temporary stockpile area for the excavation of the levee (Table 2). Likewise, approximately 1.05 acres of grassland at Site 10 would be affected by the work with 0.61 acres of this to be used as a temporary stockpile area at the waterside upland toe of the levee. There is also one mature elderberry shrub, which is potential habitat for the threatened valley elderberry longhorn beetle, on this levee that would be transplanted prior to construction. Construction at Site 11 would affect 2.37 acres of grassland, 0.11 acres of riparian habitat, and 13 mature elderberry bushes.

Construction along Site 12 would affect 2.39 acres of emergent marsh habitat and 12.39 acres of agricultural lands for mitigation plantings, although it is expected that only 6.71 acres of these lands would be planted in the near future to compensate for habitat losses at Sites 12, 12A, and 13. Approximately 1.69 acres of woody riparian habitat and 21 mature elderberry bushes would be affected by the work at Sites 12 and 12A. An additional 1.99 acres of agricultural land would be lost at site 12A for the construction footprint. Site 13 activities would affect 0.02 acres of woody riparian habitat, 0.42 acre of emergent marsh habitat, 2.06 acres of agricultural land for the construction footprint, and 1 mature elderberry shrub. A total of approximately 36.32 acres of grassland, which is potential habitat for the threatened giant garter snake, would also be affected at Sites 12, 12A, and 13. The 2.43 acres of emergent marsh habitat lost at Sites 12 and 13 would be restored prior to and during construction of the spoil berms along the levee toe. The installation of the berms will require relocating the drainage ditches at Sites 12 and 13; therefore, the riparian and emergent marsh habitat identified at Sites 12 and 13 would be adversely affected by construction of the spoil berms. These affects would be compensated for by a new and wider drainage ditch that will be realigned less than 50 feet away and then connect back to sections not affected by project construction. Wildlife would likely be displaced by the construction effort until all work is complete and the area revegetated. Within a year or two of completion of construction, emergent marsh habitat would likely establish in the newly relocated drainage ditches at Sites 12 and 13. It is likely that local wildlife dependent on this habitat would be displaced until the new emergent marsh habitat matures.

In addition, construction activities could adversely affect any nesting birds or mammals in or near the project area. Peak nesting and rearing of young typically starts in April and May for most avian species and other wildlife species, and extends through July. For about 5 months (period of breeding and raising young during the spring and summer), construction activities could result in adverse effects to resident and seasonal wildlife species due to disturbance to the soils where ground dwelling species live, disturbance to the nearby existing vegetation, and noise and human disturbance from construction activities. As a consequence, effects to wildlife could result in their temporary dispersal, avoidance of the area, or limiting their daily or seasonal use during non-construction periods early in the morning or at the end of the day after construction stops. However, the project would have a less than significant effect on vegetation and wildlife with the incorporation of the below mitigation measures with the project.

3.2.3 Mitigation

Mitigation for grassland, woody riparian, emergent marsh (wetland ditch/pond) acreages and elderberry impacts for the design at the six levee reconstruction sites have been calculated and are shown in Table 3.

Table 3 Habitat mitigation (in approximate acres, except as noted)

| Site | Woody Riparian ¹ Habitat (acres/# of trees) | Giant Garter Snake Habitat (wetland restoration) | Elderberry (>1" stems) (shrubs/stems transplanted + stems planted = total #/ acres) | Grassland (native GL planted) |
|--------------------|---|---|--|----------------------------------|
| 9 | 0 | 0 | 0 | 1.29 |
| 10 | 0 | 0 | 1/6 + 10 = 16/0.13 | 1.05 |
| 11 | 0.33/50 | 0 | 13/193 + 342 = 535/5.22 | 2.37 |
| Sub-total | 0.33/50 | 0 | 14/199 + 352 = 551/5.35 | 4.71 |
| 12 | 4.09/618 | 6.48 | 21/54 + 90 = 144/2.12 | 37 (GGS GL habitat) |
| 12A | Included in Site 12 | 0 | Included in Site 12 | Included in Site 12 |
| 13 | 0.05/7 | 0.84 | 1/4 + 6 = 10/0.12 | Included in Site 12 |
| Sub-total | 4.47/675 | 7.33 | 22/58 + 96 = 154/2.24 | 37 (GGS GL habitat) |
| Grand Total | 4.8/725 | 7.33 | 36/251 + 438 = 689/7.46 | 40.55 |

The loss of riparian habitat would be mitigated for onsite with the creation of 4.8 acres of riparian woodland habitat. At least 675 of the riparian plantings/seedlings covering 4.47 acres are expected to be planted at Site 12 along and to the east of the new or existing wetland ditch.

Affected emergent marsh habitat would be mitigated on site with the creation of 7.33 acres of new emergent marsh habitat. A new agricultural drainage ditch at Sites 12 and 13 would be relocated within 50 feet of the existing one. Riparian trees and scrub-shrub species will be planted along both sides of the newly relocated ditch in order to establish a wildlife corridor. Mitigation for grasslands would be accomplished on-site by planting new native grasses on the constructed levees and spoil berms.

In addition, the Corps will provide and incorporate the following mitigation/design measures recommended by the USFWS in their new and revised *Draft Coordination Act Report for the Sacramento River Flood Control System Evaluation Phase III*, dated June 28, 2012 (Appendix B will have a revised final Report to reflect the differences in this EA/IS):

- Avoid impacts to migratory birds nesting in trees along the access routes and adjacent to the proposed repair sites by conducting pre-construction surveys for active nests along proposed haul roads, staging areas, and construction sites. Work activity around active nests should be avoided until the young have fledged. The following protocol from the California Department of Fish and Game for Swainson's Hawk would suffice for the pre-construction survey for raptors:

A focused survey for Swainson's hawk nests will be conducted by a qualified biologist during the nesting season (February 1 to August 31) to identify active nests within 0.25 mile of the project area. The survey will be conducted no less than 14 days and no more than 30 days prior to the beginning of construction. If nesting Swainson's hawks are found within 0.25 mile of the project area, no construction will occur during the active nesting season of February 1 to August 31. Or until the young have fledged (as determined by a qualified biologist), unless otherwise negotiated

with the California Department of Fish and Game. If work is begun and completed between September 1 and February 28, a survey is not required.

- Avoid future impacts to the site by ensuring all fill material is free of contaminants.
- Minimize project impacts by reseeding all disturbed areas at the completion of construction with forbs and grasses.
- Minimize the impact of removal and trimming of all trees and shrubs by having these activities supervised and/or completed by a certified arborist.
- Compensate for the loss of 1.93 acres of riparian woodland by acquiring a minimum of 9.65 acres at the Schreiner's mitigation site for the adverse impacts on wildlife from project construction activities affecting riparian woodland and riparian scrub-shrub cover types. If the Schreiner's site will not be used, inform the Service of current plans for mitigation.
- Compensate for the loss of 2.43 acres of emergent marsh along the existing landside toe ditch by relocating or replacing the toe ditch and replanting it with emergent marsh cover. The new ditch would create 7.33 acres of emergent marsh.
- Implement at least a 20-year monitoring and remediation period to determine the success of the plantings and correct any failures of the mitigation effort. Monitoring and reporting to the Service should be required every year for the first 5 years of the 20-year period, and every 5 years afterward. If, within the monitoring period, revegetation efforts are unsuccessful, corrective actions would be required until mitigation goals are met. Funding sources for monitoring and remediation should be appropriated prior to project construction.
- Complete consultation with the Service on project effects on the valley elderberry longhorn beetle, its critical habitat, and the giant garter snake.
- Contact the California Department of Fish and Game regarding possible effects of the project on State-listed species.
- Contact NOAA Fisheries regarding possible effects of the project on the anadromous fish species of the Sacramento River.

3.3 Special Status Species

3.3.1 Existing Conditions

An updated species list (Appendix C) was generated from the U.S. Fish and Wildlife Service (USFWS) Sacramento Office website on June 15, 2012 for the Knights Landing USGS 7.5-minute quadrangle map where the levee construction sites are located. The California Natural Diversity Database was also accessed on June 15, 2012, to determine species most likely to occur within each project areas (Table 4).

Table 4 Listed species with the potential to occur in the area of the six levee repair sites

| Name | USFWS | CA State | Habitat | Potential Onsite Presence |
|--|-------|----------|---|---|
| AMPHIBIANS and REPTILES | | | | |
| California tiger salamander (<i>Ambystoma californiense</i>) | T | --- | Vernal pools; seasonal ponds; stock ponds. | No suitable habitat; Not known to be in area. |
| California red-legged frog (<i>Rana draytonii</i>) | T | --- | Dense, shrubby or emergent riparian vegetation adjacent to deep (>2 1/3') still or slow moving water. | No suitable habitat; Not known to be in area. |
| Giant garter snake (<i>Thamnophis gigas</i>) | T | T | Requires emergent, herbaceous vegetation (cattails, tules) for cover, grassy areas for basking, uplands for refuge. Emergent marsh habitat, irrigation ditches, canals with water. | Yes, likely to occur in irrigation ditches adjacent to Knights Landing Ridge Cut Slough;, suitable habitat exists on Sites 12, 12A, and 13 |
| BIRDS | | | | |
| Swainson's hawk (<i>Buteo swainsoni</i>) | -- | T | Riparian riverine systems with tall trees along aquatic sources and open fields. Nesting period is March to August. | Yes, could potentially exist on each site nesting in nearby trees. Mostly tall cottonwoods or oak trees. Surveys will be conducted prior to construction. Known to occur within vicinity of each site. |
| Bank swallow (<i>Riparia riparia</i>) | -- | T | Vertical banks and cliffs with fine-textured or sandy soils near streams | No suitable habitat exists on site, levees are not steep enough. |
| INVERTEBRATES | | | | |
| Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>) | T | -- | Vernal pool species. | No vernal pools in or around project sites. No suitable habitat. |
| Vernal pool tadpole shrimp (<i>Lepidurus packardi</i>) | E | -- | Vernal pool species. | No vernal pools in or around project sites. No suitable habitat. |
| Valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>) | T | -- | Inhabits elderberry shrubs all over Central Valley. | Yes, shrubs with exit holes present at Sites 11, 12, and 12A. Suitable habitat exists within project area adjacent to levees, riparian corridors. |

In compliance with the California Endangered Species Act and the Fish and Wildlife coordination Act, the Corps and California Department of Water Resources (DWR) have coordinated with CDFG to determine that there would be no effects to other State-listed species with the possible exception of the State-threatened Swainson's hawk and giant garter snake. For the giant garter snake, CDFG concurred that the reasonable and prudent measures to be issued in the biological opinion from USFWS for the snake, when implemented, would reduce any project-caused effects to the snake to less than significant. For the Swainson's hawk, specific avoidance measures are to be implemented to avoid significant effects to the hawk. The measures to be implemented by the Corps are listed below.

The special status species that would most likely occur and have the potential to be affected by project activities include giant garter snake, valley elderberry longhorn beetle, and Swainson's hawk.

3.3.1.1 Giant Garter Snake

Field visits by Corps, USFWS, and DWR staff have confirmed the existence of various levels of suitable habitat for the giant garter snake at levee repair Sites 12 and 13. Each site has a significant water source to support giant garter snakes and their habitat. The water side of Sites 12 and 13 levees includes the Knights Landing Ridge Cut Slough, which is considered prime habitat for the snake. On the landside of the levee there is an 8 to 10 foot wide farm drainage ditch used to convey runoff from the adjacent fields. This ditch is primarily dominated by emergent marsh vegetation (tules, sedges, and cattails) and standing water occurs throughout the year. Giant garter snakes may use the upland slope portions of the levee as a corridor between the slough and drainage ditch as well as for basking during summer months.

The ditches at Sites 12 and 13 are not regularly maintained. Consistent over growth within the channels of emergent vegetation and riparian trees/shrubs along the banks has encouraged garter snakes to use this habitat. It is the Corps' biological assessment that the project could temporarily adversely affect giant garter snake habitat during construction and relocation of the drainage ditches at Sites 12 and 13.

3.3.1.2 Valley Elderberry Longhorn Beetle

Each site was surveyed for elderberry shrubs that could potentially be inhabited by the beetle. Elderberry shrubs that would be affected by the project were identified and measured by Corps biologists on September 2011 and April 2012. Most of these shrubs were found on the levee slopes, along riparian corridors, and adjacent to drainage ditches interspersed among riparian trees such as oak, box elder, wild grape, and other herbaceous vegetation. A total of 36 mature shrubs that would be impacted by the work were recorded during the survey as being within or adjacent to five of the project sites. Site 9 had no elderberry shrubs at the date of the most recent survey. Two of the larger established elderberry shrubs were observed having beetle exit holes (Table 5).

Table 5 Stem count at each remediation site based on elderberry shrub surveys

| Site | Number of shrubs | Number of stems <u>with</u> beetle exit holes | | | Number of stems <u>without</u> beetle exit holes | | |
|----------|------------------|---|---------|--------|--|---------|--------|
| | | 1-3 in. | 3-5 in. | 5+ in. | 1-3 in. | 3-5 in. | 5+ in. |
| Site 9 | 0 | N/A | N/A | N/A | N/A | N/A | N/A |
| Site 10 | 1 | 0 | 0 | 0 | 3 | 2 | 1 |
| Site 11 | 13 | 0 | 0 | 0 | 83 | 71 | 23 |
| Site 12* | 21 | 0 | 0 | 2 | 33 | 6 | 11 |
| Site 13 | 1 | 0 | 0 | 0 | 2 | 2 | 0 |
| Total | 36 | 0 | 0 | 2 | 121 | 81 | 35 |

*-includes site 12A

3.3.1.3 Swainson’s Hawk

The proposed alternative may adversely affect the State-listed Swainson’s hawk. Suitable nesting habitat for Swainson’s hawk, including tall riparian trees with nearby foraging fields, is located within 0.5 mile of all six sites. Depending on the timing and duration of construction activities, the area will be surveyed using recommendations developed by the Swainson’s Hawk Technical Advisory Committee to maximize the potential for locating nesting Swainson’s hawks so that the potential for nest failures as a result of project activities/disturbances can be minimized.

3.3.2 **Effects**

3.3.2.1 Significance Criteria

Effects on special-status species would be considered significant if construction or operation of the project:

- Has a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS;
- Substantially conflicts with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan, or other approved local, regional, or State HCP;
- Substantially reduces the number or restricts the range of an endangered, rare, or threatened species.

3.3.2.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Alternative would not be constructed. Continued seepage at these levee sites would increase the risk of levee failure and possible flooding of surrounding areas. Levee failure and flooding could result in significant effects to special status species that inhabit the area. Special status fish species and their habitat not affected by the proposed action could be affected as a result of flood fighting, such as for emergency repairs of any breached levees and/or future necessary actions to immediately repair the levees.

3.3.2.3 Proposed Alternative

Under the Proposed Alternative, substantial adverse impacts resulting in a take, as defined by the Federal ESA, would occur to the threatened giant garter snake and the threatened valley elderberry longhorn beetle. The State-listed Swainson’s hawk would also be affected by construction at the six levee repair sites if the work is in close proximity to an active nest. Giant garter snake and Swainson’s hawk habitats would be disturbed by removing existing riparian trees and emergent marsh vegetation to construct the spoil berms. Elderberry shrubs and giant garter snake habitat would be mitigated for onsite. The proposed on-site mitigation and the additional mitigation measures described below would reduce these effects on Special Status Species to a less than significant level.

Valley elderberry longhorn beetle habitat would be affected by construction at five of the six levee repair sites. One elderberry shrub was surveyed at Site 10 next to the slurry wall footprint zone. Site 11 has 13 elderberry shrubs located on the landside of the levee directly within the construction footprint. All of these shrubs would be directly affected by construction and would be relocated onsite. Sites 12 and 12A have 21 elderberry shrubs growing on the landside of the Knights Landing Ridge Cut. These shrubs would be directly affected by spoil berm construction and the realignment of the existing drainage ditch. They will be relocated onsite. There is 1 elderberry shrub present at Site 13 that would also be relocated onsite in Site 12. No elderberries were located at Site 9.

Giant garter snake habitat will be impacted by construction activities at three of the 6 levee repair sites. The drainage ditches running along Sites 12, 12A, and 13 have suitable habitat for giant garter snake. The relocation and realignment of these ditches would temporarily affect snake habitat. Approximately 1.93 miles of drainage ditch (2.4 acres of emergent marsh) would be relocated at Site 12 and 1,850 LF (0.42 acre of emergent marsh) would be relocated at Site 13. Both ditches would be realigned less than 50 feet from their existing locations. The ditches would be realigned and connect back to the undisturbed sections. An additional 700 LF of existing drainage ditch that widens into a pond area would be partially filled and re-excavated at Site 12. There is no suitable habitat for the giant garter snake at Sites 9, 10, and 11. Table 6 shows the acreages of suitable garter snake habitat affected by project construction.

The latest elderberry survey, conducted in compliance with the *Mitigation Guidelines for the Valley Elderberry Longhorn Beetle, July 9, 1999* (USFWS 1999), was completed in September 2011 and sites identified were revisited in April 2012 to confirm their presence. Other field observations, such as dimensions of the existing ditches, was also obtained during these site visits. The areas described in Table 3, 5, and 6 were determined using the above field observations with the proposed plans.

Table 6 Acres of giant garter snake habitat affected by this project

| Site Location | Emergent Wetlands Habitat (acres) | Upland Grassland Habitat (acres) | Total |
|---------------|-----------------------------------|----------------------------------|--------|
| 12 | 2.4 | 29.17* | 31.57* |
| 13 | 0.04 | 7.15 | 7.57 |
| Total | 2.43 | 36.32 | 39.14 |

*-includes site 12A

3.3.3 Mitigation

Avoidance and mitigation measures will be undertaken to minimize and prevent adverse effects to special status species.

3.3.3.1 Giant Garter Snake

The project plans, which proposes mitigating for giant garter snake aquatic habitat on a more than 3:1 scale, is consistent or exceeds the terms and conditions to mitigate giant garter snake habitat impacts in the USFWS October 22, 1999, Biological Opinion issued for the 1999 EA. Further, the following mitigation conditions will also be followed:

- Ground disturbance activity within or near potential giant garter snake habitat would be limited in time to between April 30 and October 1, unless otherwise approved by USFWS.
- Prior to construction activities, a qualified biologist would provide construction personnel with worker awareness training to recognize the giant garter snake and its habitat.
- Prior to construction activities, the site would be inspected by a qualified biologist, who has been approved by the Sacramento Field Office of the USFWS, so that the killing and harassing of giant garter snakes can be minimized or avoided.
- Nearby habitat designated as environmentally sensitive to the snake would be flagged and avoided by all construction personnel.
- Movement of heavy equipment to and from the project site or borrow site would be confined to existing roadways to minimize habitat disturbance. Equipment would stay at least 200 feet from the banks of giant garter snake aquatic habitat, wherever feasible.
- Drainage/wetland ditches and ponds would be pumped dry and would remain dry for at least 15 consecutive days prior to construction/fill.
- If a giant garter snake is encountered during construction, activities would cease until capture and relocation have been completed by the USFWS-approved biologist.
- Any incidental take would be reported to the USFWS immediately by telephone at (916) 414-6600/6601.
- If construction were to extend into October at a site, a USFWS-approved biologist would be onsite to monitor construction activities.
- New irrigation or drainage ditches would be excavated prior to filling the existing ditches.
- Mitigation for giant garter snake habitat would take place onsite. Both upland and emergent wetland habitat would be created to offset effects to their habitat during construction of the spoil berms and realignment of the ditches.

3.3.3.2 Valley Elderberry Longhorn Beetle

A total of 36 elderberry shrubs affected by this project will be mitigated by onsite transplants and plantings. Table 3 identifies the amount of acreage required to mitigate for these effects. Construction in Contract Area 3 will require a total of 7.46 acres of elderberry mitigation habitat to be planted onsite. This acreage includes the establishment of associated native plantings. It is expected that 2.24 acres of this would be planted in the near future to mitigate for elderberry impacts at Sites 12, 12A, and 13 and the rest would be planted at a later time (see the Construction Schedule earlier in this EA/IS).

Avoidance and mitigation measures outlined in the *Mitigation Guidelines for the Valley Elderberry Longhorn Beetle, July 9, 1999* (USFWS 1999) would be followed in addition to any other terms and conditions issued by the USFWS. They are listed below:

Protective Measures

- Fence and flag all areas to be avoided. Provide a minimum setback of at least 20 feet from the

drip line of any elderberry plants.

- Provide worker awareness training to contractors and work crews on the need to avoid damaging the elderberry plants and possible penalties for not complying with these requirements.
- Place signs every 50 feet along the edge of the avoidance areas with the following information: “This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment.” The signs would be clearly readable from a distance of 20 feet, and would be maintained for the duration of construction.

Restoration and Maintenance

- Restore any damage done to the buffer area during construction. Provide erosion control and revegetate with appropriate native plants.
- No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant would be used in the core and buffer avoidance areas, or within 100 feet of any elderberry plant with a stem measuring 1.0 inch or greater in diameter at ground level.
- The construction contractor is required to provide a written description of how the core and buffer avoidance areas are to be restored and protected.

3.3.3.3 Swainson’s Hawk

Conduct surveys for Swainson’s hawks in the vicinity of the Contract Area 3 in accordance with CDFG (2000) guidelines prior to the start of construction. These surveys would occur within one-half mile of all six levee construction sites, including staging areas, and borrow sites.

If hawks with active nests are found within the one-half mile radius of the worksite, the Corps would implement appropriate mitigation measures to be defined by CDFG. Measures could include a moratorium on construction in the area where the nest(s) is/are located until the newly hatched young have exited the nest (usually May through August 1 depending upon how early nesting activity started).

3.4 Water Quality and Wetlands

3.4.1 Existing Conditions

3.4.1.1 Water Quality

Water quality in the Mid-Valley area is based on the quality of its numerous beneficial uses recognized by the Central Valley Regional Water Quality Control Board (CVRWQCB). The October 2011 fourth edition to *The Water Quality Control Plan (Basin Plan) for the Central Valley Region* (CVRWQCB 2011) shows that beneficial uses for the primary waterways adjacent to the project area include domestic municipal use, irrigation for agriculture, livestock watering, recreation, warm water and coldwater fish habitat, wildlife habitat, and navigation.

Rivers and streams in the Mid-Valley project area are part of the Sacramento River Basin. Numerous streams and rivers including the Feather River drain the western slopes of the Sierra Nevada and Cascades and empty into the Sacramento River. Overall, water quality of the Sacramento River is good near the project sites as indicated by results reported by the U.S. Geological Survey (USGS 2005). However, water quality at specific sites varies due to the effects of variations in stream flow and the quantity of local waste discharges and irrigation return flows.

Turbidity in the Sacramento River is highest in the winter and spring, corresponding to the heavy runoff season. Tributary streams receive agricultural drainage and natural runoff (Corps 1991). Water quality varies near agricultural runoff and urban storm drainage areas.

The Knights Landing Ridge Cut (KLRC) drains agricultural waters from the Colusa Basin Drainage Canal to the Yolo Bypass. This irrigation drainage water has significant turbidity and includes fertilizer and pesticide runoff. The water quality in the KLRC is seasonally poor, especially during low-flow periods in the spring and summer when agricultural runoff is highest.

During high flows in the Sacramento River, floodwaters are diverted into the Yolo Bypass and conveyed south around Sacramento. Additional flows enter the bypass from west side tributaries, including Willow Slough and the Willow Slough Bypass. Water quality in the Yolo Bypass is similar to the Sacramento River, but with increased turbidity. Non-floodwater uses consist of irrigation for agriculture, livestock, and private hunting clubs.

The water in the drainage ditches is pumped into the KLRC and has similar water quality as the Sacramento River, but is slightly more turbid. The farther the water is from the pumping source, a higher percentage of agricultural runoff and dissolved salts that have entered the ditch and, therefore, the lower the quality of the water.

3.4.1.2 Wetlands

Jurisdictional wetlands or emergent marsh exists at Sites 12 and 13. These include the 2.75 miles of drainage ditches that convey runoff from the adjacent farm land toward the KLRC. These ditches were artificially created but have not been maintained regularly. Therefore wetland vegetation (cattails, sedges, and bulrushes), hydric soils, and evidence of wetland hydrology were observed during the field surveys to each site. See Appendix A for a further analysis of the project's impacts on these wetlands.

3.4.2 Effects

3.4.2.1 Significance Criteria

- Violates applicable water quality standards or otherwise substantially degrades water quality; or
- Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in a substantial increase in the availability and mobilization of sediments and associated contaminants.

3.4.2.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Alternative would not be constructed. Continued seepage at these levee sites would increase the risk of levee failure and flooding of surrounding areas. Levee failure and flooding could result in significant effects to the water quality of the Sacramento River and KLRC. As described in Section 3.2.2.2, floodwaters have the potential to entrain toxic substances into the water, including gasoline, lubricants, insecticides, pesticides, sewage, and other petroleum-based products. Floodwaters could carry these substances into the Sacramento River where they would severely degrade water quality and effect aquatic organisms through exposure to lethal concentrations. Flood fighting efforts could also cause greater water quality impacts than the project, especially if earthen embankments need to be constructed since they would be subject to erosion resulting in increased downstream turbidity impacts.

3.4.2.3 Water Quality

Except for the slurry walls at Sites 9, 10 and 11, all work would be done on the landside of the existing levees. No haul roads or any staging areas would occur on the waterside. The temporary stockpiling of the top 7 feet of the levee at Sites 9 and 10 for the slurry wall trenching would be on the waterside of the levee, but it would be in an upland area at least 25 feet from the top of the bank of the Sacramento River landward of a riparian forest that would not be impacted. As a precaution, silt fencing would be placed on the waterside of the levee to keep the sediment from entering the river.

In addition, all work including seeding for erosion control would be completed prior to the rainy season of each construction year. For sites with relocations of toe drains or ditches, the work would either be completed during the dry season for that construction year and/or the ditches would be pumped dry prior to filling them.

3.4.2.4 Wetlands

The Proposed Alternative requires a Section 404 (b) (1) evaluation (Appendix A) pursuant to the Clean Water Act because there would be filling of waters of the U.S., specifically the emergent marsh drainage ditches at Sites 12 and 13. The Section 404(b)(1) evaluation found that the project would have a substantial impact on the wetlands in the project area located at Sites 12 and 13. However, the proposed project design with the creation of 7.33 acres of similar wetlands and the below mitigation measures results in a less than significant effect on wetlands and water quality for the project. A State 401 Water Quality Certification will also be obtained from the Central Valley Regional Water Quality Control Board prior to construction.

3.4.3 Mitigation

Substantial impacts would occur to wetlands as a result of the work at Sites 12 and 13. Total wetland impacts would be 2.43 acres caused by the filling of the wetland ditches and pond at Site 12 (2.39 acres) and the filling of a wetland ditch at Site 13 (0.04 acres). However, the wetland impacts would be mitigated onsite and would total 7.33 acres through the excavation of a wider wetland ditch or pond and other wider wetland ditches totaling 2.39 acres at site 12 and a new wider wetland ditch at Site 13 that would provide 0.04 acres of wetlands.

Under Section 401 of the Clean Water Act, the projects at Sites 12, 12A, and 13 are subject to the conditions of certification to be issued by the State Water Resources Control Board. Since there would be no other work in any wetlands or waters, the work at Sites 9, 10, and 11 would not require Section 401 certification.

However, each of the project areas (Sites 9, 10 and 11 and Sites 12, 12A, and 13) would be subject to additional Clean Water Act (CWA) regulations, such as the National Pollutant Discharge Elimination System (NPDES) pursuant to Section 402 of the CWA. Similar to previous work on the flood control project, the Section 401 and 402 approvals require the implementation of numerous BMPs to reduce any potential adverse effects to water quality. Implementation of these BMPs would reduce any adverse effects to water quality to less than significant.

Erosion control and sediment detention devices such as using straw bales, fencing, sandbags, and/or similar devices would be incorporated into the project and implemented at the time of the project action. These devices would be in place during the project action, and after if necessary, for the purpose of minimizing fine sediment/water slurry input to flowing water. The devices would be placed at all locations where the likelihood of sediment input exists.

The contractor would prepare and implement (1) an erosion and sediment control plan for minimizing the potential for sediment input into the river or KLRC, (2) a toxic material control and spill response plan for preventing toxic material spills, (3) a soil management plan that provides criteria for classifying wastes in soil and managing soils

possibly contaminated by toxics, and (4) a hazardous and toxic materials contingency plan in the event that unlisted hazardous and toxic sites are uncovered during construction.

Dewatering of work areas, such as pumping the wetland ditches dry, would be conducted in accordance with all regulatory requirements to avoid or minimize any effects on water quality.

All fill and rock materials would be non-toxic. Any combination of wood, plastic, concrete, or steel is acceptable, provided that there are no toxic coatings, chemical anti-fouling products, or other treatments that could leach into the surrounding environment.

3.5 Air Quality and Climate Change

3.5.1 Existing Conditions

3.5.1.1 Regulatory Background

Construction of the project would occur within the Sacramento Valley Air Basin (SVAB). Air quality in the air basin is regulated by Federal, State, and regional agencies. At the Federal level, the U.S. Environmental Protection Agency (EPA) is responsible for overseeing implementation of the 1990 Federal Clean Air Act (42 U.S.C. 7401 *et seq.*). The Air Resources Board is the State agency that regulates mobile sources and oversees implementation of State air quality laws, including the 1988 California Clean Air Act (Health & Safety §§ 42300 *et seq.*). The Yolo-Solano Air Quality Management District (YSAQMD) is the primary agency that regulates air quality on a regional level over stationary sources in the project area. Regional planning and attainment of air quality goals also involve air quality agencies in neighboring counties.

The EPA developed the General Conformity Rule to implement Section 176(c) of the Federal Clean Air Act. The rule states that a Federal action must not cause or contribute to any violation of the National Ambient Air Quality Standards (NAAQS). A conformity determination is required for each pollutant where the total of direct and indirect emissions caused by a Federal action in a non-attainment area exceeds *de minimus* threshold levels listed in the General Conformity Rule (40 CFR 93.153(b)). If it is predicted that local air standards of significance would be exceeded, the construction contractor would need to implement appropriate mitigation measures.

Pursuant to the Federal Clean Air Act, the EPA has established National ambient air quality standards for criteria pollutants, including ozone (O₃), carbon monoxide (CO), particulate matter 10 micrometers in diameter (PM₁₀), and particulate matter of respirable size (PM_{2.5}). California's ambient air quality standards are generally more stringent than the Federal standards. The Federal and State standards for O₃, CO, PM₁₀ and PM_{2.5} are summarized in Table 7.

Table 7 Ambient air quality standards

| Pollutant | Averaging Time | California Standards ¹ | Federal Standards ² | |
|-------------------|------------------------|-----------------------------------|--------------------------------|------------------------|
| | | | Primary ³ | Secondary ⁴ |
| O ₃ | 8 hour | 0.07 ppm | 0.075 ppm | 0.075 ppm |
| | 1 hour | 0.09 ppm | -- | -- |
| CO | 8 hour | 9.0 ppm | 9 ppm | -- |
| | 1 hour | 20 ppm | 35 ppm | -- |
| PM ₁₀ | Annual arithmetic mean | 20 ug/m ³ | -- | -- |
| | 24 hour | 50 ug/m ³ | 150 ug/m ³ | 150 ug/m ³ |
| PM _{2.5} | Annual arithmetic mean | 12 ug/m ³ | 15 ug/m ³ | 15 ug/m ³ |
| | 24 hour | -- | 35 ug/m ³ | 35 ug/m ³ |

¹California standards for O₃, CO, and PM₁₀ are values that are not to be exceeded.

²National standards, other than ozone and those based on annual averages or annual arithmetic mean are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

³National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

⁴National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Source: CARB (2008).

3.5.1.2 Local Air Quality Management

Project site standards would follow those enforced by the YSAQMD. The YSAQMD is the primary local agency responsible for protecting human health and property from the harmful effects of air pollution for all of Yolo County and northeastern Solano County.

The Sacramento Valley Air Basin, including Yolo County, is designated as a non-attainment area for the Federal and State ozone standards. Yolo County is designated as a serious non-attainment area according to Federal 8-hour and State 1-hour ozone standards. Yolo County is classified as non-attainment based on State 8-hour standards. For the state PM₁₀ standards, the entire air basin is currently considered a non-attainment area.

Existing conditions for air quality in the project area can be described with summary statistics for critical air pollutants. Typical pollutants include O₃, CO, and coarse particles: PM₁₀ and PM_{2.5}. Air quality data for the Sacramento Valley Air Basin from 2008 to 2011 are summarized in Table 8.

Table 8 Air quality data for the Sacramento Valley Air Basin, 2008-2011

| Year | Pollutant (Averaging Time) | Maximum Concentration | Number of Days Exceeding Federal Standards | Number of Days Exceeding State Standards ¹ |
|------|----------------------------|-------------------------|--|---|
| 2008 | O ₃ (1h) | 0.135 ppm | 9 | 41 |
| | O ₃ (8h) | 0.120 ppm | 54 | 78 |
| | CO (8h) | 3.49 ppm | 0 | 0 |
| | PM ₁₀ (daily) | 236.7 ug/m ³ | 7 | 69 |
| 2009 | O ₃ (1h) | 0.136 ppm | 0 | 29 |
| | O ₃ (8h) | 0.118 ppm | 45 | 65 |
| | CO (8h) | 3.06 ppm | 0 | 0 |
| | PM ₁₀ (daily) | 76 ug/m ³ | 0 | 18 |
| 2010 | O ₃ (1h) | 0.138 ppm | 0 | 15 |
| | O ₃ (8h) | 0.121 ppm | 29 | 46 |
| | CO (8h) | 2.75 ppm | 0 | 0 |
| | PM ₁₀ (daily) | 87.4 ug/m ³ | 0 | 12 |
| 2011 | O ₃ (1h) | 0.123 ppm | 0 | 26 |
| | O ₃ (8h) | 0.112 ppm | 46 | 59 |
| | CO (8h) | 2.78 ppm | 0 | 0 |
| | PM ₁₀ (daily) | 73.5 ug/m ³ | 0 | 24 |

¹N/A = not applicable; State standards for ozone are based on 1 hour averaging time only.

ppm = parts per million; ug/m³ = micrograms/per cubic meter.

Source: CARB (2009a)

The Sacramento Valley Air Basin does not consistently meet several applicable State air quality standards (CARB 2009b). Depending on the pollutant, the boundaries of the attainment areas vary. Between 2008 and 2011, measures of ozone frequently exceeded both Federal and State standards, whereas concentrations of PM₁₀ rarely exceeded Federal standards (Table 8). PM₁₀ concentrations did, however, frequently exceed State standards. Concentrations of CO did not exceed State or Federal standards during 2008 to 2011.

3.5.1.3 Greenhouse Gas (GHG) Emissions

Climate change results from the accumulation in the atmosphere of “greenhouse gases” produced by the burning of fossil fuels for energy. The principal greenhouse gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), perfluorocarbons (PFC), hydrofluorocarbons (HFC), and water vapor. Carbon dioxide is produced during the burning of fossil fuels and is the predominant greenhouse gas created during this project. Because no major sources exist for the other greenhouse gases during the construction process, they are not considered to be significant and no quantitative emission calculations were made for them.

The California Global Warming Solution Act of 2006 (AB 32), mandates that emissions of greenhouse gases must be capped at 1990 levels. Considering that about 40% of greenhouse gas emissions come from motor vehicles, projects that generate new vehicle trips can be in conflict with AB 32 goals. While there are no specific thresholds associated with greenhouse gases, it is still recommended to at least include a qualitative discussion of greenhouse gases in air quality analyses for sizable projects (YSAQMD 2007).

3.5.2 Effects

3.5.2.1 Significance Criteria

The project would have a significant adverse effect on air quality if it:

- Conflicts with or obstructs implementation of an applicable air quality plan;
- Violates any air quality standard or contributes substantially to an existing or projected air quality violation;
- Results in a cumulatively considerable net increase of any criteria pollutant for which the project is in non-attainment under applicable Federal or State ambient air quality standards (including releasing emissions, which exceed quantitative thresholds for ozone precursors);
- Exposes sensitive receptors to substantial pollutant concentrations; or
- Creates objectionable odors affecting a substantial number of people.

3.5.2.2 No-Action Alternative

Under the No-Action Alternative, the Corps and the CVFPB would not implement the proposed remediation work at the six levee sites in Contract Area 3. Potential flood fighting activities would result in temporary effects to air quality that would likely be less than analyzed under the proposed alternative. The types of construction equipment would be similar, but the flood fighting activities would be expected to be a shorter duration. The No-Action Alternative would likely result in a continuation of the current air quality standard violations, similar to the trend shown in Table 8.

3.5.2.3 Proposed Alternative

Under the Proposed Alternative, short-term effects to air quality would occur in Yolo County. This section describes the potential air quality effects of the Proposed Alternative, including exhaust emissions from construction equipment and worker commute and delivery vehicles, fugitive dust generated by construction activities, and vehicle travel over unpaved roads. To complete the analysis, information was collected on projected construction activities, duration, and timing, equipment use, and activities for each construction year. Emissions associated with vehicle exhaust for employee commute vehicles and delivery trucks were estimated using SMAQMD's Road Construction Emission Model Version 6.3.2, (Appendix D). These emissions were based on assumptions in Table 9. Emissions associated with the operation of construction equipment were estimated using the SMAQMD's *Guide to Air Quality Assessment in Sacramento County* (SMAQMD 2009). Construction equipment usage from similar projects under the SRBPP was used to estimate daily and annual exhaust emissions for construction equipment. Emissions are considered significant if emissions exceed the local thresholds established by these agencies for construction activities. Thresholds established to assist in analyses within the YSAQMD boundaries include the following (YSAQMD 2007):

- 55 pounds per day of NO_x.
- 55 pounds per day of ROG.
- 150 pounds per day of PM₁₀.

Emissions for the project are considered significant under NEPA if annual emissions exceed the EPA’s general conformity thresholds. Conformity thresholds are based on the *de minimus* thresholds included in the EPA’s general conformity guidelines for air pollutants in non-attainment areas (40 CFR 51.853), as applicable for the Sacramento area.

- 50 tons per year of NO_x.
- 50 tons per year of ROG.
- 100 tons per year of CO.

Potential air pollutants generated during construction include PM₁₀ emissions from debris moving activities and vehicle travel on unpaved roads, and exhaust emissions from the operation of construction equipment, delivery and haul trucks, and employee vehicles. Tailpipe exhaust emissions include ozone precursors (NO_x and ROG) and PM₁₀. The air quality estimates are based on construction equipment emissions for Sites 9, 10, 11 and Sites 12, 12A, and 13.

Remediation work includes installation of three slurry walls down the crown of the levees (Sites 9, 10 and 11) with the remainder of the levee work consisting of construction of spoil berms. Estimated equipment used would include a hydraulic crane, generator, excavators, loaders, rollers, blades, transit mixer, water tank, end-dump truck, 6 x 4 3-axle trucks, asphalt finisher (for County Road 116B restoration at Site 11), a street sweeper, and a generator. Some equipment would be used to remove trees and other vegetation at the sites, the crane and excavators would be used for the slurry walls, loaders to move levee material, and large trucks to transport soil and aggregate. A water truck would be used to control dust. Table 9 shows a list of construction equipment to be used for each levee repair site.

Table 9 List of construction equipment

| Emission Source | Levee Remediation Sites (<i>n</i> of equipment) |
|---|---|
| Material placed for all sites (hailed in by truck) | Sites 9-11: 91,208 cubic yards of soil Sites 12-13: 132,800 cubic yards of soil |
| Employee commute trips | Five employee trips per day, 20 miles each way (per site) |
| Delivery truck trips Debris haul truck trips | Ten trips per day for each repair site Average round trip for trucks: 60 miles 20 cubic yards average load for trucks 60-90 hauling days |
| Fuel-fired construction equipment for each site | Chain saws (2) Chippers (1) Dump trucks for delivery/hauling (10) Excavators (2) Dozer (1) Pickup trucks (4) Grader (1) Loader (1) Trencher (1) Paving equipment (1 each): rollers, pavers, surfacing machines Heavy duty water tank trucks (1) |

The maximum daily emissions in pounds per day for construction of sites under the Proposed Action were estimated (Table 10) and the average annual emissions in tons per year for the construction period were also estimated (Table 11).

Table 10 Maximum daily construction emission estimates (pounds per day)

| Project Component | NO _x | ROG | PM ₁₀ | CO | CO ₂ | Air Quality District |
|-------------------|-----------------|------|------------------|------|-----------------|----------------------|
| Sites 9, 10, 11 | 119.9 | 15.1 | 15.4 | 89.6 | 21,588 | YSAQMD |
| Sites 12, 12A, 13 | 115.5 | 16.3 | 20.8 | 95.4 | 19,387.2 | |
| Threshold | 55 | 55 | 80 | N/A | N/A | |

N/A - not applicable, California Ambient Air Quality Standards not based upon emission rate, but prohibit increases in ambient CO concentrations by 5% or more.

Table 11 Average annual construction emission estimates (tons per year)

| Project Component | NO _x | ROG | PM ₁₀ | CO | CO ₂ | Air Quality District |
|-------------------|-----------------|-----|------------------|-----|-----------------|----------------------|
| Sites 9, 10, 11 | 9.2 | 1.2 | 1.4 | 6.8 | 1,569.4 | YSAQMD |
| Sites 12, 12A, 13 | 9.0 | 1.3 | 1.9 | 7.4 | 1,468.6 | |
| Threshold | 50 | 50 | N/A | 100 | N/A | |

N/A - not applicable, due to being unclassified for all criteria pollutants based on Federal standards or unclassified for PM₁₀ (YSAQMD 2007).

Based on this analysis, construction of the proposed project would result in the temporary increase in emissions of ROG, CO, NO_x, and PM₁₀. Estimated daily emissions of NO_x would exceed thresholds established by YSAQMD under the Proposed Action (Table 10). Temporary increases in emissions are considered to be a significant impact, absent mitigation incorporated into the project. Under NEPA, federal conformity for NO_x, ROG, PM₁₀, and CO would not be exceeded, based on annual thresholds (Table 11). The proposed mitigation measures included in Section 3.5.3 would reduce air quality effects to a less-than-significant level.

To help protect ambient air quality conditions, BMP's would be implemented for O₃ and PM₁₀. To reduce O₃ and PM₁₀ levels, the contractor would perform routine tuning and maintenance of construction equipment to ensure that the equipment is in proper running order. The contractor would also monitor dust conditions along access roads and within the construction area to ensure that the generation of fugitive dust, which includes PM₁₀ and PM_{2.5}, is minimized below the 50 ug/m³ 24-hour threshold. Water sprays would be periodically applied to disturbed areas and soil stockpiles for dust control (at least three times per day during hot weather). Minimum freeboard for all haul vehicles would be two-feet or greater. Lastly, soil-disturbing activities would be suspended during periods with winds over 25 miles per hour.

The short-term construction activities would not conflict with or obstruct implementation of the YSAQMD air quality plan or substantially contribute to an existing or projected air quality violation.

With respect to the air quality plan and contribution to existing or projected air quality violations the air quality effects of the proposed action would be less than significant.

In addition, construction of the Proposed Alternative would contribute to the generation of GHG emissions through short-term construction activities at the project site. Short-term air pollution in the form of particulate matter (fugitive dust) and CO₂ may be caused by construction activity, including truck and equipment movement, grading, and earthwork. While no Federal or State agency has established thresholds of significance for GHG or other impacts to global climate change, CARB has established 7,000 metric tons of CO₂ per year baseline to provide context to the scale for the proposed project. The proposed action is estimated to produce 1,569.4 and 1,468.6 tons per year of CO₂ under the construction for Sites 9, 10, 11 and Sites 12, 12A, 13, respectively (Table 11). These values are both well below the baseline of 7,000 metric tons per year suggested by CARB (2008). Therefore, the proposed action is not expected to significantly influence global climate change.

3.5.2.4 Sensitive Receptors

Sensitive receptors are located within the project areas of Sites 9, 10, and 11 and consist of primarily individual residences within ½ mile or less (Table 12). The repair sites are mainly adjacent to agricultural lands set away from urban areas. The Proposed Alternative is not expected to create objectionable odors because diesel exhaust would be readily dispersed. Due to the short-term duration of this project and the dispersive nature of diesel emissions the effect on sensitive receptors is deemed less than significant.

Construction of the Proposed Alternative is not expected to create objectionable odors that would affect a large number of people or expose sensitive receptors to substantial pollutant concentrations. Therefore, the project would result in a less-than-significant effect on air quality associated with increasing objectionable odors or substantially increasing pollutant concentrations. No offsite mitigation is required.

Table 12 Sensitive receptors within one mile of each levee remediation site

| Remediation Site | Sensitive Receptors |
|------------------|--|
| Site 9 | Four individual residences (within ¼ mile of site) |
| Site 10 | Four individual residences (within ¼ mile of site) |
| Site 11 | One individual residence (within ½ mile of site) |
| Site 12 | Farm and agricultural land surrounding site |
| Site 12A | Farm and agricultural land surrounding site |
| Site 13 | Farm and agricultural land surrounding site |

3.5.3 Mitigation

Best management practices (BMPs) will be implemented by the Corps construction contractor at each repair site. These include dust and PM₁₀ abatement by watering, limiting on-site idling time of heavy equipment, and ensuring that all internal combustion engine equipment is properly tuned to the manufacturer’s specification. These practices would result in limiting emissions during the construction period and would be sufficiently effective to avoid exceeding significance thresholds.

3.5.3.1 Measures to be Implemented

Standard construction practices at the erosion sites would ensure that exhaust emissions from all off-road diesel-powered equipment used on the sites do not exceed 40% opacity for more than three minutes in any one hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0) would be repaired immediately. The Corps and/or the appropriate local air quality agency would be notified within 48 hours of identification of non-compliant equipment.

For NO_x, significant air quality effects have been identified, and the USACE or CVFPB shall implement the mitigation measures to reduce emissions when YSAQMD thresholds are exceeded. The YSAQMD does not levy fees for NO_x emissions in excess of daily or annual thresholds and, therefore, no estimates of mitigation fees have been made for this project. Furthermore, the project is not expected to exceed annual NO_x emissions thresholds within the YSAQMD. However, the project applicant or representative shall provide a plan for approval by YSAQMD and the USACE or CVFPB demonstrating that the construction activities shall not exceed 55 pounds per day of NO_x. The plan shall demonstrate that heavy-duty (>50 horsepower) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, will achieve a project-wide fleet-average 20 percent NO_x reduction and 45 percent particulate reduction compared to the most recent CARB fleet average at time of construction. To reduce NO_x emissions for this project, the applicant may employ one or more of the following measures:

- Require injection timing retard of two degrees on all diesel vehicles, where applicable.
- Install high pressure injectors on all vehicles, where feasible.
- Encourage the use of reformulated diesel fuel.
- Electrify equipment, where feasible.
- Maintain equipment in tune with manufacturer's specifications.
- Install catalytic converters on gasoline-powered equipment.
- Substitute gasoline-powered for diesel-powered equipment where feasible.
- Use compressed natural gas or on-site propane mobile equipment instead of diesel-powered equipment, where feasible.

The contractor shall submit to USACE, CVFPB, 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 production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory shall be updated and submitted monthly throughout the duration of construction activities, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the contractor shall provide the YSAQMD with the anticipated construction timeline, including start date and the name and phone number of the project manager and on-site foreman. The local air quality district and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this section would supersede YSAQMD or State rules or regulations.

BMPs and implementation of the standard construction mitigation measures as recommended by YSAQMD would reduce GHG emissions through the same processes that reduce total NO_x and PM₁₀ emissions.

Implementation of the mitigation described above would reduce potential impacts from the proposed action to a less-than-significant level.

3.6 Land Use and Agriculture

3.6.1 Existing Conditions

All sites contain agricultural land used for growing crops such as wheat, beans, tomatoes, and other specialty crops, including walnut orchards. According to the NRCS, soils of the project areas in Yolo County are considered Prime Farmland when irrigated, except for those in the Yolo Bypass, which are not Prime Farmland (CDOC 2009). For Yolo County, the total Prime and Unique Farmland as identified in the year 2002 is 316,235 acres (CDOC 2002).

3.6.2 Effects

3.6.2.1 Significance Criteria

Effects are considered significant if the project:

- Has a substantial effect on an established community;
- Conflicts with an applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect set forth by an agency with jurisdiction over any of the erosion sites that together make up the project;
- Converts a substantial amount of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Important Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
- Converts a substantial amount of land in an area designated by existing zoning for agricultural use or under a Williamson Act contract, or in a Farmland Security Zone to an inconsistent use; or
- Involves other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use.

3.6.2.2 No-Action Alternative

Under the No-Action Alternative, no action would be taken to repair the levee at the six sites. Land uses associated with the existing levees would remain unchanged for the immediate future. Agricultural operations would continue under the threat of increased seepage and eventual levee failure. There would be no direct effect on existing land uses, no conversion of existing land uses would occur, and there would be no conflict with any land use policy, plan, or regulation.

Continued seepage at these levee sites would increase the risk of levee failure and possible flooding of surrounding areas. Levee failure and flooding may result in significant effects to surrounding land uses and established agricultural operations as a result of flooding and resultant flood fighting caused by levee failure.

3.6.2.3 Proposed Alternative

Under the Proposed Alternative, approximately 4.05 acres of Prime and Unique Farmland would be affected by the levee reconstruction at Sites 12A and 13. An additional 12.39 acres of Prime and Unique Farmland at Site 12 is expected to be converted to non-agricultural use by the mitigation plantings for riparian and elderberry impacts. Borrow sites would not affect Prime or Unique Farmlands. A farmland conversion effect application will be submitted to the USDA/NRCS office in Davis, California to ensure compliance with the Farmland Protection Policy Act. No Prime or Unique Farmlands would be affected at Sites 9, 10, and 11.

Preparation of the levee slope for construction of the spoil berms would include clearing and grubbing to remove all existing vegetation, crops, and farming equipment on the landside of the levee. The work at Sites 9, 10, and 11 is not expected to impact any farmland as it can be avoided with minimal effects to ruderal grasslands, as described above. Site 12 mitigation work would affect 12.39 acres; Site 12A construction work would affect 1.99 acres; and Site 13 construction work would affect 2.06 acres of farmland along Knights Landing Ridge Cut slough. A total of 16.45 acres of prime agricultural land would be affected by construction activities in Contract Area 3. However, 5.68 acres of the mitigation work at Site 12 will likely not occur until 2015, at the earliest, and it may occur at a different site, such as the farmland at Site 11. The spoil berms would be seeded with native grasses to establish an open space grassland habitat. These sites would be maintained by the local reclamation district. This results in a less than significant effect on land use and agriculture, as explained further below.

3.6.3 Mitigation

The environmental values of open space and habitat will remain similar before and after construction so the impacts are less than significant; therefore no mitigation is required. All the levee stabilization would be occurring in agricultural areas directly benefiting the farmers and the continued use of this land for farming. Stabilization of the levees would occur in agricultural areas and will help ensure that the levees do not continue to weaken and be subject to the effects of seepage, boils, as well as levee failures. The Prime and Unique Farmland will benefit from the construction of the spoil berms and slurry walls as it will be better protected from potential flooding.

3.7 Traffic and Circulation

3.7.1 Existing Conditions

The highways and roads that would be used to transport materials, equipment, and personnel to the repair sites receive widely varying levels of traffic. Existing traffic volumes not only vary widely among the road systems serving the six repair sites, but they also vary at each site in accordance with time of day and season of year. Sites 9, 10, 12, 12A, and 13 receive little traffic because they are located on levee roads behind locked gates where public travel is restricted. Site 11 is located along a road that receives substantial use. Table 13 identifies the most likely roadways that would be used for transportation of construction materials, equipment and personnel to the repair sites.

Table 13 Roads used to access the remediation sites

| Remediation Site | Access Roads |
|------------------|---|
| Site 9 | Interstate 5 (I-5) to Road 102 to Road 16 to County Road 116B to Levee Gravel Road |
| Site 10 | I-5 to Road 102 to County Road 16 to County Road 116B to Levee Gravel Road |
| Site 11 | I-5 to Road 102 to County Road 16 to County Road 116B |
| Site 12 | I-5 to Road 102 to County Road 16 to Knights Landing Ridge Cut Slough Levee Gravel Road |
| Site 12A | I-5 to Road 102 to County Road 16 to Knights Landing Ridge Cut Slough Levee Gravel Road |
| Site 13 | I-5 to Road 102 to County Road 16 to Knights Landing Ridge Cut Slough Levee Gravel Road |

3.7.2 Levels of Service

Levels of service (LOS) are a qualitative description of operation of a roadway based on length of delay and degree of maneuverability, ranging from “A”, representing free-flow conditions, to “F”, representing gridlock and heavy traffic congestion.

Table 14 Unsignalized intersection level of service definitions

| Level of Service | Average Control Delay (seconds/vehicle) |
|------------------|--|
| A | < 10.0 |
| B | 10.1 – 15.0 |
| C | 15.1 – 25.0 |
| D | 25.1 – 35.0 |
| E | 35.1 – 50.0 |
| F | > 50.0 |

Source: *Highway Capacity Manual*, Transportation Research Board 2010.

Table 15 below displays the LOS for roadways in the vicinity of Mid-Valley project, Knights Landing Area, Sites 9-13

Table 15 Level of service for Yolo County roads used to access the Mid-Valley Project construction sites

| Yolo County Roadway | LOS |
|---------------------|-----|
| Road 102 | A |
| Road 16 | A |
| Road 116 | A |
| Road 116A | A |
| Road 116B | A |

LOS A has free-flow travel with an excellent level of comfort and convenience and the freedom to maneuver and very low delay is experienced at intersections. Traffic congestion is not a problem on these rural county roads that are mainly used for commuting, agricultural operations, recreation, and rural residential use.

3.7.3 Effects

Construction access will be determined based upon the contractor and the location of each site. Truck traffic that would result from landside construction may temporarily affect roads in the vicinity of the levee repair sites.

3.7.3.1 Significance Criteria

Effects to traffic and transportation as a result of implementing the proposed levee repairs would be significant if the project would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the road system;
- Exceed, either individually or cumulatively, a level of service standard established by the county

congestion management agency for designated roads and highways;

- Result in a change in traffic patterns, including either an increase in traffic levels or a change in location, that results in substantial safety risks; or
- Result in inadequate parking capacity.

3.7.3.2 No-Action Alternative

Under the No-Action Alternative, no activities would be conducted to repair the six levee sites. Traffic conditions near the repair sites would remain unchanged; no effects would occur from repair site-related construction traffic. Over time, flood flows, and human disturbance would contribute to continued instability and risk of levee failure.

Given the extent of existing seepage, seepage would likely increase in severity to the point that pre-failure emergency repairs would be warranted or the levee would fail, resulting in flooding, greatly accelerated seepage, and the need for flood fighting involving post-failure emergency repairs. Pre-failure and post-failure emergency repairs would result in substantial traffic increase during transportation of equipment and personnel to the repair sites. Lane closures and traffic delays might be necessary to accommodate emergency staging and construction activities. The duration of traffic effects might be greater than under the proposed action because a larger repair area would likely be required. Additionally, the need for emergency repairs would allow minimal opportunity for planning haul routes and traffic detours to minimize effects to traffic. Levee failure, flooding, and flood fighting could result in road closures and other restrictions in traffic flow, including access by emergency vehicles.

3.7.3.3 Proposed Alternative

Under the Proposed Alternative, access to the construction sites would be via Federal highways, State routes (SR), and county and local roads, including gravel levee roads. Interstate 5, State Routes 99 and 113, and Garden Highway levee road are the larger transportation routes that would be used by construction equipment and worker vehicles to access the project sites. The county roads provide access to the small rural communities and are used mainly by the local residents. Traffic on the roadways includes cars, light trucks, farm equipment, and 18-wheel trucks on larger roadways. The unpaved roads and levee roads are almost exclusively used by local farmers or resource agencies. It would not be necessary to route construction vehicles through the community of Knights Landing since the borrow sites are located to the east of the levee sites rather than to the west and north where Knights Landing is located.

The contractor would be responsible for developing a traffic management plan and obtaining any required permits prior to construction. Adherence to load limits and size restrictions of construction equipment would be the responsibility of the contractor to prevent damage to State and county highways or roads. Payment for damages to State and county highways or roads due to levee construction activities would be the responsibility of the construction contractor. All ramps to homes and farms would remain in place, unobstructed, so as to allow access during construction. The contractor would avoid blocking off ramps to residences and would provide access lanes for local traffic or establish detour routes around the construction.

The Proposed Alternative would involve the placement of soil revetment on the landside of the levee slopes. This construction work would involve the steady transport of large loads of soil fill for a substantial portion of the construction timeframe. The duration of construction activities is estimated to be up to 300 days for each project area (Sites 9/10/11 and Sites 12/12A/13), with the majority of material and debris hauling completed within 60 days. Estimated construction personnel commute trips is 10 trips/day per site, with an estimated average round trip commute of 40 miles.

Vehicle trips associated with construction activities would generally take place between the hours of 6:00 a.m. and 5:00 p.m. Most trips would occur during off-peak traffic hours between 9:00 a.m. and 4:00 p.m.

The LOS standard for the roads used to access Sites 9-13 may increase to "B" due to the construction of the levees. County Road 16, which comes off Road 102 main route between Woodland and Knights Landing, will have more construction related traffic as a result of this project. This road and County Road 116B along the Sacramento River are rarely used during the day since there are only a few small residential homes located along those roads. Most of the traffic on those roads is driven by agricultural vehicles and delivery trucks. There will be a temporary increase of usage on these roads during construction activities. County Road 16 will be open during construction of Sites 12 and 13 and a traffic control plan will be implemented as required. County Road 116, which comes out of the town of Knights Landing at the north end of the project area, will also be open to traffic but haul truck traffic to the construction sites will increase during those activities.

Due to the construction of the levee on County Road 116B (Site 11), a 1-mile section of this road will be closed temporarily to 2-way traffic. The road will be closed where it intersects at County Road 16 and 116A on the south portion of Site 11 construction activity. Residents and farmers who live and work on County Roads 16 and 116A will still be able to access their homes and properties from Road 102 running between Woodland and Knights Landing. There are two private dirt farm roads that can be utilized on the land side of Site 11 during construction.

At the north end of Site 11, the road will be closed to traffic where County Road 116B drops down off the levee splitting from the levee gravel road used to access Sites 9 and 10. This area does not have any residential homes, only agricultural land which is easily accessible via dirt farm roads just before where the road closure will take place.

3.7.4 Mitigation

Substantial impacts to traffic would occur by the project dependent upon traffic flow and capacity. The most severe effects would occur by the work for Site 11 as portions of County Road 116B, which is located on top of the Corps levee at site 11, would need to be entirely closed and traffic detoured around the site to complete the work. However, implementation of the following mitigation measures would reduce potential traffic- and circulation-related effects to less-than-significant levels. These measures would be incorporated as appropriate in construction plans and specifications.

3.7.4.1 Traffic Control Plan

- a. The construction contractor would prepare and implement a traffic control plan (or plans) that addresses conditions at each site. The plan(s) would be approved by the Yolo County Department of Public Works, the Town of Knights Landing if their city streets would be used, and Caltrans, as applicable, prior to the initiation of construction activities. The plan(s) would include measures to (1) reduce, to the extent practicable, the number of vehicles (construction-related and other) on the roadways adjacent to the sites; (2) reduce, to the extent practicable, the interaction between construction equipment and other vehicles; and (3) promote public safety through actions aimed at driver and road safety.
- b. Prior to implementation of construction activities, the contractor would verify that all roads, bridges, culverts, and other infrastructure along the access routes can support expected vehicle loads.
- c. The plan(s) would identify all intended haul routes, locations of signage, locations of flaggers, approved permits, documentation of coordination with local and State agencies, and locations of potential delays to vehicle and pedestrian traffic. Construction vehicles would follow established truck routes to the greatest extent practicable.

3.7.4.2 Travel Flow and Access

- a. The contractor would maintain travel traffic on all roads adjacent to the site and on all affected public roads during the construction period. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, would be as required by State and local authorities having jurisdiction.
- b. The traveling public would be protected from construction and work damage to person and property. The contractor's traffic on roads selected for hauling material to and from the site would interfere as little as possible with public traffic.
- c. Traffic controls on major roads and collectors would include flag-persons wearing safety vests and using "stop/slow" paddles to direct drivers.
- d. Detour and road closure signs will be placed on both ends of County Road 116B during construction activities on Site 11.
- e. Through access for emergency vehicles would be provided at all times.
- f. Access to public transit would be maintained, and movement of public transit vehicles would not be impeded as a result of construction activities.
- g. Access to driveways and private roads would be maintained.

3.7.4.3 Construction-Related Traffic Measures

- a. Construction parking would be restricted to the designated staging areas.
- b. During peak periods, construction-generated traffic would avoid roadway segments or intersections that are at, or approaching, a level of service that exceeds local standards.
- c. The speed of all construction vehicles would be limited to a maximum of 10 miles per hour on the levee access roads. The contractor would provide a minimum of four construction speed limit signs large enough to be visible by the passing traffic. The speed limit signs would be in English units and posted on the levee and on each of the access roads. Signs would be posted for both incoming and outgoing traffic.
- d. Construction warning signs would be posted in accordance with the local standards or those set forth in the *Manual on Uniform Traffic Control Devices* (FHWA 2012) in advance of the construction area and at any intersection that provides access to the construction area.
- e. A sign, at least one square yard in size, would be posted at all active construction sites that gives the name and telephone number or email address to contact with complaints regarding construction traffic.
- f. Measures would be implemented as needed to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. The construction contractor would minimize the amount of mud transported onto paved public roads by vehicles or runoff.
- g. Rock, dirt, and/or other fill materials would be prevented from being accidentally dropped from trucks traveling on highways to and from the erosion sites.
- h. Any damage to roads caused by construction operations would be repaired to pre-project conditions.

3.8 Cultural Resources

3.8.1 Existing Conditions

3.8.1.1 Prehistory and Ethnography

The project area is within the ethnographic areas previously occupied by the Patwin and Nisenan. The Patwin occupied a territory that encompassed the southern portion of the Sacramento River Valley to the west of the river, and from the town of Princeton south to Benicia and the San Pablo and Suisun Bays. Peoples in this 3,600-square-mile territory survived through hunting, fishing, and gathering. The Patwin tribes were not politically unified and consisted of a variety of tribelets with close linguistic and cultural resemblances. The numbers of Patwin tribelets dwindled through conversion attempts of the Spanish missionaries, reservation relocations by the United States, and severe reduction in numbers due to outbreaks of malaria and smallpox in the 1800s. By the 20th century, few Patwin remained; the largest concentration was located in the vicinity of Cortina and Colusa (Johnson 1978).

The Nisenan were a southern linguistic group of the Maidu people, sometimes referred to as the “Southern Maidu.” The name “Nisenan” was a self-designation by the native groups occupying the Yuba and American River drainages (Wilson and Towne 1978). Along with the Maidu and Konkow, the Nisenan form a subgroup of the California Penutian linguistic family. The Nisenan territory covered a significant portion of the Central Valley, including the area along the Feather River, and extended into the Sierra Nevada.

Archeological investigations place the Nisenan antecedents as occupying the region from approximately 1400 B.C. to 1800 A.D. The Nisenan often inhabited areas near rivers including the American, Sacramento, Bear, Feather, and Yuba Rivers (Moratto 1984).

Generally, villages consisted of 15 to 20 people or more, with as many as several hundred in one group. House structures were conical or dome-shaped, and covered with earth, tule mats, grass thatch, and occasionally bark. These structures, along with the ceremonial lodges or chief’s residences, were large, circular or elliptical in plan form, and situated on low knolls near streams and above marshy flood plains.

The Nisenan mostly settled in permanent or winter settlements and followed a yearly gathering cycle that led them away from the lowlands and into the hill country each summer. During the annual gathering cycle, the Nisenan harvested acorns, nut meat, pine nuts, buckeyes, and sunflower seeds and often stored these for long periods. Other vegetation such as greens, tule and cattail roots, brodiaea bulbs, manzanita berries, black berries, and California grapes were harvested and eaten as they ripened. All valley groups, including the Nisenan, fished for trout, perch, chub, sucker, hardhead, eels, sturgeon, and Chinook salmon. Fishing methods included the use of hooks, nets, harpoons, traps, weirs, and poison (Moratto 1984).

3.8.1.2 History

The first recorded exploration of Alta California was by the Spanish in 1542. Further exploration of the interior of California did not occur until the 18th and 19th centuries. Gabriel Moraga, one of the first Europeans in the upper Sacramento Valley, explored the lower reaches of the Feather River in 1808. Then, in May 1817, an expedition led by Father Narciso Durán, accompanied by another relatively well-known Spanish explorer, Luis Argüello, who in 1820 named the Feather River, made a voyage by boat up the Sacramento River, probably as far north as the confluence with the Feather River. By 1828 and throughout the next 2 decades, fur trappers from the Hudson’s Bay Company and American Fur Company entered the Central Valley.

Historically, the Sacramento River was the major transportation route for goods and services up and down the Sacramento Valley. Knights Landing in Yolo County was one of the many landings and communities

that arose along the river's banks. It was established first as a ferry crossing in 1843 by William Knight, and then as a town in 1853 by Charles F. Reed (Hoover et al. 1990). Today it remains a small but viable community for recreational fishing and as a residential/commercial area serving the surrounding farmland.

In April 1849, John Sutter sold a 3 mile-long, 1 mile-wide strip of land along the Sacramento and Feather Rivers. The three men who purchased the land founded one of many short-lived "mushroom" or "satellite" towns along the Sacramento River, which they named Vernon. The winter of 1848-1849 was so dry that the Feather River was not navigable. Thus, northbound boats had to be unloaded at Vernon and their cargoes transferred to wagons. The town's first settlers envisioned a prosperous future for Vernon as the head of navigation for the region. Lots quickly sold for high prices.

Heavy rains during the following winter enabled ships to reach Marysville, which rendered Vernon and many other river towns economically unimportant. Although the town became the county seat briefly in 1851, by 1853 the hotel and post office were closed. The only remnants of the town today are Vernon Township and Vernon Road, named in its memory. A small settlement called Verona was later established on the site (Hoover et al. 1990), and the Verona School still remains as an abandoned structure.

3.8.1.3 Records and Literature Search

Because the project area is in Yolo County, records and literature search of the individual project sites were obtained from the Northwest Information Center at California State University, Sonoma. Areas of Potential Effect (APE) were defined as each levee site footprint including the levee reconstruction, permanent maintenance and temporary construction easements. The latter are the furthest away from the toe of the existing levee site. Borrow sites would not be expected to have cultural resources, since existing borrow areas have been used previously for levee material or for other commercial purposes. Staging areas would be located on top of or adjacent to the existing levees and haul routes for the levee materials would be on established roads.

The records and literature search was received from CSU, Sonoma, on February 25, 2009. Four sites were found within the levee site APEs:

- The Colusa Drainage Canal and Knights Landing Ridge Cut were identified as CA-YOL-183H.
- CA-YOL-184H is a surface distribution of farming and ranching equipment and domestic debris.
- In 1986, Kathleen Les recorded an oak grove as a historic resource based on the assumption that some of the trees were 300 to 400 years old.
- CA-YOL-43 was recorded in 1960 possibly as a prehistoric site. The site form, which did not indicate the type of site, noted only that there were no surface artifacts and that the majority of the site had been removed to reinforce a levee. This site lies about ¼ mile upstream from the upper end of levee repair Site 9.

Additional resources that were checked for the presence of cultural resources were the National Register of Historic Places web site (NPS 2011) and *Historic Spots in California* (Hoover et al. 1990). No historic properties or Places of Historic interest were found in or near the levee site APEs.

3.8.1.4 Field Inventory

All six levee reconstruction sites have been subjected to on-the-ground surveys in 2004 by a Corps archeologist qualified under the Secretary of the Interior's Standards for Professional Archeologists. The toe of the levee and footprints of the proposed spoil berms were examined. Surveys for all the levee sites consisted of walking the entire lengths of the site footprints parallel to the levees, including the berm, and

permanent and temporary construction easements. Borrow sites proposed for each contract area were also walked. The areas were examined in 1998-1999 for the 1999 EA/IS, and again in 2002-2004. Since there are often ditches adjacent to the levee toes and the agricultural fields are seasonally cultivated, ground visibility was good to excellent. No cultural materials were discovered. Since 8 years has passed since the last cultural resources surveys of the sites in 2004, the sites will be reexamined for the presence of cultural resources for the current proposed project.

3.8.2 Effects

3.8.2.1 Significance Criteria

An alternative would be considered to have a significant adverse effect on cultural resources if it diminishes the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Types of effects include physical destruction, damage, or alteration; isolation or alteration of the character of the setting; introduction of elements that are out of character; neglect; and transfer, lease, or sale.

3.8.2.2 No-Action Alternative

Under the No-Action Alternative, no activities would be conducted to repair the six levee sites. Inasmuch as there are no known NRHP eligible sites, continued erosion of the levees would have no effect on historic properties.

3.8.2.3 National Register of Historic Places Evaluation

There are two known prehistoric and historic period sites thought to be within or adjacent to the levee site APEs.

- CA-YOL-184/H was recorded in 1992 as a surface distribution of farming and ranching equipment and domestic debris. The recorders noted in 1992 that the resource was probably associated with agricultural use in the surrounding region from the first half of the 1900's. However, field investigations in 2004 revealed that the farm debris recorded as CA-YOL-184/H has been removed and the area is currently farmed. No trace of the site remains.
- CA-YOL-183/H, the KLRC, was constructed 1913-1915, for the purpose of providing drainage from the Colusa Basin area northwest of Knights Landing through to the Yolo Bypass. Approximately 6 miles long and 800 feet wide, it was constructed by excavating the soil out to form a canal. The excavated material was dumped to form the levees on either side of the canal. The KLRC is over 50 years old and therefore meets the threshold for evaluation of a cultural property for eligibility to the NRHP. The landside of the left levee (looking downstream) of the KLRC is within the APE for Sites 12, 12A, and 13 for a total distance of 18,000 linear feet.

Despite its age, the KLRC does not appear to meet any of the criteria for eligibility to the NRHP. Individually, the KLRC is not associated with any person or event important in our history (Criteria a and b), and it does not have the potential to yield information important in history (Criterion d). It does not represent an important method of construction, nor is it distinctive of any particular type or period (Criterion c). The KLRC also has not retained integrity since it has been subject to erosion and repaired numerous times. Several evaluations by various archeological consultants and Corps archeological staff were completed in 1986, 1992, 1998, and 2002. All noted the numerous alterations and erosion to the KLRC.

Within a larger historical context, the canal was one of hundreds of features such as canals, lateral ditches, drains, levees, and other features of the overall farming region which were constructed to convey water to desired locations and remove it from undesired locations. These water conveyance systems, which were

built over many years at various times are still in use and are dominant characteristics of the landscape in the Central Valley. The KLRC is a prominent feature known to local residents and farmers, but one that is easily overlooked by the casual traveler since no public roads are located on its levees. Levees are also a common physical presence of the area as a glance at the U.S.G.S. 7½' Knights Landing quadrangle readily shows.

The proposed project may affect a pump house, which is an associated feature of the KLRC. An archeological field investigation must be undertaken to determine if the pump house is older than 50 years old. If it is the resource will need to be recorded and an evaluation will need to be completed to determine if the pump house is eligible for listing in the NRHP. An updated archeological field investigation for the current overall proposed project area must be completed in order to comply with the National Historic Preservation Act of 1966.

3.8.3 Mitigation

The Corps has made preliminary determinations of non-eligibility for the known cultural resources within the APE. Concurrence with those preliminary determinations will be solicited from the State Historic Preservation Officer and potentially interested Native Americans. If the SHPO concurs with the Corps' determinations of eligibility for the KLRC and the any other cultural resources found during the updated archeological field investigations then the proposed project would have no adverse effects and there would be no need for mitigation measures.

However, if archeological deposits are found during project activities, work would be stopped pursuant to 36 CFR 800.13(b), Discoveries without Prior Planning, to determine the significance of the find and, if necessary, complete appropriate discovery procedures.

4.0 CUMULATIVE AND GROWTH-INDUCING EFFECTS

4.1 Cumulative Effects

A cumulative effect is the effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). At present, there are no other levee reconstruction projects planned for this area. The Sacramento River Bank Protection Project (SRBPP) is an authorized project that focuses on repairs to waterside bank and levee erosion on the Sacramento and Feather Rivers. Several erosion sites within the vicinity may be repaired under SRBPP, but not affect actions of the Mid-Valley project. Lands near the project contract areas are expected to remain as farmland.

The town of Knights Landing located near the levee repairs is experiencing a small growth in residential construction, but this is not located adjacent to the project levee repair sites. There would be a small permanent loss of farmland due to the project levee footprints where spoil berms and environmental mitigation sites are proposed. However, this loss would be offset by the increased levee stability which would protect the adjacent farmlands from flooding and diminish economic losses associated with the loss of crops due to flooding. Loss of special status species habitat, that is, the elderberry shrubs and giant garter snake habitat, would be mitigated onsite. Any effects on air quality would only be short-term. Loss of habitat, including wetlands, would be mitigated and/or replaced by natural re-emergence depending on the resource type. There would be less than significant effects on water quality with the inclusion of mitigation measures.

As described in Section 3.5, the proposed action would have construction-related effects on air quality as a result of the equipment needed to complete the substantial amount of earth-moving activity that would be required. Existing air quality thresholds for O₃ and particulate matter are already exceeded and in

violation of State and Federal standards in the affected air basin. Therefore, any additional contributions of pollutants resulting from the project would be potentially significant and cumulative.

Mitigation for the proposed action consists of BMPs and the implementation of on-site mitigation measures, including control of dust, and proper maintenance of construction equipment. Although some air quality thresholds would be exceeded, implementation of the mitigation measures identified in Section 3.5 would reduce impacts to a less-than-significant level. With the implementation of the mitigation measures, the incremental effect of the proposed action on air quality is not cumulatively considerable and is therefore less than significant.

There are no non-cumulative GHG emission impacts. From a climate change perspective, GHG impacts are recognized as exclusively cumulative impacts. Due to the size and short-term construction emissions the additive effect of the proposed project's GHG emissions would not result in a reasonably foreseeable cumulatively considerable contribution to global climate change.

4.2 Growth-Inducing Effects

The proposed project is not likely to have any growth-inducing effects because only small segments of the levee system will be reconstructed, thereby providing greater flood protection for a limited area. Growth in Yolo County is proceeding at rapid rates independently of the project in accordance with the Yolo County General Plans.

5.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

5.1 Federal Laws and Regulations

- **Clean Air Act (42 U.S.C. 1857 et seq.), as amended and recodified (42 U.S.C. 7401 et seq.).** *Compliance.* The proposed project is not expected to violate any Federal or State air quality standards, or hinder the attainment of air quality objectives in the local air basins. The Corps has determined that the proposed project would have no significant adverse effects on the future air quality of the area and is in compliance with this act.
- **Clean Water Act (33 U.S.C. 1251 et seq.).** *Partial Compliance.* A Section 404 (b)(1) water quality analysis has been completed for the project (Appendix A). Section 401 Water Quality Certification is also required since the agricultural drainage ditch located at Sites 12 and 13 contains wetlands that were historically and are currently hydraulically connected to other waters of the U.S. The ditch would be realigned and reconnected back to these waters of the U.S once construction of the project is completed. The project would also require an NPDES permit, through the development of a Stormwater Pollution Prevention Plan by the project contractor(s), since each project area would disturb more than one acre of ground. A separate Section 404 permit from the Corps Regulatory Division would also need to be obtained by the CVFPB or Knights Landing Ridge Drainage District if they wish to pursue working on the project (at Sites 12, 12A, and 13) themselves under an EIP.
- **Endangered Species Act (16 U.S.C. 1531 et seq.).** *Partial Compliance.* The Federally listed valley elderberry longhorn beetle and giant garter snake and their associated habitats would be adversely affected by project activities. Two previous Biological Opinions have been obtained from the USFWS through the Section 7 consultation process. The Corps will seek reinitiation of formal Section 7 consultation and an amended Biological Opinion through submission of this draft EA/IS to the USFWS.

- **Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.** *Compliance.* The order directs all Federal agencies to identify and address adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The proposed project would not significantly affect farm workers or residents, or have disproportionate adverse effects to minority and low-income populations within the project study area.
- **Executive Order 11988, Flood Plain Management.** *Compliance.* This Executive Order requires the Corps to provide leadership and take action to (1) avoid development in the base (1 in 100 annual event) flood plain (unless such development is the only practicable alternative); (2) reduce the hazards and risk associated with floods; (3) minimize the effect of floods on human safety, health, and welfare; and (4) restore and preserve the natural and beneficial values of the base flood plain.

The project would provide increased stability to existing levees in selected areas that have been determined to require reinforcement. This would decrease the risk of flooding and hazards associated with floods. It would not create development in the base flood plain but would preserve the natural and beneficial values associated with the present agricultural uses.

- **Executive Order 11990, Protection of Wetlands.** *Compliance.* This order directs the Corps to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in implementing Civil Works projects. Emergent marsh that would be affected by the project would re-establish naturally in relocated ditches. The proposed work would result in more than a 2.5:1 replacement ratio. Design of the relocated ditches would enable better access by wildlife.
- **Farmland Protection Policy (U.S. Code Title 7, Chapter 23).** *Compliance.* The purpose of this regulation is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that Federal programs are administered in a manner that, to the extent practicable, will be compatible with State, unit of local government, and private programs and policies to protect farmland. A Farmland Conversion Impact Rating (Form AD-1006) would need to be completed and submitted to the local USDA/NRCS office for approval.
- **Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661, et seq.).** *Compliance.* This act requires Federal agencies to consult with the USFWS and State fish and game agencies before undertaking projects that control or modify surface water (water projects). The consultation is intended to promote the conservation of wildlife resources by preventing loss of or damage to fish and wildlife resources and to provide for the development and improvement of fish and wildlife resources in connection with water projects. The USFWS has participated in site visits and review of the proposed design refinements and has submitted a draft Fish and Wildlife Coordination Act Report (Appendix B). The Corps will also coordinate this project and EA/IS with the California Department of Fish and Game to seek their comments regarding State fish and wildlife resources.
- **Migratory Bird Treaty Act (16 U.S.C. 703 et seq.).** *Compliance.* Construction would be accomplished to avoid destruction or harassment of active bird nests or the young of birds that breed in the area. A qualified biologist would survey the area prior to initiation of construction. If active nests are located, a protective buffer would be delineated, and the entire area would be avoided to prevent destruction of nests or harassment of young until the birds are no longer on the nests.

- **National Environmental Policy Act (42 U.S.C. 4321 et seq.).** *Partial Compliance.* This draft EA/IS partly fulfills requirements of NEPA. After a 30-day public review period, the final EA/IS will incorporate public comments, as appropriate.
- **National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.).** *Partial Compliance.* The project is in partial compliance with Section 106 of the National Historic Preservation Act (36 CFR 800). A letter dated November 18, 2004, was sent to the California State Historic Preservation Officer (SHPO) asking for their concurrence with the Corps' determination of the APE. An updated letter will be sent to the SHPO (Appendix E) documenting the current APE of the proposed project, asking for their comment and concurrence with the Corps' determination of eligibility and effect. The Corps would ensure that full compliance is required to obtain a FONSI, which must be achieved prior to implementation of project construction.

A request to the Native American Heritage Commission for potentially interested parties was sent on March 12, 2009. Letters to potentially interested Native Americans asking for their knowledge of locations of archeological sites or areas of traditional cultural interest or concern will be sent.

5.2 State of California Laws and Regulations

- **California Environmental Quality Act, California Public Resources Code, Section 21000, et. seq.** *Partial compliance.* The act requires disclosure of environmental effects, alternatives, potential mitigation, and environmental compliance of the proposed action. This document will be adopted as an EA/IS and will be accompanied by a Mitigated Negative Declaration. These CEQA documents will provide full compliance with the act.
- **California Endangered Species Act of 1984.** *Compliance.* The CDFG administers this act, which requires non-Federal lead agencies to prepare a Biological Assessment if a project may adversely affect one or more State-listed endangered species. The restoration project would not adversely affect any State-listed endangered species.
- **California Clean Air Act of 1988.** *Compliance.* The YSAQMD determines whether project emission sources and emission levels significantly affect air quality based on Federal standards established by the EPA and State standards set by the California Air Resources Board. The restoration project is in compliance with all provisions of Federal and State Clean Air Acts.
- **California Fish and Game Code.** *Compliance.* Under sections 1600-1616, the CDFG regulates activities that would substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed that falls under CDFG jurisdiction. In practice, CDFG marks its jurisdictional limit at the top of the stream or lake bank, or the outer edge of the riparian vegetation, where present, and sometimes extends its jurisdiction to the edge of the 100-year floodplain. Notification is required prior to any such activities and CDFG will issue an agreement with any necessary mitigation to ensure protection of the State's fish and wildlife resources. The local sponsor would be responsible for obtaining any needed Streambed Alteration Permit.

6.0 COORDINATION AND REVIEW OF EA/IS

6.1 Agencies and Persons Consulted

This draft EA/IS and the proposed design refinements have been coordinated with all the appropriate government agencies including USFWS, CVFPB, DWR, CDFG, SHPO, and the local RD managers.

6.2 Public Involvement and Review

Public involvement for the Mid-Valley Project in its entirety has a long history, beginning with a Notice of Intent published on February 1, 1990, in the *Federal Register* prior to preparation of the Programmatic EIS/EIR for the Sacramento River Flood Control System Evaluation. The Reclamation Board sponsored four environmental scoping meetings to provide information to the public and solicit input.

The draft EA/IS prepared to address design changes in the Mid-Valley project was circulated for public and agency comment in 1995. A final EA/IS and FONSI/Mitigated Negative Declaration was prepared in March 1996. Five comments were received.

Because of problems at several construction sites due to high waters, design revisions were again considered. Another draft EA/IS was distributed to the public and agencies for review and comment in 1999. The final EA/IS with FONSI/Mitigated Negative Declaration was prepared in November 1999. One comment was received.

Due in part to rising costs and in part to levee problems at some sites since 1999, additional design refinements have been prepared. The present draft EA/IS, which has been prepared to address those refinements, will be circulated for public and agency review for 30 days (Appendix F). Comments received will be incorporated into the final EA/IS along with a final FONSI/Mitigated Negative Declaration.

7.0 CONCLUSIONS

This draft EA/IS evaluates the environmental effects of the proposed reconstruction at six levee sites. Potential adverse effects to vegetation and wildlife, special status species, air quality, traffic, and cultural resources were analyzed. Other resources not reanalyzed in detail for this draft EA/IS include soils, water quality, fisheries, socioeconomics/land use, recreation/aesthetics/visual resources, noise, and hazardous, toxic, and radiological waste. These were addressed extensively in the previous two EA/IS's, and significant effects are not anticipated for the proposed design refinements.

This draft EA/IS will be submitted to the USFWS to reinitiate formal Section 7 consultation for the valley elderberry longhorn beetle and the giant garter snake. The adverse effects to the snake or its habitat and the elderberry shrubs, host of the beetle, would be mitigated to less than significance by implementing avoidance measures during construction and by mitigating for loss habitat by following the reasonable and prudent measures, and terms and conditions in the Biological Opinion issued by the USFWS.

A draft CAR was prepared by the USFWS and their design and mitigation recommendations were carefully considered in preparing this draft EA/IS report (Appendix B).

The proposed project would not result in any moderate, significant, short-term, long-term, or cumulative adverse effects. Therefore, construction of the proposed project would not significantly affect the quality of the human environment. Based on this evaluation, the proposed action meets the definition of a FONSI as described in 40 CFR 1508.13. Therefore, a draft FONSI has been prepared and accompanies this draft EA/IS.

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PLATES

