

FINAL
City of West Sacramento
Levee Improvement
Early Implementation Project

Environmental Assessment | September 2008



Prepared For:

U.S. Army Corps of Engineers
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On Behalf of:

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(ICF J&S 00887.07.) Sacramento, CA. Prepared on behalf of West Sacramento
Area Flood Control Agency for U.S. Army Corps of Engineers.

Environmental Resources Branch

FINDING OF NO SIGNIFICANT IMPACT

City of West Sacramento Levee Improvement,
Early Implementation Project, California

I have reviewed and evaluated the information presented in this Environmental Assessment (EA) prepared for proposed federal levee alterations, pursuant to 33 USC 408, in West Sacramento, California. The work is being funded and performed by the West Sacramento Area Flood Control Agency (WSAFCA).

The possible consequences of the work described in the EA have been evaluated with consideration given to environmental, socioeconomic, cultural, and engineering feasibility. The environmental effects have been coordinated with the U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) Fisheries, California Historic Preservation Officer (SHPO), the California Department of Fish and Game, and the City of West Sacramento.

Consultation with USFWS and NOAA Fisheries on Federally-listed species has been completed and no adverse effects from the project were identified. Cultural resources surveys have been conducted and no known cultural resources would be affected by the project. The Corps has received concurrence from SHPO that there would be no adverse effect to historic properties.

No significant impacts on resources would result from the project. Best management practices, avoidance protocols and minimization measures would be utilized during construction to reduce effects related to air quality, sensitive biological resources, cultural resources, water quality, noise and utility systems.

Based on my review of the EA, I have determined that the proposed levee improvement project, would have no significant, long-term effects on the environment. Based on these considerations, I am convinced that there is no need to prepare an environmental impact statement. The EA and Finding of No Significant Impact provide adequate environmental documentation for the proposed action.

Date

Thomas C. Chapman, P.E.
Colonel, U.S. Army
District Engineer

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Threatened, and Proposed Species for the 7.5-minute
Sacramento West Quadrangle and Yolo County**

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Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
af	acre-feet
Alquist-Priolo Act	Alquist-Priolo Earthquake Fault Zoning Act
APE	area of potential effects
ARB	California Air Resources Board
ASTM	American Society for Testing and Materials
Basin Plans	Water Quality Control Plans
BMPs	best management practices
CAA	federal Clean Air Act
CEQ	Council on Environmental Quality
CERCLA, also known as Superfund	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CIHC	California Indian Heritage Center
City	City of West Sacramento
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
Common Features	American River Common Features Project
CVFPB	Central Valley Flood Protection Board
CWA	federal Clean Water Act
dB	Decibel
dBA	A-weighted decibel
Delta	Sacramento–San Joaquin Delta
DFG	California Department of Fish and Game
DPF	Diesel Particulate Filters
DPM	diesel particulate matter
DWR	California Department of Water Resources
EA	Environmental Assessment
EDR	Environmental Data Resources
EIP	West Sacramento Levee Improvement Early Implementation Project
EPA	U.S. Environmental Protection Agency

ESA	federal Endangered Species Act
ESU	Evolutionarily Significant Unit
FCP	frac-out contingency plan
FEMA	Federal Emergency Management Agency
Flood Control Project	Sacramento River Flood Control Project
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FR	Federal Register
FTA	Federal Transit Administration
FWCA	Fish and Wildlife Coordination Act
GHG	greenhouse gases
I-5	Interstate 5
I-80	Interstate 80
ISA	International Society of Arboriculture
L _{dn}	day-night level
L _{eq}	equivalent sound level
L _{max}	maximum sound level
L _{min}	minimum sound level
LOS	level of service
L _{xx}	percentile-exceeded sound level
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MBTA	Migratory Bird Treaty Act of 1918
MOA	Memorandum of Agreement
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NCCP/HCP	Natural Communities Conservation Plan/Habitat Conservation Plan
NCCPA	Natural Community Conservation Planning Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOX	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NRHP	National Register of Historic Places
OHWM	ordinary high watermark
Plan	Central Valley Flood Protection Plan
RD 537	Reclamation District 537
RD 900	Reclamation District 900
Rec Board	Reclamation Board of the State of California
RM	River Mile
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SAFCA	Sacramento Area Flood Control Agency

SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SPCCP	spill prevention, control, and countermeasure program
SPRR	Southern Pacific Railroad
SRFCP	Sacramento River Flood Control Project
State Water Board	State Water Resources Control Board
SVAB	Sacramento Valley Air Basin
SWP	State Water Project
SWPPP	stormwater pollution prevention plan
TACs	toxic air contaminants
TDS	total dissolved solids
TMDL	total maximum daily load
USACE	U.S. Army Corps of Engineers
USC	United States Code
USGS	U.S. Geological Survey
USGS	U.S. Geological Survey
VOCs	volatile organic compounds
West Sacramento Project	Sacramento Metropolitan Area, California, Feasibility Report
WRDA	Water Resources Development Act of 1996
WSAFCA	West Sacramento Area Flood Control Agency
WSLIP	West Sacramento Levee Improvements Program
YSAQMD	Yolo-Solano Air Quality Management District

Purpose of the Proposed Action

The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the West Sacramento Levee Improvement Early Implementation Project (EIP). The purpose of the proposed action is to improve a critical section of levee in the redevelopment area along the riverfront of the city of West Sacramento to reduce flood risk to public safety, private property, and public infrastructure. This would be accomplished by improving a 475-linear foot reach (530-linear foot disturbance area) of the Sacramento River levee to address the problems of through- and under-seepage (Figure 1-1, “City of West Sacramento Early Implementation Project Location”). A regional setting depicting the project location and the Sacramento and American Rivers is presented in Figure 1-2, “Regional Setting of the West Sacramento Early Implementation Project.” The improvements would enable this levee reach to meet the most recent federal levee design criteria for seepage, the need for which has been established through geotechnical and other engineering studies.

WSAFCA is a Joint Powers Authority created in 1994 through a Joint Exercise of Powers Agreement by the City of West Sacramento (City), Reclamation District 900 (RD 900), and Reclamation District 537 (RD 537). WSAFCA was established to coordinate the planning and construction of flood protection facilities within the boundaries of the member agencies and to finance the local share of flood control projects.

The proposed levee improvement is compatible with and complementary to an overall program called the West Sacramento Levee Improvements Program (WSLIP) (Figure 1-3, “WSLIP Program Area”). The purpose of the WSLIP is to achieve a minimum of 200-year flood protection for the entire city by improving the approximately 50 miles of levees protecting West Sacramento. A 200-year flood is a flood that has a 0.5% chance of occurring in any given year. Implementation of the EIP is part of achieving that goal. Further detail on the EIP and the WSLIP are provided under “Relationship of the Proposed Action to the WSLIP and Independent Utility” below.

Note: References in this document to levels of flood protection (such as 100-year or 200-year) are based on WSAFCA’s deterministic approach (the current FEMA method) and should not be taken as USACE concurrence that such levels will be achieved when the USACE probabilistic approach is utilized to define

system performance. In any case, flood risk to the WSAFCA service area would be reduced by the proposed project.

This Environmental Assessment (EA) has been prepared to fully assess the effects of constructing and operating the proposed EIP (also referred to as “proposed project” or “project”), as required under the National Environmental Policy Act (NEPA). NEPA compliance is triggered under the authority of the U.S. Army Corps of Engineers (USACE) to approve modifications to a federal project levee, as are most of the levees under WSAFCA’s program. WSAFCA is in the process of requesting approval from the Central Valley Flood Protection Board (CVFPB) to construct the EIP. As part of its approval process, the CVFPB will request a determination from the USACE under Section 14 of the Rivers and Harbors Act of 1899 (33 USC § 408), allowing modifications of the federal project as proposed by WSAFCA. USACE authorization consists of approval from the Chief of Engineers, or his designee, for alterations to certain public works as described in 33 USC § 408.

Need for and Objectives of the Proposed Action

Based on studies performed by California Department of Water Resources (DWR) and the WSAFCA’s engineering consultants, geotechnical issues have been identified throughout the levee system that protects the City. In particular, the proposed EIP project site has been identified as not meeting USACE’s geotechnical criteria for seepage.

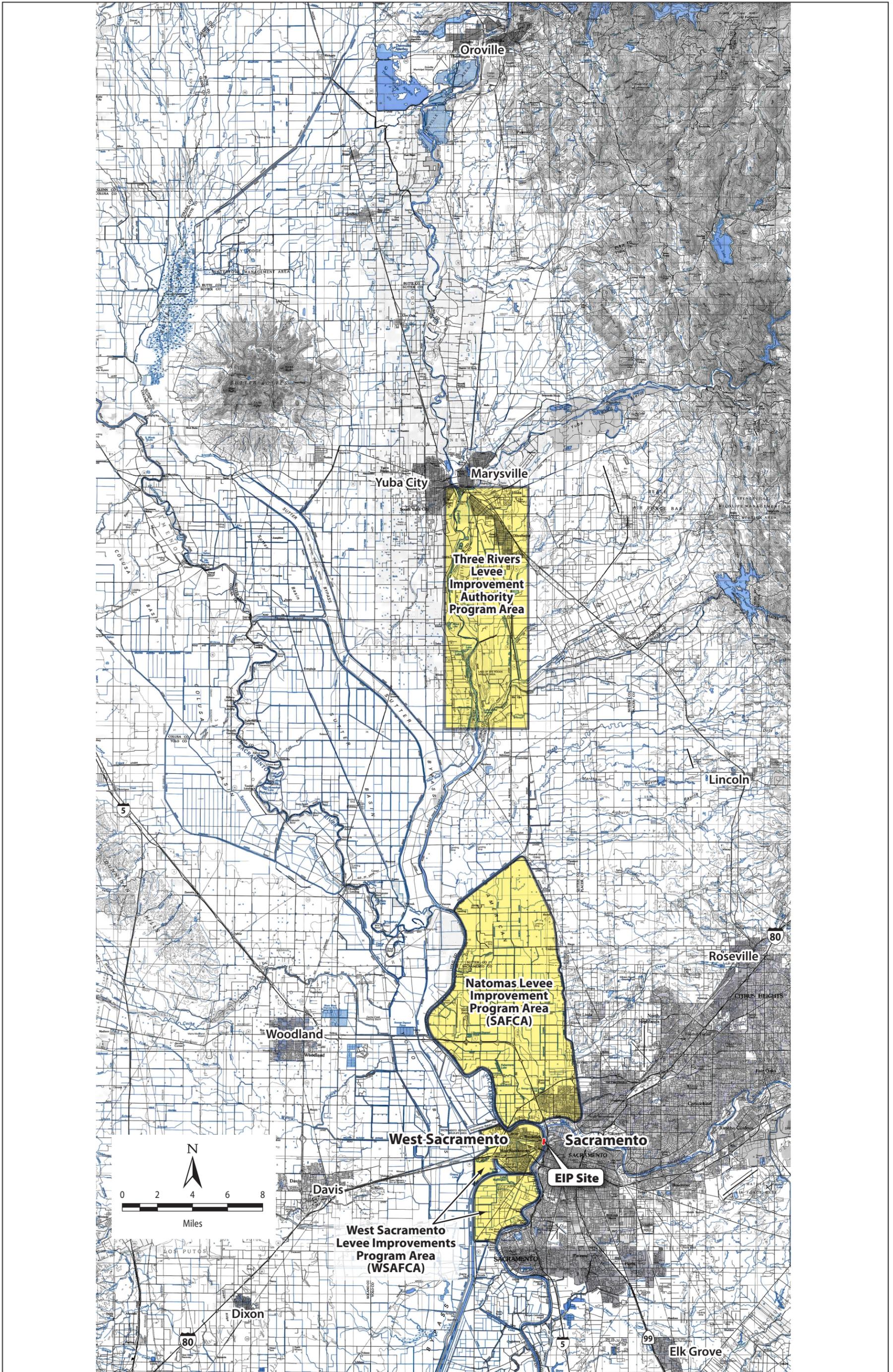
Seepage is a phenomenon wherein water moves outward and downward away from the river channel, either through the levee cross section (i.e., through-seepage) or below the levee and surrounding land surface (i.e., under-seepage) (Figure 1-2). The key problem associated with seepage is levee breach or collapse, which occurs when the earth material within or underlying the levee becomes undermined by the pressure of the seeping water. A subform of seepage is the phenomenon of soil piping, which occurs when a void in the earth material becomes exploited by moving water, causing the void to rapidly increase and threaten the levee integrity. Several factors contribute to seepage, including high water pressure within the water course (such as during periods of high river stage, which are common based on local hydrology) and pervious earth material within or underlying the levee.

The proposed EIP is intended to meet the following objectives:

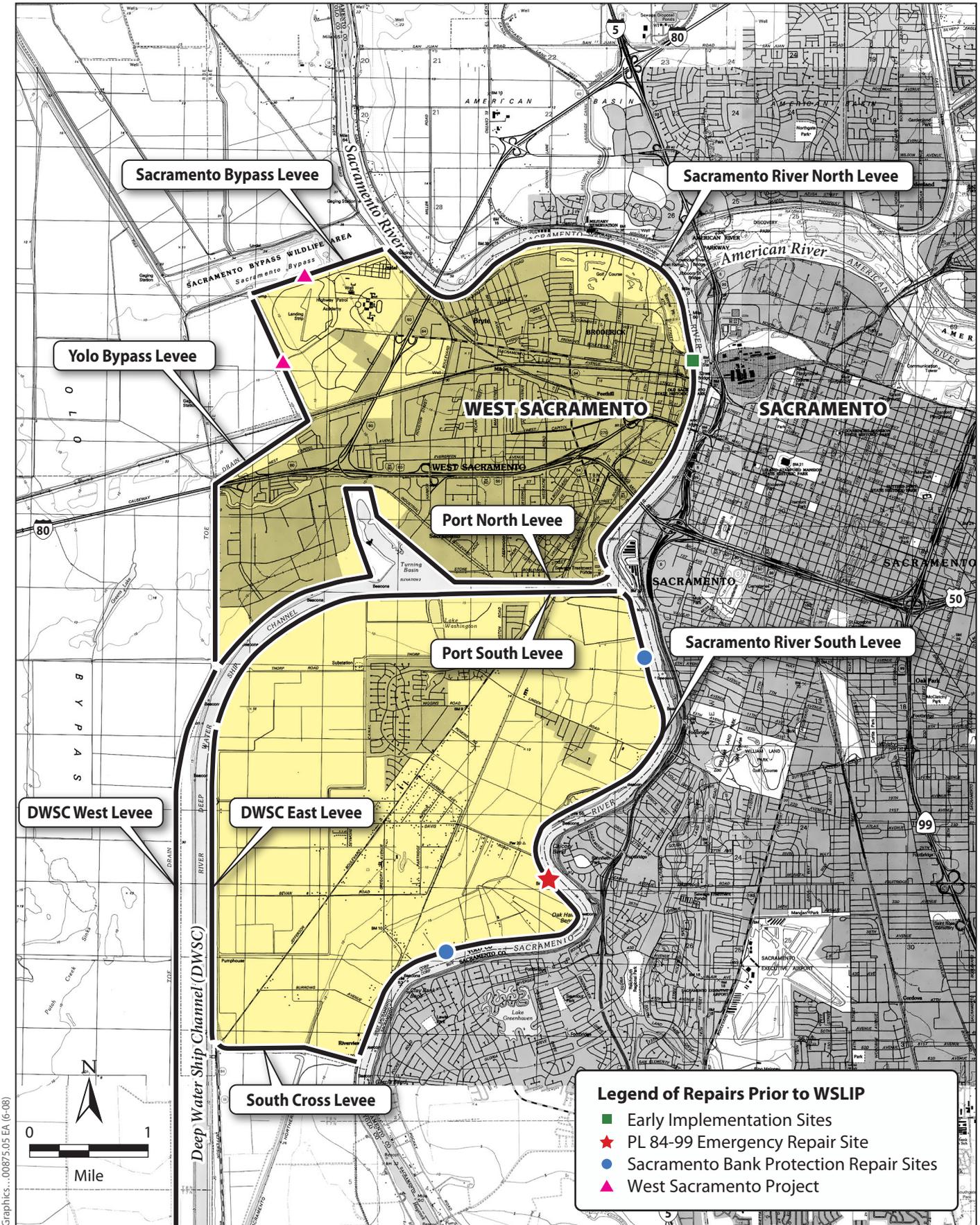
- the proposed project will alleviate under- and through-seepage concerns at the site;
- the cost will not exceed available funding;
- the proposed project will not create an increased flood risk problem for surrounding levee districts;



Figure 1-1
City of West Sacramento Early Implementation Project (EIP) Location



00887.07 EIP (05-08)



Graphics...00875.05 EA (6-08)

Figure 1-3
West Sacramento Levee Improvements Program Area
and Previous Repairs

- it will not affect the ability of the CVFPB or other applicable federal and state agencies to implement future system wide flood protection improvements;
- the proposed project will be constructed as soon as possible to reduce flood risk; and
- the proposed project is politically, socially, and environmentally acceptable.

An additional element of urgency for completing the EIP as expeditiously as possible in 2008 is further heightened by the need to complete recreational and economic redevelopment improvements at the EIP site, funded by grants which expire in May 2009. The EIP improvements underlie the grant-funded recreational improvements on the levee. If the EIP is not constructed in 2008 to allow subsequent construction of the grant-funded improvements before May 2009, the grant funding will be lost. Therefore, the EIP and its timing are important to execute efficient use of public tax dollars for a previously authorized and funded project. Further details highlighting the importance of the EIP are described below under “Independent Utility.”

Relationship of the Proposed Action to the WSLIP and Independent Utility

Purpose of the WSLIP

As stated above, the purpose of the WSLIP is to achieve a minimum of 200-year flood protection for the entire city by improving the approximately 50 miles of levees that protect West Sacramento. The intent of the WSLIP is to provide a comprehensive evaluation of the entire levee system that protects the city, develop recommended strategies for improvement, and provide a basis for partnerships with federal and state agencies to implement improvements that meet the flood protection goal.

There are several factors that prompted WSAFCA and the City to embark on the WSLIP and EIP, listed below.

- WSAFCA and its partners have recently undertaken several levee repair projects to address urgent levee deficiencies that pose serious flood risk (Figure 1-1). Further detail on these projects is provided below, under “Levee History and Planning Context.”
- The Federal Emergency Management Agency (FEMA) is in the process of implementing a modernization program which may lead to the City of West Sacramento being mapped within the 100-year floodplain. This would make flood insurance mandatory for all federally guaranteed loans and restrict development which was expected to bear much of the cost of levee improvements.

- As a result of knowledge gained from the Comprehensive Study, the USACE revised its levee criteria regarding seepage and under-seepage, a known problem to exist within the WSAFCA levee system.
- The Central Valley Flood Protection Plan requires 200-year flood protection by the year 2025. The time and effort required to fully evaluate approximately 50 miles of levees and develop recommended strategies for improvement prompted action without further delay.
- Federal funding for these activities is currently unavailable and the process to approve funding and begin evaluation can be lengthy. Recognizing this fact, WSAFCA launched the WSLIP, and smaller scale improvements (Early Implementation Projects) that address urgent needs and can be constructed in advance of the overall program.
- In May of 2007, WSAFCA sought a new annual parcel assessment from property owners to help raise necessary local funds for levee improvements and repairs. The majority of funds necessary to improve the levees will be obtained through state and federal assistance; however, local communities are required to pay for a portion of the overall costs. The property owners of the City recognized the flood risks and indicated their willingness to participate in improvements by voting to approve an annual parcel assessment in 2007.

The City recognizes that its efforts must be integrated with the efforts of state and federal partners and their respective plans and programs. In light of that fact, the alternatives developed for the WSLIP will be in alignment with those efforts. In addition, the guiding principles outlined for EIPs in the Draft Framework will also be considered and incorporated to ensure that the WSLIP alternatives do not eliminate opportunity or prejudice future flood risk reduction alternatives that would provide regional or system wide benefits.

Relationship of EIP and the WSLIP

The proposed EIP is compatible with and complementary to the overall WSLIP, which will help achieve WSAFCA's goal of 200-year flood protection by bringing the subject reach to a level meeting or exceeding that standard. This EIP has been designed so as to fit together with the goals of the overall WSLIP without eliminating flood risk reduction alternatives for the WSLIP or any larger scale plans by the state or USACE that would provide regional or system-wide benefits.

Prior to initiating the WSLIP comprehensive evaluation, several problem areas were identified by WSAFCA based on observations and inspections by the local reclamation district. These sites that present significant flood risk have been identified for early implementation. Studies have indicated that the proposed project site is deficient and requires repair in the short term. While developing the overall WSLIP, WSAFCA is concurrently initiating the completion of this EIP to address this urgent need.

The selection criteria for the West Sacramento EIP have been developed with the State of California's draft "Framework for Early Implementation Project and Section 408 Approval in California's Central Valley" in mind. The intent is to provide consistency in determining whether or not a particular improvement would qualify as an Early Implementation Project. To that end, screening criteria specific to the WSLIP program area were developed. Those criteria are:

- sites offering the greatest improvement in public safety with the least negative effects on cost or scheduling,
- availability of funds,
- real estate requirements,
- scalability of construction,
- land use and project compatibility,
- evolving technical policy,
- environmental and cultural impacts,
- integration of multipurpose objectives, and
- permit requirements.

The proposed action meets each of these criteria for early implementation.

Scope of Action and Analysis

The EIP was further evaluated to consider "connected actions" to ensure the EIP would not be considered a segmented action under NEPA. NEPA regulations require agencies to consider three types of actions: connected actions, cumulative actions, and similar actions under 40 CFR §1508.25. Cumulative and similar actions are described in Chapter 4. Connected actions are actions closely related and therefore should be discussed in the same environmental assessment. According to 40 CFR §1508.25(a)(1), actions are connected if they:

- automatically trigger other actions which may require environmental impact statements or environmental assessments,
- cannot or will not proceed unless other actions are taken previously or simultaneously, or
- are interdependent parts of a larger action and depend on the larger action for their justification.

Based on this definition, there are no connected actions associated with the EIP and the proposed action is not segmented based on the following points.

- The project will alleviate under- and through-seepage concerns and bring that section of levee to a 200-year level of protection. The project does not depend on other phases to be constructed to achieve this objective.

- The project is important to protect downtown infrastructure and will reduce risk for critical downtown commerce by protecting the foundation of the new California State Teachers' Retirement System (CalSTRS) building adjacent to the levee and by protecting adjacent parcels planned for economic development and revitalization of downtown and the riverfront.
- The project reduces local flood risk. DWR studies (conducted under contract) for geotechnical levee evaluation in 2007 indicate that the proposed action site is the weakest link along the urbanized area along the Sacramento River between I Street and the Port of Sacramento Barge Canal (URS 2007). These findings have been verified through further studies conducted by the City (under contract) during the design phase and can reasonably be expected to result in changes to the footprint of the floodplain in this portion of the city.
- The project reduces flood risk. Topography in the northern half of the study area is generally characterized by higher ground in the northern and eastern portions of the city near the Sacramento River, where the project site is located. A levee failure in the proposed action reach would inundate the northern portions of the city, as floodwaters would drain from the higher ground in the north and east to lower ground in the south and west. This inherent condition is dissimilar from other basins in the region (such as the communities in Natomas or the Pocket Area in Sacramento), which would more uniformly flood from a breach at any location along the perimeter. Therefore, the EIP would reduce the flood risk in both the northern and southern portion of the city.

Levee History and Planning Context

Regional Levee History

The Sacramento River Flood Control Project (Flood Control Project) was authorized by Congress in 1917. The Flood Control Project was the major project for flood control on the Sacramento River and its tributaries. It was sponsored by The Reclamation Board of the State of California (Rec Board) and was the first federal flood control project constructed outside the Mississippi River Valley (U.S. Army Corps of Engineers 2006a).

Under natural conditions, the floodplain of the Sacramento River varied from 2 to 30 miles wide, extended about 150 miles along the river and annually covered over 1 million acres. Low, discontinuous levees were built by individual landowners from the 1840s to the 1890s. Those levees concentrated flood flows and contributed to problems that were made worse by the hydraulic gold mining that occurred in the late 1800s. With the authorization of the Flood Control Project, the USACE and state began managing the project as a "regional system," constructing improvements to approximately 1,100 miles of levees, creating bypasses and floodways.

Although the flood control infrastructure has seen extensive improvement and upgrades over the years, the underlying foundation of most of the levees and channels pre-date any state or USACE involvement and still retain their original materials, including dredged riverbed sands, soil, and organic matter. At the time of the Flood Control Project authorization in 1917, the areas being protected by the levees were primarily agriculture with minimal improved infrastructure such as railroads and highways. Much of these levees protect agricultural land and land that is now heavily urbanized and densely populated including the City of West Sacramento (U.S. Army Corps of Engineers 2006a).

The federal government has extensive maintenance responsibilities for the levee system and may participate in improvement projects. Most of the levees, channels, and related flood control structures are owned, operated, and maintained by the State of California and local levee and reclamation districts. However, most of the levee districts are significantly under-funded and unable to maintain the system to federal standards. The levees surrounding the City are maintained by the USACE, RDs 537, 900, and DWR's Maintenance Area 4.

In recent decades, a number of evaluations of levee conditions as well as repair and reconstruction efforts have occurred. Some have been the result of particular flood events; others have been part of regular maintenance activities.

In 1986, 1995, and 1997, there were record flood stages in the Sacramento region. As a result, the USACE evaluated the level of flood protection within the Flood Control Project with updated hydrology and levee analysis. It was determined that the risk of flooding from the system ranges from 1 in 25 (25-year) to over 1 in 100 (100-year) each year, depending on the location. In addition, some reaches of levees within the Flood Control Project in the Sacramento urban area were found to have structural problems.

West Sacramento Area Levee History

The levees surrounding the City were partially built in the 1840s to 1890s, and became part of the Flood Control Project authorized by Congress in 1917. Several projects to strengthen and maintain these levees have occurred. In addition, the City and the agencies that maintain the levees have coordinated to streamline funding and maintenance activities. Recent milestones include the following activities.

- In 1991, the USACE concluded that the levees along the Sacramento River and Yolo Bypass did not provide protection from a 100-year flood event.
- In 1993, a flood control project was completed as part of the Sacramento Urban Levee Reconstruction Project. This project placed a stability berm and related features to address through-seepage along the entire length of the Sacramento River levee bordering the Southport area.
- In 1994, the City and Reclamation Districts formed a Joint Powers Authority, WSAFCA, to coordinate, fund, and construct major flood protection

improvements which were beyond the means of individual entities (City of West Sacramento 2000).

- In 1995, WSAFCA formed an assessment district to fund the local cost share of a second flood control project, the West Sacramento Project. This project was part of the federal Sacramento Metro Area Project authorized by the WRDA. The WSAFCA assessment funded geotechnical and engineering investigations of the Sacramento River levees and the southern boundary cross levee in the Southport area (PB 2007). The West Sacramento Project was designed to provide the City with a greater than 200-year level of protection.
- During the 1997 record flood stage event, the levees surrounding the City sustained minor damage. As design work was nearing completion on the West Sacramento Project, under-seepage was noted along the Sacramento Bypass levee.
- In 1998, stability issues became apparent along a levee maintained by RD 537.
- In 2002, the West Sacramento Project was completed. This project involved raising more than one mile of the south levee of the Sacramento Bypass by up to 5 feet and raising 4.5 miles of the Yolo Bypass levee by up to 5.5 feet.
- In May of 2007, WSAFCA sought a new annual parcel assessment from property owners to help raise necessary local funds for levee improvements and repairs. The majority of funds necessary to improve the levees will be obtained through state and federal assistance, however, local communities are required to pay for a portion of the overall costs. City property owners approved the new annual parcel assessment (City of West Sacramento 2007).

Regional Planning Context

This section includes an overview of federal and state flood protection activities which provide the planning context for the WSLIP and the EIP.

Federal and State Levee Improvement Activities

Sacramento River Flood Control System

Following the flood of 1986, the USACE and the State of California, along with local partners, completed a comprehensive evaluation of the Sacramento River Flood Control System and initiated a flood risk management program aimed at repairing, raising, and strengthening urban levees, among other activities. This effort, known as the Sacramento River Flood Control System Evaluation resulted in the repair of over 70 miles of deficient levees. However, to date, all the authorized repairs have not been completed. Moreover, the completed repairs were built to less rigorous standards than current standards (Draft Framework for Early Implementation Projects and Section 408 Approval).

Sacramento-San Joaquin Rivers Comprehensive Study

Following the 1997 flood, a Comprehensive Study was initiated by the State and the USACE to formulate comprehensive plans for flood risk reduction and environmental restoration. This study was unable to stimulate widespread public or political interest in flood risk reduction or environmental restoration activity beyond the ongoing urban levee improvement programs. The study did result in a new set of engineering criteria for the design and evaluation of urban levees and a greatly expanded scope and cost for the ongoing urban levee improvements efforts on the Sacramento and American Rivers. In addition, the adequacy of previous repairs was called into question (Draft Framework for Early Implementation Projects and Section 408 Approval).

Sacramento Metropolitan Area, California Feasibility Report (Known as the West Sacramento Project)

The Sacramento Metropolitan Area, California, Feasibility Report was completed in 1992 and describes the results of studies on flood problems along the Sacramento River and Yolo Bypass from the Sacramento Weir downstream to an area just south of Freeport. Known as the West Sacramento Project, the report included plans for improving flood protection for the City of West Sacramento. The study area is located along the west bank of the Sacramento River in Yolo County, California (Figure 1-3). The West Sacramento Project was completed in 2002. The project involved raising more than one mile of the south levee of the Sacramento Bypass by up to 5 feet and raising 4.5 miles of the Yolo Bypass levee by up to 5.5 feet.

The original West Sacramento Project studied only a small portion of the levees that provide flood protection for the City of West Sacramento. Presently, the USACE is preparing to begin the development of a Feasibility Report for West Sacramento levee improvements to assess the entirety of the levees protecting the City of West Sacramento in light of most recent criteria and knowledge regarding levee design. The intent is to provide the City of West Sacramento with at least a “200-year” level of flood protection. The USACE anticipates completion of this Feasibility Report by the end of the year 2010.

American River Common Features Project

To provide increased flood protection for the City of Sacramento which is bordered by the east bank of the Sacramento River, the American River Common Features Project (Common Features) was authorized by Congress in the Water Resources Development Act of 1996 (WRDA). This authorization called for strengthening the north and south levees of the American River and raising and strengthening the upper 12 miles of the east levee of the Sacramento River in the Natomas area, just north of the City of Sacramento. These improvements were considered “common features” of any comprehensive plan of flood protection for the Sacramento area that might ultimately be approved by Congress. In WRDA

1999, the scope of the Common Features authorization was expanded to include raising portions of the north and south levees of the American River (including the Mayhew Levee), additional levee strengthening along portions of the north levee of the American River, and raising and strengthening the north and south levees of the Natomas Cross Canal in the Natomas area. In 2006, the Common Features authorization was deemed sufficient to cover improvements to the east levee of the Sacramento River near the Pioneer Reservoir and in the Pocket/Freeport area.

The USACE is currently developing a General Re-Evaluation Report which it expects to complete by the end of 2009 for presentation to Congress in 2010. This General Re-Evaluation Report is re-examining the previous Common Features Project and identifying levee improvements needed to provide the City of Sacramento and the Natomas area to the north with at least a “200-year” level of flood protection (Ghelfi pers. comm.).

The Central Valley Flood Protection Act

The Central Valley Flood Protection Act, enacted in California in 2005, calls for the DWR to develop the Central Valley Flood Protection Plan (Plan) by January 1, 2012. The Plan will outline a comprehensive system wide approach for the protection of lands currently protected from flooding by the existing Sacramento River Flood Control Project. It also establishes a new standard of 200-year level flood protection for urban areas in the Central Valley and requires this standard be achieved by 2025.

The people of California also passed two bond measures that provide approximately \$5 billion toward flood improvements to reduce flood risk, particularly to State-federal levees protecting urban areas in the Central Valley. These levee improvements are expected to occur over the next ten years with much of the bond money spent after the year 2012. However, there are urgent needs to improve inadequate flood protection in existing urban areas in advance of the overall comprehensive effort. These advance efforts are being called “Early Implementation Projects.” Early Implementation Projects will proceed ahead of the comprehensive effort, yet be designed to ensure that they do not eliminate opportunity or prejudice flood risk reduction alternatives that would provide regional or system wide benefits.

Local agencies and the State are taking the lead in completing Early Implementation Projects ahead of the full involvement of the USACE (Draft Framework for Early Implementation Projects and Section 408 Approval).

Along with the requirement for increased flood protection by 2025, one of the objectives of the Plan is “increasing the engagement of local agencies willing to participate in flood protection, ensuring a better connection between state flood protection decisions and local land use decisions (Draft Framework for Early Implementation Projects and Section 408 Approval). In line with that objective, WSAFCA has proposed the West Sacramento Levee Improvements Program and the Early Implementation Project.

The Central Valley Flood Protection Act allows EIPs to proceed in advance of completion of the Plan if the following criteria apply:

- The improvements are necessary and require State funding before the completion of the comprehensive Plan;
- The improvements will reduce or avoid risk to human life in one or more urban areas;
- The improvements will not impair or impede future changes to regional flood protection of the comprehensive Plan;
- The improvements will be maintained by a local agency that has committed sufficient funding to maintain both the existing and improved facilities of the State Plan of Flood Control;
- The affected cities, counties, and other public agencies will have sufficient revenue resources for the operation and maintenance of the facility;
- Upon the allocation of funds for a project, the proposed project is ready for implementation.

The proposed action meets each of these EIP criteria.

Introduction

This chapter of the EA describes the proposed action and other design alternatives that were developed to achieve the project purpose and need while avoiding or minimizing environmental effects. The alternatives that were evaluated include relief wells, a slurry cutoff wall, a sheet pile wall and a seepage berm. The alternative screening process is presented below.

The slurry cutoff wall has been selected as the proposed action. Chapter 3 of this EA includes an in-depth analysis of the effects of the proposed action and the no-action alternative. A detailed description of these alternatives follows the alternative screening discussion.

Alternatives Screening

WSAFCA considered four alternatives that would address through- and under-seepage at the project site, described below.

■ **Alternative 1: Relief Wells**

A relief well is drilled as a passive pathway near the levee landside toe to provide a lower resistance route for the under-seepage to exit to the ground surface without creating sand boils or piping levee foundation materials. Wells can be up to 120 feet deep. Once on the surface, the water is collected in a trench to be discharged to an appropriate disposal area.

■ **Alternative 2: Slurry Cutoff Wall**

A slurry cutoff wall is a vertical barrier that consists of low permeability materials that is placed parallel to and through the center of the levee crown to resist water pressure. The depth of the wall can vary based upon seepage conditions, but is typically 20 to 80 feet deep.

■ **Alternative 3: Sheet Pile Wall**

A sheet pile wall is a vertical barrier of interlocking steel panels that is placed parallel to and through the center of the levee crown to alleviate through- and under-seepage.

■ **Alternative 4: Seepage Berm**

A seepage berm is a widened earthen embankment of low-permeability materials to resist accumulated water pressure. Berms are typically one-third the height of the levee, extending outward from the landside toe approximately 300 to 400 feet, and laterally along the levee as long as required relative to the seepage conditions.

WSAFCA established and applied nine criteria to qualitatively evaluate the alternatives and eliminate those alternatives that did not adequately meet the criteria. The criteria are below.

- **Meet the Project Objectives Regarding Seepage**—The objective of the project is to alleviate through- and under-seepage concerns on this portion of the levee. Alternatives that provide the greatest reduction in subsurface water pressure (measured as the exit gradient of water moving through the soil) are the most favored.
- **Availability of Funds**—Levee repairs are necessary throughout the Sacramento River watershed. Federal and state monies as well as local matching monies must be spent thoughtfully to enable all the necessary levee improvements to be constructed. The preferred alternative would allow WSAFCA to implement the action through existing revenue sources without a cost-sharing partner. A preliminary cost estimate was performed for each conceptual alternative. The lowest cost alternative is assigned the value of 1.0. The other alternatives were assigned cost multipliers based on the lowest cost alternative.
- **Scalability of Construction**—The scalability of an alternative refers to the ability of the design and construction documents to be increased or decreased if issues arise with contract financing or an unstable construction bid climate. Alternatives such as cutoff walls or seepage berms that can be partially constructed, as funds allow, are more desirable than setback levees or relief well systems that are not compatible with partial construction techniques. Alternatives that facilitate the ability to connect future adjacent improvements to the selected site without significant rework or cost are favored.
- **Real Estate Requirements**—An alternative that requires large land acquisition from private owners, such as a setback levee, is potentially cost prohibitive. Real estate acquisition may also present challenges with public and political acceptance. Temporary construction easements would not create as many issues as the need for permanent easements or fee-title acquisition. Alternatives requiring little to no additional flood protection easement are favored.
- **Land Use Compatibility**—The future land use of the areas on or adjacent to the proposed levee improvements should be taken into consideration. If known projects exist or have been approved by the City along the affected levee reach, alternatives should be evaluated with consideration of the degree to which they disrupt or interfere with such land uses. Alternatives which do not require modification to existing land-use plans adjacent to the site are favored.

- **Permit Requirements**—Permit requirements can greatly influence how soon an alternative can be implemented and flood protection can be provided. Projects which do not require numerous complex federal, state, or local authorizations are favored.
- **Environmental Constraints (such as biological and cultural resources)**—Locations along the river support habitat critical to threatened or endangered species such as the valley elderberry longhorn beetle or the giant garter snake. In addition, the river corridor has a rich history of human use and contains cultural resources significant to that history. The environmental review and permitting process for effects to these types of resources can be lengthy and delay construction of improvements. Therefore, alternatives that avoid effects to these resources are preferable.
- **Integration of Multiple Objectives**—Propositions 50 and 84 include the goals of integrating multiple objectives to address a range of public policy priorities, leverage funding, integrate and coordinate projects, and achieve economies of scale. The community benefits from the coordination of levee improvements with other planned projects as it would enable the City to realize other goals in concert with flood protection goals and provide potential economies of scale, while minimizing disruption. Alternatives which facilitate realization of other objectives within the project area are favored.
- **Evolving Technical Policy**—The risks associated with evolving technical policy are also considered. Future policy may require seismic stability of levees or vegetation-free zones that vary from current conditions. These may also eventually lead to stricter design guidelines for levee construction protecting highly urbanized areas. The potential effects of this evolving policy are included in the consideration of alternatives. Alternatives which have low risk of major reinvestment based on any foreseeable change in acceptance criteria are favored.

In some cases, an alternative may partially meet a criterion while another meets it more fully. For this reason, the designations of more favorable and less favorable were applied to each criterion for each alternative. Table 2-1 below provides the results of the criteria evaluation and Table 2-2 provides the results of the cost evaluation of each alternative.

Table 2-1. Evaluation of Alternatives

Evaluation Criteria	Alternative 1 (Relief Wells)	Alternative 2 (Slurry Cutoff Wall)	Alternative 3 (Sheet Pile Wall)	Alternative 4 (Seepage Berm)
Meet the Project Objective	LF	MF	LF	MF
Availability of Funds	MF	MF	LF	LF
Scalability of Construction Project	LF	MF	MF	MF
Real Estate Requirements	LF	MF	MF	LF
Land-Use/Project Compatibility	LF	MF	MF	LF
Permit Requirements	LF	MF	MF	LF
Environmental and Cultural Impacts	MF	MF	MF	LF
Integration of Multiple Objectives	LF	MF	MF	LF
Evolving Technical Policy	MF	MF	MF	MF

Table 2-2. Evaluation of Cost

Alternatives	Alternative 1 (Relief Wells)	Alternative 2 (Slurry Cutoff Wall)	Alternative 3 (Sheet Pile Wall)	Alternative 4 (Seepage Berm)
Cost Multiplier	1.4	1.0	1.5	2.1

The least favorable alternatives are Alternatives 1 and 4.

Alternative 1 involves the construction of relief wells which would alleviate through- and under-seepage but not nearly as reliably as other alternatives. The degree of performance to evacuate the water may be dependent upon a pump which can falter due to mechanical or electrical failure. In addition, regular operation and maintenance is required to ensure the wells passively convey water with resistance less than the surrounding soil profile and to ensure performance of the collection and discharge system. While the cost of construction may not be as great as other alternatives, placement of the wells would require the acquisition of additional real estate, which would increase overall costs. In addition, relief wells do not allow for the same degree of scalability of construction as Alternatives 2 and 3. Finally, permits for the appropriate discharge of pumped water must also be obtained. Based on the determination that the alternative would not reliably meet the purpose of the project, the USACE determined Alternative 1 was not a reasonable alternative to carry forward for detailed analysis.

Alternative 4 is a seepage berm which requires real estate acquisition. The need to acquire real estate increases the cost of the project. Use of additional real estate involves a larger footprint which may not be compatible with existing and

adjacent land use, increases environmental and cultural impacts and resultant permit requirements, as well as eliminates the integration of multiple objectives. Based upon the analysis of cost, when compared to Alternative 2, a seepage berm is more than twice the cost of the selected alternative; therefore, the USACE determined Alternative 4 was not a reasonable alternative to carry forward for detailed analysis.

The most favorable alternatives are **Alternatives 2 and 3**, a slurry cutoff wall and sheet pile wall, respectively. Both would adequately meet the project objective of alleviating through- and under-seepage and both do not require the acquisition of additional land for construction. In addition, with less of an impact footprint, fewer environmental impacts would occur, leading to fewer permit requirements. Both also meet the criteria of scalability of construction, land use/project compatibility, integration of multiple objectives and evolving technical policy. Notwithstanding these similarities, the construction of a sheet pile wall is significantly more expensive than a slurry cutoff wall. Based on the lifespan of the sheetpile, expense, and lack of the reliability of the sheetpile joints, the USACE determined that Alternative 3 was not a reasonable alternative to carry forward for detailed analysis.

After application and consideration of all the selection criteria, Alternative 2, the slurry cutoff wall, is the proposed action as it most favorably meets the criteria. It provides the most benefit for the cost, meets multiple objectives, does not require permanent real estate acquisition, is compatible with adjacent land use, and has the least potential environmental impacts based on minimum footprint size. This alternative was carried forward for detailed environmental analysis, compared to no action.

Alternatives Evaluated in Detail

No Action

The No-Action Alternative represents conditions that “would be reasonably expected to occur in the foreseeable future if the project were not approved based on current plans and consistent with available infrastructure and community services.” The No-Action Alternative would consist of continuation of current conditions and operation and maintenance practices. Due to uncertainties in local, State, and federal funding; future state and federal authorization; and other approvals, it is not reasonable to predict construction of the project improvements in the foreseeable future. Therefore, the No-Action Alternative assumes no levee repair or strengthening would be implemented. If WSAFCA were not to implement the EIP in 2008, flood risk would not be reduced for this area of West Sacramento and recreation improvements as part of the Riverwalk are in jeopardy of not being implemented due to loss of grant funding which expires in early 2009.

Beyond the proposed action not being implemented, the future under the No-Action Alternative would likely entail removal of vegetation from the levee

slopes as a result of the more robust enforcement anticipated for the USACE's operation and maintenance policies. Further, because the flood risk would not be reduced, the City's existing emergency response plan would be supplemented with a site-specific emergency response plan.

Proposed Action

To address under- and through-seepage concerns, a 475-foot slurry cutoff wall is proposed as the treatment for the project reach. The site extends along the right bank of the Sacramento River, 530 feet southward of the I Street Bridge to the edge of the current northern limit of the Riverwalk (Figure 2-1). (Implementation of a 475-linear foot cutoff wall necessitates disturbance of a 530-linear foot area based on the mechanical limitation of the excavator arm to angle down to the desired depth.) The levee at the project site was constructed primarily by dredging and piling materials from the adjacent Sacramento River. Thus, there is little to no compaction of the soil and the composition of the embankment fill is not suitable as levee material under current standards.

All staging activity and storage of equipment and materials would take place on adjacent undeveloped lots, presently vegetated with a mix of trees and ruderal plants on the landside of the levee west of 2nd Street (Figures 2-2 and 2-3).

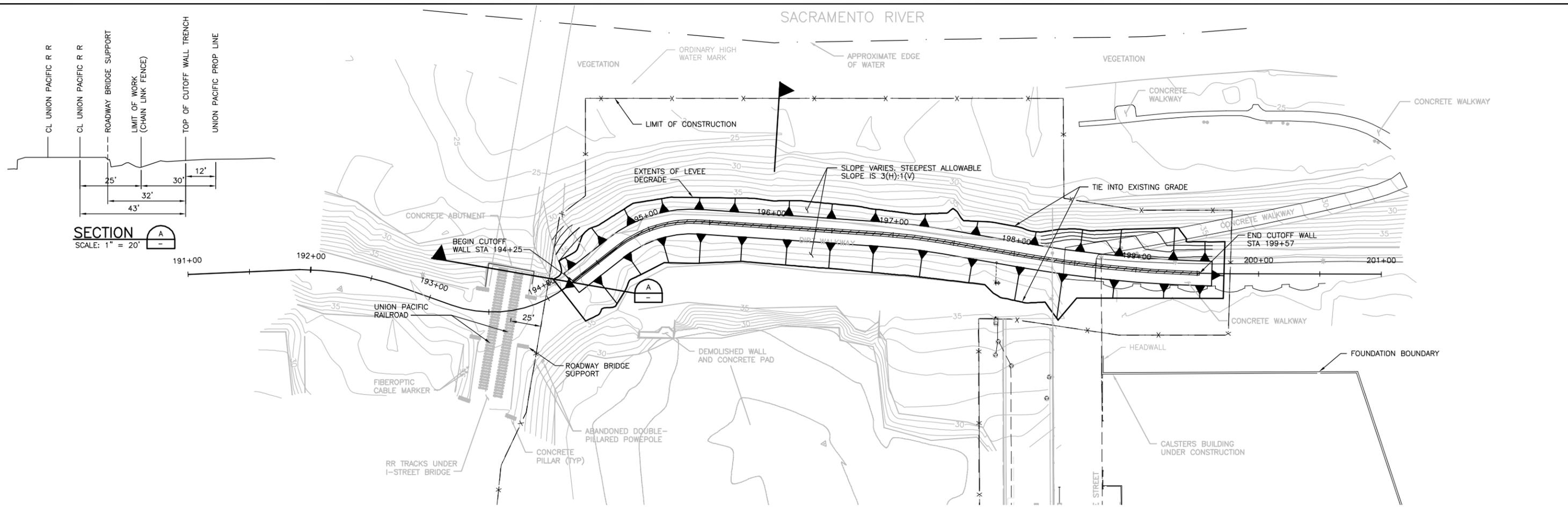
Native and nonnative trees and ruderal grassland vegetation are located on both sides of the levee at the project site. The project reach is accessible to the public and used to access the Riverwalk and river shore. Additional descriptions of the project site specific to certain resources are provided in the environmental conditions discussions in Chapter 3.

Treatment

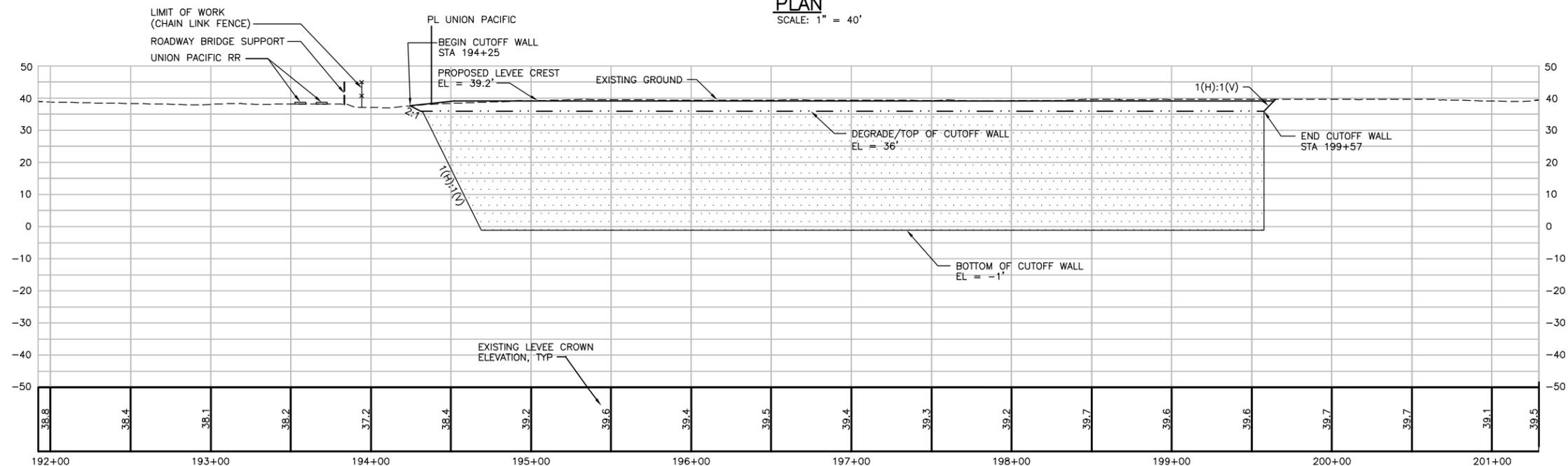
Cutoff Wall Overview and Installation

A slurry cutoff wall up to 45 feet deep by 3 feet wide wall would be constructed using the conventional slot trench method; i.e., a trench would be excavated through the levee and subsurface materials and then backfilled with low-permeability materials to decrease seepage potential (Figure 2-4). During construction, the trench would be kept open using a bentonite-water slurry mix. The soil excavated from the trench would be hauled to a mixing plant located at the staging area, where it would be mixed with hydrated bentonite to reduce permeability and increase strength. The soil-cement-bentonite mixture then would be hauled to the levee crown and backfilled into the trench.

During slurry cutoff wall construction, one crew would be able to construct approximately 50 linear feet of seepage cutoff wall in an 8-hour shift. Equipment needed for the crew would include a long-reach track hoe, a, three or four dump trucks (10-cubic yard capacity each), two loaders at the mixing location,



PLAN
SCALE: 1" = 40'



PROFILE
SCALE: HORIZ: 1" = 40'
VERT: 1" = 20'

00887.07 (6/08)

Source:HDR Engineering, Inc - April 2008



08887.07 (5/08)

Figure 2-2
Design Plan - Traffic Control, Site Haul Route, and Staging Area
City of West Sacramento Early Implementation Project

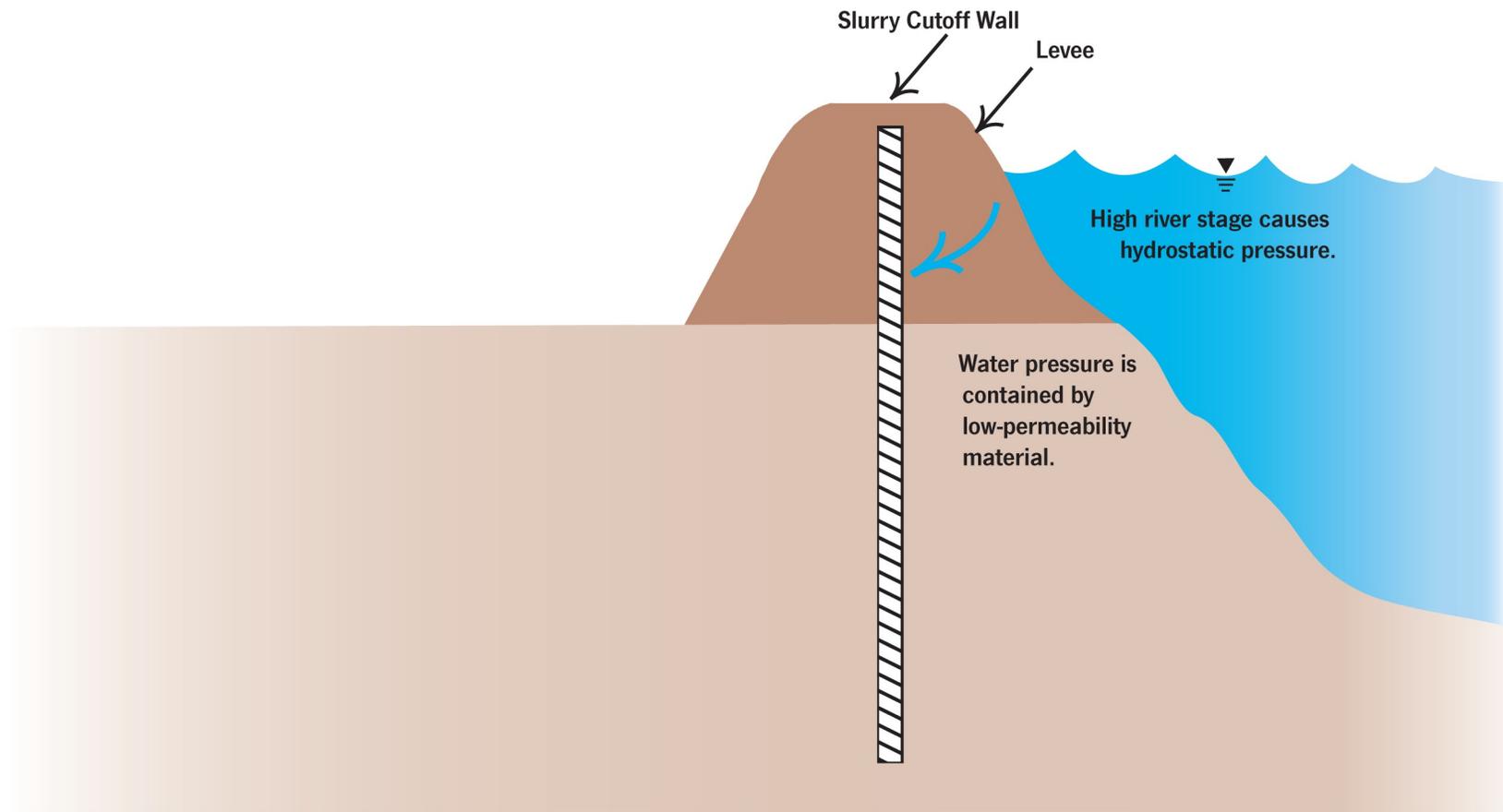


00887.07 (5/08)

Figure 2-3
Demolition Plan
City of West Sacramento Early Implementation Project

SLURRY CUTOFF WALL

Concept: Potential seepage paths are blocked and dispersed by a low-permeability wall constructed in the levee cross section.



Not to Scale

00887.07 EIP (05-08)

bulldozers, excavators, loaders, a rough terrain forklift, compactors, maintainers, and a water truck. As mentioned above, staging would take place on the property adjacent to the landside of the levee. Mixing areas would be located at the staging area. The mixing area would be used to prepare the soil-bentonite mixture and supply bentonite-water slurry. The mixing area would be contained to avoid inadvertent dispersal of the mixing materials. Dump truck trips would haul material between the excavator and the mixing area along the levee.

Levee Degradation

Approximately two-thirds of the levee crown would be degraded to provide a 60- to 80-foot working platform. Approximately 5,000 cubic yards would be degraded and hauled from the project site, and disposed of at a permitted site located at the Port of Sacramento. Following completion of the slurry cutoff wall, approximately 5,400 cubic yards of suitable levee construction material would be transported from a permitted source 13 miles away from the project site to restore the levee crown to its original elevation. Levee side slopes may be flattened relative to their pre-project conditions to meet current standards for slope stability.

Demolition and Vegetation Pruning and Removal

Demolition and vegetation clearing will encompass 1.73 acres of the project site. Trees, brush, debris, and sidewalk and associated Riverwalk will be removed in these areas to facilitate slurry wall construction, create space for staging and haul routes, and to allow for levee reshaping to pre-project conditions. Approximately 39 trees will be removed.

Materials Importation

In summary, materials imported to the project site would include bentonite, cement, incidental construction support materials, and new levee material to replace the poor levee material at the project site.

Temporary Facilities and Access Provisions

To facilitate project construction, earthen ramps would be improved to allow equipment access between the levee crown and staging area. Temporary construction easements may be required to lawfully secure access to the areas affected by construction.

Post-Construction Operation

The only permanent facility associated with the construction of the seepage cutoff wall would be the seepage wall itself, which may be 3 feet wide, up to 45 feet deep, and up to a total of 530 feet long (existing within the levee cross section). The levee and the staging areas and would be seeded after the slurry cutoff wall is constructed for erosion protection and to prevent colonization by invasive exotic vegetation.

Construction Schedule

The goal of the project is to complete the levee improvements in 2008. The project is expected to be completed within 60 days. Equipment necessary for construction consist of bulldozers, dump trucks, excavators, a long reach track hoe, loaders, a rough terrain forklift, compactors, and a water truck. Table 2-3 shows specific durations and equipment needed for each phase of project construction.

Table 2-3. Timing and Phasing of Construction

Phases of Construction	Equipment Needed	Estimated Days of Construction (8 Hour Workdays)
Mobilization, Site Preparation, Clearing and Grubbing	Bulldozers, Dump Trucks, and Excavators	4
Levee Degradation	Bulldozers, Dump Trucks, and Excavators	2
Slurry Wall Installation	Bulldozers, a Long Reach Track Hoe, Loaders, and a Rough Terrain Forklift	7
Fill Placement (after 23 days of slurry wall settling) and Demobilization	Bulldozers, Dump Trucks, Excavators, Compactors, Maintainers, and a Water Truck	3

Environmental Commitments

To reduce or eliminate construction-related effects, WSAFCA will implement the following environmental commitments to reduce or offset short-term, construction-related effects. The identified measures include:

- conduct preconstruction surveys to determine the presence of nesting or roosting raptors (specifically, Swainson's hawk and white-tailed kite);
- identify trees proposed for trimming or removal and comply with the City tree ordinance;
- install construction fencing to exclude access to sensitive areas from construction disturbance;

- implement the use of low emission fuels and equipment;
- prepare and implement a stormwater pollution prevention plan (SWPPP) prior to construction activities that will cause ground disturbance;
- implement noise-reduction construction practices; and
- implement a traffic control plan.

Raptors

In the event construction commences prior to August 1, preconstruction surveys will be performed to determine if raptors are nesting or roosting at or adjacent to staging or construction areas. In the event nesting or roosting raptors are identified, WSAFCA will coordinate with the California Department of Fish and Game (DFG) to identify measures to ensure raptors are not adversely affected. These measures may include implementation of suitable buffers and phasing of construction.

Protected Trees and Riparian Trees

WSAFCA shall comply with the DFG Streambed Alteration Agreement and City tree ordinance requirements. WSAFCA will implement the following measures.

- Protect heritage trees that occur in the vicinity of the project site and outside the construction area by installing protective fencing. Protective fencing shall be installed along the edge of the construction area (including temporary and permanent access roads) where construction will occur within 20 feet of the dripline of an oak or native tree 6 inches or more in diameter at 4.5 feet above the ground (as determined by a qualified biologist or arborist).
- Provide signs along the protective fencing at a maximum spacing of one sign per 100 feet of fencing stating that the area is environmentally sensitive and that no construction or other operations may occur beyond the fencing.
- Retain a certified arborist to perform any necessary pruning of oak or native trees along the construction area, in accordance with International Society of Arboriculture (ISA) standards.
- Prepare tree and riparian habitat mitigation and monitoring plans. Potential mitigation areas shall be evaluated by a qualified restoration ecologist, biologist, or certified arborist to determine their suitability to support the target native tree species.

Stormwater Pollution Prevention Plan

Because the proposed project would result in the disturbance of an area greater than one acre, WSAFCA would need to obtain coverage under the Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES)

general construction activity storm water permit. The Central Valley Regional Water Quality Control Board (RWQCB) administers the NPDES storm water permit program in Yolo County. Obtaining coverage under the NPDES general construction activity permit generally requires that the project applicant prepare a SWPPP that describes the best management practices (BMPs) that will be implemented to control accelerated erosion, sedimentation, and other pollutants during and after project construction.

The specific BMPs that will be incorporated into the erosion and sediment control plan and SWPPP will be determined during the final design phase of the selected alternative, and will be prepared by the construction contractor in accordance with the California RWQCB Field Manual. However, the plan will likely include, but not be limited to, one or more of the following standard erosion and sediment control BMPs:

- ***Timing of construction.*** The construction contractor will conduct all construction activities during the dry season to avoid ground disturbance during the rainy season.
- ***Staging of construction equipment and materials.*** All construction-related equipment and materials will be staged on the landside of the subject levee reaches. To the extent possible, equipment and materials will be staged in areas that have already been disturbed.
- ***Minimize soil and vegetation disturbance.*** The construction contractor will minimize ground disturbance and the disturbance/destruction of existing vegetation. This will be accomplished in part through the establishment of designated equipment staging areas, ingress and egress corridors, and equipment exclusion zones prior to the commencement of any grading operations.
- ***Stabilize grading spoils.*** Grading spoils generated during the construction will be temporarily stockpiled in staging areas. Silt fences, fiber rolls, or similar devices will be installed around the base of the temporary stockpiles to intercept runoff and sediment during storm events. If necessary, temporary stockpiles may be covered with an appropriate geotextile to increase protection from wind and water erosion.
- ***Install sediment barriers.*** The project proponent may install silt fences, fiber rolls, or similar devices to prevent sediment-laden runoff from leaving the construction area.
- ***Stormwater drain inlet protection.*** The project proponent may install silt fences, drop inlet sediment traps, sandbag barriers, and/or other similar devices.
- ***Permanent site stabilization.*** The construction contractor will install structural and vegetative methods to permanently stabilize all graded or otherwise disturbed areas once construction is complete. Structural methods may include the installation of biodegradable fiber rolls and erosion control blankets. Vegetative methods may involve the application of organic mulch and tackifier and/or the application of an erosion control seed mix. Implementation of a SWPPP would substantially minimize the potential for

project-related erosion and associated adverse effects on water quality. Because all project-related grading would occur on the subject levee reaches, the project also would not result in the loss of topsoil resources.

Noise-Reducing Construction Practices

The construction contractor will employ noise-reducing construction practices such that noise from construction does not exceed applicable City of West Sacramento noise ordinance limits. Measures that can be used to limit noise may include but are not limited to:

- locating equipment as far a practical from noise sensitive uses,
- using sound control devices such as mufflers on equipment,
- using equipment that is quieter than standard equipment, and
- using noise-reducing enclosures around noise-generating equipment.

Traffic Control and Road Maintenance Plan

WSAFCA, in coordination with relevant City and County public works departments, will develop and implement traffic control plan(s) for the proposed project.

A traffic control plan describes the methods of traffic control to be used during construction. All on-street construction traffic would be required to comply with the local jurisdiction's standard construction specifications. The plan will reduce the effects of construction on the roadway system in the project area throughout the construction period. Construction contractors will follow the standard construction specifications of affected jurisdictions and obtain the appropriate encroachment permits, if required. The conditions of the encroachment permit will be incorporated into the construction contract and will be enforced by the agency that issues the encroachment permit.

At least one lane of traffic will be maintained at all times along major streets. Proposed lane closures during the a.m. and p.m. commuting hours will be coordinated with the appropriate jurisdiction and minimized during the morning and evening peak traffic periods. Standard construction specifications also typically limit lane closures during commuting hours. Lane closures will be kept as short as possible. Safe pedestrian and bicyclist access, if any, will be maintained in or around the construction areas at all times. Construction areas will be secured as required by the applicable jurisdiction to prevent pedestrians and bicyclists from entering the work site, and all stationary equipment will be located as far away as possible from areas where bicyclists and pedestrians are present. WSAFCA will notify and consult with emergency service providers to maintain emergency access and facilitate the passage of emergency vehicles on city streets.

WSAFCA will assess damage to roadways used during construction and will repair all potholes, fractures, or other damages.

Recreation Area Access Closure Notification

WSAFCA shall ensure that the contractor posts notice of construction activities and intended days of access closure at least 10 days in advance of the closure. Notice should be posted adjacent to access road, and signs shall be at least 3 square feet in size. The sign shall also indicate a contact regarding recreational area access closure.

Frac-Out Contingency Plan

The contractor will prepare and implement a frac-out contingency plan (FCP) for any excavation activities that use pressurized fluids (other than water). If the contractor prepares the plan, it will be subject to approval by the USACE and WSAFCA before excavation can begin. The frac-out plan will include measures intended to minimize the potential for a frac-out associated with excavation and tunneling activities; provide for the timely detection of frac-outs; and ensure an organized, timely, and “minimum-effect” response in the event of a frac-out and release of excavation fluid (i.e., bentonite). The contingency plan will require, at a minimum, the following measures.

- If a frac-out is identified, all work will stop, including the recycling of the bentonite fluid. In the event of a frac-out into water, the location and extent of the frac-out will be determined, and the frac-out will be monitored for four hours to determine whether the fluid congeals (bentonite will usually harden, effectively sealing the frac-out location).
- The National Marine Fisheries Service (NMFS), DFG, and the RWQCB shall be notified immediately of any spills and shall be consulted regarding clean-up procedures. A brady barrel shall be on-site and used if a frac-out occurs. A vacuum truck and containment materials, such as straw bales, shall also be on-site prior to and during all operations. The site supervisor shall take any necessary follow-up response actions in coordination with agency representatives. The site supervisor will coordinate the mobilization of equipment stored at staging areas (e.g., vacuum trucks) on an as needed basis.
- If the frac-out has reached the surface, any material contaminated with bentonite shall be removed by hand to a depth of 2-feet, contained and properly disposed of, as required by law. The drilling contractor shall be responsible for ensuring that the bentonite is either properly disposed of at an approved Class II disposal facility or properly recycled in an approved manner.
- If the bentonite fluid congeals, no other actions, such as disturbance of the streambed, will be taken that would potentially suspend sediments in the water column.

- The site supervisor shall take any necessary follow-up response actions in coordination with agency representatives. The site supervisor will coordinate the mobilization of equipment stored at off-site locations (e.g., vacuum trucks) on an as needed basis.
- The site supervisor has overall responsibility for implementing this FCP. The site supervisor shall be notified immediately when a frac-out is detected. The site supervisor will be responsible for ensuring that the biological monitor is aware of the frac-out, coordinating personnel, response, cleanup, regulatory agency notification and coordination to ensure proper clean-up, disposal of recovered material and timely reporting of the incident. The site supervisor shall ensure all waste materials are properly containerized, labeled, and removed from the site to an approved Class II disposal facility by personnel experienced in the removal, transport and disposal of drilling mud.
- The site supervisor shall be familiar with the contents of this FCP and the conditions of approval under which the activity is permitted to take place. The site supervisor shall have the authority to stop work and commit the resources (personnel and equipment) necessary to implement this plan. The site supervisor shall assure that a copy of this plan is available (onsite) and accessible to all construction personnel. The site supervisor shall ensure that all workers are properly trained and familiar with the necessary procedures for response to a frac-out, prior to commencement of excavation operations.

Chapter 3

Affected Environment and Environmental Effects

Introduction

This chapter provides an overview of the existing conditions for each of the resources that may be affected by the proposed project. The existing conditions are followed by an evaluation of the environmental affects for each resource.

Resources Eliminated from the Evaluation

Effects on several environmental resources were evaluated and found to be minor. Below is a discussion of these resources and the reasons they were eliminated from detailed discussion.

Land Use

This project would not result in any changes to land use; therefore, land use is not evaluated in detail in this document. Specifically, there would be no change to the adjacent land uses, including recreation. The project site is planned to be a recreational waterfront park area and extend the current Riverwalk.

Public Services

The project would not result in any changes to public services. The project is a levee repair project; it will not result in any new or physically altered government facilities, nor will it result in an increased demand for public services.

Population and Housing

The project would not involve the construction of new housing or require the addition of housing to accommodate workers. The project would not bring into development any areas that are not already planned and approved for development.

Aesthetics

Introduction and Methodology

The term *aesthetics* typically refers to the perceived visual character of an area, such as a scenic view, open space, or architectural façade. The aesthetic value of an area is a measure of its *visual character* and *visual quality* combined with *viewer response* (Federal Highway Administration 1983). This combination may be affected by the components of a project (e.g., buildings constructed at a height that obstructs views, hillsides cut and graded, open space changed to an urban setting), as well as changing elements, such as light, weather, and the length and frequency of viewer exposure to the setting. Aesthetic effects are changes in viewer response as a result of project construction and operation.

Visual Quality

Visual quality is evaluated based on the relative degree of vividness, intactness, and unity as modified by its visual sensitivity.

- *Vividness* is the visual power or memorability of landscape components as they combine in striking or distinctive visual patterns.
- *Intactness* is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, as well as natural settings.
- *Unity* is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the artificial landscape (Federal Highway Administration 1983).

High-quality views are highly vivid and relatively intact and exhibit a high degree of visual unity. Low-quality views lack vividness, are not visually intact, and possess a low degree of visual unity.

Viewer Response

Viewer response is the psychological reaction of a person to visible changes in the viewshed. A viewshed is defined as all of the surface area visible from a particular location (e.g., an overlook) or sequence of locations (e.g., roadway or trail) (Federal Highway Administration 1983). The measure of the quality of a view must be tempered with the overall sensitivity of the viewer and viewer response. Viewer sensitivity is dependent on the number and types of viewers and the frequency (e.g., daily or seasonally) and duration of views (i.e., how long a scene is viewed). Visual sensitivity is also modified by viewer activity,

awareness, and visual expectations in relation to the number of viewers and the viewing duration.

Aesthetic Assessment Process

The concepts presented above are combined in a visual impact assessment process that involves identification of the following:

- visual character and quality of the project area,
- relevant policies and concerns for protection of visual resources,
- general visibility of the project area and site using descriptions and photographs, and
- viewer response and potential impacts.

Significance Criteria

A project impact would have a significant effect on aesthetic resources if it would:

- substantially damage scenic resources, including, but not limited to, trees, rock outcrops, and historic buildings, within a scenic highway;
- substantially degrade the existing visual character or quality of the site and its surroundings; or
- create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Existing Conditions

The project is located within an area that is being redeveloped for urban and recreational uses. The project lies south of the I Street Bridge and North of the Riverwalk. The road on the crown of the subject levee is bare soil and the vegetation and landscape within the project area is characterized by disturbed areas with ruderal grasses and scattered native and nonnative trees with patches of bare soil.

Environmental Consequences

No Action

Under the No-Action Alternative, no construction would occur. However, in order to comply with the USACE levee operation and maintenance guidelines,

trees and vegetation must be removed along the levee slopes and 15 feet from the toe. The effects associated with vegetation removal would be the same as those described under long-term effects.

Proposed Action

Short-Term Effects

The presence of construction equipment on the levee crown and adjacent to the levee would temporarily degrade the existing views at the project sites. Construction equipment would be present up to 60 days. Travelers on adjacent roads, residents and guests of nearby residential structures, employees of adjacent facilities, and recreationists using the river and parks would be able to see construction workers and equipment.

The buildings near the waterfront and the I Street Bridge (and its auto and train traffic) contribute to daytime glare and nighttime light. Depending on specific construction scheduling, the project may increase nighttime light for safety and security, but the effect would be temporary. There may be some minor increases in daytime glare reflecting off construction equipment, but it would be less than significant. There would be no permanent operation changes in light and glare from the proposed project. Because the effect is of a relatively short duration and would last no longer than the construction period (45 days), no mitigation is required.

Long-Term Effects

Trees would be trimmed and removed on the waterside in the process of excavating the upper two thirds of the levee crest to provide clearance for the construction equipment. Trees would be also removed within the staging area to create room for equipment, mixing areas, and the haul route. Upon completion of construction, the only above-ground physical change to the viewshed of the project site would be the removal of trees along the waterside slope of the levee and within the staging area. Because the visual quality and character of project site is of low to moderate and trees will be preserved on both the waterside of the levee and within the staging area, this effect is not significant.

Mitigation

No mitigation is required.

Air Quality

Introduction

This section presents the environmental background necessary to analyze the air quality effects associated with the proposed project.

There is no operational component of the project. Thus, the project would not affect air quality post construction. However, construction of the proposed project would require use of heavy equipment at the construction staging areas and project site.

The primary effect of the proposed project would be the result of temporary increase in pollutant emissions during construction activities.

Existing Conditions

The proposed Project is located in Yolo County, which is located in the Sacramento Valley Air Basin (SVAB). The SVAB includes Sacramento, Shasta, Tehama, Butte, Glenn, Colusa, Sutter, Yuba, Yolo, and parts of Solano and Placer Counties. The SVAB is bound on the west by the Coast Ranges and on the north and east by the Cascade Range and Sierra Nevada.

The SVAB has a Mediterranean climate characterized by hot, dry summers and cool, rainy winters. In general, the prevailing wind in the Sacramento Valley is from the southwest, from marine breezes flowing through the Carquinez Strait. The Carquinez Strait is the major corridor for air moving into the Sacramento Valley from the west.

The SVAB's climate and topography contribute to the formation and transport of photochemical pollutants throughout the region. The region experiences temperature inversions that limit atmospheric mixing and trap pollutants, resulting in high pollutant concentrations near the ground surface. Generally, the lower the inversion base height from the ground and the greater the temperature increase from base to top, the more pronounced the inhibiting effect of the inversion would be on pollutant dispersion. Consequently, the highest concentrations of photochemical pollutants occur from late spring to early fall when photochemical reactions are greatest because of more intense sunlight and the lower altitude of daytime inversion layers. Surface inversions (those at altitudes of 0–500 feet above sea level) are most frequent during winter, and subsidence inversions (those at 1,000–2,000 feet above sea level) are most common in summer.

Criteria Pollutants and Local Air Quality

Description of Pollutants

Ozone

Ozone is a respiratory irritant that increases susceptibility to respiratory infections. It is also an oxidant that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors—reactive organic gases (ROG) and oxides of nitrogen (NO_x)—react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem.

Particulate Matter

Particulates can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials. Particulate emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere.

Carbon Monoxide

Carbon monoxide (CO) is a public health concern because it combines readily with hemoglobin and reduces the amount of oxygen transported in the bloodstream. CO can cause health problems such as fatigue, headache, confusion, dizziness, and even death. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

Toxic Air Contaminants

Diesel-powered construction equipment used for levee construction would emit a range of toxic air contaminants (TACs) including diesel particulate matter (DPM), benzene, formaldehyde, acrolein, 1,3-butadiene, and others. Although ambient air quality standards exist for criteria pollutants, no standards exist for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, the California Air Resources Board (ARB) has consistently found there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risk they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor called a Hazard Index is used to evaluate risk.

Sensitive Receptors

For the purposes of air quality analysis, sensitive land uses are defined as locations where people reside or where the presence of pollutant emissions could adversely affect the use of the land. Residences and the Riverwalk are within 300 feet of the project site.

Regulatory Setting

The air quality management agencies of direct importance in Yolo County include the U.S. Environmental Protection Agency (EPA), ARB, and Yolo-Solano Air Quality Management District (YSAQMD). The EPA has established federal standards for which the ARB and YSAQMD have primary implementation responsibility. The ARB and YSAQMD are responsible for ensuring that state standards are met. The YSAQMD is responsible for implementing strategies for air quality improvement and recommending mitigation measures for new growth and development. At the local level, air quality is managed through land use and development planning practices, which are implemented in the County through the general planning process. The YSAQMD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws.

The YSAQMD attainment status for criteria pollutants is summarized below in Table 3-1.

Table 3-1. Yolo-Solano Air Quality Management District Attainment Status

Pollutant	Averaging Time	State Standards	National Standards
Ozone	1-Hour	Nonattainment	N/A
	8-Hour	Nonattainment	Nonattainment
Carbon Monoxide	1-Hour	Attainment	Unclassified Attainment
	8-Hour	Attainment	Unclassified Attainment
Nitrogen Dioxide	1-Hour	Attainment	N/A
	Annual	N/A	Attainment
Sulfur Dioxide	1-Hour	Attainment	N/A
	24-Hour	Attainment	Attainment
	Annual	N/A	Attainment
Coarse Particulate Matter (PM10)	24-Hour	Nonattainment	Unclassified
	Annual Average	Nonattainment	N/A
Fine Particulate Matter (PM2.5)	24-Hour	N/A	Unclassified
	Annual Average	N/A	Unclassified
Sulfates	24-Hour	Attainment	N/A
Lead	30-Day Average	Attainment	N/A
	Calendar Quarter	N/A	Attainment
Hydrogen Sulfide	1-Hour	Attainment	N/A
Vinyl Chloride	24-Hour	Attainment	N/A
Visibility Reducing Particles	8-Hour	Attainment	N/A

Notes:

N/A = not applicable, state or federal standard does not exist for the combination of pollutant and averaging time.

Unclassified areas are those for which air monitoring has not been conducted but which are assumed to be in attainment.

Source: California Air Resources Board State and National Area Designation Maps (California Air Resources Board 2007) (Available: <<http://www.arb.ca.gov/desig/adm/adm.htm>>).

Significance Criteria

The YSAQMD has specified significance thresholds within its Air Quality Handbook (Yolo-Solano Air Quality Management District 2007) to determine whether mitigation is needed for project-related air quality impacts. According to the YSAQMD's Handbook (2007), the EPA has designated the YSAQMD as in attainment for CO since 1999, which was subsequently deleted as a pollutant of concern and is not included in Table 3-2 below. The YSAQMD's thresholds of significance for construction- and operation-related emissions are presented in Table 3-2.

Table 3-2. Yolo-Solano Air Quality Management District Thresholds of Significance

Pollutant	Thresholds of Significance
ROG	10 tons/year
NO _x	10 tons/year
PM10	80 lbs/day
CO Violation of a state ambient air quality standard for CO.	
Source: Yolo-Solano Air Quality Management District 2007.	

Environmental Consequences

No Action

Under the No Action Alternative there would be no use of construction equipment, no ground disturbing activities, or modifications in current maintenance and operations activities that could result in increased emissions of pollutants or toxic air contaminants. Therefore, there would be no effects related to air quality.

Proposed Action

During construction of the proposed project, emissions would be produced by a variety of sources. They would include criteria pollutant emissions produced by construction equipment and fugitive dust created by wind and the operation of construction equipment over exposed earth.

Construction-phase emissions would result from material handling and heavy equipment operations. It is anticipated site-grading activities would result in the highest daily fugitive dust generation. Table 3-3 shows equipment and truck hours for each phase of construction. Maximum daily construction emissions are shown in Table 3-4.

Table 3-3. Construction Equipment, and Schedule Assumptions during Construction (September–November 2008)

Phases of Construction	Equipment Needed (HP/unit)	Truck Hours
Mobilization, Site Preparation, Clearing and Grubbing	Bulldozers (230)	6
	Dump Trucks (450)	91
	Excavators (247)	6
Levee Degradation	Bulldozers (230)	24
	Dump Trucks (450)	358
	Excavators (247)	24
Slurry Wall Installation	Bulldozers (230)	60
	Long Reach Track Hoe (167)	60
	Loaders (79)	60
	Rough Terrain Forklift(86)	60
Fill Placement (after 23 days of slurry wall settling) and Demobilization	Bulldozers (230)	55
	Dump Trucks (450)	414
	Excavators (247)	28
	Compactors (315)	28
	Maintainers (300)	7
	Water Truck (330)	7

Table 3-4. Estimated Emissions for Construction Activity

West Sacramento Levee EIP	ROG (tons/year)	NO _x (tons/year)	CO (tons/year)	PM10 (lbs/day)
Project	0.04	0.39	0.14	109
Project with Mitigation	0.04	0.38	0.14	10
Yolo-Solano Air Quality Management District Construction Thresholds	10	10	–	80

Without mitigation, construction-related emissions under the proposed action may exceed YSAQMD's daily thresholds for ROG, NO_x, or PM10 and would result in a significant effect. With implementation of Mitigation Measure AQ-1 this effect would be minimized.

Mitigation

Mitigation Measure AQ-1: Implement Air Emission Reducing Measures

Incorporate the following construction measures to reduce particulates:

- apply soil stabilizers to inactive areas;
- replace ground cover in disturbed areas quickly;
- water exposed surfaces 2 times daily;
- reduce speeds on unpaved roads to less than 15 mph;
- water haul roads 2 times daily; and
- fit off highway trucks, including water trucks, with Diesel Particulate Filters (DPF).

In addition to the measures above, the contractor shall provide a plan, for approval by WSAFCA and YSAQMD, demonstrating that the heavy-duty off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, will achieve a project-wide fleet-average 25% NO_x reduction and 40% particulate reduction compared to the most recent ARB fleet average at time of construction. The contractor shall submit to WSAFCA 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 the project, 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 project representative shall provide YSAQMD with the anticipated construction timeline including start date and name and phone number of the project manager and on-site foreman.

Biology

Introduction

This section presents the environmental background necessary to analyze the effects on biological resources associated with the proposed project.

Methodology

Prefield Investigation

ICF Jones & Stokes biologists reviewed the following existing resource information to evaluate whether special-status species or other sensitive biological resources could occur in the proposed project area:

- records in the California Natural Diversity Database (CNDDDB) of the U.S. Geological Survey (USGS) 7.5-minute Sacramento West quadrangle (California Natural Diversity Database 2008);
- the USFWS list of endangered, threatened, and proposed species for the 7.5-minute Sacramento West quadrangle and Yolo County obtained from the USFWS web site (U.S. Fish and Wildlife Service 2008) (Appendix A);
- the California Native Plant Society's (CNPS's) 2007 online *Inventory of Rare and Endangered Plants of California* (California Native Plant Society 2007); and
- ICF Jones & Stokes file information.

This information was used to develop lists of special-status species and other sensitive biological resources that could be present in the project area.

Field Surveys

Field surveys were performed in October 2007 and March 2008. The general purposes of the field surveys were to:

- characterize and map biological communities and their associated wildlife habitat values,
- determine whether suitable habitat is present for special-status plant and wildlife species that have the potential to occur in the project vicinity, and
- identify potential waters of the United States including wetlands.

During the field surveys, an ICF Jones & Stokes botanist/wetland ecologist and biologist conducted a reconnaissance-level habitat-based assessment of the project.

Existing Conditions

The project site is located in the Sacramento Valley subdivision of the California Floristic Province (Hickman 1993) and ranges in elevation from approximately 15 feet to 25 feet above mean sea level. The project is a levee reach located along the Sacramento River just south of the I Street Bridge.

There is no in-water work proposed for the project and any waterside work will occur above the ordinary high water mark.

Land Cover Types

Five land cover types were observed in the project area: riparian, ruderal annual grassland, developed, and bare/disturbed. The riparian areas and ruderal annual grassland are considered biological communities. Each of these land cover types is described below and their locations are shown in Figure 3-1. The acreages of each land cover type at the project site are shown in Table 3-5 below.

Table 3-5. Acreages of Land Cover Types at the Project Site

Land Cover Type	Project Site
Developed	0.87
Ornamental Landscape	3.15
Riparian	0.39
Ruderal Annual Grassland	0.83
Total Acreage	5.24

Riparian

Riparian habitat occurs at and in the vicinity of the project site. Representative trees observed in the riparian areas were Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), valley oak (*Quercus lobata*), black willow (*Salix gooddingii*), box elder (*Acer negundo* var. *californicum*), and sandbar willow (*Salix exigua*).

Ruderal Annual Grassland

Ruderal annual grassland is considered separate from non-native annual grassland because it includes disturbed area which supports a high proportion of ruderal species (weedy species that typically colonize disturbed areas) in addition to annual grasses and forbs. Portions of ruderal annual grassland, particularly areas along the top and sides of the levees, have been mowed. Species commonly observed in ruderal annual grassland were foxtail barley (*Hordeum murinum* ssp. *leporinum*), yellow star-thistle (*Centaurea solstitialis*), prickly lettuce (*Lactuca serriola*), riggut brome (*Bromus diandrus*), perennial peppergrass (*Lepidium latifolium*), and Italian ryegrass (*Lolium multiflorum*).

Other Land Cover Types

Ornamental Landscape

The ornamental landscape cover type include areas consisting of ornamental trees with an understory of ruderal vegetation, typically in preparation for future residential or commercial development, as well as areas adjacent to paved areas. Representative ruderal species observed were prickly lettuce, perennial pepperweed (*Lepidium latifolium*), sweet fennel (*Foeniculum vulgare*), and black mustard (*Brassica nigra*). The trees are primarily nonnative but a few valley oaks and black walnut trees also occur within the land cover type.

Developed

Developed areas occur throughout the project area and consist of residential development, landscaping, and paved areas. Plant species observed within developed portions of the project area were primarily ornamentals planted for landscaping purposes. Representative species observed were crapemyrtle (*Lagerstroemia indica*), oleander (*Nerium oleander*), and privet (*Ligustrum* sp.).

Ecological Value

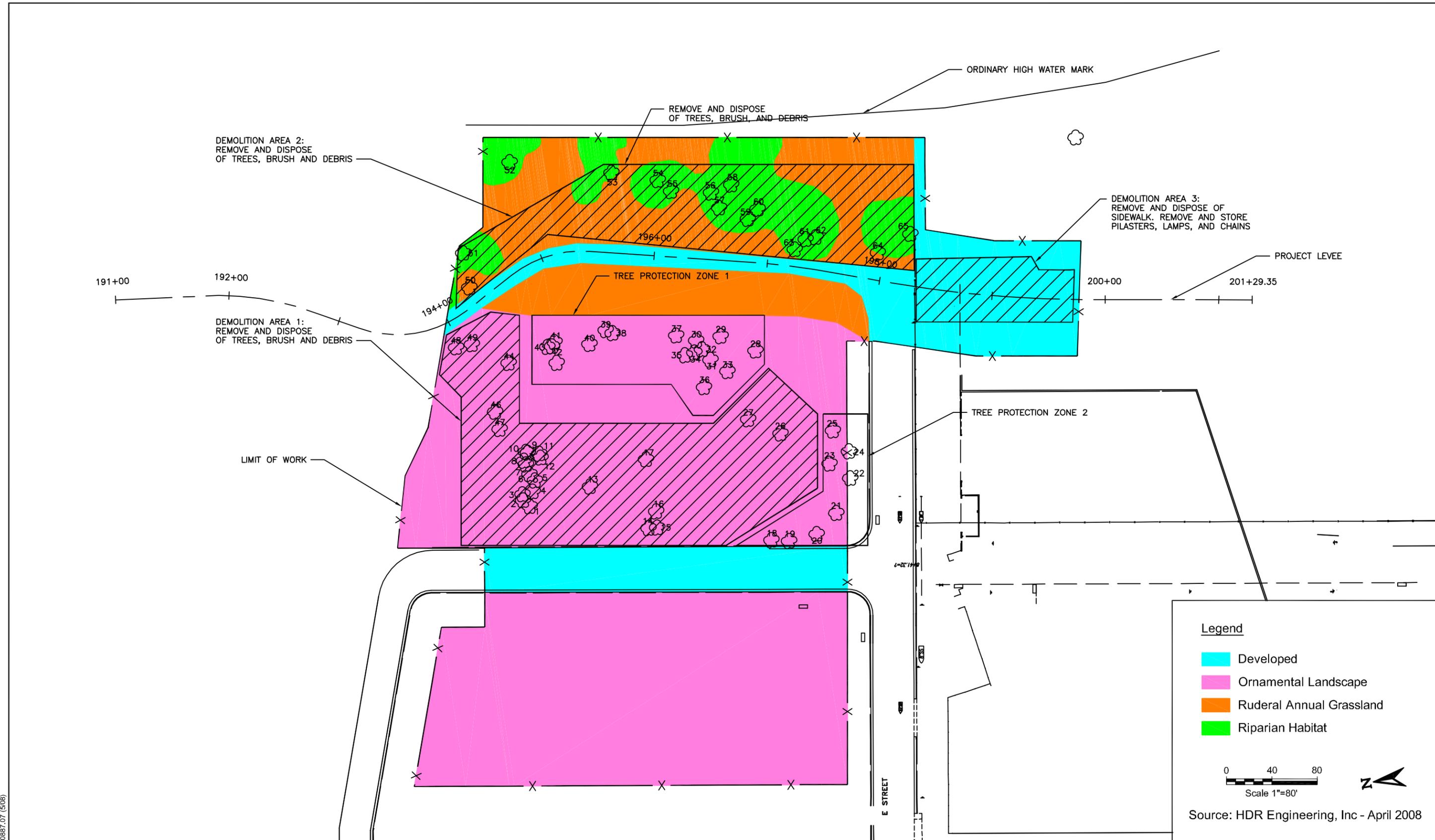
The riparian trees and trees on the landside of the levee provide roosting and nesting habitat for numerous wildlife species, including resident, wintering, and migratory species, including raptors. The riparian habitat provides less habitat value than would be expected if the riparian corridor were wider with a more complex vegetation structure. Riparian vegetation within the project footprint is located on a bench above the ordinary high watermark (OHWM) of the Sacramento River and does not provide shade to the adjacent Sacramento River. The project site is also subject to human disturbance from pedestrians and recreationists accessing the bank through the project site.

Sensitive Biological Resources

Special-Status Species

Special-status species include plants and animals that are legally protected under the California Endangered Species Act (CESA), the federal Endangered Species Act (ESA), or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. For the purpose of this EA, special-status species include:

- species listed or proposed for listing as threatened or endangered under ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [FR] [proposed species]); and
- species that are candidates for possible future listing as threatened or endangered under ESA (71 FR 53757, September 12, 2006);



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Figure 3-1
Land Cover Types at the Project Site
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- species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5);
- plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.);
- plants considered by CNPS to be “rare, threatened, or endangered in California” (Lists 1B and 2, California Native Plant Society 2007);
- animal species of special concern to DFG (list obtained from <<http://www.dfg.ca.gov/bdb/pdfs/spanimals.pdf>>); and
- animals fully protected in California (California Fish and Game Code Sections 3511 [birds], 4700 [mammals], and 5050 [amphibians and reptiles]).

Special-Status Plant Species

A search of the CNDDDB (2008) conducted as part of the prefield investigation identified 15 special-status plants as having the potential to occur in the project area (Table 3-6). Suitable habitat is not present in the project area for these 15 species (California Native Plant Society 2007).

Special-Status Wildlife Species

Based on a review of the CNDDDB records, USFWS special-status species list, and knowledge of the proposed project area, biologists identified six special-status wildlife species as having potential to occur in the region.

- Swainson’s hawk,
- western pond turtle,
- giant garter snake
- Valley elderberry longhorn beetle
- Cooper’s hawk, and
- white-tailed kite.

The presence for giant garter snake was evaluated at the project site and based on field surveys, it was determined that the project site provides no habitat for this species due to lack of suitable open water and wetland habitat. During the 2007 and 2008 surveys of the site, one elderberry shrub, habitat for the federally protected Valley Elderberry Longhorn beetle, was found more than 100 feet outside the project disturbance footprint. The project will not result in adverse effects to the subject elderberry shrub.

Swainson’s Hawk

Swainson’s hawk is designated as a federal species of concern and state-listed as threatened. Swainson’s hawk is a summer resident in the study area. In the Central Valley, Swainson’s hawk nests primarily in riparian areas adjacent to

agricultural fields or pastures, although it sometimes uses isolated trees or roadside trees (California Department of Fish and Game 1994). The Swainson's hawk nests in mature trees; its preferred tree species are valley oak, cottonwood, willows, sycamores, and walnuts. Nest sites typically are located near suitable foraging areas. The primary foraging areas for Swainson's hawk include open agricultural lands and pastures (California Department of Fish and Game 1994).

The riparian habitat along the Sacramento River provide suitable nesting habitat for Swainson's hawk. A CNDDDB records search identified Swainson's hawk occurrences along the Sacramento River. Formal surveys have not been performed to determine whether this species was currently present and nesting in the project area. However, Swainson's hawk is expected to be a permanent resident in the vicinity of the project area and may nest in large trees adjacent to the project site. The ruderal vegetation in the staging area supports a minimal amount of foraging habitat for Swainson's hawk.

Western Pond Turtle

The western pond turtle is designated as a federal and state species of concern. The western pond turtle inhabits permanent or nearly permanent waters with little or no current (Behler and King 1998). The channel banks of inhabited waters usually have thick vegetation, but basking sites such as logs, rocks, or open banks must also be present (Zeiner et al. 1988). Eggs are laid in nests along sandy banks of large, slow-moving streams or in upland areas, including grasslands, woodlands, and savannas. Nest sites typically are found on a slope that is unshaded and has a high clay or silt composition and in soil at least 4 inches deep (Jennings and Hayes 1994).

A CNDDDB records search did not identify any occurrences within a 5-mile radius of the project site. Western pond turtles may use the waterside of the levee to bask and nest.

Cooper's Hawk

The Cooper's hawk is federally listed as a species of concern. The hawk breeds throughout most of California in a variety of woodland habitats, including riparian and oak woodlands. Cooper's hawk are known to be permanent residents in the project vicinity.

Although Cooper's hawks have not been recorded at the project site, the project site provides suitable habitat for this species. A CNDDDB records search did not identify any occurrences of Cooper's hawk in the 500 feet of the project site (California Natural Diversity Database 2008). However, the mature riparian vegetation provides suitable nesting. Cooper's hawk may use any of the trees in the project area for roosting. Minimal foraging habitat exists within the staging area.

White-Tailed Kite

The white-tailed kite is designated as a federal species of concern and is a fully protected state species. The white-tailed kite inhabits open lowland grassland,

Table 3-6. Special-Status Plants Identified During the Prefield Investigation as Having the Potential to Occur in the Project Area

Common Name and Scientific Name	Legal Status ^a Federal/State/ CNPS	Geographic Distribution/Floristic Province	Habitat Requirements	Blooming Period	Potential for Occurrence in the Project Area
Ferris's milk vetch <i>Astragalus tener</i> var. <i>ferrisiae</i>	-/-/1B.1	Historic range included the Central Valley from Butte to Alameda Counties; currently only occurs in Butte and Glenn Counties	Seasonally wet areas in meadows and seeps, subalkaline flats in valley and foothill grassland; 5–75 meters	Apr–May	Not present; no suitable habitat occurs in the project area
Alkali milk vetch <i>Astragalus tener</i> var. <i>tener</i>	-/-/1B.2	Southern Sacramento Valley, northern San Joaquin Valley, eastern San Francisco Bay	Playas, on adobe clay in valley and foothill grassland, vernal pools on alkali soils; below 60 meters	Mar–Jun	Not present; no suitable habitat occurs in the project area
Heartscale <i>Atriplex cordulata</i>	-/-/1B.2	Western Central Valley and valleys of adjacent foothills	Saline or alkaline soils in chenopod scrub, meadows and seeps, sandy areas in valley and foothill grassland; below 375 meters	Apr–Oct	Not present; no suitable habitat occurs in the project area
Brittlescale <i>Atriplex depressa</i>	-/-/1B.2	Western and eastern Central Valley and adjacent foothills on west side of Central Valley	Alkaline or clay soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland, vernal pools; below 320 meters	May–Oct	Not present; no suitable habitat occurs in the project area
San Joaquin saltscale <i>Atriplex joaquiniana</i>	-/-/1B.2	Western edge of the Central Valley from Glenn to Tulare Counties	Alkaline soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland; below 320 meters	Apr–Oct	Not present; no suitable habitat occurs in the project area
Palmate-bracted bird's-beak <i>Cordylanthus palmatus</i>	E/E/1B.1	Livermore Valley and scattered locations in the Central Valley from Colusa to Fresno Counties	Alkaline grassland, alkali meadow, chenopod scrub; 5–155 meters	May–Oct	Not present; no suitable habitat occurs in the project area
Dwarf downingia <i>Downingia pusilla</i>	-/-/2.2	Inner North Coast Ranges, southern Sacramento Valley, northern and central San Joaquin Valley	Wet areas in valley and foothill grassland, vernal pools; below 445 meters	Mar–May	Not present; no suitable habitat occurs in the project area
Boggs Lake hedge hyssop <i>Gratiola heterosepala</i>	-/E/1B.2	Inner North Coast Ranges, central Sierra Nevada foothills, Sacramento Valley, Modoc Plateau	Marshes and swamps along lake margins, vernal pools on clay soils; 10–2,375 meters	Apr–Aug	Not present; project area is outside documented elevation range for this species.

Table 3-6. Continued

Common Name and Scientific Name	Legal Status ^a Federal/State/ CNPS	Geographic Distribution/Floristic Province	Habitat Requirements	Blooming Period	Potential for Occurrence in the Project Area
Rose-mallow <i>Hibiscus lasiocarpus</i>	-/-/2.2	Central and southern Sacramento Valley, deltaic Central Valley, and elsewhere in the U.S.	Freshwater marsh along rivers and sloughs; below 120 meters	Jun-Sep	Not present; no suitable habitat occurs in the project area
Northern California black walnut <i>Juglans hindsii</i>	-/-/1B.1	Last two native stands in Napa and Contra Costa Counties; historically widespread through southern Inner North Coast Ranges, southern Sacramento Valley, northern San Joaquin Valley, San Francisco Bay	Riparian scrub and riparian woodland; below 440 meters	Apr-May	Moderate; suitable habitat present but not observed during field surveys. Nearest occurrence is ~9 miles away.
Legenere <i>Legenere limosa</i>	-/-/1B.1	Sacramento Valley, North Coast Ranges, northern San Joaquin Valley and Santa Cruz mountains.	Vernal pools; below 880 meters	May-Jun	Not present; no suitable habitat occurs in the project area
Heckard's pepper-grass <i>Lepidium latipes</i> var. <i>heckardii</i>	-/-/1B.2	Southern Sacramento Valley	Alkaline flats in valley and foothill grassland; 10-200 meters	Mar-May	Not present; project area is outside documented elevation range for this species.
Baker's Navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	-/-/1B.1	Inner North Coast Ranges, western Sacramento Valley	Mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools; 5-1,740 meters	Apr-Jul	Not present; no suitable habitat occurs in the project area
Colusa grass <i>Neostapfia colusana</i>	T/E/1B.1	Central Valley with scattered occurrences from Colusa to Merced Counties	Adobe soils of vernal pools; 5-200 meters	May-Aug	Not present; no suitable habitat occurs in the project area
Sanford's arrowhead <i>Sagittaria sanfordii</i>	-/-/1B.2	Scattered locations in Central Valley and Coast Ranges	Freshwater marshes, sloughs, canals, and other slow-moving water habitats; below 610 meters	May-Oct	Not present; no suitable habitat occurs in the project area
Crampton's tuctoria <i>Tuctoria mucronata</i>	E/E/1B.1	Southwestern Sacramento Valley, Solano and Yolo Counties	Wet areas in valley and foothill grassland, vernal pools; 5-10 meters	Apr-Aug	Not present; no suitable habitat occurs in the project area

Table 3-6. Continued

Common Name and Scientific Name	Legal Status ^a Federal/State/ CNPS	Geographic Distribution/Floristic Province	Habitat Requirements	Blooming Period	Potential for Occurrence in the Project Area
^a Status explanations:					
Federal					
E = listed as endangered under the federal Endangered Species Act.					
T = listed as threatened under the federal Endangered Species Act.					
– = no listing.					
State					
E = listed as endangered under the California Endangered Species Act.					
– = no listing.					
California Native Plant Society (CNPS)					
1B = List 1B species: rare, threatened, or endangered in California and elsewhere.					
2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.					
0.1 = seriously endangered in California.					
0.2 = fairly endangered in California.					

riparian woodland, seasonal wetlands, and scrub areas. It requires some large shrubs or trees for nesting.

A CNDDDB records search identified one occurrence within 5 miles of the project site. Formal surveys have not been performed to determine whether this species was present and nesting in the project site. However, white-tailed kite is expected to be a permanent resident within the vicinity of the project site.

Within the project site, riparian habitat along the Sacramento River provides nesting and roosting habitat for this species. The ruderal vegetation within the staging area supports a minimal amount of foraging habitat for white-tailed kite that breed or winter in the project vicinity.

Other Protected Species

Non-special-status migratory birds and raptors have the potential to nest in trees and shrubs throughout and adjacent to the proposed project area. Although these species are not considered special-status wildlife species, their occupied nests and eggs are protected by California Fish and Game Code Sections 3503 and 3503.5 and the Migratory Bird Treaty Act of 1918 (MBTA) (50 CFR 10 and 21).

Special-Status Fish Species

The Sacramento River runs adjacent to the project and provides a migratory pathway for listed fish species. No work will occur within OHWM of the Sacramento River. Special-status fish species occurring within the Sacramento River consist of Sacramento River winter-run Chinook salmon Evolutionarily Significant Unit (ESU) (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon ESU (*O. tshawytscha*), Central Valley fall-/late fall-run Chinook salmon ESU (*O. tshawand ytscha*), Central Valley steelhead DPS (*O. mykiss*).

Other Sensitive Biological Resources

Sensitive Habitats

The riparian habitat within the project site is considered a sensitive habitat. Important biological communities such as riparian habitat are considered sensitive because of high species diversity, high productivity, unusual nature, limited distribution, declining status, or a combination of these attributes. Local, state, and federal agencies consider such habitats important. The CNDDDB (2008) contains a current list of rare (i.e., important) natural communities throughout the state. USFWS considers certain habitats, such as wetlands and riparian communities, important to wildlife.

Waters of the United States, Including Wetlands

There are no waters of the United States within disturbance footprint of the project site. All work will occur above the OHWM.

Heritage Trees

Heritage trees are defined by the city of West Sacramento Tree Ordinance as any living tree with a trunk circumference of 75 inches [diameter of 24 inches] or more, or any living native oak (any species of the genus *Quercus*) with a trunk circumference of 50 inches [diameter of 16 inches] or more, both measured 4 feet 6 inches above ground level. There are five heritage trees on the landside of the levee. All heritage trees on the waterside of the levee are considered riparian trees.

Regulatory Setting

City of West Sacramento Tree Preservation Ordinance

The City of West Sacramento Tree Preservation Ordinance is found in the Municipal Code, Title 8, Health and Safety, Chapter 24, Tree Preservation. The City of West Sacramento has definitions for heritage trees and landmark trees.

A *heritage tree* means any living tree with a trunk circumference of 75 inches [diameter of 24 inches] or more, or any living native oak (any species of the genus *Quercus*) with a trunk circumference of 50 inches [diameter of 16 inches] or more, both measured 4 feet 6 inches above ground level. The circumference of multi-trunk trees shall be based on the sum of the circumference of each trunk.

A *landmark tree* means a tree or stand of trees that is especially prominent, stately, or of historical significance as designated by the city council. It is unlawful in the city of West Sacramento to perform any of the following acts with respect to a heritage or landmark tree without a tree permit issued by the city tree administrator.

- Move, remove, cut down, poison, set fire to or permit fire to burn in proximity to, or perform or fail to perform any act that results in the unnatural death or destruction of a landmark or heritage tree.
- Perform any activity that will interfere with or retard the natural growth of any landmark or heritage tree.
- Perform any work or permit any work to be performed within the dripline area of a landmark or heritage tree.
- Trim or prune any branch of a landmark or heritage tree that is 5 inches or more in diameter.
- Change the appropriate amount of irrigation or drainage water provided to any landmark, heritage, or street tree.

- Trench, grade, pave, or otherwise damage or disturb any exposed roots within 1 foot outside the drip line area of any landmark, heritage, or street tree.
- Park or operate any motor vehicle within 1 foot outside the drip line area of any landmark, heritage, or street tree.
- Place or store any equipment or construction materials within 1 foot outside the dripline area of any landmark, heritage, or street tree.
- Place, apply, or attach any signs, ropes, cables, or any other items to any landmark, heritage, or street tree.
- Place or allow to flow any oil, fuel, concrete mix, or other deleterious substance into or over within 1 foot outside the drip area of any landmark, heritage, or street tree.

Significance Criteria

For the purpose of this analysis, the proposed project was considered to have a significant effect if it would cause:

- temporary or permanent removal, filling, grading, or disturbance of waters of the United States, including wetlands and jurisdictional and nonjurisdictional woody riparian vegetation;
- temporary or permanent loss of occupied special-status species habitat or indirect or direct mortality of more than 10% of the individuals of a special-status species documented by project surveys in the project area; or
- a reduction in the area or geographic range of rare natural communities and significant natural areas.

Environmental Conditions

No Action

Under the No-Action Alternative, no construction activities that could directly or indirectly affect protected vegetation or wildlife would occur. However, woody vegetation will be removed along the levee slopes and 15 feet from the toe to comply with more robustly enforced USACE levee operation and maintenance guidelines. The effects associated with vegetation removal would be the same as those described below for the proposed action.

Proposed Action

Sensitive Biological Resources

Riparian Habitat

Construction of the project would result in the removal of approximately 0.29 acres of riparian habitat in order to reshape the levee slope and to allow for room for equipment. Removal of riparian habitat would be considered a significant effect; however, implementation of Mitigation Measures BIO-1 would reduce the effect to below a level of significance.

Heritage Trees

Construction of the project would result in tree removal and trimming of approximately 24 trees on the landside of the levee. The removal is required to create space for haul routes, mixing areas, and equipment storage. Five of the 24 trees are protected by the city of West Sacramento Tree Ordinance and are considered heritage trees.

Removal of protected trees would be considered a significant effect, but implementation of Mitigation Measures BIO-2 would reduce the effect to below a level of significance.

Mitigation for Sensitive Biological Resources

Mitigation Measure BIO-1: Compensate for Removal of Riparian Habitat

WSAFCA will compensate for the permanent loss of riparian habitat caused by project construction. Compensation will include restoring or enhancing in-kind riparian habitat at a ratio of 2 acres for each acre affected, for a total of 0.58 acres. The mitigation ratio will ensure long-term replacement of habitat functions and values. Revegetation will be planned and coordinated prior to the removal of existing riparian vegetation.

Mitigation will not occur within the area of disturbance. As much of the mitigation habitat as possible will be created near the project area. Mitigation site selection, however, will avoid areas where future levee improvements will occur or where maintenance is likely. To the extent practicable, mitigation sites will be located in the vicinity of the project area. If not all mitigation is feasible near the project site, WSAFCA shall acquire mitigation credits at the DFG-approved mitigation bank, a DFG approved compensation site, or other DFG-approved strategy.

WSAFCA will prepare a revegetation plan and monitor the restoration or enhancement mitigation sites. The revegetation plan will be prepared by a qualified restoration ecologist and reviewed by the appropriate agencies. The revegetation plan shall include a description and map of the site, including the soil type and existing vegetation, the species to be planted and/or seeded; a

description of the extent and method of irrigation; specifications for site preparation and installation of plant materials; specification and schedule for installation, including amount and application method of fertilizers; and specifications for a success criteria and the corrective action recommended or to be taken when mitigation measures do not meet the proposed success criteria

Mitigation Measure BIO-2: Compensate for Removal of Protected Trees

WSAFCA will compensate for the permanent loss of heritage trees caused by project construction. WSAFCA will apply for a tree permit from the City of West Sacramento. Tree permits require the applicant implement a tree replacement plan to replace a tree that must be removed with a living tree on the property or within the city of West Sacramento in a location approved by the tree administrator. Trees will not be replanted within the project disturbance area. To the extent practicable, tree mitigation sites will be located in the vicinity of the project area.

Replacement trees are required at the ratio of 1-inch diameter of replacement plant for every 1-inch diameter of tree removed. Replacement trees may be a combination of 15-gallon-size trees, which are the equivalent of a 1-inch-diameter tree, or 24-inch box trees, which are the equivalent of a 3-inch-diameter tree.

Special-Status Wildlife Species

Potential Loss or Disturbance of Active Swainson's Hawk Nests

Suitable nesting habitat for Swainson's hawks occurs at and adjacent to the project area. A CNDDDB record search indicates the presence of active nest sites along the Sacramento River. Although no active nests were observed during the field survey, active nests may be established in the vicinity of the project area before construction begins. Noise and other construction-related disturbances may affect nesting Swainson's hawks in the vicinity of the construction corridor during the breeding season (March through August). This effect would be considered significant because construction disturbances of nest sites may contribute to continuing local decline of Swainson's hawks. These effects would be reduced to below a level of significance with implementation of Mitigation Measures BIO-3.

Direct or Indirect Adverse Effects on Western Pond Turtle

The waterside bank of the project site may provide suitable habitat for Western Pond Turtle. Ground disturbing activities may affect nesting sites on the waterside of the levee. WSAFCA will avoid and minimize potential effects on pond turtle by implementing Mitigation Measure BIO-4 along with environmental commitments in Chapter 2.

Potential Loss or Disturbance of Active Cooper's Hawk, White-Tailed Kite, and Other Non-Special-Status Raptor Nests

Suitable nesting habitat for Cooper's hawk, white-tailed kite, and other non-special-status raptors, including red-tail hawk, red-shouldered hawk, and great horned owl, occurs in the riparian habitat adjacent to the project area. Noise and other construction-related disturbances may affect nesting raptors in the vicinity of the project area during the breeding season (March through August). This effect would be considered significant because construction disturbances of nest sites may contribute to continuing local decline of these species. These effects would be reduced below a level of significance by implementing Mitigation Measure BIO-5.

Mitigation for Special-Status Wildlife Species

Mitigation Measure BIO-3: Conduct Preconstruction Surveys for Nesting Swainson's Hawks and Avoid Removal or Disturbance of Active Nests

A biologist will conduct preconstruction surveys prior to the start of construction to locate all active nest sites within 0.5 mile of the project site. WSAFCA will establish a 0.25-mile buffer zone around all known and suspected Swainson's hawk nests. The 0.25-mile buffer and a 100-yard buffer will be marked with specific identifiable flags. Construction will be restricted to areas more than 100 yards from active nests until after chicks have hatched in June. Vehicles will be allowed to drive past the nest within that 100-yard buffer zone, but will not be allowed to stop, honk their horns, or otherwise project a physical, visual, or audible disturbance. Whenever construction occurs within 0.25 mile of an active nest, a biological monitor will observe the nesting hawks for stressed/detrimental behavior that threatens nest success. If there appears to be a threat to nesting success resulting from construction activity within the 0.25-mile buffer, work will be halted until the hawk's behavior normalizes and the threat has dissipated. The most obvious and dangerous detrimental behavior occurs when the hawk is scared off the nest. If that occurs (even momentarily), construction will stop immediately within 0.25 mile of the nest for at least 1 hour after the hawk returns to the nest and her behavior appears to normalize. When construction resumes, if the hawk is scared off the nest a second time, WSAFCA will not resume construction within that 0.25-mile zone until having consulted with DFG to discuss further options. Other stressors/detrimental behaviors that the monitor will look for include the hawk being off the eggs while still on the nest (e.g., circling/walking around the nest and calling). In the execution of this mitigation measure, the biological monitor will watch for signs that the hawks are paying attention to construction instead of behaving normally (e.g., sitting calmly on the nest, watching out for or scaring away potential predators) and will apply professional expertise and discretion in determining the specific effects of the project's construction activities on the hawks.

Mitigation Measure BIO-4: Conduct a Preconstruction Survey for Northwestern Pond Turtles

To avoid construction-related effects on northwestern pond turtles, the applicant or its contractor will retain a qualified wildlife biologist to conduct a preconstruction survey for northwestern pond turtles on the waterside of the levee no more than 48 hours before the start of construction. The wildlife biologist will look for adult pond turtles, in addition to nests containing pond turtle hatchlings and eggs. If a northwestern pond turtle is located in the project area, the biologist will move the turtle to a suitable aquatic site, outside the construction area. If an active pond turtle nest containing either pond turtle hatchlings or eggs is found, the applicant will consult DFG to determine and implement appropriate avoidance measures, which may include a “no-disturbance” buffer around the nest site until the hatchlings have moved to a nearby aquatic site.

Mitigation Measure BIO-5: Conduct Surveys for Nesting Cooper’s hawk, White-Tailed Kites and Other Non-Special-Status Raptors, and Avoid Removal or Disturbance of Active Nests

A qualified biologist will conduct a preconstruction survey to locate all active nest sites within 0.25 mile of the project site. Direct disturbance, including removal of nest trees and activities in the immediate vicinity of active nests, will be avoided during the breeding season (March through August) where feasible. No-disturbance buffers will be established around each active nest to avoid disturbing nesting birds where feasible. The size and configuration of buffers will be based on the proximity of active nests to construction, existing disturbance levels, topography, the sensitivity of the species, and other factors and will be established through coordination with DFG representatives on a case-by-case basis.

Special-Status Fish Species**Construction Related Effects to Fish Habitat**

Increases in suspended sediment and turbidity or the release of toxic substances could directly or indirectly harm fish or their habitat during construction (permanent water bodies during the non-flood season). The potential for adverse effects depends on the sensitivity of the species and life stage and the concentration and duration of exposure.

The levels of suspended sediment and turbidity that can be generated by construction activities on the levee slope can potentially reach levels that disrupt the normal activities of fish (feeding, sheltering, and migrating) and lead to reduced growth and survival if inputs persist. High concentrations of sediment can also settle out and reduce the amount or quality of habitat for fish and other aquatic organisms.

Toxic substances used at construction sites, including gasoline, lubricants, and other petroleum-based products, can enter water bodies as a result of spills or leakage from machinery or storage containers. Bentonite and cement used for

the slurry cutoff walls could enter the Sacramento River. These substances can kill fish and other aquatic organisms through exposure to lethal levels or through exposure to non-lethal levels that cause physiological stress and increased susceptibility to other sources of mortality.

Implementation of project a Stormwater Pollution Prevention Plan, described in Mitigation Measure GEO-1 and the environmental commitment Frac-Out Contingency Plan described in Chapter 2 would reduce the effect to below a level of significance.

During construction activities, some harassment or delay of migrating adults or juveniles may occur as a result of noise, artificial light, and other disturbances. The environmental commitment Noise-Reducing Construction Practices described in Chapter 2 will lessen disturbance to fish species. These disturbances are not expected to be of sufficient extent, duration, or intensity to affect survival, growth, or spawning success.

Cultural Resources

Introduction

Cultural resources are those resources listed or considered eligible for listing on the National Register of Historic Places (NRHP). This section outlines the cultural setting, resource assessment criteria and potential effects of the construction of levee repairs on important cultural resources.

Existing Conditions

Cultural Setting

Prehistoric Context

It is probable that humans have inhabited the Sacramento Valley for the last 10,000 years. However, evidence for early occupation is likely deeply buried under alluvial sediments deposited during the late Holocene. Although rare, archaeological remains of the early period have been identified in and around the Central Valley (Johnson 1967; Peak & Associates 1981; Treganza and Heizer 1953), but to date none have been located in the West Sacramento area. Early archaeological manifestations are categorized as the Farmington Complex, which is characterized by core tools and large, reworked percussion flakes (Treganza and Heizer 1953). The economy of this early period was likely based on the exploitation of large game.

Later periods are better understood because of more abundant representation in the archaeological record. Fredrickson (1973) identified three general patterns of

cultural manifestations for the period between 4,500 B.P. and 3,500 B.P.: the Windmill, Berkeley, and Augustine Patterns.

The Windmill Pattern (4,500 B.P.–3,000 B.P.) shows evidence of a mixed economy consisting of the generalized hunting of game, fishing, and use of wild plant foods. Settlement strategies during the Windmill period reflect seasonal occupation of valleys during the winter and the foothills during the summer (Moratto 1984).

Cultural changes are manifested in the Berkeley Pattern (3,500 B.P.–2,500 B.P.). Technological changes in groundstone from handstones and milling slabs to the mortar and pestle indicate a greater dependence on acorns, and the presence of a wide variety of projectile points and atlatls indicate hunting was still an important activity (Fredrickson 1973).

The Berkeley Pattern was superseded by the Augustine Pattern around A.D. 500, and reflects a change in subsistence and land use patterns similar to those of the ethnographically known people of the proto-historic era. This pattern exhibits a great elaboration of ceremonial and social organization, including the development of social stratification. Elaborate exchange systems, further reliance on acorns, and a wide variety of artifacts (flanged tubular smoking pipes, harpoons, clamshell disc beads, and an especially elaborate baked clay industry, which included figurines and pottery vessels called Cosumnes Brownware) are associated with the Augustine Pattern. Increased village sedentism, population growth, and an incipient monetary economy are also hallmarks of this pattern (Moratto 1984).

Ethnographic Context

The project area is located at the interface of three Native American groups: the Patwin (or Wintun), and to a lesser extent the Nisenan and the Plains Miwok. The banks of the Sacramento River and associated riparian and tule marshland habitats were inhabited by the River or Valley Patwin. The Plains Miwok and Nisenan, while primarily occupying territories east of the Sacramento River, utilized land west of the river as well (Johnson 1978; Levy 1978; Wilson and Towne 1978).

The material culture and settlement-subsistence behavior of these groups exhibit similarities, likely because of historical relationships and a shared natural environment. Historical maps and accounts of early travelers to the Sacramento Valley testify that tule marshes, open grasslands, and occasional oak groves (Jackson 1851; Ord 1843; Wyld 1849) characterized the study area. The area was generally wet in the winter and often subject to flooding; the weather was exceedingly dry in summer. Much of the floodplain was presumably sparsely inhabited, and Native Americans typically situated their larger, permanent settlements on high ground along the Sacramento and American Rivers (Bennyhoff 1977; Kroeber 1925, 1932; Levy 1978; Wilson and Towne 1978).

The Native American economy in the project area was based principally on the use of natural resources from the riparian corridors, wetlands, and grasslands adjacent to the Sacramento River. Fish, shellfish, and waterfowl were important sources of protein in the diet of these groups (Johnson 1978; Kroeber 1932). Salmon, sturgeon, perch, chub, sucker, pike, trout, and steelhead were caught with nets, weirs, lines and fishhooks, and harpoons. Mussels were harvested from the gravels along the Sacramento River channel. Geese, ducks, and mudhens were hunted using decoys and various types of nets. The majority of important plant resources in the Patwin diet came from the grasslands of the Sacramento River floodplain. In addition to the staple acorn, a number of seed plants were important secondary food sources. These plants included sunflower, wild oat, alfilaria, clover, and bunchgrass (Johnson 1978).

Historical Context

Yolo County is located in the northern part of the Central Valley and was one of the original 27 counties created when California became a state in 1850. Yolo County originally consisted of eleven Mexican land grants. Of these eleven, only five, Rancho Rio de los Putos, Rancho Quesesosi, Rancho Rio de Jesus Maria, Rancho Jimeno, and Rancho Canada de *Capay*, were eventually confirmed by the U.S. government after assuming control of the region (Coy 1973; Gudde 1969; Kyle et al. 1990).

The California Gold Rush transformed the county from an isolated farming community into a booming agricultural region as disenchanting miners realized they could make a greater fortune through farming and ranching rather than gold prospecting. From the mid-nineteenth through the mid-twentieth centuries, Yolo County was generally agrarian in focus, the main crops being wheat, barley, and other grains. Commercial enterprises related to agriculture and livestock also sprang up during this period, furthering the development and growth of the region (Davis 1890; Larkey and Walters 1987).

The county's first town, Fremont, was founded in 1849 along the confluence of the Sacramento and Feather Rivers (south of present day Knights Landing). It became the first county seat in 1850. Margaret McDowell established the town of Washington—presently known as West Sacramento—along the west bank of the Sacramento River directly across from the City of Sacramento in 1849, a short time after Fremont was founded. After Fremont suffered flood damage in 1851, the county government was moved to Washington. Between 1857 and 1861, the county seat moved from Washington to Cacheville (present day Yolo) and back to Washington. Finally in 1862, flooding motivated voters to choose centrally located Woodland as the permanent county seat (Kyle et al. 1990).

Present-day West Sacramento experienced little growth until the early 1900s when levee construction along the Sacramento River encouraged settlement and development of the area. Early settlers included Jan Lows de Swart (holder of the Rancho Nueva Flandria land grant), who constructed a home in the 1840s along the west bank of the river directly across from Sacramento. By 1846,

James McDowell had acquired the property, and three years later his widow, Margaret, laid out the town of Washington (later called Broderick and now part of the City of West Sacramento). In 1911, the West Sacramento Company laid out the community of Riverbank (later called Bryte) directly east of the present-day Interstate 80 crossing of the Sacramento River. Shortly thereafter, plans were underway for the establishment of the town of West Sacramento (Corbett 1993).

Between 1911 and 1918 hundreds of miles of levees were constructed in order to control flooding in the Sacramento Valley. As early as 1892, farmers of Yolo County came together to construct levees along the Sacramento River from the town of Washington to roughly 9 miles downstream. In March 1911, the Sacramento Land Company (formerly the West Sacramento Land Company) assisted with the establishment of RD 900 in what is now West Sacramento. The formation of this district created a framework for using public funds through bonds, levies, and taxes to drain the land (Bouey and Herbert 1990; Corbett 1993; Walters 1987).

Under the direction of civil engineers Haviland & Tibbetts, formation of RD 900 began. The district spanned 11,500 acres from the east-west line of the Southern Pacific Railroad (SPRR) tracks, south to the vicinity of Riverview. Construction involved installing drainage canals, levees, and pumphouses. The canals carried drainage to the pumphouses, which, in turn, moved the water over the levees into the Yolo Bypass. As the land was drained of water, the fields of tules were removed, establishing acres of agricultural land (Corbett 1993).

Following World War I, West Sacramento remained an unincorporated area primarily populated by small farms and a handful of industries. By the 1920s, the main east-west transcontinental highway (U.S. Highway 40, now West Capitol Avenue) traveled through West Sacramento; within a few years several hotels and motels were constructed along its route through town. During World War II factories and other industries began to prosper along the west bank of the Sacramento River. Following the war, like much of the state, the region experienced a housing boom that would last for several decades (Corbett 1993).

In 1987, after numerous previous attempts, the City of West Sacramento was officially incorporated. The new city included the former communities of Broderick, Bryte, and surrounding urban and rural areas on the west side of the Sacramento River into Southport (Walters 1987).

Regulatory Setting

Pursuant to federal regulations federal agencies must comply with Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 470) and the implementing regulations prior to any federal undertaking. Before beginning any undertaking, Section 106 requires a federal agency to take into account the effects of the undertaking on historic properties and afford the Advisory Council

on Historic Preservation (ACHP) an opportunity to comment on these actions. The Section 106 process has four basic steps:

1. Identify and evaluate historic properties.
2. Assess effects of the project on historic properties.
3. Resolve any adverse effects of the project on historic properties in consultation with the State Historic Preservation Officer (SHPO), resulting in a Memorandum of Agreement (MOA) that spells out specific measures to avoid or mitigate effects on the historic property.
4. Proceed in accordance with the MOA.

Specific regulations regarding compliance with Section 106 state that the tasks necessary to comply with Section 106 may be delegated to others, however, the federal agency (in this case, the USACE) is ultimately responsible for ensuring that the Section 106 process is completed according to statute.

Section 106 requires federal agencies, or those they fund or permit, to consider the effects of their actions on the properties that may be eligible for listing or are listed in the NRHP. To determine whether an undertaking could affect NRHP-eligible properties, cultural resources (including archaeological, historical, and architectural properties) must be inventoried and evaluated for the NRHP. To be listed in the NRHP, a property must be 50 years old or older and be evaluated as significant (or if less than 50 years old, be of exceptional historic significance). To qualify for listing in the NRHP, a property must represent a significant theme or pattern in history, architecture, archaeology, engineering, or culture at the local, state, or national level. It must meet one or more of the following four criteria and have sufficient integrity to convey its historic significance. The criteria for evaluation of the eligibility of cultural resources for listing in the NRHP are defined in 36 CFR 60.4 as follows:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that have yielded, or may be likely to yield, information important in prehistory or history.

Methodology and Results

The cultural resources inventory efforts for the project area consisted of searching records at state information centers and conducting a reconnaissance level survey of the project area, and Native American consultation.

Records Search

In October 2007, ICF Jones & Stokes requested a search of database files from both the North Central and Northwest Information Centers of the California Historical Resources Information System located at California State University, Sacramento and Sonoma State, respectively. The records search area included the project area as well as a ¼-mile radius around the project area. The Information Center staff consulted the state's database of previous studies and recorded cultural resource sites, as well as all pertinent historical inventories and historic maps.

The records search resulted in the findings that the project area has been previously surveyed. There have been many cultural studies conducted along this portion of the Sacramento River and often several studies will overlap giving coverage to the project area as part of several studies. For the purposes of this document, only the most recent studies and the studies covering the largest area of the project area have been referenced in Table 3-7 below.

Table 3-7. Previous Cultural Resources Surveys

Project Site	2002. Institute for Western Maritime Archaeology. 1996. Jones & Stokes.
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Additionally, the information center provides data on known previously recorded cultural resources. The records search resulted in the finding that no formally recorded sites are located within the project area and 8 other recorded resources are located within the project vicinity. Additionally, the Sacramento Levee listed in Table 3-8 is a historic resource that is located within the project area. For the purposes of this document, the resources listed in Table 3-8 are limited to those located on the west side of the Sacramento River.

Table 3-8. Cultural Resources

Within Project Area	Within ¼ -mile of Project Area
None formally recorded; I Street Bridge, Sacramento Levee	P-57-423; HRI 8/SW, 219, 220, 221, 223, 224, & 228: Historic structures and buildings

Reconnaissance Survey

In October 2007, an ICF Jones & Stokes archaeologist conducted a reconnaissance level survey of the proposed project area. Although the records search indicated that the project area had been previously surveyed, an additional reconnaissance review was deemed necessary to confirm previous findings and to confirm coverage of the entire area. The project area is located within heavily developed areas of West Sacramento and very little, if any, natural ground surface remains. The project area has been graded, landscaped, and developed. No new cultural resources were noted within the project area.

During a subsequent visit to the project area in April 2008, an isolated find was noted just south of the I Street Bridge. The find was identified as a portion of an unidentifiable concrete structure abutting the landside toe of the levee but the function could not be ascertained. No other artifacts or associated historic debris were found in the vicinity of the concrete. The resource was evaluated by ICF Jones & Stokes architectural historians in April 2008.

The three concrete features in question appear to have served as foundations for residential structures built between 1895 and the early 1910s. As noted below, research indicates that each of the former residences cannot be clearly linked to a particular individual for any length of time over 15 years. Thus, it is unlikely that the former residences in question served as primary residences for notable individuals or the sites of notable events. As relatively minor features of previously extant residential structures, these historic concrete foundation remains do not appear to be features which retain structural historic integrity. Whereas the foundations themselves were intended to (and did) support functioning buildings, they (even as separate engineering entities) no longer retain integrity of design, feeling, and association. The residences associated with these foundations are not known to have been occupied by persons of historical significance on a national, state, or local level.

Reproductions of historic photographs were collected of the site on file at the West Sacramento Historical Society Museum and Visitors Center. Utilizing city directories on file at the California State Library Reading Room in Sacramento names of individuals who occupied the residences associated with the concrete features were documented. Additional searches were conducted of histories of Yolo County and West Sacramento on file at the California State Library for references for individuals who occupied those residences between 1913 and 1961 (and found none).

During the late nineteenth and early twentieth century, the structures associated with the concrete features were located in the town of Washington on the western bank of the Sacramento River near Taylor's Landing, along what was known by the street name of "Levee Street." Each of these concrete remains likely functioned as partial perimeter foundations supporting the eastern portion of the structures. The use of concrete for building foundations was generally accepted or construction during the early 20th century and may have been a later modification to protect the buildings, which presumably stood on marginally

stable ground at the western edge of the levee. The partial foundations may have also been intended to protect the buildings from periodic flooding and/or erosion from river currents prior to the construction of the adjacent levee. It is possible that the entire buildings (if not just the western ends) were initially set atop post-and-pier-type foundations or directly atop the soil as was also common for the period. The levee along this portion of the western bank of the Sacramento River was built amid a flurry development and reclamation activity in eastern Yolo County during the early 1910s, activity which included construction of the I Street Bridge in 1911 (Sanborn Sacramento Maps 1895: Sheets 41A and B; 1915: Sheet 92; Walters 1987:22).

Currently, the northernmost foundation remains (the most visible of the three) extends approximately eight feet out from the western slope of the levee at a location approximately 100 feet south of the I Street Bridge. This northern foundation remnant appears to have been associated with a two-story residence likely dating to between 1895 and 1915. The eastern facade of the residence appears to have included a prominent bay window overlooking the river (and later levee) which was evidenced by the design pattern of the partial foundation's remains. Evidence suggests that the two-story house was likely a Queen Anne design typical of the period. It should be noted that there is some discrepancy in the address of this northernmost property. The residence is listed as 410 Levee in Sacramento city directories from 1914 to 1925 and is noted as 414 Levee in the 1915 Sanborn Sacramento map. However, from 1930 to 1961, the residence is listed in both Sanborn maps and city directories as 406 Levee. During its first three decades of existence, the residence was never occupied for a decade or longer by the same person or family. Members of the Boyd, Brown, Shoemaker, and Williams families occupied the residence during the 21-year period of 1914–1935. In fact, the residence housed several different occupants during ten years of the 1950s. Again, research indicates that none of the occupants listed in city directories appear to have played significant roles in the history of West Sacramento, Yolo County, California, or the nation (Sanborn Sacramento Maps 1915: Sheet 92; 1951: Sheet 92; Sacramento Directories 1913, 1914, 1915, 1920, 1925, 1930, 1935, 1952, 1955, 1961).

Approximately 100 feet south of the residence discussed above at 406 Levee Street stood a group of smaller structures which appear to have featured a primary two-story residence and at least one secondary residence. Members of the Painter family resided in what appears to have been the primary residence at 420 Levee for much of the early twentieth century. C.H. Painter occupied the residence from as early as 1920 to at least 1935, and Mrs. E.T. Painter resided there as late as 1952. A third foundation located approximately 50 feet south of 420 Levee supported a structure which may have contained two residences and which appears to have been associated with the addresses 426, 428, and/or 430 Levee (Sanborn Sacramento Maps 1915: Sheet 92; 1951: Sheet 92; Sacramento Directories 1913, 1914, 1915, 1920, 1925, 1930, 1935, 1952, 1961).

Regardless of address ambiguity, directory research indicates that all of the previous residences possibly associated with the subject foundations do not appear to have housed occupants for periods extending beyond five-to-ten years

and do not appear to be associated with historically significant events or individuals. When considered as architectural features, the foundations are now shorn of the structures which historically stood upon them and are not known to be particularly innovative or unique. In addition, the surrounding blocks are devoid of contemporaneous structures, with the exception of the adjacent I Street Bridge (1911). Thus the foundations no longer appear to retain historic integrity; particularly that of design, feeling and association. Given this, they lack the ability (on their own) to convey any argued significance of any previously extant buildings at the site.

Native American Consultation

In January 2008, ICF Jones & Stokes cultural resources staff contacted the Native American Heritage Commission (NAHC). A list of potentially interested Native American representatives and a search of the NAHC's sacred lands database was requested. The NAHC responded with a list of Native American representatives for the Yolo County area. The search of the sacred lands database was negative.

In March 2008, letters were sent to Native American representatives for Yolo County informing them of the project and requesting their input and concerns. As of May 5, 2008, no responses have been received.

Significance Criteria

The project would have a significant effect on cultural resources if it would:

- cause a substantial adverse change in the significance of a historical resource (i.e., cause the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired) (Public Resources Code §15064.5[b]).

Actions that would "materially impair" the significance of a historic resource are any actions that would demolish or adversely alter the physical characteristics of a historical resource that convey its historical significance and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of Public Resources Code, Sections 5020.1(k) and 5024.1(g).

Environmental Consequences

No Action

Under the No-Action Alternative there would be no ground disturbing activities that might adversely affect known or currently undiscovered cultural resources. There would be no effects on cultural resources.

Proposed Action

Cultural, Historic, or Prehistoric Resources

There are no known cultural resources formally recorded at the project site; however, the Sacramento Levee is considered a cultural resource, although not formally recorded as one. The portion of the Sacramento Levee within the project area does not appear to meet the significance criteria of the National Register of Historic Places for reasons of compromised integrity (as defined for cultural resources). The levee is undoubtedly associated with an important historical theme (Sacramento Valley Flood Control Plan adopted in 1911) and is an integral component of the Sacramento Valley; however, the portion of levee within the project area has suffered a substantial loss of integrity. The historical setting of the levee segment lacks integrity and the structure of the levee has been considerably altered since the original construction. Therefore, the proposed project would not cause a significant adverse affect to the portion of the levee involved in the proposed project and no mitigation is necessary.

The I Street Bridge borders the northernmost portion of the project area. No levee improvement work that would result in direct or indirect effects is proposed at or near the I Street Bridge. The project would have no effect on the I Street Bridge.

The isolated find of three concrete features is considered to have no integrity and is not considered a significant resource for the purposes of Section 106. Nonetheless, there are no proposed effects to the features as a result of the project. Tree removal activities are proposed nearby, but will not likely result in any direct or indirect effects to these concrete features.

During construction, ground-disturbing activities could inadvertently unearth and damage historical resources. Damage to or destruction of such resources is considered a significant effect. However, implementation of Mitigation Measure CR-1 would reduce the effect below a level of significance.

Paleontological Resources or Human Remains

No paleontological resources were observed, or appear likely to be present. However, the potential exists that remains are buried and could be unearthed during construction activities such as trenching. The direct or indirect destruction of paleontological resources or a unique geologic feature would be a significant effect. Implementation of Mitigation Measure CR-1 would reduce the effect below a level of significance.

Interred human remains are not known to be located within or adjacent to the project area and thus, no significant effect is anticipated. However, it is possible that construction activities could result in the inadvertent discovery of buried human remains. This potential effect is considered significant. In the event that human remains are unearthed during construction, all construction efforts in the area of the find and within 100-feet of the discovery would be stopped, the City of West Sacramento shall be notified, and the county coroner shall be consulted in accordance with State laws. If the bones appear to be of Native American origin, a qualified archaeologist and the appropriate Native American group or individual would be consulted and a treatment plan developed and implemented as described in Mitigation Measure CR-1. The effect would be reduced below a level of significance with the implementation of Mitigation Measures CR-1 and CR-2.

Mitigation

Mitigation Measure CR-1: Stop Work If Cultural Resources Are Discovered During Ground-Disturbing Activities

If buried cultural resources, such as chipped or ground stone, historic debris, building foundations, or bone are inadvertently discovered during ground-disturbing activities, all work shall stop in the area of the find and within 100 feet of the discovery until a qualified archaeologist can assess the importance of the find and, if necessary, develop appropriate treatment measures. Treatment measures typically include development of avoidance strategies, capping with fill material, or mitigation of effects through data recovery programs such as excavation or detailed documentation. If cultural resources are discovered during construction activities, the construction contractor and lead contractor compliance inspector will verify that all work is stopped until appropriate treatment measures are developed and implemented.

Mitigation Measure CR-2: Comply with State Laws Pertaining to the Discovery of Human Remains

If human remains of Native American origin are discovered during ground-disturbing activities, it is necessary to comply with state laws relating to the

disposition of Native American burials, which falls within the jurisdiction of the California Native American Heritage Commission (Public Resources Code Section 5097). If human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

- the coroner of Yolo County has been informed and has determined that no investigation of the cause of death is required.

If the remains are of Native American origin, no further activities shall occur until:

- the descendants from the deceased Native Americans have made a recommendation to the land owner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or
- the California Native American Heritage Commission was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the Commission.

According to California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission.

Environmental Justice

Introduction

On February 11, 1994, President Clinton issued Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.” Environmental justice refers to “nondiscrimination in federal programs substantially affecting human health and the environment” and “providing minority communities and low-income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment.” In particular, it involves preventing minority and low-income communities from being subjected to disproportionately high and adverse environmental effects of federal actions. In complying with NEPA, the USACE is required to consider human health, economic, and social impacts of the proposed action on minority and low-income communities. (Executive Order 12898.)

Existing Conditions

Funding for the proposed levee repair will be drawn from taxes garnered from West Sacramento residents, and from State and Federal sources. The resulting protection from the project will broadly benefit all types of communities throughout the City. Thus, no disproportionate cost/benefit relationship is present.

Levee repair at the project site has the potential to cause temporary construction annoyance to adjacent neighborhoods and businesses. (The transportation, noise, water and air quality sections evaluate such construction effects.) Based on the review of demographic data collected during the 2000 U.S. Census, the income level and ethnic makeup of neighborhood communities near the project site are diverse.

Significance Criteria

No formal, commonly accepted significance criteria have been adopted for Environmental Justice effects. However, the Presidential Memorandum accompanying the Executive Order directs Federal agencies to include measures to mitigate disproportionately high and adverse environmental effects of proposed Federal actions on minority and low-income populations. Federal agencies also are required to give affected communities opportunities to provide input into the NEPA process, including identification of mitigation measures. No specific significance thresholds have been developed.

Environmental Consequences

No Action

Under the No-Action Alternative there would be no activities that might adversely affect low-income or ethnic communities disproportionately. Therefore, there would be no environmental injustices.

Proposed Action

Disproportionate effects on low-income or minority communities are not expected to occur because of the EIP. As previously described, the City of West Sacramento in general and the project area in particular, are economically and ethnically diverse. The types of effect mechanisms associated with project implementation (e.g., traffic, air quality, and noise) are short-term in nature, are mitigated to a negligible level, and will not disproportionately affect low-income or minority populations. Furthermore, the project would benefit the community

as a whole by reducing the level of flood risk to this site, and no adverse effects would occur as a result of the project.

Mitigation

No mitigation required.

Geology, Soils

Introduction

This section presents the environmental background necessary to analyze the effects on geology and soils associated with the proposed project.

Methodology

Effects associated with geology and soils that could result from construction activities were evaluated qualitatively based on expected construction practices, materials, and locations, and the expected duration of project construction and related construction activities. The effects of operations were also evaluated qualitatively based upon anticipated flood operations as described previously. It was assumed the design and construction of the proposed flood control facilities would meet or exceed applicable standards for static and dynamic stability, secondary effects related to ground shaking (including liquefaction), and seepage.

Existing Conditions

Geology and Soils

The project site is located in the south-central Sacramento Valley, and occupies a topographically low position at about 15 to 25 feet elevation above mean sea level. West Sacramento is adjacent to the confluence of the Sacramento and American Rivers, two large waterways that drain a substantial portion of the Western Sierra Nevada in northern California. Because of the low topographic position and proximity to the confluence of the Sacramento and American Rivers, the proposed action area has been subjected to repeated inundation by floodwaters during late Holocene time, and consequently is underlain by relatively thick alluvial deposits. The surface and subsurface distributions of sandy and clayey deposits are a function of former river alignments on the landscape, and present-day geomorphic processes adjacent to the river channels (i.e., flooding and deposition).

Previous geologic mapping within the West Sacramento area (including the project site) generalized the surficial deposits as: Quaternary alluvium (Qa) proximal to the modern river channel, and undifferentiated Quaternary Basin (Qb) deposits away from the modern river channel (Helley and Harwood 1985; Wagner et al. 1987). Both of these map units are considered Holocene age (less than 11,000 years old). The previous maps show the alluvial deposits to include gravel, sand, and silt flanking the modern river channels; and basin deposits to be silt and clay, representing deposition in low-energy environments (William Lettis & Associates 2007).

William Lettis & Associates' surficial geologic mapping (2007) subdivides these two generalized units and delineates individual deposits based on relative age and depositional process or environment. Three ages of deposits are recognized at the ground surface within their map area: latest Pleistocene, Holocene, and Recent/Historic. Four categories of geologic deposits are identified: channel, floodplain, basin, and cultural deposits. As mapped by William Lettis & Associates (2007), the project site consists of Recent/Historic channel meander scroll deposits; Recent/Historic artificial fill (culturally deposited); and Holocene alluvial deposits. The Recent/Historic channel meander scroll deposits consist of interfingering sand, silt, and clay from lateral migration of the river channel. These deposits generally exhibit ridge and swale micro-topography. The Holocene alluvial deposits consist of sand, silt, and minor lenses of gravel obscured by urbanization (William Lettis & Associates 2007).

According to the Soil Survey of Yolo County (Wells 1972), the project site is in an area classified as the Sycamore silt loam (So) and Lang sandy loam (La); Lang sandy loam, deep (Lb); and Lang sandy loam, deep, flooded (Lc). The Sycamore silt loam consists of gray-brown silty clay loam material on alluvial fans formed from mixed sources. The soil is classified as hydrologic group C. The risk of corrosion to uncoated steel is rated as high. The Lang sandy loam consists of somewhat poorly drained soils with a subsoil of clay to heavy silty clay at a depth ranging from 40 to 60 inches. The Lang soil is classified as hydrologic group C. The risk of corrosion to uncoated steel is moderate to high.

Erosion Hazard

The erosion hazard on the level and nearly level terrain that exists on the landside of the levee reach is slight. The hazard of erosion on the steeper levee banks is greater. Additionally, erosion hazard on the waterside of the levee varies with the frequency of high water events within the Sacramento River. Erosion potential for all soil map units is not addressed in the soil survey; however, it can be assumed that all soils have a moderate to high erosion hazard due to the lack of clay content.

Subsidence

Subsidence is the gradual lowering of the earth surface as a result of groundwater overdraft, compaction and oxidation of peat soils, and hydrocompaction. The hazard of subsidence at the project site is inferred to be low, based on the absence of organic soils and lack of farming.

Seismicity

Seismic hazards are earthquake fault ground rupture and ground shaking (primary hazards) and liquefaction and earthquake-induced slope failure (secondary hazards), discussed below.

Fault Rupture Hazard

The purpose of the Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) is to regulate development near active faults to mitigate the hazard of surface rupture (Hart and Bryant 1997). Faults in an Alquist-Priolo Earthquake Fault Zone are active faults. As defined under the Alquist-Priolo Act, an active fault is one that has had surface displacement within Holocene time (about the last 11,000 years). An early Quaternary fault (sometimes referred to as a potentially active fault) is one that has had surface displacement during Quaternary time (the last 1.6 million years). A pre-Quaternary fault is one that has had surface displacement before the Quaternary period.

There are no active faults or Alquist-Priolo Earthquake Fault Zones in the vicinity of the project site (International Conference of Building Officials 1997; Jennings 1994). The closest active fault is the Dunnigan Hills Fault, which is located approximately 33 miles northwest of the project site. Accordingly, the project site is not likely to be affected by surface fault rupture.

Ground-Shaking Hazard

The project site is located in a region of California characterized by a low ground-shaking hazard. Based on a probabilistic seismic hazard map that depicts the peak horizontal ground acceleration values exceeded at a 10% probability in 50 years (Cao et al. 2003; California Geological Survey 2003), the probabilistic peak horizontal ground acceleration values in the project site range from 0.1 to 0.2g, where one g equals the force of gravity, thus indicating that the ground-shaking hazard in the project site is low.

Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of unconsolidated sediments are reduced by earthquake shaking or other rapid loading. Poorly consolidated, water-saturated fine sands and silts having low plasticity and located within 50 feet of the ground surface are typically considered to be the most susceptible to liquefaction. Soils and sediments that are not water-saturated and that consist of coarser or finer materials are generally less susceptible to liquefaction. Geologic age also influences the potential for liquefaction. Sediments deposited within the past few thousand years are generally much more susceptible to liquefaction than older Holocene sediments; Pleistocene sediments are even more resistant; and pre-Pleistocene sediments are generally immune to liquefaction (California Department of Conservation, Division of Mines and Geology 1997).

Based on the types and age of sediments and the relatively shallow depth to groundwater in the project site, liquefaction susceptibility is high. However, liquefaction hazard is low based on the low ground-shaking hazard in the project site.

Seismically-Induced Ground Failure and General Slope Stability

Within the limits of ground disturbance of the project site, there is no risk of naturally occurring large landslides (both seismically and non-seismically induced), since it is essentially flat and topographically featureless on the landside of the levee.

Significance Criteria

For the purpose of this analysis, the proposed project was considered to have a significant effect if it would:

- result in substantial soil erosion or the loss of topsoil; or
- be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in on- or off-site lateral spreading, subsidence, liquefaction or collapse.

Environmental Consequences

No Action

There would be no ground disturbing activities under the No-Action Alternative, nor any new structures or modifications to the existing flood control facilities. Therefore, there would be no effects on geology and soils resources.

Proposed Action

Accelerated Erosion and Sedimentation

Ground disturbance caused by project construction activities has the potential to increase erosion and sedimentation rates above preconstruction levels. Because most of the ground disturbance earthwork would be conducted on and immediately adjacent to the subject levee reaches, accelerated erosion and sedimentation resulting from construction-related ground and vegetation disturbance would not result in an appreciable loss of topsoil. However, earthwork related to the project could adversely affect water quality in the Sacramento River and receiving waters. This effect is significant; however, implementation of the Stormwater Pollution Prevention Plan as described in Chapter 2 would reduce the potential for increased erosion and sedimentation. Therefore, construction of the proposed project would not result in any erosion conditions that would be hazardous to persons, property, or resources.

Increased Levee Stability

There are no existing hazards on the level terrain surrounding the subject levee. The proposed project would improve the stability of the levee by further reducing internal and foundational erosion forces from through- and under-seepage and improving the levee slopes at a flatter angle and more consistently compacted structure and surface. Therefore, this effect would be beneficial.

Hazards

Introduction

This section analyzes the potential effects related to hazardous, toxic, and radiological wastes. Hazardous materials and wastes are those substances that, because of their physical, chemical, or other characteristics, may pose a risk of endangering human health or safety or of endangering the environment (California Health and Safety Code Section 25260). Types of hazardous

materials include petroleum hydrocarbons, pesticides, and volatile organic compounds (VOCs). Hazardous materials that would be used during construction activities for the project include diesel fuel and other liquids in construction equipment.

Existing Conditions

ICF Jones & Stokes, with Environmental Data Resources (EDR), reviewed records of federal, state, and local regulatory agencies regarding hazardous substance use, storage, or disposal at the project site, and within a one-mile radius of project reach (Environmental Data Resources 2007). No hazardous sites were found within the affected area of the reach.

Significance Criteria

The proposed project was considered to cause a significant effect if it would:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials to the environment; or
- be located on a site that is on a list of hazardous materials sites compiled pursuant to California Government Code 65962.5, and as a result would create a significant hazard to the public or the environment.

Environmental Consequences

No Action

Under the No-Action Alternative, no ground disturbing activities will occur nor will any hazard waste materials will be brought to the project site. Therefore, there would be no effect on hazardous materials.

Proposed Action

Possible Temporary Exposure to or Release of Hazardous Materials during Construction

During construction of the slurry cutoff wall, hazardous materials such as fuels and lubricants would be used to operate construction equipment and vehicles such as excavators, compactors, haul trucks, and loaders. Refueling of most

equipment (except for the cranes and trench excavators) would be limited to the designated staging area. Fuels and lubricants have the potential to be released into the environment at the project site and along haul routes, causing environmental and/or human exposure to these hazards. Implementation of a SWPPP, as described under Mitigation Measure GEO-1, would ensure that the risk of accidental spills and releases into the environment would be minimal and that the effect would not be significant.

Exposure of Hazardous Materials to the Environment during Ground-Disturbing Activities

Clearing and grading would be necessary to install seepage cut-off walls. This ground-disturbance may expose contaminants to humans or the environment that would otherwise remain buried within the levee. Implementation of a SWPPP, as described in Chapter 2, would ensure that the risk of accidental spills and releases into the environment would be minimal and that the effect would not be significant.

Hydrology, Water Quality, and Geomorphology

Introduction

This section presents the environmental background necessary to analyze the effects on hydrology, water quality, and geomorphology associated with the proposed project.

Existing Conditions

Climate

West Sacramento has a mild, Mediterranean-type climate. Mean annual temperature is a relatively mild 62.2°F. Maximum average annual temperatures during the summer range from 87.1–93.1°F. Temperatures sometimes exceed 100°F. Winter temperature maximums vary from 54.5–60.6°F. Average low temperatures in the winter range from 40.2–43.7°F. Temperatures in the winter only occasionally drop below freezing (Andrews 1972).

Average annual precipitation is 17.87 inches, with approximately 80 percent of the total rainfall occurring between November and March. Cloud-free skies generally prevail throughout the summer months, and in much of the spring and fall. Thunderstorms are relatively infrequent, although occasionally occur in the late summer and other times of the year when unstable air masses are situated over the region. The highest rainfall generally occurs in January, when the

average is 4.18 inches of precipitation. The driest month is July, averaging only 0.05 inches of rain (Andrews 1972).

Regional Hydrology

Rivers flowing into the Sacramento–San Joaquin Delta (Delta) convey approximately 50% of the state’s annual runoff (California Department of Water Resources 1995). The main rivers are the Sacramento, San Joaquin, Mokelumne, Cosumnes, and Calaveras Rivers. All the major rivers are regulated by dams, except for the Cosumnes River. The Sacramento River is the dominant source of fresh water and sediment to the Delta, accounting for approximately 80% of annual freshwater inflows. The San Joaquin River is the second largest contributor, accounting for about 10% of annual freshwater inflows. Outflow from the Delta passes into the San Francisco Bay system and the Pacific Ocean through the Golden Gate.

The Sacramento River drainage basin upstream of the American River confluence encompasses approximately 23,500 square miles and produces an average annual runoff of about 17,000,000 acre-feet (af) at the Freeport gaging station (below the confluence with the American River). Principal reservoirs controlling flows in the lower Sacramento River include Lake Shasta (4,550,000 af) on the Sacramento River upstream of Redding and Trinity Lake (2,480,000 af), which regulates deliveries made to the Sacramento River from the Trinity River basin. Diversions from the Trinity River basin into the Sacramento River basin averaged 1,030,000 af annually from 1967 to 1991. The Feather River is a major tributary to the Sacramento River, and Lake Oroville is a component of the State Water Project (SWP) system that provides 3,540,000 af of storage. Average runoff from the Feather River basin (including the Yuba River) is approximately 5,850,000 af at the Nicholas gaging station (downstream of the confluence with the Yuba River).

Local Surface Hydrology

The Sacramento River is the major surface water body in the immediate vicinity of the project area. The reach of the Sacramento River including the project area is characterized by a very low gradient and typical low-velocity flow and is composed almost entirely of deep flatwater with a sand bed. River stage is controlled by dam and weir release upstream and is subject to diurnal tidal fluctuation. Very little sediment is stored in bars and the bank-building process typical of lowland alluvial rivers no longer occurs. The channel in the vicinity of the project is approximately 750 feet wide (Northwest Hydraulic Consultants 2007a).

Daily streamflows have been recorded at the Sacramento River at Verona gage (gage 11425500) by the USGS since 1929. The gage is upstream of the project area, at approximately River Mile (RM) 78.6. The Sacramento River at

Sacramento (I-Street) gage (gage 11447500) was operated by USGS from 1948 to 1979; it is now operated by DWR. The gage is located about 1,000 feet upstream of the I Street Bridge and about ½ mile downstream of the American River confluence at RM 59.5 in Reach 8 (in the project reach). The Freeport gage (gage 11447650) is downstream of the project reach, at about RM 46. Projected peak flows in the Sacramento and American Rivers were provided by MBK Engineers (2006) based on the Comprehensive Study Sacramento River UNET model. In Table 3-9, the 100-year projected peak flow is based on a 145,000 cfs.

American River peak flow and upstream Sacramento River levees overtopping without failing; the 200-year peak is based on 160,000 cfs American River peak flow and the same levees overtopping without failing. See section on *Flooding* below for further information.

Table 3-9. Projected Peak Flows for Sacramento River Sites

Location	Projected Peak Flow (cfs)	
	100-Year	200-Year
Sacramento River at Verona Gage	113,800	135,200
Sacramento River at I Street	134,300	141,500
Sacramento River at Freeport Gage	133,900	140,800
American River at H Street	144,800	160,000

Source: Taken from Table 3-1 in Northwest Hydraulic Consultants 2007a.

Water Quality

The upper reaches of the Sacramento River generally have excellent mineral and nutrient quality, with low total dissolved solids (TDS) content. As water flows into the Central Valley, water quality typically changes as a result of water diversions and returns. Sources of degradation include waste discharges such as treated municipal wastewater, urban stormwater runoff, and irrigated agricultural return flows.

CWA Section 303(d) establishes the total maximum daily load (TMDL) process to assist in guiding the application of state water quality standards, requiring states to identify streams in which water quality is impaired (i.e., affected by the presence of pollutants or contaminants) and to establish the TMDL, or the maximum quantity of a particular constituent that a water body can assimilate without experiencing an adverse effect. The Sacramento River is listed as being impaired for unknown toxicity and mercury.

Geomorphology

The primary geomorphic features and associated surficial geological map units in the project site and surrounding area include abandoned paleochannels, meander scroll deposits, crevasse splay and overbank flood deposits, flood basin deposits, and other features commonly associated with large, active river systems (William Lettis & Associates 2007).

All geomorphic information described below (i.e., descriptions of hydraulic geometry, levee and bank geometry, and channel morphology) for the levee under investigation is derived and summarized from Northwest Hydraulic Consultants (2007a).

Hydraulic Geometry

The hydraulic geometry or hydraulic properties of the West Sacramento reach of the Sacramento River are based on analysis of cross sections on a 1,000-foot spacing along the Sacramento River right-bank levee, as obtained from MBK Engineer's UNET model (MBK Engineers 2006, 2007). The hydraulic geometry is based on a bankfull geometry interpreted from the cross sections and the 200-year projected peak flow geometry, calculated from the water surface elevations reported by the UNET model. This information is described in further detail in Northwest Hydraulic Consultants' internal report *West Sacramento Erosion Site, Design Scour Levels for Erosion Protection* (Northwest Hydraulic Consultants 2007b). Table 3-2 of Northwest Hydraulic Consultants 2007a shows the geometry at the erosion sites in the vicinity of the project site for the 100- and 200-year AEP water levels, as interpreted from the nearest cross section. The geometric properties of the Sacramento River through West Sacramento are as follows:

■ Average surface width at natural bankfull conditions	570 feet
■ Average bed width, excluding one triangular section	340 feet
■ Average bankfull depth, averaged over 19 sections	39 feet
■ Average bankfull cross-sectional area	17,400 feet ²
■ Range of maximum depths below 200-yr water-level	49–92 feet

The 200-year discharge at the project site is 141,500 cfs. At the Freeport gauge about 10 miles downstream the maximum recorded discharge over the past 50 years was just less than 120,000 cfs, in 1986. The computed 200-year water surface slope for the reach in the vicinity of the project site is approximately 0.53 ft/mile (0.10 m/km).

Assuming a Manning roughness *n* value of 0.030, the cross-sectional average velocity under bankfull conditions is estimate as about 4.6 ft/s, resulting in an estimated bankfull discharge of about 80,000 cfs. Based on the cross sections provided by MBK Engineers, during the 200-year flood the average channel

velocity in the reach in the vicinity of the project site is about 5.1 ft/s (see Table 3-2 of Northwest Hydraulic Consultants 2007b) and the average cross-sectional area is about 25,500 ft², giving a calculated discharge of about 138,000 cfs, essentially equal to the stated value of 141,500 cfs.

Levee and Bank Geometry

Levee Geometry

Crest elevations along the Sacramento River North Levee in the vicinity of the project site range from 34 to 44 feet NGVD 29 (Figure 3-1 of Northwest Hydraulic Consultants 2007a).

Channel Morphology

Channel Planform

The planform of the lower Sacramento River can be described as generally sinuous, with a mix of irregular, partly entrenched meanders and nearly straight reaches. The channel is controlled in many places by bank protection, levees, and resistant outcrops, so that lateral migration rates are low.

Historic Dredging and Maintenance

The original Sacramento River shallow-draft channel project was first authorized by the River and Harbor Act of March 3, 1875, and as modified in 1882, 1889, and 1892. It provided for improvement of low-water navigation by dredging the Sacramento River to provide a depth of 7 feet, by snagging and construction of temporary wing dams in the Feather River and by repairing damages caused by floods and removal of obstructions in the lower Sacramento River (U.S. Army Corps of Engineers 1960). Construction of the 7-foot channel downstream of Sacramento began in 1899 and was completed in 1904.

Improvements to the shallow-draft channel were authorized by the River and Harbor Act of March 3, 1899, and as modified in 1912, 1927, and 1935. They provided various improvements including a channel 10 feet deep and 150 to 200 feet wide, at mean lower low water, from Suisun Bay to Sacramento, a distance of approximately 60 miles. The modified 10-foot channel was initiated in 1928 and completed in 1931. Upstream of Sacramento, the draft was to be obtained by removal of snags, concentration of flow by dredging and wing dams, and by regulation from the Shasta Reservoir (U.S. Army Corps of Engineers 1960). WET (1990) estimated that, by 1940, about 186 million cubic yards of sediment had been dredged from the Sacramento River downstream of Sacramento.

Major channel maintenance activities ceased in the early 1970s as hydraulic mining debris impacts lessened, river transportation needs diminished, and environmental concerns with dredging moved to the forefront.

Channel Bathymetry

It is well known that in the latter half of the 19th century, bed levels in the lower Sacramento River aggraded substantially, due to inflows of sediment derived from hydraulic mining in the Sierra Nevada (Alder 1980; Fisher and Harvey 1991; Gilbert 1917; James 1989). A degradation or incision trend began during the first half of the 20th century, in response to the end of substantial sediment inputs from hydraulic mining, navigation dredging, levee construction and other works along the river, and the washing of accumulated sediment through to the Delta. In the second half of the 20th century, some incision may also have occurred in response to trapping of bed sediment in upstream reservoirs.

Significance Criteria

For the purposes of this analysis, an effect was considered to be significant if it would result in any of the following.

- violate any water quality standards, waste discharge requirements, or otherwise substantially degrade water quality;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted);
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site;
- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- substantially degrade the existing surface and groundwater quality as a result of erosion and siltation.

Environmental Consequences

No Action

Under the No-Action Alternative hydrology and water quality would not change relative to existing conditions; however, the current levee would remain more susceptible to failure. In addition, proposed levee strengthening projects within the system may transfer flood risk to the project reach if the project-reach levee were to remain below current engineering standards while other levees in the system were improved to meet or exceed current standards.

Proposed Action

Accelerated Erosion and Sedimentation

Ground-disturbing activities could result in a slight increase in the potential for erosion and sedimentation in the Sacramento River. However, as discussed under geology and soils, construction of the slurry wall would be limited to the landside and crown of the existing levee resulting in no in-water construction. Staging and construction would only occur during the dry season, August through November. In addition, as required by the NPDES Construction General Permit, the contractor would prepare and implement a SWPPP to control stormwater runoff, erosion, sedimentation, and other construction-related pollutants during excavation and until construction is complete and all disturbed areas are permanently stabilized. The BMPs included in the SWPPP would substantially minimize the potential for project-related erosion, sedimentation, and the violation of applicable water quality standards. Therefore, this effect is not significant with the implementation of Mitigation Measure GEO-1.

Potential Inadvertent Release of Petroleum Products or Slurry into the Sacramento River

Small volumes of petroleum products (fuel, engine oil, and hydraulic line oil) would be temporarily used and handled to operate construction equipment. In addition, there is potential for a frac-out of slurry during construction of the seepage cutoff wall. There is a danger that these materials may be released in accidental spills and result in harm to people or the environment. The implementation of a SWPPP (described in the Geology and Soils section), which would include methods to protect water quality in response to emergency spills, would minimize potential effects. However, if a spill occurs, surface water quality and groundwater quality may be impacted. Implementation of Mitigation Measures WQ-1, WQ-2, and environmental commitments in Chapter 2 for a SWPPP and Frac-Out Contingency Plan would minimize this effect.

Effects on Groundwater Quality from Construction below the Water Table

Trenching and excavation during construction of the slurry wall may reach a depth that can expose the water table, in which an immediate and direct path would become available for contaminants to enter the groundwater system. Primary construction-related contaminants that could reach groundwater would include sediment, oil and grease, and construction-related hazardous materials.

In addition, discharge of construction-related dewatering effluent could result in the release of contaminants to surface or groundwater.

These impacts are considered potentially significant. Implementation of Mitigation Measures WQ-2 and WQ-3 would ensure that effects would be reduced below a level of significance.

Indirect Effects on Groundwater Movement from Construction of Slurry Wall

The slurry wall will be up to 45 feet deep and may result in partially blocking groundwater from entering the Sacramento River. In addition, the slurry wall may also partially block the surface water from recharging the aquifer. However, although the 45-foot depth may reach groundwater, it will not cause a significant reduction in the movement between groundwater and surface water. This is not a significant effect. No mitigation is required.

Indirect Effects on Hydrology and Surrounding Levees and Flooding

Increasing the strength of the levee may have a slight effect on the potential for seepage to occur through levees immediately adjacent to the project site that do not have cutoff walls installed. The improvements are not expected to have an effect on downstream hydrology because the height of the levee would not be increased. The change in hydrologic conditions resulting from installing the seepage cutoff wall is not expected to result in a substantial increase in seepage through adjacent levees because the length of the new seepage wall is relatively short and the hydrologic conditions downstream of the project site are not expected to change from current conditions. As the proposed action is small in area and consistent with improvements on the left bank of the Sacramento River within the project vicinity (specifically, the urbanized reach of the Sacramento River) and other similar improvements in upstream areas of the Sacramento Valley, there is no significant potential for transference of flood risk to or from another community induced by the project.

Mitigation

Mitigation Measure WQ-1: Implement a Spill Prevention and Control Program

WSAFCA or its contractor shall use and existing or develop and implement a spill prevention, control, and countermeasure program (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities for all contractors. The program shall be completed before any construction activities begin. Implementation of this measure would comply with state and federal water quality regulations and minimize this effect.

WSAFCA shall review and approve the SPCCP before onset of construction activities. WSAFCA will routinely inspect the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained. The City will notify its contractors immediately if there is a noncompliance issue and will require compliance.

The federal reportable spill quantity for petroleum products, as defined in the EPA's CFR (40 CFR 110) is any oil spill that (1) violates applicable water quality standards, (2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or (3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

If a spill is reportable, the contractor's superintendent would notify WSAFCA and WSAFCA will need to take action to contact the appropriate safety and clean-up crews to ensure the spill prevention plan is followed. A written description of reportable releases must be submitted to the Central Valley RWQCB. This submittal must include a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases would be documented on a spill report form.

If groundwater quality or surface water quality levels have been degraded in excess of water quality standards, Mitigation Measure WQ-2 would be required and would reduce this impact to a less-than-significant level.

Mitigation Measure WQ-2: Implement Measures to Maintain Groundwater or Surface Water Quality

If an appreciable spill has occurred and results determine that project activities have adversely affected surface or groundwater quality, a detailed analysis will be performed by a Registered Environmental Assessor to identify the likely cause of contamination. This analysis will conform to American Society for Testing and Materials (ASTM) standards, and will include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, WSAFCA and its contractors will select and implement measures to control contamination, with a performance standard that surface water quality and groundwater quality must be returned to baseline conditions.

Mitigation Measure WQ-3: Provisions for Dewatering

If dewatering is needed for construction of the slurry wall, WSAFCA or their contractor shall obtain an NPDES Low Threat Discharge and Dewatering Permit. Depending on the volume and characteristics of the discharge, coverage under the RWQCB's General Construction Permit or General Dewatering Permit is possible. As part of the permit, the permittee will design and implement

measures as necessary so that the discharge limits identified in the relevant permit are met. As a performance standard, these measures will be selected to achieve maximum sediment removal and represent the BAT that is economically achievable. Implemented measures may include retention of dewatering effluent until particulate matter has settled before it is discharged, use of infiltration areas, and other BMPs. Final selection of water quality control measures will be subject to approval by the City.

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

Noise

Introduction

This section presents the environmental and regulatory background necessary to analyze the noise effects associated with the proposed project.

There is no operational component of the project. Therefore the project is not expected to result in an effect on the noise environment. However, construction of the proposed project would require use of heavy equipment at the project site and construction staging areas.

The primary effect of the proposed project would be the result of a temporary increase in the noise environment during construction activities.

Existing Conditions

Noise Terminology

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary enormously within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. The human ear is not equally sensitive to all frequencies in the entire

spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called “A-weighting,” written “dBA.”

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (L_{xx}), the day-night sound level (L_{dn}), and the community noise equivalent level (CNEL). Below are brief definitions of these measurements and other terminology used in this chapter:

- **Sound.** A vibratory disturbance created by a vibrating object that when transmitted by pressure waves through a medium such as air is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB).** A unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.
- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in dB that approximates the frequency response of the human ear.
- **Maximum Sound Level (L_{max}).** The maximum sound level measured during the measurement period.
- **Minimum Sound Level (L_{min}).** The minimum sound level measured during the measurement period.
- **Equivalent Sound Level (L_{eq}).** The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.
- **Percentile-Exceeded Sound Level (L_{xx}).** The sound level exceeded “xx” percent of a specific time period. L_{10} is the sound level exceeded 10% of the time.
- **Day-Night Level (L_{dn}).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m., and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.

L_{dn} and CNEL values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment. In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level.

Existing Noise Environment

The project area extends through commercial, recreational and residential areas, along the Sacramento River. Existing noise levels in this area are typical of suburban environment with sound levels in the range of 40 to 60 dBA.

Noise-Sensitive Land Uses

Noise sensitive land uses are land uses such as residences, schools, libraries, hospitals, and other similar uses where noise can adversely affect use of the land. The nearest noise-sensitive receiver, residences, is approximately 300 feet from the project site.

Regulatory Setting

State Regulations

California requires each local government entity to implement a noise element as part of its general plan. California Administrative Code, Title 4, has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure.

Local Regulations

The proposed project lies within the City of West Sacramento. The City has established policies and regulations concerning the generation and control of noise that could adversely affect their citizens and noise-sensitive land uses. The General Plan is a document required by state law that serves as the jurisdiction's "blue print" for land use and development. The plan is a comprehensive, long-term document that provides details for the physical development of the jurisdiction, sets out policies, and identifies ways to put the policies into action. The General Plan provides an overall framework for development in the jurisdiction and protection of its natural and cultural resources. The noise element of the General Plan contains planning guidelines relating to noise.

City of West Sacramento General Plan Noise Element

The City of West Sacramento has established noise-level performance standards for projects affected by non-transportation sources (Table 3-10). The General Plan Noise Element states that residential hourly exterior noise levels from non-transportation noise sources may not exceed 50 dBA L_{eq} during daytime hours (between 7:00 a.m. and 10:00 p.m.) and 45 dBA L_{eq} during nighttime hours (between 10:00 p.m. and 7:00 a.m.). The maximum residential exterior noise levels from non-transportation noise sources allowed under the General Plan are 70 dBA L_{eq} during daytime hours and 65 dBA L_{eq} for nighttime hours. For

interior residential noise levels, the General Plan limits daytime hourly noise levels from non-transportation noise sources to 45 dBA L_{eq} and nighttime hourly noise levels to 35 dBA L_{eq} . There is no maximum interior noise level given in the General Plan. These City standards are summarized below in Table 3-10.

Table 3-10. City of West Sacramento General Plan and Noise Ordinance Noise-Level Performance Standards for New Projects Affected by or Including Non-Transportation Sources

Land Use	Noise Level Descriptor	Exterior Noise Level Standard (Applicable at Property Line)		Interior Noise-Level Standard	
		Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Residential	L_{eq}	50	45	45	35
	L_{max}	70	65	–	–
Transient lodging	L_{eq}	–	–	45	35
Hospitals, nursing homes	L_{eq}	–	–	45	35
Theatres, auditoriums, music halls	L_{eq}	–	–	35	35
Churches, meeting halls	L_{eq}	–	–	40	40
Office buildings	L_{eq}	–	–	45	45
Schools, libraries, museums	L_{eq}	–	–	45	45

Note: Each of the noise levels specified above shall be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These Noise-level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

Source: City of West Sacramento 2000.

[[NOTE: For the purposes of the noise element, “transportation noise sources” are defined as traffic on public roadways, railroad line operations and aircraft in flight. Non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, loading docks, construction equipment, etc.]]

City of West Sacramento Noise Ordinance

Chapter 17.32 from the City’s zoning ordinance establishes performance standards for different land uses throughout the City.

Although the Noise Ordinance does not address Construction noise specifically, conversation with City staff indicates that construction activities are limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday and 8:00 a.m. to 5:00 p.m. on weekends and holidays. (Powderly pers. comm. 2002.)

Significance Thresholds

The following thresholds of significance have been developed for this Project based on the City of West Sacramento noise standards.

Noise resulting from the Project would be considered significant if existing residences would be exposed to:

- noise from construction activities exceeding 45 dBA L_{eq} or 65 dBA L_{max} between the hours of 7:00 PM and 7:00 AM Monday through Friday or between the hours of 5:00 PM and 8:00 AM on weekends and holidays. Noise from construction that occurs outside these hours (i.e., during daytime hours) is not considered significant.
- Operational noise that exceeds City noise standards listed in Table 3-10.

Environmental Consequences

No Action

No activities that would increase noise or groundborne vibration levels above existing conditions would occur under the No-Action Alternative. Therefore, there would be no effects related to noise and vibration.

Proposed Action

Exposure of Noise-Sensitive Land Uses to Noise during Construction Activities

The slurry wall will be constructed using conventional slot trench methods. Equipment anticipated to be used with the slot trench method includes:

- long stick excavator (slurry trenching machine),
- scraper
- three or four dump trucks,
- two loaders, and
- slurry plant.

Mixing of the soil-bentonite slurry will be conducted at the staging area.

The assessment of potential construction noise levels was based on methodology developed by the Federal Transit Administration (FTA) (Federal Highway Administration 2006). Table 3-11 summarizes noise levels produced by the construction equipment anticipated to be used for this project. Individual types

of construction equipment are expected to generate noise levels ranging from 77 to 85 dBA at a distance of 50 feet. The construction noise level at a given receiver depends on the type of construction activity, the noise level generated by that activity, and the distance and shielding between the activity and noise-sensitive receivers. L_{eq} values are calculated based on the “acoustical usage factor” which indicates the percentage of time that the equipment is expected to operate. For pieces of equipment with a factor of 50% the L_{eq} value is 3 dB less than the L_{max} value.

Table 3-11. Construction Equipment Noise Emission Levels

Equipment	Typical Maximum Noise Level (dBA) 50 feet from Source	Acoustical Usage Factor
Excavator	85	40%
Dump truck	84	40%
Front end loader	80	40%
Scraper	85	50%
Compactor	80	20%
Crane	85	16%
Drill rig truck	84	20%
Slurry plant	78	100%
Slurry trenching machine	80	50%

Source: Federal Highway Administration 2006.

Potential noise levels resulting from construction operations were evaluated by summing the noise levels of the three loudest pieces of equipment that would likely operate at the same time.

During construction, the excavator, scraper, and dump truck were assumed to operate simultaneously in the same area. Table 3-12 shows the estimated sound levels as a function of distance based on calculated point-source attenuation over “soft” (i.e., acoustically absorptive) ground.

Table 3-12. Predicted Noise Levels from Construction Activities

Construction Condition: Trench method or DSM method				
Source 1: Scraper - Sound level (dBA) at 50 feet =			85	
Source 2: Excavator - Sound level (dBA) at 50 feet =			85	
Source 3: Truck - Sound level (dBA) at 50 feet =			84	
Average Height of Sources - Hs (ft) =				10
Average Height of Receiver - Hr (ft.) =			5	
Ground Type (soft or hard) =				Soft
Calculated Data:				
All Sources Combined - L _{max} sound level (dBA) at 50 feet =			89	
All Sources Combined - L _{eq} sound level (dBA) at 50 feet =			86	
Effective Height (Hs+Hr)/2 =				7.5
Ground factor (G) =				0.62

Distance Between Source and Receiver (feet)	Geometric Attenuation (dB)	Ground Effect Attenuation (dB)	Calculated L _{max} Sound Level (dBA)	Calculated L _{eq} Sound Level (dBA)
50	0	0	89	86
100	-6	-2	82	75
150	-10	-3	74	70
300	-16	-5	69	65
400	-18	-6	66	62
500	-20	-6	63	60
600	-22	-7	61	58
700	-23	-7	59	56
800	-24	-7	58	54
900	-25	-8	57	53
1000	-26	-8	55	52
1200	-28	-9	53	50
1400	-29	-9	52	48
1600	-30	-9	50	46
1800	-31	-10	49	45
2000	-32	-10	48	44
2500	-33	-10	45	41
3000	-37	-11	43	39

Calculations based on Federal Highway Administration 2006.

Note: This calculation does not include the effects, if any, of local shielding from walls, topography or other barriers which may reduce sound levels further.

The results in Table 3-12 indicate that noise sensitive receptors located within about 1,800 feet of an active construction site could be exposed to construction noise in excess of 45 dBA-L_{eq} and that residences within about 400 feet of active construction could be exposed to construction noise in excess of 65 dBA-L_{max}. Noise from construction activities limited to the hours of 7:00 AM to 7:00 PM Monday through Friday and 8:00 AM to 5:00 PM on weekends and holidays is

not considered to be significant. Because construction noise that occurs outside these hours could exceed both the 45 dBA- L_{eq} and the 65 dBA- L_{max} thresholds at nearby residences, this effect is considered to be significant. Implementing noise-reducing construction practices would make this effect minimal.

Mitigation

Mitigation Measure NZ-1: Employ Noise-Reducing Construction Practices

The contractor will employ noise-reducing construction practices such that construction noise does not exceed 45 dBA L_{eq} or 65 dBA L_{max} between the hours of 7:00 PM and 7:00 AM Monday through Friday or between the hours of 5:00 PM and 8:00 AM on weekends and holidays.

Measures that can be used to limit noise include:

- limiting construction operations to the hours of 7:00 AM to 7:00 PM Monday through Friday and 8:00 AM to 5:00 PM on weekends and holidays,
- locating equipment as far a practical from noise-sensitive uses,
- requiring that all construction equipment powered by gasoline or diesel engines have sound-control devices that are at least as effective as those originally provided by the manufacturer and that all equipment be operated and maintained to minimize noise generation,
- prohibiting gasoline or diesel engines from having unmuffled exhaust,
- selecting haul routes that affect the fewest people,
- using noise-reducing enclosures around noise-generating equipment, and
- constructing barriers between noise sources and noise-sensitive land uses or taking advantage of existing barrier features (terrain, structures) to block sound transmission.

Recreation

Introduction

This section presents the environmental background necessary to analyze the effects on recreation associated with the proposed project.

Existing Conditions

The City of West Sacramento has 17 parks operated by the Department of Parks and Community Services. Currently more than 145 acres of developed parks are available for local residents, and recreation programs and events are designed for all ages and interests (City of West Sacramento 2005a). The City identifies parks into the following categories: mini-parks, neighborhood parks, playfields, and community parks, which include linear parks and regional parks.

Within the project area, there are several public access points to areas of the Sacramento River. These areas support popular water-dependent activities including boating and fishing. Water-enhanced activities include bicycling, walking, picnicking and wildlife viewing. Boating activities predominantly take place in summer months in the Sacramento River and fishing is a year-round activating. Water-dependent activities (swimming, boating, fishing) account for approximately 52% of the recreation uses on the Sacramento River (County of Sacramento and Bureau of Reclamation 1997). No public parks, trails, private marinas or public boat launching facilities are located in the project area.

The project site is located south of the I Street Bridge and extends to the northern entry point of the Riverwalk. Recreation opportunities in this portion of the project area include bicycling, walking, and wildlife viewing. Access to the Sacramento River for fishing and swimming is available through the project area via unpaved trails. Future uses for the Riverwalk area located in the project area include outdoor entrainment such as concerts, fairs, and other community gatherings.

Significance Criteria

Effects may be considered significant if implementation of an action would:

- substantially restrict or reduce the availability or quality of existing recreational opportunities in the project vicinity; or
- implement operational or construction-related activities related to the placement of project facilities that would cause substantial long-term disruption of any institutionally recognized recreational activities.

Environmental Consequences

No Action

Under the No-Action Alternative recreation resources would not change relative to existing conditions. Therefore, no effects related to recreation resources would occur.

Proposed Action

Temporary Disruption of Recreational Opportunities during Construction

Although this reach does not provide the highest quality water-related recreational opportunities along the Sacramento River, this reach is utilized by the public to access the north end Riverwalk. Recreational uses such as fishing, wildlife viewing, walking and biking may occur during the construction phase of this reach. Temporary disruption to these activities may occur due to the presence of construction equipment and equipment access to the project site. Areas with the potential to be disrupted include the project area, as well as staging areas. The levee crown would be closed to accommodate transportation and placement of material. Shoreline fishing and swimming would be prohibited at the site during construction to avoid hazards to the public. Because the effect would be temporary and there are alternative locations for recreation, and because notice of the closure would be given before the start of construction as described in the Environmental Commitments section of Chapter 2, this effect is below the level of significance. No mitigation is required.

Mitigation

No mitigation is required.

Traffic and Circulation

Introduction

There is no operation component of the project, thus, the project will not result in any permanent effects on transportation and circulation. However, construction of the proposed project would generate vehicle trips and affect the operation of roadways in the immediate area surrounding the project site. The primary effect of the proposed project would be the result of a temporary increase in the number of vehicles on the surrounding roadways.

Existing Conditions

Project Area Transportation Network

The project site is located within northern portion of the City of West Sacramento. Interstate 5 (I-5), Interstate 80 (I-80), Jefferson Boulevard, West Capitol Avenue, and Reed Avenue provide regional access to the project area. It is assumed that trucks and other construction equipment would access the project

areas from Jefferson Boulevard and West Capitol Avenue onto smaller roadways within the area. These would include Sacramento Avenue, 6th Street, and C Street.

Regulatory Setting

The quality of service provided by a roadway is quantified in terms of “level of service” (LOS). This method uses a letter rating to describe the peak period driving conditions for a particular facility. The letters A–F represent progressively worse driving conditions—generally, LOS A indicates a free-flowing operation with little or no delay, and LOS F denotes jammed flow with substantial delay. Table 3-13 summarizes typical LOS conditions.

Table 3-13. Level of Service Criteria for Urban Streets

Level of Service	Intersection	Roadways
A	Uncongested operations, all queues clear in a single signal cycle. V/C = 0.00–0.60	Free flow, vehicle unaffected by other vehicles in traffic stream.
B	Uncongested operations, all queues clear in a single signal cycle. V/C = 0.61–0.70	Higher speed range of stable flow. Volume 50 percent of capacity or less.
C	Light congestion; occasional back-ups on critical approaches. V/C = 0.71–0.80	Stable flows with volumes not exceeding 75 percent of capacity.
D	Significant congestion of critical approaches, but intersection functional. Cars required to wait though more than one cycle during short peaks. No long queues formed. V/C = 0.81–0.90	Upper end of stable flow conditions. Volumes do not exceed 90 percent of capacity.
E	Severe congestion with some long-standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersections upstream of critical approaches. V/C = 0.91 – 1.00	Unstable flow at roadway capacity. Operating speeds 25 to 30 mph or less.
F	Total breakdown; stop-and-go traffic operation. V/C > 1.00	Stop-and-go with operating speeds less than 30 mph.

Source: City of West Sacramento 2000.

Cities and counties use various criteria to determine acceptable levels of service on their roadway systems. The Transportation and Circulation of the City of West Sacramento General Plan contains the following policy:

West Sacramento General Plan—Transportation and Circulation: Policy 2

The City shall endeavor to maintain a Level of Service “C” on all streets within the city, except at intersections and on roadway segments within one-quarter mile of a freeway interchange or bridge crossing of the Deep Water Ship Channel, barge canal, or Sacramento River, where a Level of Service “D” shall be deemed acceptable (City of West Sacramento 2004a).

According to the city’s general plan, the project would have significant effects if the project were to result in an overall Level of Service C or worse on the City’s local and major street systems.

Significance Criteria

The following significance criterion was used in the determination of significance:

- If the proposed project were to result in an overall Level of Service C or worse on the City’s local and major street systems.

Environmental Consequences

No Action

No new vehicle trips would be generated under the No Action alternative. Therefore, there would be no effect related to traffic and circulation.

Proposed Action

Increased Traffic and Exceedance of Level-of Service Standard during Construction

During construction, the movement of crews, equipment, and material would result in temporary increases in traffic on the surrounding roadways. Locally, vehicles associated with construction activities are anticipated to travel on Jefferson Boulevard, West Capitol Avenue, Reed Avenue, Sacramento Avenue, 6th Street, and C Street.

During project construction, trucks would primarily travel along Jefferson Blvd. The construction of the project would require approximately 566 trips. The trucks would carry 18 square yards of material per trip for 40 days. There would be approximately 113 truck trips per day, and approximately 9 trips per hour. The intersection LOS along Jefferson Boulevard to the project site are generally

at levels A and B (AES 2006; EDAW 2005). The addition of 9 truck trips per hour is not expected to reduce LOS below the standards in the City's General Plan. Because construction-related traffic effects are expected to be temporary, and because the additional haul trips would not reduce existing LOS to levels below the standards set in the City's General Plan, this effect is not considered significant. Implementing a traffic control plan as described in the environmental commitments section would reduce this effect to below a level of significance.

Degradation or Damage to Local Roads

During construction, the movement of haul trucks, construction equipment, and crew vehicles could damage local roadways such as potholes or minor fractures. Implementation of the Traffic Control and Road Maintenance Plan in the Environmental Commitments will reduce the effect to below a level of significance.

Mitigation

No mitigation is required.

Utilities and Service Systems

Introduction

This section addresses several public utilities and service systems: gas, electrical, water, sewer, cable, and telephone systems. Wastewater and solid-waste systems are not discussed because the project would not result in the production of wastewater or long-term production of solid waste.

Environmental Conditions

WSAFCA performed an assessment of the above and underground utilities within the disturbance area of the project site. Overhead powerlines and phone lines and underground utilities including pipelines and telephone conduits occur in the disturbance area of the project site.

Significance Criteria

For the purposes of this analysis, effects on utilities and service systems are considered significant if the proposed project would:

- adversely affect public utility facilities that are located underground or aboveground along the local roadways.

Environmental Consequences

No Action

Under the No-Action Alternative, no ground disturbing activities will occur nor will any utilities and service systems be interrupted or damaged. Therefore, there would be no effect on utilities and service systems

Proposed Action

Damage of Public Utility Infrastructure and Disruption of Service in the Project Area

Construction could potentially necessitate the relocation of utility infrastructure, which could result in temporary loss of service. Existing infrastructure such as telephone lines, natural gas lines, and underground cable lines could be underground or overhead at the project site.

Utility infrastructure could require significant physical activities to repair, relocate, or replace depending upon specific construction activities occurring at each site. Additionally, project construction could necessitate existing utilities to be taken off-line or could cause accidental damage to identified and unidentified infrastructure. Because the potential exists for damage and service interruptions to existing utilities both identified and unidentified, this potential construction effect would be considered significant. Implementation of the following Mitigation Measure UT-1 would reduce the effect to below a level of significance.

Mitigation

Mitigation Measure UT-1: Verify Utility Locations, Coordinate with Utility Providers, and Prepare a Response Plan and Conduct Worker Training

WSAFCA will ensure the following measures are implemented to avoid and minimize potential damage to utility and service disruptions during construction. Implementing these measures will help ensure existing utilities are not damaged and that service interruptions are minimized.

1. Obtain utility excavation or encroachment permits as necessary before initiating any work with the potential to affect utility lines, and include all necessary permit terms in construction contract specifications.
2. Before the starting of construction, coordinate with utility providers in the area before construction to locate existing lines begins. Avoid the relocation of utilities when possible. Provide notification of potential interruptions in services to the appropriate agencies.
3. Before starting construction, verify utility locations through field surveys and Underground Service Alert services. Any buried utility lines shall be clearly marked in the area of construction in advance of any earthmoving activity.
4. Before starting construction, prepare a response plan to address potential accidental damage to a utility line. The plan shall identify chain of command rules for notifying authorities and appropriate actions and responsibilities to ensure the safety of the public and the workers. Contractors will conduct worker education training to respond to these situations as well.
5. Stage utility relocations to minimize service interruptions as well.

Cumulative Effects and Growth Inducement

Introduction

This chapter addresses the potential cumulative effects of the proposed project as required by NEPA, closing with an analysis of the project's potential for inducing growth (urbanized development of open space areas).

The Council on Environmental Quality's (CEQ's) regulations (40 CFR §§ 1500–1508) implementing the procedural provisions of NEPA, as amended (42 USC §§ 4321 et seq.), define cumulative effects as:

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR § 1508.7). (Council on Environmental Quality 1997.)

The following criteria were used to identify those projects or actions that may contribute to cumulative impacts.

- Is the action under active consideration (i.e., have any permit applications been filed with the appropriate responsible agency or entity, or, has an agency with oversight presented a plan or framework for a specific project or program)?
- Does the action have recently completed environmental documentation or are other environmental documents in some stage of active completion (e.g., public draft EIR)?
- Does the action, in combination with the project, have the potential to affect the same resources?

These criteria were developed based upon the CEQ guidance quoted above and guidance from the NEPA Handbook developed by the U.S. Bureau of Reclamation. (Bureau of Reclamation Draft NEPA Handbook, pp. 8-18.)

Utilizing the above criteria, the following list of past, present, and reasonably foreseeable actions was created.

Related Flood Protection Projects

According to the CEQ regulations, when determining the scope of the action assessment, similar actions must be considered. Similar actions are defined as actions when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same environmental assessment. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single environmental assessment (40 CFR § 1508.25(a)(3)). (Council on Environmental Quality 1997).

The following descriptions of related or similar flood protection projects includes those that are under active consideration, have been proposed, or have some form of environmental documentation complete. In addition, these projects have the potential to affect the same resources and fall within the geographic scope designated for cumulative assessment of those resources. In particular, those resources are biological resources (riparian habitat and wildlife disturbance) and hydrology and geomorphology. The geographic scope of consideration for effects to those resources is the Sacramento Valley region and Sacramento River system, respectively.

West Sacramento Levee Improvement Program

WSAFCA is proposing the WSLIP. The program will consist of a comprehensive evaluation of the levees that protect the City and the construction of levee improvement measures that will meet the most recent state and federal criteria. The intent is to provide a 200-year level of flood protection for the citizens and property of the City. Approximately 50 miles of levees are presently under evaluation as part of the Program. Problem identification is near completion, alternatives are being developed, and the environmental document is in progress.

SAFCA Levee Integrity Program

As part of its long-term program to improve the Natomas Basin levee system, the Sacramento Area Flood Control Agency (SAFCA) proposes to continue waterside and landside levee strengthening efforts, including increased bank protection, levee toe stabilization, and flattening of landside levee slopes to 5:1 (horizontal to vertical) in section. These activities were evaluated at a program level in the Natomas Levee Improvement Program Local Funding EIR. Specific construction activities are not yet planned, designed, or funded, and their timing is unknown; however, construction is expected to occur after 2010 and over the successive decade.

Natomas Levee Improvement Program Landside Improvements Project

SAFCA proposes to provide the Natomas Basin with at least a 100-year level of flood protection by the end of 2010 and ultimately a 200-year level of flood protection. Approximately 26 miles of levees surrounding the Natomas Basin require one or more forms of remediation to address the potential for failure in a 100-year or 200-year flood event. This will require improving conditions along the Natomas Cross Canal south levee and the Sacramento River left-bank levee to address inadequate freeboard, under-seepage and through-seepage vulnerability, and erosion. The improvements are being implemented in 2008, 2009, and 2010.

Post-2010 Natomas Levee Improvement Program Seepage Remediation Projects

SAFCA is proposing to construct seepage mitigation along the Sacramento River left-bank levee and the American River north levee to achieve a 200-year level of flood protection for the Natomas Basin. SAFCA is proposing to undertake this work after completing the improvements necessary to achieve a 100 year level of flood protection by 2010.

Natomas Cross Canal Phase 1 Improvements

SAFCA is proposing to construct the Natomas Cross Canal Phase 1 Improvements project, which includes improving a strategic reach of the Natomas Basin levee system (the westernmost portion of the Natomas Cross Canal south levee) to reduce the risk of flooding to a highly populated portion of the City of Sacramento. The project intends to address through-seepage and under-seepage potential in the westernmost 12,500 feet of the levee by constructing a cutoff wall. Construction was initiated in 2007 and will be completed in 2008.

Other Natomas Levee Improvement Program Efforts

Other projects for protecting the Natomas basin are in the planning phase. These efforts include:

- Natomas Cross Canal Phase 2
- Sacramento River East Phase 1 (Reaches 1-4B)
- Sacramento River East Phase 2 (Reaches 5A-6A, 11A-11B, and 12A)
- Pleasant Grove Creek Canal

- Natomas East Main Drainage Canal Phase 1
- American River North Levee
- Sacramento River East Phase 3 (Reaches 6B-10, 12B-20)
- Natomas East Main Drainage Canal Phase 2

Feather River Levee Repair Project Segments 1 and 3

The Feather River Levee Repair Project, Segments 1 and 3 is sponsored by non-federal sponsors Reclamation District 784 and Three Rivers Levee Improvement Authority and federal sponsor, the USACE. The proposed project includes repair and strengthening activities to two segments of the Feather River. Segment 1 is the Feather River left bank levee from PLM 13.3 to PLM 17.1. Segment 3 is the Feather River left bank levee from PLM 23.6 to PLM 26.1 and Yuba River left bank levee from PLM 0.0 to PLM 0.3. The primary methods proposed for levee repair are installation of cutoff walls, construction of landside stability berms, and construction of a waterside impervious blanket. Installation of relief wells is also proposed in the same location.

Feather River Levee Repair Project Segment 2

The Feather River Levee Repair Project, Segment 2, is sponsored by Three River Levee Improvement Authority and involves improvements to the east bank of the Feather River. To determine the most appropriate improvements, an array of alternatives which may include one or more improvement measures will be analyzed in an environmental impact statement. Flood protection measures include seepage berms, stability berms, setback levees, seepage cutoff walls, and relocation of a pump station. These improvements would be constructed to improve flood protection to portions of Yuba County and Reclamation District 784.

Feather River Setback Levee at Star Bend

Levee District No. 1 of Sutter County is proposing the Feather River Setback Levee at Star Bend on the west bank of the Feather River near the eastern boundary of Sutter County. The proposed project would construct an earthen levee west of the Feather River at Star Bend. The project would replace a segment of the river's existing levee that currently constricts flood flows in the river and presents an unacceptably high risk for levee failure due to seepage concerns. Construction of the setback levee would remove the existing constriction and reduce water surface elevations along the levees upstream of the project site. In doing so, hydrostatic pressure on these levees and risk of failure would be substantially reduced.

West Sacramento Project

The West Sacramento Project was constructed in the late 1990s and early 2000. Several of the repaired segments of levee have exhibited waterside and landside slope instability since the completion of construction. This instability has manifested itself in the form of slips and associated cracking within the levee slope. The USACE is currently investigating two deficient sites for repair.

Sacramento River Bank Protection Project

This project is located within the limits of the existing Flood Control Project and provides bank protection to the Sacramento River levees. Site inspections of the project are performed on an annual basis and recommendations for priority repairs are made. Nine sites within the City of West Sacramento were identified for repair in 2007.

Sacramento Urban Levee Program

The California Department of Water Resources is evaluating sites similar to the USACE's Sacramento River Bank Protection Project. The state will be repairing 19 critical erosion sites. One of these sites is in West Sacramento at RM 55.8.

PL 84-99 (Public Law 84-99, the Flood and Coastal Storm Emergencies Act)

PL 84-99 authorizes the USACE to conduct emergency repairs to flood management works threatened or destroyed by high-water events. A "PL 84-99" site was repaired in the WSAFCA service area within the last 5 years. The typical repair treatment for PL 84-99 sites along the Sacramento River consists of rock placement. Additional sites may continue to be repaired within the WSAFCA service area depending on funding and the urgency to repair based on erosion conditions (and other factors).

Potential Projects Requesting Section 408 Approval

A number of projects within the Central Valley may request Section 408 approval. The table below describes potential project with Section 408 requests.

Table 4-1. Potential Project Request

Project	Lead Agency/Agencies	Estimated Date for Submitting Section 408
Sutter County Setback Levee at Star Bend	Levee District No. 1	Summer 2008
West Sacramento 2008–2009 Improvements	WSAFCA	February 2008
West Sacramento 2009–2011 Improvements	WSAFCA	February 2008
Atlas Tract Levee Realignment	RD 2126	November 2007
Implementation Repairs (San Joaquin River Flood Control System)	Rd 17, San Joaquin County	Mid 2008
Urban Protection Project	RD 17, SJAFCA	2011
River Islands Levee Alteration	City of Lathrop	Mid 2008
Urban Protection Project	RD 404	Late 2008 and 2011

Relevant Land Use Plans

Relevant land use plans are included to assess past, present, or reasonably foreseeable development actions within the City that may affect the same resources as the EIP, or provide for the restoration, preservation, or enhancement of those resources.

Yolo Natural Heritage Program/Habitat Conservation Plan

The Yolo Natural Heritage Program is a county-wide Natural Communities Conservation Plan/Habitat Conservation Plan (NCCP/HCP) for the 653,629-acre planning area that provides habitat for many special status and at-risk species found within five dominant habitats/natural communities. The Yolo Natural Heritage Program will describe the measures that will be undertaken to conserve important biological resources, obtain permits for urban growth and public infrastructure projects, and continue Yolo County's rich agricultural heritage (Yolo Natural Heritage Program 2008).

City of West Sacramento General Plan

The *West Sacramento General Plan* consists of two documents: the *General Plan Background Report* and the *General Plan Policy Document*. The *General Plan Background Report* inventories and analyzes existing conditions and trends in West Sacramento. The *Background Report*, which provides the formal supporting documentation for general plan policy, addresses eleven subject areas:

land use, housing, population, economic conditions and fiscal considerations, transportation and circulation, public facilities and services, cultural and recreational resources, natural resources, health and safety, urban structure and design, and child care. The *Background Report* also includes as an appendix the *West Sacramento General Plan Community Concerns Summary Report* prepared following the issue identification process carried out in early 1988. The *General Plan Policy Document* includes the goals, policies, standards, implementation programs, quantified objectives, land use diagram, and circulation plan diagram that constitute the formal policy of the City of West Sacramento for land use, development, and environmental quality (City of West Sacramento 2000).

Washington Specific Plan

Adopted in 1996, the Washington Specific Plan area covers the northeast area of the City of West Sacramento. The EIP site lies within the Washington Specific Plan area. The area includes plans for mixed use, residential, and commercial development. The CalSTRS building is currently under construction in the Washington Specific Plan. It is constructed adjacent to and behind the Sacramento River levee, just south of the EIP project site (City of West Sacramento 1996).

Triangle Plan

Adopted in 1993, the Triangle Plan includes primarily mid-rise to high-rise office, high-density multiple family residential, ancillary retail, government, and institutional uses. Development is proposed to occur through 2012. The Triangle Plan outlines the creation of a mixed-use community of local and regional significance. The Triangle Plan area is south of the project site with the Sacramento River as its eastern border (City of West Sacramento Department of Community Development 2000).

City of West Sacramento Development Projects

City development projects that have the potential to affect similar resource areas such as biological resources, air, and noise have been included for analysis.

Sacramento Riverfront Master Plan Improvement (Riverwalk)

This development will create a riverfront promenade, which stretches from The Rivers development on the north to the Stone Locks near the Port of Sacramento. The first two phases of the park, which spans from the Tower Bridge to approximately one block south of the I Street Bridge, were constructed in 1998

and 2002 for \$3.5 million. Phase 3, which is the Riverwalk extension from E Street to the I Street Bridge, includes plans for a pedestrian landing plaza and restroom on top of the levee. The City currently has a grant from the State Resources Agency under the Proposition 50 River Parkways program for Phase 3 of the project. The grant for implementation expires in May 2009, which intensifies the importance of completing the EIP in this same project area in 2008. Phase 4 plans are to continue the pavement of the top of the levee to the Broderick boat ramp. Phase 5 of the riverfront improvements includes a promenade along the Triangle (described above), which is from the Tower Bridge to the Pioneer Bridge. The City currently also has a Resources Agency grant for Phase 5A of the project that expires in May 2010. Phase 6 will continue the Riverwalk pathway to Pioneer Bluff.

Indian Heritage Center

Forty-three acres on the Sacramento River is designated for the California Indian Heritage Center (CIHC). The center will overlook the confluence of the American and Sacramento rivers and is located in an area of significant natural resources to American Indians. The project includes a library, archives, tribal treasures exhibit space, resident artist space, offices, classrooms, a café, museum store, amphitheatre and event space, indigenous gardens, and parking. The center will be next to the levee.

Barge Canal Redevelopment

The City plans to further and enhance current use of the barge canal area for aquatic recreational activities, such as sailing, rowing, kayaking, and canoeing, and supports the establishment of a multi-use aquatic facility along the barge canal. Aquatic parks, boat houses, docks, and other support facilities for boating shall be deemed compatible uses along the Deep Water Ship Channel and the barge canal within all land use designations. The City also promotes the development of important visual and scenic areas along the riverfront and barge canal for public access, including water-related activities and possible development of high-intensity and high-density urban uses.

City of West Sacramento Public Projects

There are approximately nine City public works projects slated to occur sometime during the summer or fall of 2008, including pump stations, I Street Bridge rail repair, traffic light installation, and street pavement rehabilitation.

City of West Sacramento Private Projects

There are several permits that have been filed with the City for private construction projects such as tenant improvements, new commercial buildings, and a parking structure. All of these projects may occur during the summer and fall of 2008, concurrent with the proposed EIP.

Cumulative Effects Analysis

Implementation of the proposed project with other actions occurring at the same time could have the potential to create and contribute to cumulative impacts on the environment.

Resources Eliminated from Cumulative Effects Analysis

The project will have no effects on some resource areas. In others, cumulative effects would not be considered cumulatively considerable for one or both of these reasons:

- cumulative effects would be beneficial, or
- the effect of the proposed project would not be added to the effect of other projects (i.e., no cumulative impact would occur) or would be too minor or localized to be cumulatively considerable.

By applying this reasoning, the following resource areas, along with a general explanation of the rationale, have been eliminated from cumulative effect consideration:

- **Cultural Resources**—There are no known sensitive cultural resources in the project area that would be affected by the project. Ground-disturbing activities could inadvertently unearth and damage historical or prehistoric resources or remains that could be potentially buried. Any potential damage would be minimized by the implementation of mitigation measures and would be limited to resources in the location of the project site.
- **Geology and Soils**—Grading and ground-disturbing activities could result in temporary, localized soil erosion. Any potential effects would be reduced with the implementation of mitigation measures and would be too minor or localized to be cumulatively considerable.
- **Hazards and Hazardous Materials**—Effects related to hazards and hazardous materials would only temporarily have the potential to occur during construction. Mitigation measures have been incorporated to minimize the potential for exposure of people or the environment to hazardous materials.

- **Land Use and Planning**—The General Plan land use designation for the project area is Recreation and Parks and Waterfront. Implementation of the EIP would enable recreational elements to be constructed for the Riverwalk. There are no conflicts with land use plans or policies and there would be no changes in land use as a result of the EIP. No existing structures would be removed or relocated. Overall, the EIP would be beneficial in facilitating and protecting current land use designations.
- **Mineral Resources**—The project area is not located on or near any known mineral resources protected for future mining.
- **Population and Housing**—No population would be displaced and there would be no influence on the economy that would result in an influx of people as a result of the EIP.
- **Recreation**—Project effects on recreation access during construction are temporary and minor. Ultimately, there would be a beneficial effect because the project enables future construction of recreational elements of the Riverwalk.
- **Transportation and Traffic**—Transportation and traffic will be temporarily affected. No changes to existing transportation infrastructure would occur.
- **Environmental Justice**—The project has no effect related to environmental justice. No persons will be displaced or disproportionately affected by the project. The project benefits nearby established neighborhoods that are diverse in income and ethnicity through enhanced flood protection.
- **Special-Status Fish Species under Biological Resources**—Effects on fish are considered to be potential (and if so, temporary) in nature. The effects could be an increase in suspended sediment and turbidity generated by construction activities and the potential for a release of toxic substances such as gasoline or lubricants. Best management practices to reduce the potential for effects will be implemented. Should any of these effects occur, they are not expected to be adverse. This finding is supported by a letter from the National Marine Fisheries Service (included in Appendix B), indicating the effects would be discountable and insignificant.
- **Utilities and Public Services**—Effects on utilities and public services involve the potential for damage and disruption of service. Measures have been incorporated to avoid these potential effects.
- **Water Quality**—Effects on water quality are related to erosion and sedimentation and the potential for inadvertent release of petroleum products in the channel. Measures have been incorporated that avoid or minimize these effects to such a degree that they would be too minor or localized to be cumulatively considerable.

Resources for which Effects May be Cumulatively Considerable

The following is an analysis of the cumulative impacts for those resource areas where cumulative effects could occur. The geographic scope considered for each of these resources is outlined in the table below.

Resource	Geographic Scope Considered
Aesthetics	The City of West Sacramento and the urbanized reach of the Sacramento River corridor
Air Quality	A 25-mile radius of the project site which is the approximate distance that haul trucks would travel to retrieve and deliver supplies to the project site), with potential regional implications within the Sacramento Valley Air Basin
Biological Resources	A 10-mile radius from the project site, which is the distance in which DFG requires mitigation for loss of riparian habitat, with some Sacramento Valley regional implications
Hydrology and Hydraulics	Sacramento River system
Noise	Immediate vicinity of the project site

Aesthetics

As detailed in Chapter 3, the City of West Sacramento includes a mix of land uses including commercial, residential, industrial, and recreational uses. The proposed project is located along the Sacramento River which is slated to become part of the Riverwalk, a paved trail that follows the river with many picnic areas and interpretive signage describing natural habitats. North of the project area is the I Street Bridge, which provides a river crossing for both train and auto traffic. South of the project area are office buildings, the River Walk Park (described above), and Raley Field (a sports stadium). On the opposite side of the river lies historic Old Sacramento with various shops, restaurants, and hotels. In general, the urbanized reach of the Sacramento River is undergoing revitalization through numerous public and private improvements, which will include recreation features, habitat, entertainment facilities, and commercial development. These improvements are governed under a publically vetted riverfront master plan and overlying specific plans. In sum, the trend is for more diverse visual character and improved visual quality in the project area.

The road on the crown of the levee in the project area is bare soil and the vegetation and landscape is characterized by disturbed areas with ruderal grasses and scattered native and nonnative trees with patches of bare soil.

The proposed project would result in the removal of trees and other vegetation from the waterside and landside of the levee within the project area. The West

Sacramento Levee Improvements Program, SAFCA's Natomas Levee Improvement Program, and other ongoing and future levee improvements projects being conducted by the USACE and DWR would also likely result in the removal of vegetation and possibly other structures or features that add to the overall riverine visual character in the area. Future development activities within the City may also result in the visual character shifting from rural/agricultural to a more suburban/urban setting. These development activities have been planned for and analyzed in the City's General and Specific Area Plans. The EIP includes mitigation measures such as the planting of additional trees that would offset the minor loss of visual character in the long-term. When added to other future and reasonably foreseeable projects, there are cumulative effects; however, the EIP's contribution to these cumulative effects is not cumulatively considerable. After completion of the EIP, the project site will be improved as part of the existing Riverwalk, which currently stops just south of the project site and is visibly incomplete. Completion of this recreational element as facilitated by the EIP will result in a beneficial effect and improve the visual character of the area.

Air Quality and Climate Change

As detailed in Chapter 3, the proposed Project is located in Yolo County, which is located in the Sacramento Valley Air Basin (SVAB). The SVAB includes Sacramento, Shasta, Tehama, Butte, Glenn, Colusa, Sutter, Yuba, Yolo, and parts of Solano and Placer Counties. The SVAB is bound on the west by the Coast Ranges and on the north and east by the Cascade Range and Sierra Nevada.

The Yolo Solano Air Quality Management District is the management agency with responsibility for ensuring that state and federal standards are met. Criteria pollutants for this area include ozone, particulate matter, carbon monoxide and toxic air contaminants. For some of these criteria pollutants, attainment status in the District has been met. For others, the status is considered nonattainment. More detailed information regarding existing conditions is provided in Chapter 3, Affected Environment and Environmental Effects.

During construction of the EIP, air quality may be affected by criteria pollutant emissions produced by construction equipment and fugitive dust created by wind and the operation of construction equipment over exposed earth. The implementation of project mitigation measures prevents the construction-related emissions from exceeding current standards of the Yolo-Solano Air Quality Management District.

Small, local development projects within an approximately 25-mile radius may occur at or the near the time that the EIP would be under construction. However, these projects will also be required to implement measures that would keep emissions at levels below standards. Therefore, with the implementation of mitigation measures, the EIP would not significantly contribute to cumulative effects on air quality.

In AB 32 (California Global Warming Solutions Act of 2006), the Legislature recognized California's vulnerability to weather events triggered by global warming. The Legislature found that global warming will "have detrimental effects on some of California's largest industries." Residents will likely be affected by many of these climate change effects, given the importance of agriculture, tourism, and recreation to Yolo County (Yolo-Solano Air Quality Management District, 2007. Handbook for Assessing and Mitigating Air Quality Impacts, Davis, California).

AB 32 mandates that emissions of greenhouse gases (GHG) be reduced to 1990 levels by 2020. Considering that 40% of GHG emissions come from motor vehicles, projects that generate new vehicle trips can conflict with AB32 goals. The proposed project would not result in a significant increase in GHG emissions because it represents a short-term increase in construction-related GHG emissions and would not result in a long-term increase in vehicle trips. In addition, the project's proposed air quality mitigation that would reduce construction emissions would also minimize the generation of GHG emissions by relying on newer, more efficient equipment for a large percentage of the construction fleet.

In addition, because the project consists of levee improvements, it would reduce the vulnerability of low lying areas to flooding caused by unusual weather events that may be attributable to global warming. Consequently, the project would result in long-term benefits to the region by reducing the area's susceptibility to flooding.

Biological Resources (Terrestrial)

As detailed in Chapter 3, prior to European settlement and the construction of the Sacramento River Flood Control Project, an extensive riparian forest ecosystem dominated the Central Valley of California. That riparian forest was reduced with the construction of levees that confined floodwaters to the river channels. The current levees and floodways support the remaining remnants of that riparian forest.

The stretch of the Sacramento River where the proposed project lies has several land cover types including riparian, ruderal annual grassland, ornamental landscape, and developed areas. Riparian habitat is considered a sensitive habitat because of high species diversity, high productivity, unusual nature, limited distribution and declining status. Due to its declining status, some of the species that rely upon this habitat have also received special status. Some of these species include Swainson's hawk, giant garter snake, Valley Elderberry Longhorn Beetle, Cooper's hawk, and white-tailed kite. More information on biological resources is provided in Chapter 3.

Sensitive Biological Resources

The implementation of the EIP would result in the removal of riparian habitat on the water side of the levee and native and nonnative trees on the land side of the levee. As noted above, riparian habitat is considered an important and sensitive habitat because of high species diversity, high productivity, unusual nature, limited distribution, declining status, or a combination of these attributes. Effects on riparian and other important terrestrial habitats can directly or indirectly affect the wildlife that depends on these habitats for at least some portion of their life cycles.

The riparian trees and trees on the landside of the levee provide roosting and nesting habitat for numerous wildlife species, including resident, wintering, and migratory species, including raptors. The riparian habitat provides less habitat value than would be expected if the riparian corridor were wider with a more complex vegetation structure. The riparian vegetation within the project footprint is located on a bench above the OHWM of the Sacramento River and does not provide shade to the adjacent Sacramento River. The project site is also subject to human disturbance from pedestrians and recreationists accessing the river shore from the project site.

The proposed EIP has incorporated mitigation measures to compensate for the loss of riparian habitat. Compensation will include restoring or enhancing in-kind riparian habitat at a ratio of 2:1 (2 acres created for each acre of habitat affected). Nonetheless, temporal losses will be incurred while that habitat becomes established and mature. Replacement riparian habitat will consist of native riparian species of greater diversity which will result in increased habitat value in comparison with the riparian habitat that will be affected.

Other development projects within the City and levee improvements projects along the Sacramento and American Rivers will also result in loss of riparian habitat. The Natomas Levee Improvement Program is proposing up-front habitat replacement, enhancement, and preservation to compensate for habitat losses and reduce their adverse effects. All relevant, proposed development and levee improvement projects will be required to coordinate with USFWS, NMFS, DFG, and appropriate local agencies to ensure appropriate compensation for effects to riparian habitat. The EIP will not result in any net loss of riparian habitat in the long term either in isolation or when combined with the effects of other related projects.

Special-Status Wildlife

Temporary wildlife and habitat disturbance may result during construction of the EIP. Swainson's hawks and other nesting raptors are known to utilize the Sacramento River corridor for nesting habitat. Measures have been incorporated to avoid or minimize disturbance of active nests within 0.25 of a mile from the project site. Moreover, the project will not likely be initiated until after the typical nesting and fledging season. Levee improvements projects along the

Sacramento River corridor may also have the potential to temporarily disturb wildlife habitat; however, it is unlikely that these projects will be occurring at the same time. In addition, all the proposed levee improvement or local development projects will be required to implement similar mitigation measures that are also expected to avoid or minimize effects to nesting raptors. Therefore, the EIP's additive contribution to habitat disturbance would be minimal and not cumulatively considerable.

Hydrology and Hydraulics

As detailed in Chapter 3, rivers flowing into the Sacramento–San Joaquin Delta (Delta) convey approximately 50% of the state's annual runoff (California Department of Water Resources 1995). The Sacramento River drainage basin, upstream of the project site, encompasses approximately 23,500 square miles and produces an average annual runoff of about 17,000,000 acre-feet (af) at the Freeport gaging station (just south of the City of Sacramento and below the confluence with the American River).

Historically, the channel was dredged to remove sediment inflows derived from upstream hydraulic mining in the Sierra Nevada. In the early 20th century, hydraulic mining decreased as did sediment input and a degradation or incision trend began. Further incision of the river may have occurred in the latter part of the 20th century due to trapping of bed sediment in upstream reservoirs. The Sacramento River channel is controlled in many places by bank protection, levees, and resistant outcrops, so that lateral migration rates are low. The EIP is an improvement consistent with the numerous improvements occurring throughout the Sacramento River Flood Control Project to maintain integrity of the system and to increase flood protection for existing population centers.

Increasing the strength of the levee may have a slight effect on the potential for seepage to occur through levees immediately adjacent to the project site that do not have comparable seepage resistance or protection. The change in hydrologic conditions resulting from installing the seepage cutoff wall is not expected to result in a substantial increase in seepage through adjacent levees because the length of the new seepage wall is relatively short and the hydrologic conditions downstream of the project site are not expected to change from current conditions. As the proposed action is small in area and consistent with improvements on the left bank of the Sacramento River within the project vicinity (specifically, the urbanized reach of the Sacramento River) and other similar improvements in upstream areas of the Sacramento Valley, there is no substantial potential for transference of flood risk to or from another community induced by the project.

The proposed action would not substantially alter waterside levee geometry or change the levee height. Further, there would be no cumulatively considerable effect between the surface water and groundwater exchange at the cumulative level from slurry wall(s). The slurry wall of the proposed project will be up to

45 feet deep. Groundwater and surface water exchange will still occur at a depth below the slurry walls.

Noise

As detailed in Chapter 3, California requires each local government entity to implement a noise element as part of its general plan. California Administrative Code, Title 4, has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure.

The City of West Sacramento has established policies and regulations concerning the generation and control of noise that could adversely affect their citizens and noise-sensitive land uses.

The EIP vicinity is bordered by commercial, recreational, and residential areas along the Sacramento River. Existing noise levels in this area are typical of suburban environment with sound levels in the range of 40 to 60 dBA.

The project will have a temporary effect on noise levels due to construction activities. Mitigation measures have been incorporated to reduce noise to an acceptable level for the duration of the construction activities. One other nearby project, the I Street Bridge rail repair, may have some construction activities that generate simultaneous noise that would be heard by the same sensitive receptors. However, if it occurs at all, that simultaneous noise would be intermittent and temporary. Therefore, the EIP would not have a cumulatively considerable effect on noise.

Growth Inducement

The project area is part of the Washington Specific Plan which proposes mixed-use, residential, and commercial development. Land use adjacent to the project area is highly urbanized and undergoing revitalization via in-fill construction in accordance with the Specific Plan. Implementation of the EIP would not remove any presently direct obstacles to growth, but would accommodate and provide better flood protection for growth that is consistent with the City's General Plan and Washington Specific Plan. The effects of such growth have been planned for, analyzed, and mitigated through the local planning process and other requisite environmental compliance.

The area protected by this levee reach (and other substantial portions of the City) may be subject to future floodplain designation by FEMA, which could place restrictions and/or special building standards on development. The EIP as part of the larger WSLIP would increase the overall level of protection in accordance with revised levee criteria and would avoid such designation when ultimately completed. The parcels adjacent to and protected by the project site levee could still be developed without the implementation of the EIP, similar to the Ziggurat

and CalSTRS buildings immediately downstream of the project reach, but structures would likely be subject to different standards to individually reduce risk from potential flooding.

In sum, the effect of the implementation of the EIP would be to accommodate growth that has been planned for and approved by the City consistent with its land use plans and applicable federal, state, and local environmental review and authorization.

Conclusions

In conclusion and summary, the EIP will not have any cumulatively considerable effects on aesthetics, air quality, biological resources, hydrology and hydraulics, or noise, as analyzed in detail above (other resource topics were dismissed from detailed evaluation). Further, the EIP will not result in any removal of obstacles to growth, but would accommodate and provide better flood protection that is consistent with growth planned for and analyzed in the City's land use plans.

Compliance with Applicable Laws, Policies, Plans, and Regulatory Framework

Introduction

This chapter provides preliminary information on the major requirements for permitting and environmental review and consultation for implementation of the project. Certain local, state, and federal regulations require issuance of permits before project implementation; other regulations require agency consultation but may not require issuance of any authorization or entitlements before project implementation.

Regulatory Framework

Federal Requirements

National Environmental Policy Act

NEPA is the nation's broadest environmental law, applying to all federal agencies and most of the activities they manage, regulate, or fund that have the potential to affect the environment. It requires federal agencies to disclose and consider the environmental implications of their proposed actions. NEPA establishes environmental policies for the nation, provides an interdisciplinary framework for federal agencies to prevent environmental damage, and contains action-forcing procedures to ensure that federal agency decision makers take environmental factors into account.

NEPA requires the preparation of an appropriate document to ensure that federal agencies accomplish the law's purposes. The President's CEQ has adopted regulations and other guidance that provide detailed procedures that federal agencies must follow to implement NEPA.

This document is the instrument for NEPA compliance for the EIP under the USACE's authority, as described in Chapter 1.

Federal Endangered Species Act

Section 7 of the ESA requires federal agencies, in consultation with USFWS and/or NMFS, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species. The required steps in the Section 7 consultation process are as follows.

- Agencies must request information from USFWS and/or NMFS on the existence in a project area of special-status species or species proposed for listing.
- Agencies must initiate formal consultation with USFWS and/or NMFS if the proposed action may adversely affect special-status species.

The EIP will not have adverse effects on any special-status species. NMFS concurred with the Corps determination of “not likely to adversely affect” special-status fish species on June 4, 2008 (Appendix B). The Corps determined the project would have “no effect” on other special-status species such as VELB. Project information, photos, and maps were provided to USFWS for review in March 2008. The USFWS agreed that no consultation on this project was necessary (Appendix B).

Clean Water Act Section 404, 404(b)(1) Guidelines, and Section 401

Section 404

Section 404 of the CWA requires that a permit be obtained from the USACE for the discharge of dredged or fill material into “waters of the United States, including wetlands.”

Waters of the United States include wetlands and lakes, rivers, streams, and their tributaries. *Wetlands* are defined for regulatory purposes, at 33 CFR § 328.3 as:

- (1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;
- (2) All interstate waters, including interstate wetlands;
- (3) All other waters such as intrastate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce;
- (4) All impoundments of waters otherwise defined as waters of the United States under the definition;
- (5) Tributaries of waters identified in paragraphs 1–4 in this section;
- (6) The territorial seas; and
- (7) Wetlands adjacent to waters identified in paragraphs 1–6 in this section.

CWA Section 404(b) requires that the USACE process permits in compliance with guidelines developed by EPA. These guidelines (404[b][1] Guidelines)

require that there be an analysis of alternatives available to meet the project purpose and need, including those that avoid and minimize discharges of dredged or fill materials in waters. Once this first test has been satisfied, the project that is permitted must be the least environmentally damaging practical alternative before the USACE may issue a permit for the proposed activity.

[[Note: Section 404 does not apply to authorities under the Rivers and Harbors Appropriation Act of 1899, except that some of the same waters may be regulated under both statutes; the USACE typically combines the permit requirements of Section 10 and Section 404 into one permitting process.]]

Coordination has been conducted with USACE Regulatory staff regarding the presence of waters of the United States near the project (specifically, the active channel of the Sacramento River). Based on the determination of the OHWM location, project activities will not affect waters of the United States and no further Section 404 action is required.

Section 401

Under federal Clean Water Act (CWA) Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval [such as issuance of a Section 404 permit]) must also comply with CWA Section 401. In California, the authority to grant water quality certification has been delegated to the State Water Resources Control Board (State Water Board), and applications for water quality certification under CWA Section 401 are typically processed by the RWQCB with local jurisdiction. Water quality certification requires evaluation of potential impacts in light of water quality standards and CWA Section 404 criteria governing discharge of dredged and fill materials into waters of the United States.

As described above, authorization under Section 404 is not triggered by the project; therefore, Section 401 compliance is likewise not triggered.

River and Harbors Appropriation Act of 1899

The River and Harbors Appropriation Act of 1899 addresses activities that involve the construction of dams, bridges, dikes, etc., across any navigable water, or placing obstructions to navigation outside established federal lines and excavating from or depositing material in such waters, require permits from the USACE. *Navigable waters* are defined in Section 329.4 of the act as:

Those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity.

Section 9

Section 9 (33 USC § 401) prohibits the construction of any bridge, dam, dike, or causeway across any navigable water of the United States in the absence of congressional consent and approval of the plans by the Chief of Engineers and the Secretary of the Army. Where the navigable portions of the water body lie wholly within the limits of a single state, the structure may be built under authority of the legislature of that state, if the location and plans or any modification thereof are approved by the Chief of Engineers and by the Secretary of the Army.

Section 10

Section 10 (33 USC § 403) prohibits the unauthorized obstruction or alteration of any navigable water of the United States. This section provides that the construction of any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters, is unlawful unless the work has been authorized by the Chief of Engineers.

Section 13

Section 13 (33 USC § 407) provides that the Secretary of the Army, whenever the Chief of Engineers determines that anchorage and navigation would not be injured thereby, may permit the discharge of refuse into navigable waters. In the absence of a permit, such discharge of refuse is prohibited. While the prohibition of this section, known as the Refuse Act, is still in effect, the permit authority of the Secretary of the Army has been superseded by the permit authority provided the Administrator, EPA, and the states under Sections 402 and 405 of the CWA, respectively.

As described above, based on the determination of OHWM, the project does not affect waters of the United States under Section 404 or navigable waters under the Rivers and Harbors Appropriation Act of 1899.

Section 14

Section 14 (33 USC § 408) requires approval from the Chief of Engineers, or his designee, for alternations to certain public works, including federal project levees such as the levee section proposed for modification by the EIP. As described in Chapter 1, WSAFCA is seeking approval under 33 USC § 408, supported by this document.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) establishes a management system for national marine and estuarine fishery resources. This legislation requires that all federal agencies consult with NMFS regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect “essential fish habitat.” *Essential fish habitat* is defined as “waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The legislation states that migratory routes to and from anadromous fish spawning grounds are considered essential fish habitat. The phrase *adversely affect* refers to the creation of any impact that reduces the quality or quantity of essential fish habitat. Federal activities that occur outside of an essential fish habitat but that may, nonetheless, have an impact on essential fish habitat waters and substrate must also be considered in the consultation process.

Under the Magnuson-Stevens Act, effects on habitat managed under the Pacific Salmon Fishery Management Plan must also be considered. The Magnuson-Stevens Act states that consultation regarding essential fish habitat should be consolidated, where appropriate, with the interagency consultation, coordination, and environmental review procedures required by other federal statutes, such as NEPA, the Fish and Wildlife Coordination Act (FWCA), CWA, and the ESA. Essential fish habitat consultation requirements can be satisfied through concurrent environmental compliance if the lead agency provides NMFS with timely notification of actions that may adversely affect essential fish habitat and if the notification meets requirements for essential fish habitat assessments.

As described above under ESA compliance, the project will not adversely affect protected species or their habitat, including anadromous fish. Therefore, this conclusion similarly applies to the Magnuson-Stevens Act and a determination that no essential fish habitat will be affected.

Fish and Wildlife Coordination Act

The FWCA in general requires federal agencies to coordinate with USFWS and state fish and game agencies whenever streams or bodies of water are controlled or modified. This coordination is intended both to promote the conservation of

wildlife resources by providing equal consideration for fish and wildlife in water project planning and to provide for the development and improvement of wildlife resources in connection with water projects. Federal agencies undertaking water projects are required to include recommendations made by USFWS and state fish and game agencies in project reports, and give full consideration to these recommendations.

Coordination under FWCA has been carried out with the Resource agencies. As a result of the limited scope of the project, USFWS did not provide any recommendations. As a part of the Streambed Alteration Agreement, recommendations by DFG were incorporated into this document.

Farmland Protection Policy Act and Memoranda on Farmland Preservation

Two policies require federal agencies to include assessments of the potential effects of a proposed project on prime and unique farmland. These policies are the Farmland Protection Policy Act (FPPA) and the Memoranda on Farmland Preservation, dated August 30, 1976, and August 11, 1980, respectively, from the CEQ. Under requirements set forth in these policies, federal agencies must determine these effects before taking any action that could result in converting designated prime or unique farmland for nonagricultural purposes. If implementing a project would adversely affect farmland preservation, the agencies must consider alternative actions to lessen those effects. Federal agencies also must ensure that their programs, to the extent practicable, are compatible with state, local, and private programs to protect farmland. NRCS is the federal agency responsible for ensuring that these laws and policies are followed.

The EIP would not result in any loss of farmland and does not require any further review under these policies.

National Historic Preservation Act

Section 106 of the NHPA requires federal agencies to evaluate the effects of their undertakings on historic properties, which are those properties eligible for listing on, or listed on, the NRHP. Implementing regulations at 36 CFR Part 800 require that federal agencies, in consultation with the SHPO, identify historic properties within the area of potential effects (APE) of the proposed project and make an assessment of adverse effects if any are identified. If the project is determined to have an adverse effect on historic properties, the federal agency is required to consult further with the SHPO and the Advisory Council on Historic Preservation (ACHP) to develop methods to resolve the adverse effects. The Section 106 process has four basic steps.

1. Initiation of the Section 106 process (define the APE and scope of identification efforts).
2. Evaluation of historic properties.
3. Determination of adverse effects to historic properties.
4. Resolution of adverse effects to historic properties.

This EA summarizes the efforts taken to identify cultural resources within the APE, and any potential effects. Consultation with SHPO has been completed. SHPO has concurred with the Corps determination of no adverse effect to historic properties.

Executive Order 11988 (Floodplain Management)

Executive Order 11988 (May 24, 1977) requires federal agencies to prepare floodplain assessments for proposed actions located in or affecting floodplains. If an agency proposes to conduct an action in a floodplain, it must consider alternatives to avoid adverse effects and incompatible development in the floodplain. If the only practicable alternative involves sitting in a floodplain, the agency must minimize potential harm to or in the floodplain and explain why the action is proposed in the floodplain.

The EIP is proposed to improve existing flood protection facilities and does not directly or indirectly propose floodplain development. Please see further discussion under “Growth Inducement” within Chapter 4.

Executive Order 12898 (Environmental Justice)

Executive Order 12898 (February 11, 1994) requires federal agencies to identify and address adverse human health or environmental effects of federal programs, policies, and activities that could be disproportionately high on minority and low-income populations. Federal agencies must ensure that federal programs or activities do not directly or indirectly result in discrimination on the basis of race, color, or national origin. Federal agencies must provide opportunities for input into the NEPA process by affected communities and must evaluate the potentially significant and adverse environmental effects of proposed actions on minority and low-income communities during environmental document preparation. Even if a proposed federal project would not result in significant adverse impacts on minority and low-income populations, the environmental document must describe how Executive Order 12898 was addressed during the NEPA process.

Environmental justice issues are discussed in Chapter 3. In summary, the EIP would not result in any adverse effects on minority or low-income populations. In reality, the project would increase flood protection to nearby established diverse communities of mixed income and ethnicity.

Executive Order 13007 (Indian Sacred Sites) and April 29, 1994, Executive Memorandum

Executive Order 13007 (May 24, 1996) requires federal agencies with land management responsibilities to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies are to maintain the confidentiality of sacred sites. Among other things, federal agencies must provide reasonable notice of proposed actions or land management policies that may restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites. The agencies must comply with the April 29, 1994, Executive Memorandum, *Government-to-Government Relations with Native American Tribal Governments*.

Based on the analysis (summarized in Chapter 3 and more thoroughly discussed in a cultural resources report for the project under separate cover), no sacred sites would be adversely affected by the implementation of the project.

Federal Clean Air Act

The federal Clean Air Act (CAA) was enacted to protect and enhance the nation's air quality in order to promote public health and welfare and the productive capacity of the nation's population. The CAA requires an evaluation of any federal action to determine its potential impact on air quality in the project region. California has a corresponding law, which also must be considered during the EIR process.

For specific projects, federal agencies must coordinate with the appropriate air quality management district as well as with EPA. This coordination would determine whether the project conforms to the CAA and the State Implementation Plan (SIP).

Section 176 of the CAA prohibits federal agencies from engaging in or supporting in any way an action or activity that does not conform to an applicable SIP. Actions and activities must conform to a SIP's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and in attaining those standards expeditiously. EPA promulgated conformity regulations (codified in 40 CFR § 93.150 *et seq.*).

The potential air quality impacts of the project resulting from construction (such as equipment emissions and fugitive dust) are discussed in Chapter 3, analyzing and documenting compliance with the CAA.

Federal Water Project Recreation Act

The Federal Water Project Recreation Act requires federal agencies with authority to approve water projects to include recreation development as a condition of approving permits. Recreation development must be considered along with any navigation, flood control, reclamation, hydroelectric, or multipurpose water resource project. The act states that,

consideration should be given to opportunities for outdoor recreation and fish and wildlife enhancement whenever any such project can reasonably serve either or both purposes consistently.

Recreation effects are described in Chapter 3, such as temporary loss to river access. Moreover, this project will benefit recreation by facilitating subsequent construction of the City's Riverwalk extension up to the I Street Bridge, overlying the project site. The Riverwalk is a prominent and important recreational feature providing visual and physical access to the river corridor.

Resource Conservation and Recovery Act

The federal Resource Conservation and Recovery Act enables the EPA to administer a regulatory program that extends from the manufacture of hazardous materials to their disposal, thus regulating the generation, transportation, treatment, storage, and disposal of hazardous waste at all facilities and sites in the nation.

No materials classified as hazardous are proposed to be used for the EIP.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund) was passed to facilitate the cleanup of the nation's toxic waste sites. In 1986, the act was amended by the Superfund Amendment and Reauthorization Act Title III (community right-to-know laws). Title III states that past and present owners of land contaminated with hazardous substances can be held liable for the entire cost of the cleanup, even if the material was dumped illegally when the property was under different ownership.

No hazardous waste sites were identified at the project site during reconnaissance surveys and record searches.

State Requirements

California Environmental Quality Act

CEQA requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. The environmental review required imposes both procedural and substantive requirements. At a minimum, an initial review of the project and its environmental effects must be conducted. CEQA's primary objectives are to:

- disclose to decision makers and the public the significant environmental effects of proposed activities,
- identify ways to avoid or reduce environmental damage,
- prevent environmental damage by requiring implementation of feasible alternatives or mitigation measures,
- disclose to the public reasons for agency approval of projects with significant environmental effects,
- foster interagency coordination in the review of projects, and
- enhance public participation in the planning process.

CEQA applies to all discretionary activities proposed to be carried out or approved by California public agencies, including state, regional, county, and local agencies, unless an exemption applies. The act requires that public agencies comply with both procedural and substantive requirements. Procedural requirements include the preparation of the appropriate public notices (including notices of preparation), scoping documents, alternatives, environmental documents (including mitigation measures, mitigation monitoring plans, responses to comments, findings, and statements of overriding considerations), completion of agency consultation and State Clearinghouse review, and provisions for legal enforcement and citizen access to the courts.

CEQA's substantive provisions require agencies to address environmental impacts disclosed in an appropriate document. When avoiding or minimizing environmental damage is not feasible, CEQA requires agencies to prepare a written statement of overriding considerations when they decide to approve a project that will cause one or more significant effects on the environment that cannot be mitigated. CEQA establishes a series of action-forcing procedures to ensure that agencies accomplish the purposes of the law. In addition, under the direction of CEQA, the California Resources Agency has adopted regulations, known as the State CEQA Guidelines, which provide detailed procedures that agencies must follow to implement the law.

An Initial Study/Mitigated Negative Declaration for this project was adopted and filed in December 2007 by WSAFCA to complete the CEQA process for the EIP.

California Endangered Species Act

CESA is similar to the ESA but pertains only to state-listed endangered and threatened species. CESA requires state agencies to consult with DFG when preparing documents under CEQA to ensure that the actions of the state lead agency do not jeopardize the continued existence of listed species. CESA directs agencies to consult with DFG on projects or actions that could affect listed species, directs DFG to determine whether there would be jeopardy to listed species, and allows DFG to identify “reasonable and prudent alternatives” to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if the agency determines that there are “overriding considerations”; however, the agencies are prohibited from approving projects that would cause the extinction of a listed species.

Mitigating impacts on state-listed species involves avoidance, minimization, and compensation (listed in order of preference). Unavoidable impacts on state-listed species are typically addressed in a detailed mitigation plan prepared in accordance with DFG guidelines. DFG exercises authority over mitigation projects involving state-listed species, including those resulting from CEQA mitigation requirements.

CESA prohibits the “take” of plant and wildlife species state-listed as endangered or threatened. DFG may authorize take if there is an approved habitat management plan or management agreement that avoids or compensates for impacts on listed species.

Take of state-listed species or substantial degradation of habitat are not presently anticipated by construction or operation of the project, so specific take authorization is not triggered. Effects on biological resources are discussed in Chapter 3.

Natural Community Conservation Planning Act

The Natural Community Conservation Planning Act (NCCPA) (California Fish and Game Code Section 2800 *et seq.*) was enacted to form a basis for broad-based planning to provide for effective protection and conservation of the state’s wildlife heritage, while continuing to allow appropriate development and growth. The purpose of natural community conservation planning is to sustain and restore those species and their habitat identified by DFG that are necessary to maintain the continued viability of biological communities affected by human changes to the landscape. A Natural Community Conservation Plan (NCCP) identifies and provides for those measures necessary to conserve and manage natural biological diversity within the plan area while allowing compatible use of the land. DFG may authorize the take of any identified species, including listed and non-special-status species, pursuant to Section 2835 of the NCCPA, if the conservation and management of such species is provided for in an NCCP approved by DFG.

Take of state-listed species or substantial degradation of habitat are not presently anticipated by construction or operation of the project, so an NCCP is not triggered. Effects on biological resources are discussed in Chapter 3.

Section 1602 of the California Fish and Game Code

DFG regulates work that will substantially affect resources associated with rivers, streams, and lakes in California, pursuant to Fish and Game Code Sections 1600 to 1607. Any action from a public project that substantially diverts or obstructs the natural flow or changes the bed, channel, or bank of any river, stream, or lake, or uses material from a streambed must be previously authorized by DFG in a lake or streambed alteration agreement under Section 1602 of the Fish and Game Code. This requirement may in some cases apply to any work undertaken within the 100-year floodplain of a body of water or its tributaries, including intermittent streams and desert washes. As a general rule, however, it applies to any work done within the annual high-water mark of a wash, stream, or lake that contains or once contained fish and wildlife, or that supports or once supported riparian vegetation.

A Streambed Alteration Agreement has been issued by DFG to authorize the project under Section 1602.

Porter-Cologne Water Quality Control Act of 1969

In 1967, the Porter-Cologne Act established the State Water Board and nine RWQCBs as the primary state agencies with regulatory authority over California water quality and appropriative surface water rights allocations. Under this act (and the CWA), the state is required to adopt a water quality control policy and WDRs to be implemented by the State Water Board and nine RWQCBs. The State Water Board also establishes Water Quality Control Plans (Basin Plans) and statewide plans. The RWQCBs carry out State Water Board policies and procedures throughout the state.

Basin Plans designate beneficial uses for specific surface water and groundwater resources and establish water quality objectives to protect those uses. The project has the potential to affect water quality in surface water or groundwater within the project area which is governed by the Central Valley RWQCB.

Chapter 3 describes project water quality compliance. No waters regulated under the Porter-Cologne Act would be affected by the EIP.

State and Regional Plan Consistency

Clean Water Act, Section 303(d)

Under CWA Section 303(d), the RWQCB and the State Water Board list water bodies as impaired when not in compliance with designated water quality objectives and standards. A TMDL program must be prepared for waters identified by the state as impaired. A TMDL is a quantitative assessment of a problem that affects water quality. The problem can include the presence of a pollutant, such as a heavy metal or a pesticide, or a change in the physical property of the water, such as DO or temperature. A TMDL specifies the allowable load of pollutants from individual sources to ensure compliance with water quality standards. Once the allowable load and existing source loads have been determined, reductions in allowable loads are allocated to individual pollutant sources.

The EIP would have no effect on TMDL issues for the Sacramento River.

Local Plan Consistency and Regulatory Requirements

In addition to the federal and state regulatory and local plan requirements, the project may be subject to certain zoning or other ordinances and general plans of Yolo County and the City of West Sacramento. For more discussion on local plans and requirements applicable to the project, refer to the Regulatory Setting part of the specific resource sections of interest within this document.

Chapter 6 **Findings**

Based on the information presented in this EA, the proposed action would have no significant adverse effects on the quality of the human environment, and the environmental commitments and other measures proposed in the EA are sufficient to reduce effects to below a level of significance. Based on this EA, a Finding of No Significant Impact (FONSI) will be prepared.

Chapter 7

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Appendix A

**U.S. Fish and Wildlife Service
List of Endangered, Threatened, and
Proposed Species for the
7.5-minute Sacramento West Quadrangle
and Yolo County**

**Federal Endangered and Threatened Species that Occur in
or may be Affected by Projects in the Counties and/or
U.S.G.S. 7 1/2 Minute Quads you requested**

Document Number: 080514090726

Database Last Updated: January 31, 2008

Quad Lists

Listed Species

Invertebrates

- Branchinecta lynchi
 - vernal pool fairy shrimp (T)
- Desmocerus californicus dimorphus
 - valley elderberry longhorn beetle (T)
- Lepidurus packardi
 - vernal pool tadpole shrimp (E)

Fish

- Acipenser medirostris
 - green sturgeon (T) (NMFS)
- Hypomesus transpacificus
 - Critical habitat, delta smelt (X)
 - delta smelt (T)
- Oncorhynchus mykiss
 - Central Valley steelhead (T) (NMFS)
 - Critical habitat, Central Valley steelhead (X) (NMFS)
- Oncorhynchus tshawytscha
 - Central Valley spring-run chinook salmon (T) (NMFS)
 - Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
 - Critical habitat, winter-run chinook salmon (X) (NMFS)
 - winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

- Ambystoma californiense
 - California tiger salamander, central population (T)

- *Rana aurora draytonii*
 - California red-legged frog (T)

Reptiles

- *Thamnophis gigas*
 - giant garter snake (T)

Quads Containing Listed, Proposed or Candidate Species:

SACRAMENTO WEST (513D)

County Lists

Listed Species

Invertebrates

- *Branchinecta conservatio*
 - Conservancy fairy shrimp (E)
- *Branchinecta lynchi*
 - Critical habitat, vernal pool fairy shrimp (X)
 - vernal pool fairy shrimp (T)
- *Desmocerus californicus dimorphus*
 - Critical habitat, valley elderberry longhorn beetle (X)
 - valley elderberry longhorn beetle (T)
- *Elaphrus viridis*
 - delta green ground beetle (T)
- *Lepidurus packardi*
 - Critical habitat, vernal pool tadpole shrimp (X)
 - vernal pool tadpole shrimp (E)

Fish

- *Acipenser medirostris*
 - green sturgeon (T) (NMFS)
- *Hypomesus transpacificus*
 - Critical habitat, delta smelt (X)
 - delta smelt (T)

- *Oncorhynchus mykiss*
 - Central Valley steelhead (T) (NMFS)
 - Critical habitat, Central Valley steelhead (X) (NMFS)
- *Oncorhynchus tshawytscha*
 - Central Valley spring-run chinook salmon (T) (NMFS)
 - Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
 - Critical habitat, winter-run chinook salmon (X) (NMFS)
 - winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

- *Ambystoma californiense*
 - California tiger salamander, central population (T)
 - Critical habitat, CA tiger salamander, central population (X)
- *Rana aurora draytonii*
 - California red-legged frog (T)

Reptiles

- *Thamnophis gigas*
 - giant garter snake (T)

Birds

- *Strix occidentalis caurina*
 - northern spotted owl (T)

Plants

- *Castilleja campestris* ssp. *succulenta*
 - Critical habitat, succulent (=fleshy) owl's-clover (X)
- *Cordylanthus palmatus*
 - palmate-bracted bird's-beak (E)
- *Neostapfia colusana*
 - Colusa grass (T)
 - Critical habitat, Colusa grass (X)
- *Oenothera deltoides* ssp. *howellii*
 - Antioch Dunes evening-primrose (E)

- *Orcuttia tenuis*
 - Critical habitat, slender Orcutt grass (X)
 - slender Orcutt grass (T)
- *Orcuttia viscida*
 - Critical habitat, Sacramento Orcutt grass (X)
 - Sacramento Orcutt grass (E)
- *Tuctoria mucronata*
 - Critical habitat, Solano grass (=Crampton's tuctoria) (X)
 - Solano grass (=Crampton's tuctoria) (E)

Candidate Species

Birds

- *Coccyzus americanus occidentalis*
 - Western yellow-billed cuckoo (C)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the [National Oceanic & Atmospheric Administration Fisheries Service](#). Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, or may be affected by projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online [Inventory of Rare and Endangered Plants](#).

Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the [Guidelines for Conducting and Reporting Botanical Inventories](#). The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal [consultation](#) with the Service.
- During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.
- Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as [critical habitat](#). These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our [critical habitat page](#) for maps.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. [More info](#)

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be August 12, 2008.

Appendix B

Consultation and Coordination

Appendix B

Consultation and Coordination

Coordination and Review of the Draft EA

A public notice, soliciting comments from the public, was published in the City newspaper, The News Ledger, and on the City website. The public notice was also sent to the Union Pacific Railroad (UPRR) and the Sacramento Area Flood Control Agency (SAFCA). The comment period closed on June 9, 2008. No comments from the public or other agencies were received. The project has been coordinated with all relevant government resource agencies including USFWS, NOAA Fisheries, SHPO, DFG, DWR, and the Central Valley Flood Protection Board.

An Initial Study/Mitigated Negative Declaration was completed and adopted for this project on December 3, 2007. The Initial Study/Mitigated Negative Declaration was circulated for a 30-day public review on November 1, 2007. The study discussed improvements to two sites, one of which has been dropped from consideration for the EIP under the proposed action. Those comments relevant to this proposed action, where appropriate, have been incorporated into this document.

PUBLIC NOTICE

Subject: The U.S. Army Corps of Engineers, Sacramento District, (Corps) is evaluating the construction of levee improvements which would result in the modification of a federal levee along the Sacramento River near the I Street Bridge in the City of West Sacramento. This notice is to inform interested parties of the proposed activities and to solicit comments. This notice may also be viewed at the City of West Sacramento's flood protection website at www.westsacfloodingprotection.com.

Authority: This application is being evaluated under 33 U.S.C. Section 408 for modification to a levee that is part of the Sacramento River Flood Control Project.

Applicant: West Sacramento Area Flood Control Agency
POC: Mr. Ken Ruzich
1450 Merkley Avenue, Office No. 4
West Sacramento, CA 95691

Agent: City of West Sacramento
POC: John Powderly, Assistant Planner
1110 West Capitol Avenue
West Sacramento, CA 95691

Location: The project site is located along the right bank of the Sacramento River immediately downstream of the I Street Bridge. The site extends from just south of the I Street Bridge approximately 450 feet southward to the edge of the existing Riverwalk promenade in the City of West Sacramento, County of Yolo, State of California, Section 28, Township 9N, Range 4E, USGS Map West Sacramento MDB&M (see Project Location map attached).

Project Description: The project consists of the construction of approximately 450 linear feet of seepage cutoff wall up to 80 feet deep and 3 feet wide through the center of the levee. To provide a 60 to 80 foot work platform and reduce the risk of hydraulic

fracturing from slurry trench fluids, 1 approximately two-thirds of the levee crown will be degraded. All staging activity and storage of degraded levee material for the project is proposed to take place in an adjacent empty lot vegetated with oak trees and ruderal vegetation on the landside of the levee. This section of the reach is accessible to the public and used to access the Riverwalk promenade.

During construction, certain areas may be temporarily closed to access. Notices will be posted advising the public of these closures. The cutoff wall would be constructed using the conventional slot trench method. This method involves excavating a trench through the levee and subsurface materials, hauling excavated soil to a mixing location where it is mixed with hydrated bentonite and cement, and then returning the cement-bentonite mixture to the levee crown where it is utilized to backfill the trench. This mixture creates an impermeable barrier in the levee.

A D D I T I O N A L INFORMATION

Environmental Setting. The proposed project area is approximately 450 feet of levee along the Sacramento River and an adjacent landside open lot for construction staging purposes in the City of West Sacramento, Yolo County, California. There are four land cover types in the project area: riparian, ruderal annual grassland, developed and bare/undisturbed. Riparian areas contain Fremont cottonwood (*Populus fremontii* spp. fremontii), valley oak (*Quercus lobata*), black willow (*Salix gooddingii*), box elder (*Acer negundo* var. *californicum*), and sandbar willow (*Salix exigua*). The ruderal grassland has a past history of disturbance and supports a high proportion of ruderal species in addition to annual grasses and forbs. Species commonly observed in ruderal annual grassland were foxtail barley (*Hordeum murinum* spp.

leporinum), yellow star-thistle (*Centaurea solstitialis*) prickly lettuce (*Lactuca serriola*), and Italian ryegrass (*Lolium multiflorum*).

Alternatives. The applicant considered the no action alternative and three alternatives to the proposed project. The three alternatives considered levee improvement measures such as seepage berms, sheet pile walls, and interior drains and relief wells along with slope flattening. Criteria applied to consider the alternatives included the availability of funds, scalability of construction, real estate requirements, land use compatibility, permit requirements, environmental and cultural constraints, and integration of multiple objectives.

The proposed project was the most favorable alternative after consideration of all the selection criteria. It was determined to provide the most benefit for the cost, meet multiple objectives, did not require a lot of real estate, was compatible with adjacent land use and had the least environmental and cultural impacts.

Mitigation. The Corps requires that applicants consider and use all reasonable and practical measures to avoid and minimize impacts to biological resources. If the applicant is unable to avoid or minimize all impacts, the Corps and other federal, state, and local agencies shall require compensatory mitigation.

OTHER GOVERNMENTAL AUTHORIZATIONS: A levee encroachment permit authorized by the Central Valley Flood Protection Board, a National Permit Discharge Elimination System permit (NPDES) under Section 402 of the Clean Water Act authorized by the California Central Valley Regional Water Quality Control Board, a Streambed Alteration Agreement authorized by the California Department of Fish and Game, and a tree permit authorized by

the City of West Sacramento. **HISTORIC PROPERTIES:** Preliminary review indicates that no historic properties will be directly affected by the proposed project. The Corps will initiate consultation with the State Historic Preservation Officer under Section 106 of the National Preservation Act, as appropriate.

ENDANGERED SPECIES: The Corps has determined that the project will have no adverse effect on listed species or their critical habitat.

EVALUATING FACTORS: The decision whether to issue a Letter of Permission to alter the federal flood control project will be based on an evaluation of the probable impacts, including cumulative impacts, of the described activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit, which reasonably may be expected to accrue from the described activity, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the described activity will be considered, including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general, the needs and welfare of the people.

The Corps is soliciting comments from the public, Federal, State, and local agencies and officials, Indian tribes, and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the

Corps to determine whether to issue a Letter of Permission to alter the federal flood control project. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

SUBMITTING COMMENTS: Written comments, referencing the "West Sacramento I Street Bridge Levee Project" must be submitted to the office listed below on or before June 9, 2008.

Mr. Brian Buttazoni,
Environmental Manager
U.S. Army Corps of Engineers,
Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Anyone may request, in writing, that a public hearing be held to consider this application. Requests shall specifically state, with particularity, the reason(s) for holding a public hearing. If the Corps determines that the information received in response to this notice is inadequate for thorough evaluation, a public hearing may be warranted. If a public hearing is warranted, interested parties will be notified of the time, date, and location. Please note that all comment letters received are subject to release to the public through the Freedom of Information Act. If you have questions or need additional information please contact the applicant or the Corps' Environmental Manager, Mr. Brian Buttazoni, at 916-557-6956.

Attachments: Project Location Map
May 21

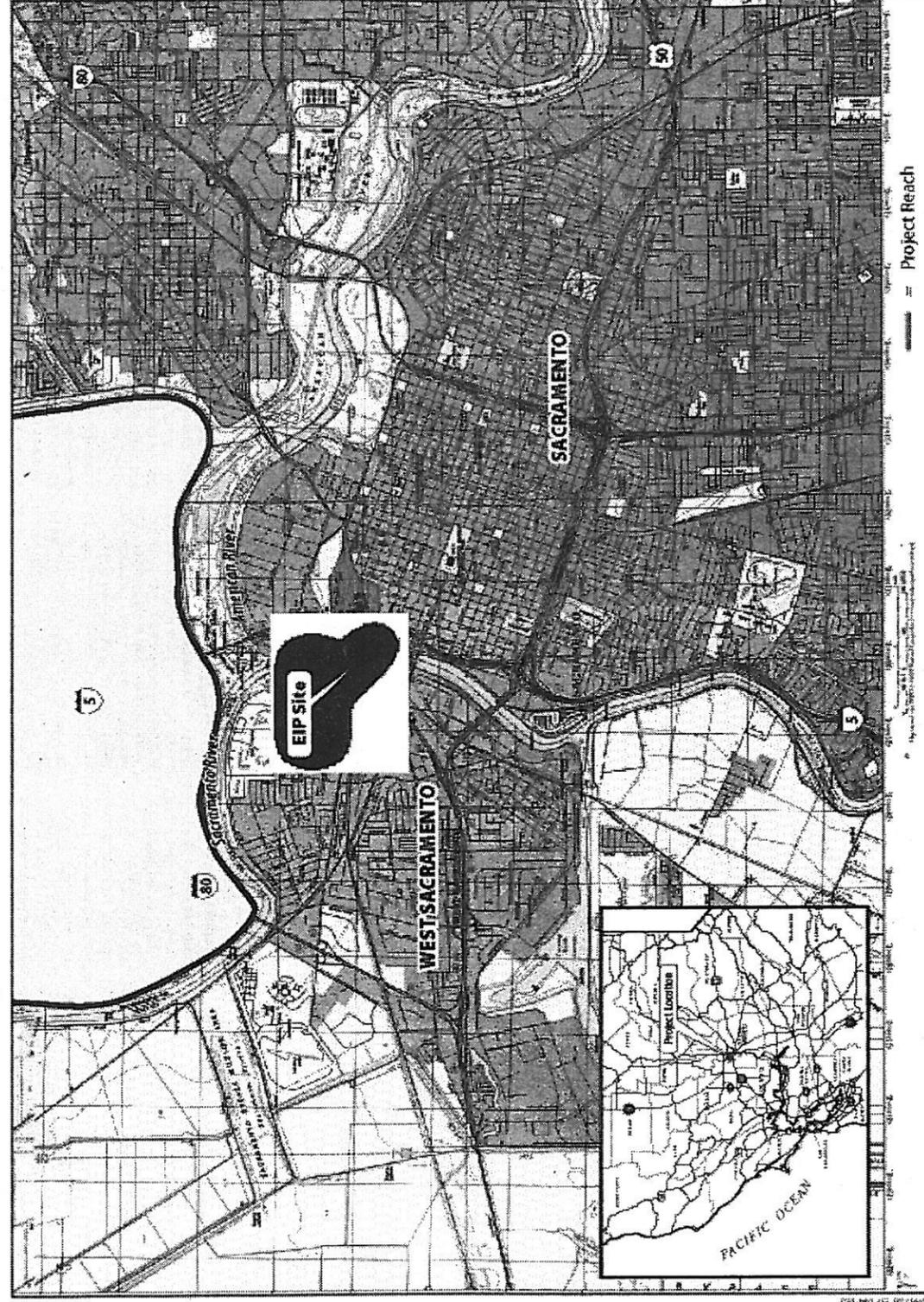
Corps to determine whether to issue a Letter of Permission to alter the federal flood control project. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

SUBMITTING COMMENTS: Written comments, referencing the "West Sacramento I Street Bridge Levee Project" must be submitted to the office listed below on or before June 9, 2008.

Mr. Brian Buttazoni,
Environmental Manager
U.S. Army Corps of Engineers,
Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Anyone may request, in writing, that a public hearing be held to consider this application. Requests shall specifically state, with particularity, the reason(s) for holding a public hearing. If the Corps determines that the information received in response to this notice is inadequate for thorough evaluation, a public hearing may be warranted. If a public hearing is warranted, interested parties will be notified of the time, date, and location. Please note that all comment letters received are subject to release to the public through the Freedom of Information Act. If you have questions or need additional information please contact the applicant or the Corps' Environmental Manager, Mr. Brian Buttazoni, at 916-557-6956.

Attachments: Project Location Map
May 21





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- [US Army Corps Of Engineers' NEPA Environmental Assessment of the West Sacramento Levee Improvement Program Early Implementation Project \(Riverwalk Park, South of I-Street Bridge\)](#)
- [Notice of Availability of a Draft Initial Study with Proposed Mitigated Negative Declaration for the West Capitol Avenue Streetscape and Infrastructure Project.](#)
- [Environmental Impact Analysis for the West Sacramento Levee Improvement Program Early Implementation Project.](#)
- [Final Supplemental Environmental Impact Report to Address a Proposed Amendment to the City General Plan](#)
- [Draft Supplemental Environmental Impact Report to Address a Proposed Amendment to the City General Plan.](#)
- [Notice of Preparation of a Draft Supplemental Environmental Impact Report to Address a Proposed Amendment to the City General Plan.](#)
- [Notice of Preparation of a Draft Program Environmental Impact Report for the West Sacramento Levee Improvements Program.](#)
- [RFQ Indefinite Deliverable/Indefinite Quantity Landscape Architecture Services.](#)
- [MEASURE K BRYTE AREA ROAD REHABILITATION PROJECT - Construction](#)
- [Downtown/Riverfront Streetcar Notice of Preparation](#)
- [Notice of Recirculation of Revisions to River Park Draft Environmental Impact Report](#)
- [Yarbrough Draft Environmental Impact](#)
- [Environmental Impact Report for the South River Road Barge Canal Crossing](#)
- [1600 kilowatt generator set located at the Bryte Bend Water Treatment Plant](#)
- [The City of West Sacramento is accepting bids for landscape maintenance services for Bridgeway Lakes CFD](#)
- [Levee Repair](#)
- [Construction begins on West Sacramento Fire Station #45](#)
- [Asphalt Rubber Cape Seal Informational Flier](#)
- [First Time Homebuyer Education Classes - call 617-4555 for more information.](#)
- [Foster & Adoptive Families are Needed - Please Call 1-530-666-8471](#)
- [Notice- Accepting bids for acquisition and installation of a 1600 kilowatt generator set located at the Bryte Bend Water Treatment Plant](#)

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US Army Corps Of Engineers' NEPA Environmental Assessment of the West Sacramento Levee Improvement Program Early Implementation Project (Riverwalk Park, South of I-Street Bridge) (PDF-60 KB)

Early Implementation Project Map (Riverwalk Park, South of I-Street Bridge) (PDF-2.8 MB)

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MEMORANDUM FOR THE RECORD

April 9, 2008

SUBJECT: I Street, Early Implementation Project, U.S. Fish and Wildlife Service
Informal Consultation

SUMMARY: This letter will serve as the administrative record for the I Street, Early Implementation Project (EIP) for compliance with the Endangered Species Act (ESA) for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB) and the Fish and Wildlife Coordination Act (FWCA).

PROJECT DESCRIPTION: The I Street EIP is located in the City of West Sacramento, along the west bank of the Sacramento River, extending from approximately 20 feet south of the I Street Bridge to 450 feet to the south. The EIP proposes construction of a soil bentonite cutoff (SBC) wall, through and along the centerline of the existing levee. The wall would be constructed via excavation of a slot trench, approximately 3-foot wide and 45-foot deep, backfilled with a slurry mix of water, native soil, and imported bentonite. Along with construction of the wall, mature woody vegetation would be removed and slopes re-graded to comply with current levee standards. To facilitate construction, the levee crown would be partially degraded and restored following wall construction. Staging areas would be on nearby vacant parcels, although there will be tree removal to facilitate access to and from the staging areas. It is anticipated that the work would begin on September 1, 2008 and will last approximately 60-80 days.

CONSULTATION HISTORY: Informal consultation with the U.S. Fish and Wildlife Service (USFWS) has been completed. On March 18 and March 19 project information including maps and a description were provided to Supervisory Fish and Wildlife Biologist Doug Weinrich with the Sacramento Office. A meeting to discuss the project was held on March 20th. Additional information including photographs of the site and blue elderberry shrub were provided to Mr. Weinrich on March 31st.

ESA SECTION 7: One elderberry shrub is located 100 feet north of the project area. The valley elderberry longhorn beetle is a Federally listed threatened species and is associated with the blue elderberry, which serves as an obligate host for the beetle larvae. The Corps has determined that there would be *no effect* on VELB from this project. The blue elderberry is immediately north of the railroad tracks/I Street Bridge. No construction activity or traffic associated with the project will occur in the vicinity of the shrub. For public safety, a temporary fence will be placed immediately south of the railroad tracks/I Street Bridge, thereby containing all construction traffic to south of the tracks.

FWCA: Coordination under the Fish and Wildlife Coordination Act (FWCA) has been completed. FWCA requires Federal agencies to coordinate their activities with USFWS for the conservation of fish and wildlife species. Project information has been provided to USFWS and no recommendations for conservation have been received.

PREPARED BY: Brian L. Buttazoni, Biological Scientist, U.S. Army Corps of Engineers.



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

Environmental Resources Branch

Mr. Rodney I. McInnis
National Marine Fisheries Service
Southwest Regional Administrator
650 Capitol Mall, Suite 8-300
Sacramento, California 95814-4706

Dear Mr. McInnis:

This letter requests concurrence with our determination of “may affect but not likely to adversely effect” for Federally listed threatened green sturgeon (*Acipenser medirostris*), the Central Valley steelhead (*Oncorhynchus mykiss*), the Central Valley spring-run and endangered winter-run chinook salmon (*Oncorhynchus tshawytscha*) for the I Street Levee Improvements, Early Implementation Project (EIP), West Sacramento, California.

The I Street EIP is located in the City of West Sacramento, along the west bank of the Sacramento River. The project site extends from 20 feet south of the I Street Bridge, to 450 feet south of the I Street Bridge. The EIP proposes the construction of a soil bentonite cutoff wall, through and along the centerline of the existing levee. The wall would be constructed via excavation of a slot trench, approximately 3-feet wide and up to 80-feet deep, and would be backfilled with a slurry mix of water, native soil, and imported bentonite. Along with construction of the wall, mature woody vegetation would be removed along the upper bank of the waterside toe and re-graded to comply with current levee standards. To facilitate construction, the levee crown would be partially degraded and restored following wall construction. Staging areas would be on nearby vacant parcels, although there would be some tree removal on the landside toe of the levee to facilitate access. It is anticipated that work would begin on or after August 15, 2008 and would last for 60 to 80 days. Best management practices for erosion control and water quality, and conservation measures for the listed species would be implemented. All work would be completed by November 15, 2008.

The Corps has determined that the project may affect, but is not likely to adversely affect these species due in part to the scope of the project:

- No work will occur in a wet or aquatic environment;
- Work is of limited duration (60-80 days);
 - No trees will be removed within 30 feet of the riverbank;
 - Trees will be removed from the upper banks of the waterside toe of the levee which is necessary to meet current levee standards;

- Trees that will be removed do not contribute to shade for the aquatic environment because several trees are fully or partly dead in part because of mistletoe parasitism and others are of insufficient height to contribute to shade;

Trees that are removed will be compensated for in a mitigation plan including planting of trees immediately along the riverbank.

The following conservation measures will be in place:

- No fill material, including bentonite, will be placed into any waters of the U.S., including wetlands;
- Should any accidental discharge of bentonite slurry occur, all drilling will be halted immediately, on-site clean up will be done and NMFS will be notified immediately. The time, duration, and length of contamination will be recorded and presented to NMFS when a discharge occurs;
- Stockpiling of construction materials, vehicles, equipment and any chemicals will be restricted to the designated construction area, exclusive of any riparian and wetland area;
- Any spill of hazardous materials will be cleaned up immediately and reported to the resource agencies within 24 hours. Any such spills, and the success of the clean up efforts to clean them, will be reported;
- If requested by a resources agency, during or upon completion of construction activities, the Corps biologist will accompany NMFS personnel on an on-site, post-construction inspection tour to review project impacts and revegetation efforts.
- Additional measures as described in the attached contingency plan.

If you need additional information or have questions about the project, please contact Mr. Brian L Buttazoni, Environmental Resources Branch, at (916) 557-6956. Thank you for your coordination on this project.

Sincerely,

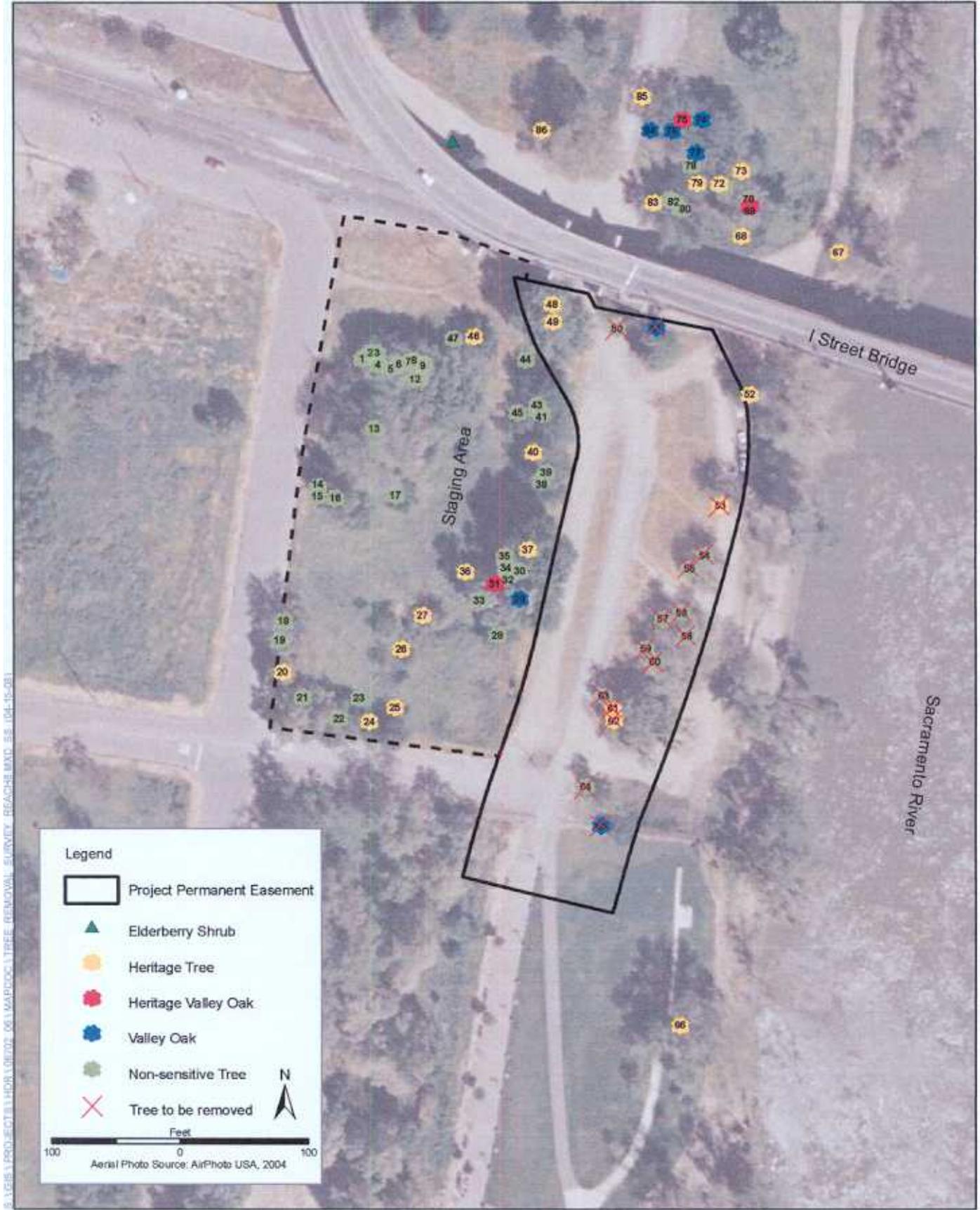


Francis C. Piccola
Chief, Planning Division

Enclosure

Copy Furnished:

Ms. Madelyn Martinez, National Marine Fisheries Service, 650 Capitol Mall, Suite 8-300,
Sacramento, California 95814-4706



City of West Sacramento Early Implementation Project - Waterside Tree Removal

Draft Frac-out Contingency Plan

The contractor will prepare and implement a frac-out contingency plan for any excavation activities that use pressurized drilling fluids (other than water). If the contractor prepares the plan, it will be subject to approval by the U.S. Army of Engineers (Corps) and WSAFCA before excavation can begin. The frac-out plan will include measures intended to minimize the potential for a frac-out associated with excavation and tunneling activities; provide for the timely detection of frac-outs; and ensure an organized, timely, and "minimum-impact" response in the event of a frac-out and release of drilling fluid (i.e., bentonite). The contingency plan will require, at a minimum, the following measures.

A full-time monitor will attend all excavation to look for observable frac-out conditions or lowered pressure readings on drilling equipment.

If a frac-out is identified, all work will stop, including the recycling of drilling fluid. In the event of a frac-out into water, the location and extent of the frac-out will be determined, and the frac-out will be monitored for four hours to determine whether the drilling fluid congeals (bentonite will usually harden, effectively sealing the frac-out location).

NOAA Fisheries, the California Department of Fish and Game (CDFG), and the Regional Water Quality Control Board shall be notified immediately of any spills and shall be consulted regarding clean-up procedures. A brady barrel shall be on-site and used if a frac-out occurs. A vacuum truck and containment materials, such as straw bales, shall also be on-site prior to and during all operations. The site supervisor shall take any necessary follow-up response actions in coordination with agency representatives. The site supervisor will coordinate the mobilization of equipment stored at off-site locations (e.g., vacuum trucks) on an as needed basis.

If the frac-out has reached the surface, any material contaminated with bentonite shall be removed by hand to a depth of 2-feet, contained and properly disposed of, as required by law. The drilling contractor shall be responsible for ensuring that the bentonite is either properly disposed of at an approved Class II disposal facility or properly recycled in an approved manner.

If the drilling fluid congeals, no other actions, such as disturbance of the streambed, will be taken that would potentially suspend sediments in the water column.

The site supervisor shall take any necessary follow-up response actions in coordination with agency representatives. The site supervisor will coordinate the mobilization of equipment stored at off-site locations (e.g., vacuum trucks) on an as needed basis.

The site supervisor has overall responsibility for implementing this FCP. The site supervisor will ensure that a biological monitor is present during and prior to all excavation. The site supervisor shall be notified immediately when a frac-out is detected. The site supervisor will be responsible for ensuring that the biological monitor is aware of the frac-out, coordinating personnel, response, cleanup, regulatory agency notification and coordination to ensure

proper clean-up, disposal of recovered material and timely reporting of the incident. The site supervisor shall ensure all waste materials are properly containerized, labeled, and removed from the site to an approved Class II disposal facility by personnel experienced in the removal, transport and disposal of drilling mud.

The site supervisor shall be familiar with all aspects of the drilling activity, the contents of this Frac-out Contingency Plan and the conditions of approval under which the activity is permitted to take place. The site supervisor shall have the authority to stop work and commit the resources (personnel and equipment) necessary to implement this plan. The site supervisor shall assure that a copy of this plan is available (onsite) and accessible to all construction personnel. The site supervisor shall ensure that all workers are properly trained and familiar with the necessary procedures for response to a frac-out, prior to commencement of drilling operations.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

June 4, 2008

In response refer to:
2008/02656

Mr. Francis C. Piccola
Chief, Planning Division
U.S. Army Corps of Engineers
1325 J Street, Suite 1480
Sacramento, California 95814

Dear Mr. Piccola:

This is in response your letter of April 23, 2008, requesting NOAA's National Marine Fisheries Service's (NMFS) concurrence on the U.S. Army Corps of Engineers' (Corps) proposal for the I Street Levee Improvements, Early Implementation Project (EIP), located in West Sacramento, California. You have determined the proposed project may affect, but is not likely to adversely affect Federally listed threatened Central Valley steelhead (*Oncorhynchus mykiss*), endangered Sacramento River winter-run Chinook salmon (*O. tshawytscha*), threatened Central Valley spring-run Chinook salmon (*O. tshawytscha*), their designated critical habitat, and the threatened Southern Distinct Population Segment of North American green sturgeon (*Acipenser medirostris*).

The proposed I Street Levee Improvement EIP is located in the City of West Sacramento, along the right bank of the Sacramento River at river mile 59.5. The project site extends from approximately 20 feet south of the I Street bridge, to 450 feet south of the I Street bridge, and from the levee crown to approximately 30 feet from the river edge. The Corps proposes the construction of a slurry wall via excavation of a slot trench, approximately 3 feet wide and up to 80 feet deep, through and along the center line of the levee, followed by back filling of the slot trench with a slurry mix of water, native soil, and imported bentonite. Along with construction of the wall, mature woody vegetation would be removed along the upper banks of the levee waterside to comply with current Corps levee standards. Approximately 14 of 86 trees in the project area would be removed. No trees located along the waterside toe of the levee, that provide shaded riverine habitat, would be removed. Best Management Practices (BMPs) for erosion control and water quality would be implemented during construction and conservation measures would be incorporated into the project plans and designs to minimize impacts to listed species. Additional conservation measures include the development (and if necessary the implementation) of a frac-out contingency plan which would require halting the project should a frac-out occur in the Sacramento River, and immediately reporting to NMFS within 24 hours of the incident. Construction activities are anticipated to begin August 15, 2008, and last for 60 to 80 days. All work would be completed by November 15, 2008.



Endangered Species Act (ESA) Section 7 Consultation

NMFS has received the information necessary to initiate consultation on the proposed project. Based on our review of the material provided with your request, two emails received on March 7 and May 14, 2008, a site visit on April 8, 2008, and the best scientific and commercial information currently available, NMFS concurs that the proposed I Street Levee Improvement EIP is not likely to adversely affect Central Valley steelhead, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, their designated critical habitat, or North American green sturgeon. NMFS has determined that the potential effects to listed species from the proposed activities would be discountable and insignificant. NMFS reached this determination for the following reasons: (1) Construction activities would occur between August 15 and November 15, when listed salmon, steelhead, and green sturgeon are least likely to occur within the action area; (2) the majority of construction activities would occur on the crown of the levee, well away from the river's edge; (3) the trees designated for removal are on the upper slopes of the levee where they do not provide shaded riverine habitat, and would not provide recruitment of future instream woody material for refugia habitat; (4) BMPs and conservation measures would be implemented to prevent sedimentation and turbidity during the project activities; and (5) additional conservation measures such as providing a contingency plan for a frac-out, halting the construction activities should a frac-out occurs, and immediately reporting to NMFS within 24 hours of the incident would be implemented.

This concludes ESA section 7 consultation for the proposed action. This concurrence does not provide incidental take authorization pursuant to section 7(b)(4) and section 7(o)(2) of the ESA. Reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered; or (3) a new species is listed or critical habitat designated that may be affected by the action.

Essential Fish Habitat (EFH) Consultation

With regards to EFH consultation, your office has determined that the I street Bridge Levee Improvement EIP will have no adverse effect to Essential Fish Habitat for Central Valley fall/late-fall-run Chinook salmon (*O. tshawytscha*), since most of the work would be on the levee crown. Thus, EFH consultation is not necessary.

Please contact Madelyn T. Martinez at (916) 930-3605, or via e-mail at Madelyn.Martinez@noaa.gov, if you have any questions concerning this project, or require additional information.

Sincerely,


for Rodney R. McInnis
Regional Administrator

cc: NMFS-PRD, Long Beach, CA

Copy to file: ARN 14122SWR2008SA00162

Brian L. Buttazoni, Environmental Resource Branch, U.S. Army Corps of Engineers, 1325 J Street, Sacramento, California 95814-2922.

Doug Weinrich, Jennifer Hobbs, and Stephanie Rickabaugh, USFWS, 2800 Cottage Way, Sacramento, CA 95825

Gary Hobgood, CDFG, 1701 Nimbus Road, Suite A, Rancho Cordova, CA 95670



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

March 19, 2008

Regulatory Division (SPK-2008-00205)

Ken Ruzich
West Sacramento Area Flood Control Agency
1420 Merkley Avenue, Office #4
West Sacramento, California 95691

Dear Ruzich:

We are responding to your consultant's request for an approved jurisdictional determination for the West Sacramento Early Implementation I Street Bridge Site project. This approximately 1.425-acre site is located in Township 9 North, Range 4 East, MDB&M, Latitude 38° 35' 10.53" North, Longitude 121° 30' 23.84" West, City of West Sacramento, Yolo County, California.

Based on available information, we concur there are no waters of the United States, including wetlands, as depicted on the March 18, 2008 *Figure 1 City of West Sacramento Early Implementation Project Plan View for the I Street Bridge Site* drawing prepared by Jones and Stokes. This jurisdictional determination is only for the 1.425-acre site identified as the I Street Bridge site.

Other Federal, State, and local laws may apply to your activities. In particular, you may need authorization from the U.S Army Corps of Engineers through Section 408, as well as the U.S. Fish and Wildlife Service, National Marine Fisheries Service, California State Water Resources Control Board and/or the California Department of Fish and Game.

This verification is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331.

A Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form is enclosed. If you request to appeal this determination you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPDPDS-O, 1455 Market Street, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been

received by the Division Office within 60 days of the NAP. Should you decide to submit an RFA form, it must be received at the above address by 60 days from the date of this letter. It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This determination has been conducted to identify the limits of Corps of Engineers' Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please complete our customer survey at http://www.spk.usace.army.mil/customer_survey.html. Your passcode is "conigliaro".

Please refer to identification number SPK-2008-00205 in any correspondence concerning this project. If you have any questions, please contact Marc Fugler at our California South Branch, 1325 J Street, Room 1480, Sacramento, California 95814, email marc.a.fugler@usace.army.mil, or telephone 916-557-5255. You may also use our website: www.spk.usace.army.mil/regulatory.html.

Sincerely,

Original Signed

Kathleen A. Dadey, Ph.D.
Chief, California South Branch

Enclosure(s)

Copy furnished without enclosure(s):

✓ Chris Elliot, Jones and Stokes, 2600 V Street, Sacramento, California 95818
Eric Nagy, HDR, 2365 Iron Point Road, Suite 300, Folsom, California 95630



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
1325 J STREET
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

Environmental Resources Branch

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer
California Department of Parks and Recreation
Office of Historic Preservation
P.O. Box 942896
Sacramento, California 94296-0001

Dear Mr. Donaldson:

The Sacramento District, U.S. Army Corps of Engineers (Corps) is writing with regard to an application from the City of West Sacramento for permission to modify a 530-foot long section of levee pursuant to Section 408 of the Rivers and Harbors Act of 1899. This letter refers to the City of West Sacramento's Early Implementation Project (EIP) on the Sacramento River. The Corps is initiating consultation to ensure that the proposed permit action is in compliance with Section 106 of the National Historic Preservation Act of 1966 as amended. We are writing pursuant to 36 CFR 800.3 establishment of the undertaking, 800.4(a) determination and documentation of the area of potential effects (APE), 800.4(b) identification of historic properties, and 800.4 (d)(1) no historic properties affected. We are requesting your concurrence with our determinations of eligibility, and no historic properties affected.

West Sacramento Area Flood Control Agency (WSAFCA), the project applicant, is proposing to improve flood protection of properties within the city limits and RD 900 service area by improving the levee along the Sacramento River levee in the city of West Sacramento, Yolo County (enclosure 1). The proposed levee improvement is compatible with and complementary to an overall program called the West Sacramento Levee Improvements Program (WSLIP)

The APE is on the Sacramento West, 1992 7.5 Minute U.S.G.S. Topographic quadrangle map. The precise location is directly south of the I Street Bridge in an unsectioned location, T 9N, R 4E. The trench will be three-feet-wide on the levee top. The vacant lot that lies between the levee and 2nd street on the west will be used as a staging area for the construction equipment. Access to the project area will be from D Street.

To address under- and through-seepage concerns, a 450-foot slurry cutoff wall is proposed as the treatment for the project reach. The site extends along the right bank of the Sacramento River, 530 feet southward of the I Street Bridge to the edge of the current northern limit of the Riverwalk. The construction trench will be 450 feet long at the bottom and 530 feet long on top. The extra 80 feet is due to the arc of the excavator arm. The levee at the project site was constructed primarily by dredging and piling materials from the adjacent Sacramento River.

Thus, there is little to no compaction of the soil and the composition of the embankment fill is not suitable as levee material under current standards.

All staging activity and storage of equipment and materials would take place on adjacent undeveloped lots, presently vegetated with a mix of trees and ruderal plants on the landside of the levee west of 2nd Street. A slurry cutoff wall up to 45 feet deep by 3 feet wide would be constructed using the conventional slot trench method; i.e., a trench would be excavated through the levee and subsurface materials and then backfilled with low-permeability materials to decrease seepage potential.

The WSAFCA contracted the professional services of ICF Jones & Stokes to conduct the cultural resources inventory of the APE. The resulting report entitled "Cultural Resources Inventory Report for the City of West Sacramento Early Implementation Project" documents the results of their records and literature search and field survey (enclosure 2). The inventory included a records search at the North Central Information Center of the California Historical Resources Information System, outreach to Native Americans, historic map research, literature review, and a pedestrian survey. The pedestrian survey covered the entire length of the project.

The only recorded resource in or near the APE is the I Street Bridge, and, although not formally recorded, the Sacramento Levee is considered a cultural resource. Additionally, isolated abandoned concrete foundation fragments were noted at the toe of the levee just south of the I Street Bridge. No known prehistoric resources are located within the APE.

The Sacramento Levee and the isolated foundation fragments near the I Street Bridge are the only known resources within the APE. The I Street Bridge is directly north of the APE and will not be involved in or affected by the project activities. The isolated foundation fragments are considered to have no integrity and therefore are not considered a significant resource for purposes of Section 106. Additionally, these foundations should not be affected by the project because only tree removal activities are anticipated in this location. Finally, the levee is probably associated with an important historical theme (Sacramento Valley Flood Control Plan adopted in 1911) and is an integral component of the Sacramento Valley; however, the portion of levee within the project site has sustained a substantial loss of integrity. Both the historical setting of the levee segment lacks integrity as well as the structure of the levee that has been considerably altered since the original construction. The levee has not been formally recorded and assigned a trinomial at this time. The project is an advance repair of a section of the levee that will eventually undergo complete repair as part of the Sacramento River Bank Protection project. The levee will be recorded and evaluated in its entirety at that time.

The proposed action improves the structural integrity of the levee and therefore could be considered important to its continued existence. Inasmuch as the levee segment had not been recorded it has been very well documented in the enclosed report. We have reviewed the report

supplied by ICF Jones & Stokes and concluded that no historic properties would be affected by approving this project. Following our review of the documentation regarding the lack of integrity of the levee segment; the small, crumbling remnant of a block foundation; and the negative nature of the records search and the field survey, we have determined that pursuant to 36 CFR 800.4(d)(1), the EIP project as planned will have no effect on historic properties.

We request that you review the enclosed documentation and concur with our determination and documentation of the APE, establishment of a federal undertaking, and our determination of no historic properties affected. If you have any questions please contact, Mr. Richard Perry, Archeologist, at (916) 557-5218, or email at Richard.m.perry@usace.army.mil.

Sincerely,



 Frances C. Piccola
Chief, Planning Division

Enclosures

**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**

P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov



July 15, 2008

In Reply Refer To: COE080617A

Francis C. Piccola
Chief, Planning Division
Department of the Army
U.S. Army Engineer District, Sacramento
1325 J Street
Sacramento, California 95814

Re: Application from the City of West Sacramento for Permission to Modify a 530-foot Section of Sacramento River Levee, Yolo County, California.

Dear Mr. Piccola:

Thank you for submitting to our office, your letter and supporting documentation regarding the undertaking noted above. The U.S. Army Corps of Engineers (COE), Sacramento District, is seeking my concurrence on the effects that the proposed project will have on historic properties, pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act (NHPA). The proposed undertaking is subject to the granting of permission by the COE pursuant to Section 408 of the Rivers and Harbors Act of 1899. Accordingly, the COE has identified this action as an undertaking subject to review under Section 106 of the NHPA.

Under the proposal by the West Sacramento Area Flood Control Agency (WSAFCA), a trench three-feet in width with a maximum depth of 45-feet will be excavated along center top of the 530-foot section of levee, which is located on the west bank of the Sacramento River in Yolo County. This trench will be filled with slurry to create a percolation/seepage cutoff wall. The levee section in the project location was constructed primarily by dredging and piling materials from the Sacramento River. The COE has determined that the Area of Potential Effects consists of the 530-foot section of levee to be affected and a staging location on a vacant lot located south of the I Street Bridge. In addition to your letter of June 16, 2008, you have submitted the following report as evidence of your efforts to identify and evaluate historic properties in the project APE.

- *Cultural Resources Inventory and Evaluation Report for the City of West Sacramento Early Implementation Project, Yolo County, California* (ICF Jones & Stokes: June 2008).

Regarding the nearby presence of the I Street Bridge, I concur that this project will not affect the appearance of the levee section and will have no visual impact to the

viewshed of this historic property. Regarding the concrete rubble and foundation remnants noted in the project APE, I concur that these will not be affected by the proposed undertaking.

The COE has however, as stated in your letter of June 17, 2008, found that this levee section is not eligible for the NRHP and has proposed a finding of No Historic Properties Affected. I cannot concur with either your NRHP eligibility determination or your finding of effect due to the insufficient documentation and assessment of the subject levee section, and the absence of a comprehensive NRHP district assessment of the levee and reclamation elements of the central California Delta and the associated river systems. This is one of the largest reclamation/flood control systems in the United States, large portions of which may merit NRHP eligibility as an historic district.

In the absence of such a study, an informal policy has been negotiated between my office and the agencies (Department of Water Resources; U.S. Army Engineer District, Sacramento; and the Bureau of Reclamation) involved in emergency levee repairs in the Sacramento/San Joaquin Delta and river systems to treat undertakings such as the current project. Consistent with that policy, the COE has agreed, in phone contacts and emails between Richard Perry of your staff and William Soule of my staff, to treat the Sacramento River levee section involved in this project as eligible (criterion A) for the National Register of Historic Places for the purposes of the undertaking, and to propose a finding of No Adverse Effect.

Based upon the COE's acceptance of this strategy, I have no objection to your finding of No Adverse Effect. Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the COE may have additional future responsibilities for this undertaking under 36 CFR Part 800.

Thank you for seeking my comments and for considering historic properties in planning your project. If you require further information, please contact William Soule, Associate State Archeologist at phone 916-654-4614 or email wsoule@parks.ca.gov.

Sincerely,

Susan K Shattor for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer



DEPARTMENT OF FISH AND GAME

North Central Region

1701 Nimbus Road, Suite A

Rancho Cordova, CA 95670

(916) 358-2900



“NOTICE OF DETERMINATION”

The Department will file a Notice of Determination for your project. The Notice will be filed with the Office of Planning and Research, as required by CEQA. The Department's compliance with CEQA may be legally challenged for 35 days following the filing of the Notice of Determination.

This completes the Department's agreement process. You may proceed with your project according to the terms and provisions of your Streambed Alteration Agreement if you have obtained all other permits required from local, other State, and Federal agencies.

(12/01/03)

Conserving California's Wildlife Since 1870

AGREEMENT REGARDING PROPOSED STREAM ALTERATION

THIS AGREEMENT, entered into between the State of California, Department of Fish and Game, hereinafter called the Department, and West Sacramento Area Flood Control Agency of West Sacramento, State of California, hereafter called WSAFCA, is as follows:

WHEREAS, pursuant to California Fish and Game Code, Section 1602, WSAFCA, on January 30, 2008, notified the Department that he intends to substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed of, the following water: Sacramento River (including the Sacramento Bypass), in the County of Yolo, State of California, Section 28, Township 9N, Range 4E, USGS Map West Sacramento MDB&M.

WHEREAS, the Department, represented by Gary Hobgood, has determined that such operations may substantially adversely affect existing fish and wildlife resources including: giant garter snake (*Thamnophis couchi gigas*); valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*); Cooper's hawk (*Accipiter cooperii*); Swainson's hawk (*Buteo swainsoni*); white-tailed kite (*Elanus leucurus*); Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*); Central Valley spring-run Chinook salmon (*O. tshawytscha*); fall-/late fall-run Chinook salmon (*O. tshawytscha*); Central Valley steelhead (*O. mykiss*); green sturgeon (*Acipenser medirostris*), Sacramento splittail (*Pogonichthys macrolepidotus*), bank swallow (*Riparia riparia*), warm water fish species, amphibians, and other aquatic and terrestrial plant and wildlife species.

THEREFORE, the Department hereby proposes measures to protect fish and wildlife during WSAFCA's work. WSAFCA hereby agrees to accept the following recommendations as part of his work:

Project Description: To address under- and through-seepage concerns at two sites along the Sacramento Bypass levee and Sacramento River in the City of West Sacramento, two treatments are being proposed. These treatments consist of seepage cutoff wall and relief well construction. Seepage cutoff wall construction is proposed at CHP Academy site and construction of seepage walls that may include relief wells is proposed at I Street Bridge site.

The CHP Academy Site is located on the eastern portion of the Sacramento Bypass levee. The Sacramento Bypass is located on the northwestern boundary of the city. The entire Sacramento Bypass Levee is a well-defined levee that has recently had improvements completed on portions of the levee. The improvements included an addition of soil cement slope protection along the Sacramento Bypass and construction of a seepage cutoff wall through the western portion of the levee. The proposed treatment area within Sacramento Bypass Levee is roughly 3,000 feet in length, extending from the Sacramento Weir in a westerly direction toward the Yolo Bypass. The treatment proposed for the Sacramento Bypass levee consists of a seepage cutoff wall up to 80 feet deep through the waterside section of the crown. The treatment would overlap with the existing seepage cutoff wall and create a continuous seepage cutoff wall through the length of the Sacramento Bypass levee. Two staging areas used for storage of construction equipment and temporary storage of soil material excavated from the crown of the levee would be located within the bypass. A band of riparian vegetation is located within the bypass at the eastern end of the project.

The I Street Bridge Site is located in West Sacramento immediately down stream of the I Street Bridge. This levee reach extends along the right bank of the Sacramento River just north of the I Street Bridge 2,000 feet southward to the edge of the Riverwalk promenade. The treatment proposed for I Street Bridge Site would consist of the construction of a seepage cutoff wall up to 80

feet deep. The treatment may also include the construction of relief wells. All staging activity and storage of degraded levee material for I Street Bridge Site is proposed to take place in an adjacent empty lot vegetated with oak trees and ruderal vegetation on the landside of the levee. Oak trees and ruderal grassland vegetation are located on both sides of the levee at the I Street Bridge Site. This section of the reach is accessible to the public and used to access the Riverwalk promenade.

Stream Zone Defined: The stream zone is that portion of the stream channel that restricts lateral movement of water. For this project, the stream zone is delineated as the area on the water side of the water side hinge-point of the levee.

1. The notification, together with all supporting documents submitted with the notification, including the **Mitigation and Monitoring Plan—City of West Sacramento Levee Improvement Early Implementation Project** and the supplemental material submitted to the Department on January 25, 2008, are hereby incorporated into this agreement to describe the location and features of the proposed project. WSAFCA agrees that all work shall be done as described in the notification and supporting documents, incorporating all project modifications, wildlife resource protection features, mitigation measures, and provisions as described in this agreement. Where apparent conflicts exist between the notification and the provisions listed in this agreement, WSAFCA shall comply with the provisions listed in this agreement. WSAFCA further agrees to notify the Department of any modifications made to the project plans submitted to the Department. At the discretion of the Department, this agreement will be amended to accommodate modifications to the project plans submitted to the Department and/or new project activities. Please see the current fee schedule to determine the appropriate amendment fee.
2. Documents, plans, surveys, notifications, and requests pertaining to this project or required by this agreement may be sent via email to Gary Hobgood at ghobgood@dfg.ca.gov or delivered to the Department of Fish and Game at 1701 Nimbus Road, Suite A, Rancho Cordova, CA 95670. Refer to Notification Number 1600-2007-0415-R2 when submitting documents to the Department.
3. The time period for completing the work within the stream zone of Sacramento River and the Sacramento Bypass shall be restricted to periods of low stream flow and shall be confined to the period of May 1 to October 31. Construction activities shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities within the stream zone shall cease until all reasonable erosion control measures, inside and outside of the stream zone, have been implemented prior to all storm events. Revegetation, restoration and erosion control work is not confined to this time period.
4. If WSAFCA finds more time is needed to complete the authorized activity, WSAFCA shall submit a written request for a work period time extension to the Department. The work period extension request shall provide the following information: 1) Describe the extent of work already completed; 2) Provide specific detail of the activities that remain to be completed within the stream zone; and 3) Detail the actual time required to complete each of the remaining activities within the stream zone. The work period extension request should consider the effects of increased stream conditions, rain delays, increased erosion control measures, limited access due to saturated soil conditions, and limited growth of erosion control grasses due to cool weather. Time extensions are issued at the discretion of the Department. The Department will review the written request to work beyond the established

work period. The Department will have ten calendar days to approve the proposed work period extension. The Department reserves the right to require additional measures designed to protect natural resources.

5. WSAFCA is responsible for obtaining all required permits and authorizations from local, state and federal agencies. WSAFCA shall notify the Department where conflicts exist between the provisions of this agreement and those imposed by other regulatory agencies. Unless otherwise notified, WSAFCA shall comply with the provision that offers the greatest protection to water quality, species of special concern and/or critical habitat.
6. A copy of this agreement shall be provided to the Contractor(s) who works within the stream zone of this project. A copy of this agreement and a copy of the original notification, including the project description, as submitted to the Department, must be available upon request at the work site. The Contractor(s) shall sign this agreement prior to working within the stream zone. The Contractor(s) or a designated crew supervisor(s) shall be on site the entire time a work crew is working near the stream zone. The supervisor(s) shall be completely familiar with the terms and conditions of this agreement and shall ensure compliance with all terms and conditions. The Department reserves the right to enter the project site at any time to ensure that there is compliance with the terms/conditions of this Agreement.
7. WSAFCA shall notify the Department within two working days of beginning work within the stream zone of Sacramento River and the Sacramento Bypass. In addition, WSAFCA/Contractor shall notify the Department within two working days of the completion of work within the stream zone on this project. Notification shall be submitted to the Department as instructed in item number 2 above.
8. Work within the flowing portion of the stream is not allowed without written authorization from the Department.
9. It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by the Fish and Game Code. No trees that contain active nests of birds shall be disturbed until all eggs have hatched and young birds have fledged without prior consultation and approval of a Department representative. It is recommended that the trees that are identified for removal, be removed during the non-nesting period of August 15 to February 15. If tree removal must occur during the period of February 16 and August 14, a qualified biologist shall conduct a pre-construction survey for bird nests or nesting activity in the project area. If any active nests or nesting behaviors are found, the Department must be notified prior to further action. WSAFCA may be required to create exclusion zones of 75 to 1500 feet depending on the species observed. The exclusion zone must be maintained until birds have fledged or nest is abandoned. Surveys required in the **Mitigation and Monitoring Plan—City of West Sacramento Levee Improvement Early Implementation Project** shall be submitted to the Department as instructed in item number 2 above. The survey results shall be provided to the Department prior to removing any trees.
10. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Except for the vegetation specifically identified for trimming and/or removal in the notification, no native trees with a trunk diameter at breast height (DBH) in excess of four (4) inches shall be removed or damaged without prior consultation and approval of a Department representative. Using hand tools (clippers, chain saw, etc.), trees may be trimmed to the

extent necessary to gain access to the work sites. All cleared material/vegetation shall be removed out of the riparian/stream zone.

11. Precautions to minimize turbidity/siltation shall be taken into account during project planning and implementation. This may require the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass to downstream reaches. Passage of sediment beyond the sediment barrier(s) is prohibited. If any sediment barrier fails to retain sediment, corrective measures shall be taken. The sediment barrier(s) shall be maintained in good operating condition throughout the construction period and the following rainy season. Maintenance includes, but is not limited to, removal of accumulated silt and/or replacement of damaged silt fencing, coir logs, coir rolls, and/or straw bale dikes. WSAFCA is responsible for the removal of non-biodegradable silt barriers (such as plastic silt fencing) after the disturbed areas have been stabilized with erosion control vegetation (usually after the first growing season). Upon Department determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation shall be halted until effective Department approved control devices are installed or abatement procedures are initiated.
12. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake by WSAFCA or any party working under contract or with the permission of WSAFCA, shall be removed immediately. The Department shall be notified immediately by WSAFCA of any spills and shall be consulted regarding clean-up procedures.
13. During construction, the contractor shall not dump any litter or construction debris within the stream zone. All construction debris and associated materials shall be removed from the work site upon completion of this project.
14. To mitigate for impacts to riparian woodlands, a restoration plan shall be prepared. The restoration plan should include the planting of riparian trees shrubs at suitable sites near the project sites. To the extent practical, riparian mitigation shall be done along and/or near the project site. The compensation ratio shall be 2:1 (2 acres created or enhanced for every 1 acre removed). When all on-site mitigation is not feasible, WSAFCA shall acquire mitigation credits at a Department approved mitigation bank, a Department approved compensation site or other Department approved mitigation strategy. The restoration plan shall include: a description and map of the site, including the soil type and existing vegetation; the species to be planted and/or seeded; a description of the extent and method of irrigation; specifications for site preparation and installation of plant materials; specifications and schedule for installation, including amount and application method of fertilizers; and specifications for a success criteria and the corrective actions recommended or to be taken when mitigation measures do not meet the proposed success criteria. Work within the stream zone shall not begin until the revegetation plan has been approved by the Department and/or the "bill of sale" from the purchase of mitigation credits or other evidence of compensation has been received and approved by the Department.
15. All exposed/disturbed areas and access points within the stream zone left barren of vegetation

as a result of the construction activities shall be restored using locally native grass seeds, locally native grass plugs and/or a mix of quick growing sterile non-native grass with locally native grass seeds. Seeded areas shall be covered with broadcast straw and/or jute netting (monofilament erosion blankets are not authorized).

16. This agreement is not valid and work may not begin until the agreement is signed by a representative of the Department of Fish & Game. Stream alteration work authorized by this agreement expires on December 31, 2012. This agreement shall remain in effect for that time necessary to satisfy all required mitigation and monitoring measures.
17. Requests for Extensions (agreement renewal), Minor Amendments, and Major Amendments must be submitted in writing prior to expiration of the agreement or commencement of work on modified project plans. Extensions and Amendments are issued at the discretion of the Department. Please see the current fee schedule to determine the appropriate fee.
18. The Department may take enforcement action and reserves the right to suspend and/or revoke this agreement if the Department determines that the circumstances warrant. The circumstances that could require these Department actions include, but are not limited to, the following: A) Failure to comply with the terms/conditions of this agreement. B) The information provided by WSAFCA in support of the agreement/notification is determined by the Department to be incomplete, or inaccurate. C) When new information becomes available to the Department representative(s) that was not known when preparing the original terms/conditions of this agreement. D) The project as described in the notification, agreement, or amendment has changed, or conditions affecting fish and wildlife resources change.
19. If, in the opinion of the Department, conditions arise or change in such a manner as to be considered deleterious to aquatic life, operations shall cease until corrective measures are taken.
20. It is understood that the Department enters into this agreement for purposes of establishing protective features for fish and wildlife, in the event that a project is implemented. The decision to proceed with the project is the sole responsibility of WSAFCA, and is not required by this agreement. It is agreed that all liability and/or incurred costs related to or arising out of WSAFCA's project and the fish and wildlife protective conditions of this agreement, remain the sole responsibility of WSAFCA. WSAFCA agrees to hold harmless and defend the State of California and the Department of Fish and Game against any related claim made by any party or parties for personal injury or other damage.

SIGNATURE PAGE

WSAFCA, as designated by the signature on this agreement, shall be responsible for the execution of all elements of this agreement. A copy of this agreement must be provided to contractor and subcontractors and must be in their possession at the work site.

Failure to comply with the provisions of this agreement and with other pertinent Code Sections, including but not limited to Fish and Game Code Sections 5650, 5652 and 5948, may result in prosecution.

Nothing in this agreement authorizes WSAFCA to trespass on any land or property, nor does it relieve WSAFCA of responsibility for compliance with applicable federal, state, or local laws or ordinances.

This agreement is not valid and work may not begin until the agreement is signed by a representative of the Department of Fish & Game.

WSAFCA
Representative: 
Kenneth A. Ruzich, Manager, WSAFCA
Please print and sign name

Date February 27, 2008

Contractor: _____ Date _____

Title: _____

Company: _____

Department
Representative:  Date 2/28/08
Sandra Morey, Regional Manager